IBM TotalStorage Enterprise Storage Server

Configuration Planner for Open-Systems Hosts

SC26-7477-05

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Note:
Before using this information and the product it supports, read the information under “Safety and environmental notices” on page xi and “Notices” on page 311.

Sixth Edition (May 2004)

This edition replaces SC26-7477-04.

Contents

Tables

Safety and environmental notices

This chapter contains information about:

- Safety notices that are used in this guide
- Environmental notices for this product

Safety notices

To find the translated text for a danger or caution notice:

1. Look for the identification number at the end of each danger notice or each caution notice. In the following examples, the numbers **1000** and **1001** are the identification numbers.

   DANGER

   A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

   1000

   CAUTION:
   A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

   1001

2. Find the number that matches in the *IBM TotalStorage Safety Notices*, GC26-7229.

Environmental notices

This section identifies the environmental guidelines that pertain to this product.

Product recycling

This unit contains recyclable materials. Recycle these materials at your local recycling sites. Recycle the materials according to local regulations. In some areas, IBM provides a product take-back program that ensures proper handling of the product. Contact your IBM representative for more information.

Disposing of products

This unit might contain batteries. Remove and discard these batteries, or recycle them, according to local regulations.

About this book

This publication provides information about configuring the storage of an IBM® TotalStorage® Enterprise Storage Server® (ESS). It gives examples of the open-systems configuration work sheets that you and the IBM service support representative (SSR) need to complete to plan the initial logical configuration of the ESS. The work sheets are located on an IBM internal Web site. The SSR uses these work sheets and the instructions in this planner to implement the required logical configuration.

For S/390® and zSeries® configuration information and work sheets, see the *IBM TotalStorage Enterprise Storage Server: Configuration Planner for S/390 and IBM @server zSeries Hosts*.

Disclaimer: The configuration processes described in this document do not support feature code 9904, Reserve SSA Loops. Logical configurations that involve feature code 9904 use a custom configuration process. Feature code 9904 uses a Define Disk Groups work sheet version that accommodates the number of installed 2105 and 7133 drawer disk groups. For assistance with this process, contact your IBM representative. The ESS Models 750 and 800 do not support feature code 9904.

Who should use this guide

This publication is for IBM service personnel, storage administrators, system programmers, and performance and capacity analysts.

Conventions used in this publication

This section describes style conventions, terminology, or presentation techniques that are used in this publication.

References

References in this publication to S/390 implicitly include the @server zSeries.

Because an array consists of a pack of eight disk drive modules (DDMs), it is also referred to as an eight pack or a disk eight pack in this publication.

Array formats

In discussions in this publication of redundant array of independent disks (RAID), the following conventions are used to show the formats of the arrays:

6 + P + S (RAID 5)
The number 6 represents the number of DDMs in the array that have data. The letter P represents the parity striped across the drives. Parity takes one DDM of storage. The S represents the spare DDM.

7 + P (RAID 5)
The number 7 represents the number of DDMs in the array that have data. The letter P represents the parity striped across the drives. Parity takes one DDM of storage. There are no spares in this array.

3 x 2 + 2S (RAID 10)
The number 3 represents the number of DDMs mirrored (x 2) to a second set of three DDMs in the array. The 2S represents two spare DDMs in the array.

4 x 2 (RAID 10)
The number 4 represents the number of DDMs that are mirrored (x 2) to a second set of four DDMs in the array. There are no spares in this array.

Typefaces

The following typefaces are used to show emphasis in this publication:

boldface Text in **boldface** represents menu items and lowercase or mixed-case command names.

italics Text in *italics* is used to emphasize a word.

`monospace` Text in `monospace` identifies the data or commands that you type, samples of command output, or examples of program code or messages from the system.

Related information

The tables in this section list and describe the following publications:

- The publications that make up the IBM® TotalStorage™ Enterprise Storage Server™ (ESS) library
- Other IBM publications that relate to the ESS
- Non-IBM publications that relate to the ESS

See "Ordering IBM publications" on page xxii for information about how to order publications in the IBM TotalStorage ESS publication library. See "How to send your comments" on page xxiv for information about how to send comments about the publications.

ESS library

The following customer publications make up the ESS library. Unless otherwise noted, these publications are available in Adobe portable document format (PDF) on a compact disc (CD) that comes with the ESS. If you need additional copies of this CD, the order number is SK2T-8803. These publications are also available as PDF files by clicking on the **Documentation link** on the following ESS Web site:

http://www-1.ibm.com/servers/storage/support/disk/2105.html

See "IBM publications center" on page xxii for information about ordering these and other IBM publications.

Title	Description	Order Number
IBM TotalStorage Enterprise Storage Server: Command-Line Interface User's Guide	This guide describes the commands that you can use from the ESS Copy Services command-line interface (CLI) for managing your ESS configuration and Copy Services relationships. The CLI application provides a set of commands that you can use to write customized scripts for a host system. The scripts initiate predefined tasks in an ESS Copy Services server application. You can use the CLI commands to indirectly control peer-to-peer remote copy and FlashCopy® configuration tasks within an ESS Copy Services server group.	SC26-7494 (See Note.)
IBM TotalStorage Enterprise Storage Server: Configuration Planner for Open-Systems Hosts	This guide provides guidelines and work sheets for planning the logical configuration of an ESS that attaches to open-systems hosts.	SC26-7477 (See Note.)

Title	Description	Order Number
IBM TotalStorage Enterprise Storage Server: Configuration Planner for S/390 and IBM @server zSeries Hosts	This guide provides guidelines and work sheets for planning the logical configuration of an ESS that attaches to either the IBM S/390® and IBM @server zSeries host system.	SC26-7476 (See Note.)
IBM TotalStorage Enterprise Storage Server: Host Systems Attachment Guide	This guide provides guidelines for attaching the ESS to your host system and for migrating to fibre-channel attachment from either a small computer system interface or from the IBM SAN Data Gateway.	SC26-7446 (See Note.)
IBM 2105 TotalStorage Enterprise Storage Server: DFSMS Software Support Reference	This publication provides an overview of the ESS and highlights its unique capabilities. It also describes Data Facility Storage Management Subsystems (DFSMS) software support for the ESS, including support for large volumes.	SC26-7440 (See Note.)
IBM TotalStorage Enterprise Storage Server: Introduction and Planning Guide	This guide introduces the ESS product and lists the features you can order. It also provides guidelines for planning the installation and configuration of the ESS.	GC26-7444
IBM TotalStorage Enterprise Storage Server: Quick Configuration Guide	This booklet provides flow charts for using the TotalStorage Enterprise Storage Server Specialist (ESS Specialist). The flow charts provide a high-level view of the tasks that the IBM service support representative performs during initial logical configuration. You can also use the flow charts for tasks that you might perform when you are modifying the logical configuration.	SC26-7354
IBM TotalStorage Enterprise Storage Server: System/390® Command Reference	This publication describes the functions of the ESS and provides reference information, such as channel commands, sense bytes, and error recovery procedures for IBM S/390 and zSeries hosts.	SC26-7298
IBM TotalStorage Storage Solutions Safety Notices	This publication provides translations of the danger notices and caution notices that IBM uses in ESS publications.	GC26-7229
IBM TotalStorage Enterprise Storage Server: SCSI Command Reference	This publication describes the functions of the ESS. It provides reference information, such as channel commands, sense bytes, and error recovery procedures for UNIX®, IBM Application System/400® (AS/400®), and @server iSeries™ 400 hosts.	SC26-7297
Subsystem Device Driver User's Guide for TotalStorage Enterprise Storage Server and IBM TotalStorage SAN Volume Controller	This publication describes how to use the IBM Subsystem Device Driver (SDD) on open-systems hosts to enhance performance and availability on the ESS. SDD creates redundant paths for shared logical unit numbers. SDD permits applications to run without interruption when path errors occur. It balances the workload across paths, and it transparently integrates with applications.	SC26-7540
IBM TotalStorage Enterprise Storage Server: User's Guide	This guide provides instructions for setting up and operating the ESS and for analyzing problems.	SC26-7445 (See Note.)
IBM TotalStorage Enterprise Storage Server: Web Interface User's Guide	This guide provides instructions for using the two ESS Web interfaces, ESS Specialist and ESS Copy Services.	SC26-7448 (See Note.)

Title	Description	Order Number
The IBM TotalStorage Common Interface Model Agent Installation and Configuration Guide	This guide introduces the common interface model (CIM) concept and provides instructions for installing and configuring the CIM Agent. The CIM Agent acts as an open-system standards interpreter, allowing other CIM-compliant storage resource management applications (IBM and non-IBM) to interoperate with each other.	GC35-0485
IBM TotalStorage Enterprise Storage Server Application Programming Interface Reference	This publication provides reference information for the IBM TotalStorage Enterprise Storage Server (ESS) application programming interface (API) and provides instructions for installing the Common Information Model Agent, which implements the ESS API.	GC35-0489
Note: No hardcopy book is produced for this publication. However, a PDF file is available from the following Web site: http://www-1.ibm.com/servers/storage/support/disk//2105.html		

Other IBM publications

Other IBM publications contain additional information that is related to the ESS. The following list is divided into categories to help you find publications that are related to specific topics. Some of the publications are listed under more than one category. See “IBM publications center” on page xxii for information about ordering these and other IBM publications.

Title	Description	Order Number
Data-copy services		
z/OS DFSMS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, ShapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428
DFSMS/MVS V1: Remote Copy Guide and Reference	This publication provides guidelines for using remote copy functions with S/390 and zSeries hosts.	SC35-0169
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the ESS and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the ESS.	SG24-5465
Implementing Copy Services 0n S/390	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on an ESS that is attached to an S/390 or zSeries host system. Copy Services functions include peer-to-peer remote copy, extended remote copy, FlashCopy®, and concurrent copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment.	SG24-5680

Title	Description	Order Number
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure ESS Copy Services on UNIX, Windows NT®, Windows 2000, Sun Solaris, HP-UX, Tru64, OpenVMS, and iSeries host systems. The Copy Services functions that are described include peer-to-peer remote copy and FlashCopy. This publication describes the functions and shows you how to implement them into your environment. It also shows you how to implement these functions in a high-availability cluster multiprocessing environment.	SG24-5757
Fibre channel		
Fibre Channel Connection (FICON) I/O Interface: Physical Layer	This publication provides information about the fiber-channel I/O interface. This book is also available as a PDF file from the following Web site: www.ibm.com/servers/resourcelink/	SA24-7172
Fibre-channel Subsystem Installation Guide	This publication tells you how to attach the IBM xSeries™ 430 and NUMA-Q® host systems with fibre-channel adapters to the ESS. Contact your sales representative to obtain this publication.	No order number
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234
IBM SAN Fibre Channel Managed Hub: 3534 Service Guide	This guide explains how to convert the IBM SAN Fibre Channel Managed Hub from a Fibre-Channel Arbitrated Loop (FC-AL) configuration to a fabric-capable switched environment.	SY27–7616
IBM SAN Fibre Channel Managed Hub: 3534 User's Guide	This guide provides an overview of the product and discusses available features and upgrades. It also tells you how to install the hub, how to manage and monitor it using zoning, and how to manage it remotely. It also tells you how to use the IBM 3534 SAN Fibre Channel Managed Hub TotalStorage ESS Specialist.	GC26-7391
IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide	This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08.	SC26-7350
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol.	SC26-7349
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the ESS. It provides you with a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment. This book also describes the steps required to migrate to direct fibre-channel attachment from native SCSI adapters and from fibre-channel attachment through the SAN Data Gateway.	SG24-6113
Open-systems hosts		

Title	Description	Order Number
ESA/390: ESCON I/O Interface	This publication provides a description of the physical and logical ESA/390 I/O interface and the protocols that govern information transfer over that interface. It is intended for designers of programs and equipment associated with the ESCON I/O interface and for service personnel who maintain that equipment. However, anyone concerned with the functional details of the ESCON I/O interface can find it useful.	SA22-7202
ESS Solutions for Open Systems Storage: Compaq AlphaServer, HP, and Sun	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure the ESS when you attach Compaq AlphaServer (running Tru64 UNIX), HP, and Sun hosts. This book does not cover Compaq AlphaServer that is running the OpenVMS operating system. This book also focuses on the settings that are required to give optimal performance and on the settings for device driver levels. This book is for the experienced UNIX professional who has a broad understanding of storage concepts.	SG24-6119
Fibre-channel Subsystem Installation Guide	This publication tells you how to attach the IBM xSeries 430 and NUMA-Q host systems with fibre-channel adapters to the ESS. Contact your sales representative to obtain this publication.	No order number
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure ESS Copy Services on UNIX, Windows NT, or Windows 2000 host systems. The Copy Services functions that are described include peer-to-peer remote copy and FlashCopy. This publication describes the functions and shows you how to implement them into your environment. It also shows you how to implement these functions in a high-availability cluster multiprocessing environment.	SG24-5757
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the ESS. It gives you a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment. This book also describes the steps that are required to migrate to direct fibre-channel attachment from native SCSI adapters and from fibre-channel attachment through the SAN Data Gateway.	SG24-6113
S/390 and zSeries hosts		
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product that are used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	GC35-0033
z/OS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, SnapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428
DFSMS/MVS V1: Remote Copy Guide and Reference	This publication provides guidelines for using remote copy functions with S/390 and zSeries hosts.	SC35-0169

Title	Description	Order Number
ESA/390: ESCON I/O Interface	This publication provides a description of the physical and logical ESA/390 I/O interface and the protocols that govern information transfer over that interface. It is intended for designers of programs and equipment associated with the ESCON I/O interface and for service personnel who maintain that equipment. However, anyone concerned with the functional details of the ESCON I/O interface will find it useful.	SA22-7202
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234
Implementing ESS Copy Services on S/390	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on an ESS that is attached to an S/390 or zSeries host system. Copy Services functions include Peer-to-Peer Remote Copy, Extended Remote Copy, FlashCopy, and Concurrent Copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment.	SG24-5680
ES/9000, ES/3090: IOCP User Guide Volume A04	This publication describes the Input/Output Configuration Program that supports the Enterprise Systems Connection (ESCON) architecture. It describes how to define, install, and configure the channels or channel paths, control units, and I/O devices on the ES/9000 processors and the IBM ES/3090 Processor Complex.	GC38-0097
IOCP User's Guide, IBM @server zSeries 800 and 900	This publication describes the Input/Output Configuration Program that supports the zSeries 800 and 900 servers. This publication is available in PDF format by accessing ResourceLink at the following Web site: www.ibm.com/servers/resourcelink/	SB10-7029
IOCP User's Guide, IBM @server zSeries	This publication describes the Input/Output Configuration Program that supports the zSeries server. This publication is available in PDF format by accessing ResourceLink at the following Web site: www.ibm.com/servers/resourcelink/	SB10-7037
S/390: Input/Output Configuration Program User's Guide and ESCON Channel-to-Channel Reference	This publication describes the Input/Output Configuration Program that supports ESCON architecture and the ESCON multiple image facility.	GC38-0401
IBM z/OS Hardware Configuration Definition User's Guide	This guide provides conceptual and procedural information to help you use the z/OS Hardware Configuration Definition (HCD) application. It also explains: • How to migrate existing IOCP/MVSCP definitions • How to use HCD to dynamically activate a new configuration • How to resolve problems in conjunction with MVS/ESA HCD	SC33-7988
OS/390: Hardware Configuration Definition User's Guide	This guide provides detailed information about the input/output definition file and about how to configure parallel access volumes. This guide discusses how to use Hardware Configuration Definition for both OS/390® and z/OS V1R1.	SC28-1848
OS/390 V2R10.0: MVS System Messages Volume 1 (ABA - ASA)	This publication lists OS/390 MVS™ system messages ABA to ASA.	GC28-1784

Title	Description	Order Number
Using IBM 3390 Direct Access Storage in a VM Environment	This publication provides device-specific information for the various models of the 3390 and describes methods you can use to manage storage efficiently using the VM operating system. It provides guidance on managing system performance, availability, and space through effective use of the direct access storage subsystem.	GG26-4575
Using IBM 3390 Direct Access Storage in a VSE Environment	This publication helps you use the 3390 in a VSE environment. It includes planning information for adding new 3390 units and instructions for installing devices, migrating data, and performing ongoing storage management activities.	GC26-4576
Using IBM 3390 Direct Access Storage in an MVS Environment	This publication helps you use the 3390 in an MVS environment. It includes device-specific information for the various models of the 3390 and illustrates techniques for more efficient storage management. It also offers guidance on managing system performance, availability, and space utilization through effective use of the direct access storage subsystem.	GC26-4574
z/Architecture Principles of Operation	This publication provides a detailed definition of the z/Architecture™. It is written as a reference for use primarily by assembler language programmers and describes each function at the level of detail needed to prepare an assembler language program that relies on a particular function. However, anyone concerned with the functional details of z/Architecture will find this publication useful.	SA22-7832
SAN		
IBM OS/390 Hardware Configuration Definition User's Guide	This guide explains how to use the Hardware Configuration Data application to perform the following tasks: • Define new hardware configurations • View and modify existing hardware configurations • Activate configurations • Query supported hardware • Maintain input/output definition files (IODFs) • Compare two IODFs or compare an IODF with an actual configuration • Print reports of configurations • Create graphical reports of a configuration • Migrate existing configuration data	SC28-1848
IBM SAN Fibre Channel Managed Hub: 3534 Service Guide	This guide explains how to convert the IBM SAN Fibre Channel Managed Hub from a Fibre-Channel Arbitrated Loop (FC-AL) configuration to a fabric-capable switched environment.	SY27–7616
IBM SAN Fibre Channel Managed Hub: 3534 User's Guide	This guide provides an overview of the product and discussed the features and upgrades available. It also tells you how to install the hub, how to manage and monitor it using zoning, and how to manage it remotely. It also tells you how to use the IBM 3534 SAN Fibre Channel Managed Hub TotalStorage ESS Specialist.	GC26-7391
IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide	This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08.	SC26-7350
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol (SNMP).	SC26-7349

Title	Description	Order Number
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the ESS. It provides you with a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment. This book also describes the steps required to migrate to direct fibre-channel attachment from native SCSI adapters and from fibre-channel attachment through the SAN Data Gateway.	SG24-6113
Seascape family		
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the ESS and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the ESS.	SG24-5465
IBM Enterprise Storage Server Performance Monitoring and Tuning Guide	This guide, from the IBM International Technical Support Organization, provides guidance on the best way to configure, monitor, and manage your ESS to ensure optimum performance.	SG24-5656
IBM Versatile Storage Server: Introduction and Planning Guide	This publication introduces the IBM Versatile Storage Server™ and lists the features you can order. It also provides planning information for both 2105 Models B09 and 100.	GC26-7223
Implementing the IBM Enterprise Storage Server in Your Environment	This publication, from the IBM International Technical Support Organization, can help you install, tailor, and configure the ESS in your environment.	SG24-5420
Storage management		
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	GC35-0033
IBM TotalStorage Solutions Handbook	This handbook, from the IBM International Technical Support Organization, helps you understand what makes up enterprise storage management. The concepts include the key technologies that you must know and the IBM subsystems, software, and solutions that are available today. It also provides guidelines for implementing various enterprise storage administration tasks so that you can establish your own enterprise storage management environment.	SG24-5250
IBM TotalStorage Expert: Hands-On Usage Guide	This guide, from the IBM International Technical Support Organization, helps you install, tailor, configure, and use TotalStorage ESS Expert.	SG24-6102
IBM TotalStorage Expert Installation Guide	This guide helps you install the IBM TotalStorage Expert (formerly the IBM StorWatch Expert) program. The IBM TotalStorage Expert provides asset, capacity, and performance management information for disk and tape storage systems.	GC26-7436

Title	Description	Order Number
Using IBM 3390 Direct Access Storage in a VM Environment	This publication provides device-specific information for the various models of the 3390 and describes methods that you can use to manage storage efficiently using the VM operating system. It provides guidance for managing system performance, availability, and space through effective use of the direct access storage subsystem.	GG26-4575
Using IBM 3390 Direct Access Storage in a VSE Environment	This publication helps you use the 3390 in a VSE environment. It includes planning information for adding new 3390 units and instructions for installing devices, migrating data, and performing ongoing storage management activities.	GC26-4576
Using IBM 3390 Direct Access Storage in an MVS Environment	This publication helps you use the 3390 in an MVS environment. It includes device-specific information for the various models of the 3390 and illustrates techniques for more efficient storage management. It also offers guidance for managing system performance, availability, and space use through effective use of the direct access storage subsystem.	GC26-4574

Ordering IBM publications

This section tells you how to order copies of IBM publications and how to set up a profile to receive notifications about new or changed publications.

IBM publications center

The publications center is a worldwide central repository for IBM product publications and marketing material.

The IBM publications center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download free of charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM publications center through the following Web site:

www.ibm.com/shop/publications/order/

Publications notification system

The IBM publications center Web site offers you a notification system for IBM publications. Register and you can create your own profile of publications that interest you. The publications notification system sends you a daily e-mail that contains information about new or revised publications that are based on your profile.

If you want to subscribe, you can access the publications notification system from the IBM publications center at the following Web site:

www.ibm.com/shop/publications/order/

Non-IBM publications

Other related publications are not available through IBM ordering systems. To order them, contact the sales representative at the branch office in your locality.

Title	Description
Quick Start Guide: An Example with Network File System (NFS)	This guide tells you how to configure the Veritas Cluster Server. See also the companion document, *Veritas Cluster Server User's Guide*.

Title	Description
Veritas Cluster Server Installation Guide	This guide tells you how to install the Veritas Cluster Server. See also the companion document, *Veritas Cluster Server Release Notes*.
Veritas Cluster Server Release Notes	These release notes tell you how to install the Veritas Cluster Server. See also the companion document, *Veritas Cluster Server Installation Guide*.
Veritas Cluster Server User's Guide	This guide tells you how to configure the Veritas Cluster Server. See also the companion document, *Quick Start Guide: An Example with Network File System (NFS)*.
Veritas Volume Manager Hardware Notes	These hardware notes tell you how to implement multiple paths dynamically.
Veritas Volume Manager Installation Guide	This guide tells you how to install VxVM.
Veritas Volume Manager Storage Administrators Guide	This guide tells you how to administer and configure the disk volume groups.

Web sites

The following Web sites provide information about the ESS and other IBM storage products.

Type of Storage Information	Web Site
Concurrent Copy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
Enterprise Storage Server (ESS)	http://www.storage.ibm.com/disk/ess/index.html?/ess.htm
ESS Copy Services command-line interface (CLI)	http://www-1.ibm.com/servers/storage/support/software/cscli.html
ESS publications	http://www-1.ibm.com/servers/storage/support/disk/2105.html Click **Documentation**.
FlashCopy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
Host system models, operating systems, and adapters that the ESS supports	http://www-1.ibm.com/servers/storage/support/disk/2105.html Click **Interoperability matrix**.
IBM storage products	http://www.storage.ibm.com/
IBM version of the Java (JRE) that is often required for IBM products	http://www-106.ibm.com/developerworks/java/jdk/
Multiple Device Manager (MDM)	http://www.ibm.com/servers/storage/support/ Click **Storage Virtualization**.
NUMA-Q host systems	http://publib.boulder.ibm.com/xseries/
PPRC for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/
SAN fibre channel switches	http://www.ibm.com/storage/fcswitch/
Storage Area Network Gateway and Router	http://www-1.ibm.com/servers/storage/support/san/index.html?
Subsystem Device Driver (SDD)	http://www-1.ibm.com/servers/storage/support/software/sdd.html
TotalStorage Expert	http://www-1.ibm.com/servers/storage/support/software/swexpert.html

Type of Storage Information	Web Site
XRC for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/

How to send your comments

Your feedback is important to help us provide the highest quality information. If you have any comments about this book or any other ESS documentation, you can submit them in one of the following ways:

- e-mail

  Submit your comments electronically to the following e-mail address:

  starpubs@us.ibm.com

  Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

- Mail

  Fill out the Readers' Comments form (RCF) at the back of this book. Return it by mail or give it to an IBM representative. If the RCF has been removed, you can address your comments to:

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Summary of Changes

This document contains maintenance and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change. This summary of changes describes new functions that have been added to this release.

Summary of Changes for SC26-7477-05 IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts

This document contains information previously presented in the *IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts*, SC26-7477-04.

The following sections summarize the changes to that information.

New Information

This edition includes the following new information:

- Support for ESS Model 750.

Summary of Changes for SC26-7477-04 IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts

This document contains information previously presented in the *IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts*, SC26-7477-03.

The following sections summarize the changes to that information.

New Information

This edition includes the following new information:

- Support for the arrays across loops feature
- Support for new LUN sizes

Deleted information

This edition includes the following deleted information:

- Work sheets that support the ESS Model 800 Batch Configuration Tool were removed from Appendix A. The Batch Configuration Tool is no longer supported for the ESS Model 800.

Summary of Changes for SC26-7477-03 IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts

This document contains information previously presented in the *IBM TotalStorage Enterprise Storage Server Configuration Planner for Open-Systems Hosts*, SC26-7477-02.

The following sections summarize the changes to that information.

New Information

This edition includes the following new information:

- Support for Windows Server 2003 operating system.

Chapter 1. ESS introduction and overview

This chapter includes the following information about the IBM® TotalStorage™ Enterprise Storage Server™ (ESS):

- ESS introduction
- ESS configuration overview
- ESS architecture

ESS introduction

The ESS is a high-performance, disk storage server. The ESS conforms to the IBM Seascape® architecture and provides a reliable, powerful, modular physical platform that a variety of system architectures can access. The versatility of the ESS makes configuration planning important to ensure that your performance and capacity needs are met.

The ESS models support the following disk drive module (DDM) sizes:

- Models E10 and E20 support 9.1-, 18.2-, and 36.4-GB DDMs.

  Note: 9.1-GB DDMs are no longer available.
- Models F10 and F20 support 9.1-, 18.2-, 36.4-, and 72.8-GB DDMs.
- Model 750 supports 72.8- and 145.6-GB DDMs (10 000 rpm drives only).
- Model 800 supports 18.2-, 36.4-, 72.8-, and 145.6-GB DDMs.

Note: Models E10, E20, F10, and F20 are no longer available from the factory. Models 750 and 800 supersede Models E20 and F20. This publication includes information about Models E10, E20, F10 and F20 for those models that are currently in the field. IBM will continue to support these models.

ESS models F20 and 800, with an expansion enclosure, can provide the following data storage capacity:[1]

- With 18.2-GB homogeneous DDMs, the maximum capacity is 7.06 TB.
- With 36.4-GB homogeneous DDMs, the maximum capacity is 14.13 TB.
- With 72.8-GB homogeneous DDMs, the maximum capacity is 28.26 TB.
- With 145.6-GB homogeneous DDMs, the Model 800 supports a maximum capacity of 56.52 TB. (Support of the 145.6-GB DDMs requires an ESS LIC level of 2.1.0 or later.)

The large-capacity DDMs, in conjunction with DDM intermix support, provide an almost unlimited number of configuration options.

ESS configuration overview

Your ESS is manufactured with a standard physical configuration that meets most performance requirements. You, with guidance from your IBM service support representative (SSR), determine the logical configuration to meet your specific needs. A given ESS can be configured to support multiple operating systems when

1. Storage capacity refers to raw data storage capacity of the DDMs. The actual usable data storage capacity will be less than the raw data storage capacity, due to the storage capacity that is consumed by RAID parity, storage facility metadata, and by spare DDM allocations.

required. Many users configure the ESS to support a single environment, such as a multiplatform UNIX® storage server or an S/390® storage server.

The ESS provides a set of standard logical configurations that are built-in for many applications. In some cases, if the standard configurations do not satisfy your specific needs, the full flexibility of the product is available using the IBM TotalStorage Enterprise Storage Server Specialist (ESS Specialist) to provide a specific product configuration.

This document helps you complete a set of work sheets that will organize the information that your SSR needs to configure the ESS. Completion of these work sheets provides the following data:

- Names and types of host systems, such as RS/6000®, AS/400®, or S/390
- Amount of storage capacity each host system requires
- General information about your environment

ESS architecture

When planning an ESS configuration, it is important to understand some basic concepts about how the server is constructed and the relationship between an ESS and the attached host systems. This section describes how data flows using Enterprise Systems Connection Architecture® (ESCON®), fibre connection (FICON™), small computer system interface (SCSI), and fibre-channel features.

The ESS fibre-channel adapter is configured for one of two connection topologies. The point-to-point topology supports the SCSI to fibre-channel protocol (SCSI-FCP) or the FICON protocol. The fibre channel-arbitrated loop (FC-AL) topology supports the SCSI-FCP communications protocol. An ESS fibre-channel host adapter (HA) supports both SCSI-FCP and FICON protocols.

The host adapter attaches the ESS to a host system. You can install the adapters to support any combination of ESCON, SCSI, or fibre-channel connections. The ESCON and SCSI adapters provide two ports (interfaces). The fibre-channel adapter provides a single port. A total of 16 adapters can be installed, providing a total of up to 32 ports.

The host adapter can access either of two clusters installed in independent bays using the common-parts interconnect capability. The clusters use a symmetric multiprocessor to coordinate data transfer and perform advanced functions between the host adapters and device adapters. Each cluster includes cache and nonvolatile storage.

Cache stores frequently accessed data and makes it quickly available. Similarly, nonvolatile storage together with cache storage improves performance of write operations and provides data integrity in the event of an unplanned loss of power to the cluster.

The SSA device adapters connect the disk drive modules (DDMs) to the clusters in a serial loop of up to six arrays. An ESS contains eight device adapters, which are installed in pairs, four in each cluster. Each device adapter pair supports one or two serial loops.

Arrays are composed of a group of eight DDMs that store data within the ESS. DDMs are installed in pairs of disk eight packs. Each pair must be attached to the same loop. Within a DDM eight pack, all the disk drives are the same capacity and speed, and can contain 9.1-, 18.2-, 36.4-, 72.8-, or 145.6-GB DDMs.

Chapter 2. RAID overview

The ESS supports RAID implementation on the device adapters. With RAID implementation, the ESS offers fault-tolerant data storage.

An ESS disk group consists of eight disk drives. The ESS supports groups of disk drive modules (DDMs) in a RAID-5, a RAID-10, or non-RAID implementation. For a RAID implementation, DDM capacity and speed intermix are supported.

ESS Models E10, E20, F10 and F20 support RAID-5 and non-RAID disk groups. Models 750 and 800 support RAID-5 and RAID-10 implementation.

RAID-5 implementation

RAID 5 is a method of spreading volume data plus data parity across multiple disk drives. The ESS supports RAID-5 implementation on all models.

RAID 5 provides faster performance than non-RAID by striping data across a defined set of DDMs. Data protection is provided by data parity, which is stored on the same set of DDMs.

Because the ESS requires that a loop have two spare disk drives, the first two RAID-5 disk groups must consist of six DDMs for data, one DDM for parity, and one spare. If a RAID disk group has already created the spares, subsequent disk groups on the same loop could stripe data plus data parity across all eight DDMs in a set.

RAID-10 implementation

RAID-10 implementation provides data mirroring from one DDM to another DDM. RAID 10 is supported only on the ESS Models 750 and 800.

RAID-10 stripes data across half of the disk drives in the RAID-10 disk group. The other half of the array mirrors the first set of disk drives.

Because the ESS requires that a loop have two spare disk drives, the first RAID-10 disk group must consist of six DDMs, with the data on three DDMs mirrored to the other three DDMs, and two spares. If a RAID disk group has already created the spares, subsequent disk groups on the same loop could have eight DDMs, with the data on four DDMs mirrored to the other four DDMs.

RAID 10 offers faster destage of writes than RAID 5 because it does not need to manage parity. However, with half of the DDMs in the group used for data and the other half for mirrored data, RAID-10 disk groups have less capacity than RAID-5 disk groups.

You can reconfigure RAID-5 as RAID-10 or vice versa. The only requirement is that there is a sufficient number of spare DDMs following reconfiguration. See the *IBM TotalStorage Enterprise Storage Server: Web Interface User's Guide* for more information.

Arrays across loops feature

The ESS supports the arrays across loops feature on open-systems, S/390, and zSeries hosts. This feature allows configuration of arrays across loops on 2105 Model 800 only. Disk arrays are spread across the loops of an SSA device adapter to optimize single array performance. For RAID 10, the arrays across loops feature provides mirroring across two loops, preventing loss of the array during loop failure. For more information about the arrays across loops feature, see the *IBM TotalStorage Enterprise Storage Server: Introduction and Planning Guide*.

Chapter 3. Planning the capacity and performance of your ESS

This chapter provides guidelines to help you plan the configuration of your ESS for optimal capacity and performance. The guidelines are intended to work in most situations. However, they are not absolute nor are they applicable to all situations. You might find the guidelines useful in the absence of specific information about your application workloads.

If you need additional help planning your configuration, contact your field technical support specialist (FTSS) who can conduct modeling of your application with the Disk Magic tool. This tool provides information about how different workloads and ESS configurations affect performance.

Determining the number of SCSI ports

If you know how many megabytes per second (MB per second) of data transfer are required to meet your application needs, you can determine the correct number of ports by assuming the following sustained throughput capabilities per port:

- 30 MB per second per Ultra-SCSI port
- 15 MB per second per SCSI Fast-Wide port

See Table 1 on page 8 to determine the number of SCSI host adapters to order depending on the number of disk packs you need.

Note: The Model 750 does not support SCSI host adapters.

Table 1. Number of Host adapters based on raw storage capacity

Disk Packs	Capacity (GB)	Disks Size (GB)	Arrays	Minimum Number of Host Adapters
8	420	9	8	8
16	840	9	16	16
4 - 8	840	18	8	8
10 - 12	1050	18	10	12
14 - 48	1470 - 5600	18	14 - 48	16
4	840	36	4	8
6	1260	36	6	12
8	1680 - 11200	36	8 - 48	16
4	1680 - 9240	72	4	8
6	2520 - 21000	72	6	12
8	3360 - 22400	72	8 - 48	16
4	3360 - 22400	145	4	8
6	5040 - 42000	145	6	12
8	6720 - 44800	145	8 - 48	16

Determining the number of fibre-channel ports

The maximum bandwidth capability of the fibre-channel architecture is 200 megabytes per second (MB per second) for full-duplex mode for a total of 400® MB per second. This bandwidth is applicable for attached hosts that support this transfer rate. However, you should never plan the workload based on these maximum bandwidths. The throughputs also vary based on the type of application, specific adapter, and host attachment. If you have little or no information about the exact performance requirements of the application, you must estimate the number of ports required. The following guidelines might help with these estimates:

- For an ESS configured entirely for open-systems attachment, four fibre-channel ports are usually adequate to handle most workloads and applications. Most online transaction processing, file serving, and standard applications fall into this category. This assumes that the workload is well balanced across the ports. If some of the ports have little activity while others are busy, then you need to plan for more ports.
- For some high-bandwidth applications in open-systems environments, more ports could be necessary. For example, business intelligence applications that rely on massive parallel-database scans that need all available bandwidth could require as many as eight fibre-channel ports. In this case, you might need to install two adapters in each of the four I/O bays.
- If the fibre-channel ports attach to both open systems that use SCSI-FCP protocol and S/390 or zSeries systems that use the FICON protocol, plan for an adequate number of fibre-channel ports to access both types of data. Plan to connect and configure one set of fibre-channel ports for SCSI-FCP access and another set of ports for FICON access.
- In some cases, you might not be planning to use the full ESS capacity for accessibility from fibre-channel attached hosts. For example, you might be mixing SCSI and ESCON attachments with your fibre-channel host attachments. In this case, base the number of fibre-channel ports on the amount of disk capacity you plan to access through the fibre-channel ports.

ESS fibre-channel adapters support either longwave or shortwave fibre links. ESS fibre-channel adapters for the E and F models support 1 gigabit per second (Gbps) operation, which can result in channel-link speeds up to 100-MB per second full duplex. ESS fibre-channel adapters for Models 750 and 800 support 1 Gbps or 2 Gbps operation. However, only 2 Gbps adapters are being shipped with the Model 750. When operating at 2 Gbps, channel-link speed can be up to 200 MB per second full duplex. However, effective *sustained* throughput of the adapters will be less than these theoretical maximums.

You must have between two and eight fibre-channel adapters based on the fraction of total ESS capacity accessed through the fibre channels. A minimum of two-ports ensures data availability in the event of an interface failure.

Note: The Model 750 is limited to six fibre-adapters.

Using ESCON channels for PPRC links

ESCON channels that are used for PPRC links require a minimum of four ESCON links. For the ESS E and F models, you usually do not require more than eight PPRC links. Because the ESS Models 750 and 800 support much higher PPRC throughput, you must have approximately half as many PPRC links as the E and F models.

Defining the size of logical devices

The size of the logical devices that you define generally does not have an impact on the performance of the ESS. For operating systems that support command tag queueing, the ESS does not serialize I/O operations on the basis of logical devices. You can select the size based on operating system constraints or storage administration needs.

Consolidating storage

When you use an ESS, you could be combining data and workloads from different kinds of independent servers into a single shared resource. You might be mixing production and test servers in an open-systems environment or mixing S/390 or zSeries and open-systems hosts. In this kind of independent server environment, servers might rarely, if ever, contend for the same resource.

Sharing resources in the ESS has advantages for storage administration and resource sharing, but does have some implications for workload planning. The benefit of sharing is that a larger resource pool (for example, disk drives or cache) is available for critical applications. However, you should ensure that uncontrolled or unpredictable applications do not interfere with critical work. This requires the same kind of workload planning you use when you mix various types of work on a server.

If your workload is critical, you might consider isolating it from other workloads. To isolate the workloads:

- Place the data on separate RAID disk groups. S/390 or zSeries and open-systems data are automatically placed on separate arrays, which reduces the contention for disk use.
- Place the data on separate device adapters.
- Place the data in separate ESS clusters, which isolates use of memory buses, microprocessors, and cache resources. Before you make this decision, make sure that the isolation of your data to a single cluster provides adequate data

access performance for your application. The Disk Magic tool provides a way to model the performance of your data to a single cluster.

Balancing the I/O load for maximum throughput

You can generally maximize the performance of an application by spreading the I/O load across clusters, arrays, and device adapters in the ESS. There are also data availability considerations in making that choice, which are beyond the scope of this document.

When attempting to balance the load within the ESS, placement of application data is the determining factor. The following resources are the most important to balance, roughly in order of importance:

- Balance® activity to the RAID disk groups. Use as many RAID disk groups as possible for the critical applications. Most performance bottlenecks occur because a few disks are overloaded. Spreading an application across multiple RAID disk groups ensures that as many disk drives as possible are available. This is extremely important for open-system environments where cache-hit ratios are usually low.
- Balance activity to the clusters. When selecting RAID disk groups for a critical application, spread them across separate clusters. Because each cluster has separate memory buses and cache memory, this maximizes the use of those resources.
- Balance activity to the device adapters. When selecting RAID disk groups within a cluster for a critical application, spread them across separate device adapters.
- Balance activity to the SCSI or fibre-channel ports. Use the IBM TotalStorage Enterprise Storage Server Subsystem Device Driver (SDD) or similar software for other platforms to balance I/O activity across SCSI or fibre-channel ports. See the *Subsystem Device Driver User's Guide for TotalStorage Enterprise Storage Server and IBM TotalStorage SAN Volume Controller* for more information on the SDD.
- Balance activity to the adapter bays. When selecting SCSI ports to assign to a given server, spread them across different adapter bays. Spreading across adapter-bay pairs 1 and 4 or adapter-bay pairs 2 and 3 also balances processor activity.

Chapter 4. Identifying your storage requirements

This chapter identifies the information that you and your field technical support specialist (FTSS) need to select the configuration method and parameters that will meet your requirements. This chapter includes the work sheets that you complete to identify your host systems and to list requirements for ESS storage. The IBM SSR uses these work sheets during the initial installation and configuration of your ESS. After the initial configuration, you might want to refer to these work sheets when you make changes to the configuration with ESS Specialist.

Configuration planning for open-systems hosts

This section provides the work sheets that you need to complete to plan the ESS configuration for open-systems storage. It describes the work sheets and identifies the information that your SSR needs to select the configuration method and parameters that will meet your storage requirements. Enter your requirements, such as logical unit number (LUN) sizes, in the work sheet.

Storage requirements

Table 2 summarizes host system attachments and storage requirements at a high level. If you choose to complete only Table 2, the SSR generates Table 3 on page 14 automatically.

Note: The Model 750 does not support SCSI host adapters.

Make copies of the tables as necessary to identify the storage attachment requirements for each host system attached to an ESS. Refer to the text following each table for a brief description of each column.

Table 2. Storage requirements for host systems

Host System Name	Host System Type	Number of Host Adapters		Total ESS Storage Capacity (GBs)	Load Balancing Software (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs (Yes/No) (optional)
		SCSI	Fibre					
Configuration notes:								

Host System Name and Host System Type: In the first two columns, identify the system name and system type for each host system to be attached to the ESS. Host system names are displayed in most of the ESS Specialist panels and printed reports and are useful for identifying storage that each system accesses. The ESS Specialist uses the host system type information to configure ESS SCSI adapters according to specific SCSI bus behavior and storage-access requirements. The supported host system types are:

- Hewlett-Packard AlphaServer with Tru64 UNIX and OpenVMS operating systems

- Data General with the DG/UX operating system

  Note: Data General host systems are not supported by ESS Models 750 and 800.
- Hewlett-Packard with the HP-UX operating system
- IBM AS/400 and the IBM @server iSeries 400 (iSeries) with the IBM Operating System/400® (OS/400®)
- IBM AS/400 and the IBM @server iSeries 400 (iSeries) with Linux operating system
- IBM NUMA-Q and the IBM @server xSeries (xSeries) with the IBM ptx and DYNIX® operating system
- IBM RS/6000, @server pSeries™ (pSeries), and RS/6000 SP with the IBM AIX® operating system
- Intel-based servers with the Microsoft® Windows NT operating system
- Intel-based servers with the Microsoft Windows® 2000 operating system
- Intel-based servers with the Microsoft Windows Server 2003 operating system (both 32-bit and 64-bit)
- Intel-based servers with the Novell NetWare operating system
- Intel-based servers with the Red Hat Linux and SuSE Linux operating system
- Silicon Graphics with the IRIX operating system
- Sun with the Solaris operating system

For more information about supported host systems and attachment details, see the following Web site:

http://www.storage.ibm.com/disk/ess/index.html?/supserver.htm

Number of host adapters (fibre channel and SCSI): Identify the number of SCSI and fibre-channel adapters in the host system that will access ESS storage.

Note: The Model 750 supports a maximum of 6 host adapter cards, either ESCON or fibre-channel.

Total ESS storage capacity (GBs): Identify the total amount of ESS storage in gigabytes that host system adapters will access. You should leave this field blank if you are sharing storage.

Load balancing software (Yes/No): Will load balancing software be installed for the host system adapters that access ESS storage?

Shared storage (Yes/No) Which host?: If the storage for this host is shared with the storage of a previously defined host in this table, type `Yes` and the name of the host that is sharing storage. The Total ESS Storage Capacity column should be left blank when sharing storage.

Sometimes shared storage includes a parallel application with a share-all policy, for example, the Oracle Parallel Server or the high-availability configurations that involve server failover such as the HACMP environment in the RS/6000. If this is the case, then you need to type `Yes` and the name of the second host. Enter the second host as an additional row in the first column of the table but do not specify storage capacity.

LUN Size GBs (optional): Identify the preferred LUN size for ESS storage partitioning. The LUN sizes are available in 100-MB increments. ESS LUN sizes are from 0.1 GB to full array capacity. The default LUN size is 8 GBs.

The choice of the LUN size depends on the type of the application and the operating system. On operating systems with a built-in Logical Volume Manager (LVM), such as AIX, HP-UX, IBM, Windows NT, Windows 2000, or Windows Server 2003, 8 GBs or 16 GBs can satisfy most requirements. 8 GBs or 16 GBs can also satisfy most requirements on operating systems with a Logical Volume Manager add-on, such as Veritas Volume Manager for Sun Solaris. Because the data is accessed on logical rather than on physical volumes, you can use the LVM to split up one larger physical volume into several smaller logical volumes or concatenate several physical volumes to a bigger logical volume. You must adjust the volume size to the given requirements on operating systems without an LVM (Sun Solaris and Windows NT in an MSCS environment). However, a bigger volume can be a better choice because most operating systems have the ability to divide a physical volume into smaller parts (partitions or slices). If you use a LUN size of 4 GBs, 8 GBs, 16 GBs, 8.59 GBs (for AS/400 only) or maximum LUN size for the array, then select a standard configuration and use the Batch Configuration tool.

If for any reason you have a requirement for a LUN size that the Batch Configuration tool does not support, then select a custom configuration process and use the ESS Specialist. For more information about custom configuration, see Chapter 6, “Open-systems custom configuration,” on page 75.

Note: AS/400 allows 4.19-GB LUNs for OS/400 V3R1 or V3R6 and LUN sizes of 4.19, 8.59, 17.54, 35.17 or 36 GBs when running OS/400 Ver2 or V3R7 or higher. The iSeries supports a LUN size of 70.56 GB. It is supported only for fibre channel and requires OS/400 V5R1 or later.

Spread LUNs Yes/No (optional): Should the LUNs assigned to this host system be spread across the allocated storage arrays? The default is to spread the LUNs. Refer to Chapter 3, “Planning the capacity and performance of your ESS,” on page 7 for guidelines.

Storage requirements for host systems and the attachment environment

Use the work sheet, Table 3 on page 14, to provide detailed information about the host systems and the attachment environment.

Note: RAID 10 is supported only on ESS Models 750 and 800.

Table 3. Storage requirements for host systems and the attachment environment

Host Name and Type	Host System Adapter	Shared Storage Access	RAID Type		Storage Capacity	LUN Size	Sequential or Spread LUNs
			RAID 5	RAID 10			
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			____GBs ____GBs	____GBs ____GBs	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____			_____GBs _____GBs	_____GBs _____GBs	Sequential _____ Spread _____
Configuration notes:							

Host Name and Type: In the first column, identify the system name and system type for each host system to be attached to the ESS. Host system names are displayed in most of the ESS Specialist panels and printed reports and are useful for identifying storage that each system accesses. The ESS Specialist uses host type information to configure ESS SCSI adapters according to specific SCSI bus behavior and storage-access requirements. The supported system host types are:

- Hewlett-Packard AlphaServer with Tru64 UNIX and OpenVMS operating systems
- Data General with the DG/UX operating system

  Note: Data General host systems are not supported by ESS Models 750 and 800.
- Hewlett-Packard with the HP-UX operating system
- IBM AS/400 and the IBM @server iSeries 400 (iSeries) with the IBM Operating System/400 (OS/400)
- IBM AS/400 and the IBM @server iSeries 400 (iSeries) with Linux operating system
- IBM NUMA-Q and the IBM @server xSeries (xSeries) with the IBM ptx and DYNIX operating system
- IBM RS/6000, @server pSeries (pSeries), and RS/6000 SP with the IBM AIX operating system
- Intel-based servers with the Microsoft Windows NT operating system
- Intel-based servers with the Microsoft Windows 2000 operating system
- Intel-based servers with the Microsoft Windows Server 2003 operating system (both 32-bit and 64-bit)
- Intel-based servers with the Novell NetWare operating system
- Intel-based servers with the Red Hat Linux and SuSE Linux operating system
- Silicon Graphics with the IRIX operating system
- Sun with the Solaris operating system

For more information on supported host systems and attachment details, see

http://www.storage.ibm.com/disk/ess/index.html?/supserver.htm

Host System Adapter: Each host system contains one or more SCSI or fibre-channel adapters that control the connections to an ESS. Each SCSI connection needs to be configured for the storage that the ESS will access through each adapter. In the second column, for SCSI connections, identify the SCSI bus target ID that is assigned to each SCSI adapter. The default target ID setting in an adapter card is ID 7. The target ID setting does not need to be changed unless multiple host system initiators will share a common SCSI bus-cable attachment to an ESS. The ESS Specialist uses the target ID setting information to ensure that LUNs are not assigned to the same target ID. With fibre-channel connections, specify a nickname to be used for the fibre-channel host adapter. The ESS Specialist uses this nickname to configure restricted access of the LUNs.

Shared Storage Access: Complete the third column only if the host system adapter connection is a secondary-access path to LUNs that are configured for primary access through another host system adapter, either in this host system or in another host system. If this is a secondary-access path to LUNs, identify the system and adapter numbers for the primary-access path. The ESS Specialist uses this information to copy the storage access control map from the primary-access path to

the secondary-access path. If this is a secondary-access path to LUNs, you do not need to complete the remaining columns for this adapter.

You can configure a secondary-access path to LUNs that are accessed by a primary-access path in the same host system if the SDD is used for alternate path/load balancing access control. You can also configure a secondary-access path for a primary-access path located in another host system if software is installed to manage host-system failover-access control.

Storage Type: If this is a primary-access path, identify the storage type (RAID 5 or RAID 10) to be configured for the storage accessed using this host system adapter. The ESS Specialist configuration methods allow LUNs from both types of storage to be configured for access.

Storage Capacity: If this is a primary-access path, identify the storage capacity in gigabytes that is to be configured for access using this host system SCSI adapter. The total storage capacity configured for all primary-access paths cannot exceed the installed capacity of the ESS.

LUN Size: If this is a primary-access path, identify the LUN size in gigabytes that is to be configured for the storage accessed using this host-system SCSI adapter. The ESS Specialist configuration methods allow the storage to be partitioned into multiple LUNs of different sizes. The ESS LUN sizes can be defined in increments of 100 MBs, except for the AS/400 hosts. The ESS supports LUN sizes from 0.1 GB - to full array capacity.

Sequential or Spread LUNs: If this is a primary-access path, indicate if the configured LUNs should be consolidated into a sequential group using the least number of storage devices. The default configuration in the ESS Specialist sequentially groups the LUNs. The alternative option spreads the LUNs across multiple storage devices and access paths. Refer to Chapter 3, “Planning the capacity and performance of your ESS,” on page 7 for guidelines.

Fibre-channel attachment

For fibre-channel attachments, LUNs have an affinity to the hosts fibre-channel adapter through the worldwide port name (WWPN) for the host adapter. In a switched fabric configuration, a single fibre-channel host could have physical access to multiple fibre-channel ports on the ESS. In this case, you can configure the ESS either to allow the host to use all physically accessible fibre-channel ports on the ESS, or to allow the host to use only a subset of the physically accessible fibre-channel ports on the ESS. In either case, the set of LUNs that the fibre-channel host can access are the same on each of the ESS ports that are available to that host.

Targets and LUNs

For fibre-channel attachments, each fibre-channel host adapter can architecturally attach up to 2^{64} LUNs. However, the ESS supports only a maximum of 4096 LUNs, divided into a maximum of 16 logical subsystems each with up to 256 LUNs. If the software in the fibre-channel attached host supports the SCSI command **Report LUNs**, you can configure potentially all 4096 LUNs on the ESS to be accessible by that host. AIX and dynix/PTX are supported by the ESS as Report LUNs hosts and a server host bus adapter can access as many LUNs as are defined in the ESS (up to 4096). Other server platforms are supported by the ESS as non-Report LUNs

hosts. With these server platforms, you can configure no more than 256 of the LUNs in the ESS to be accessible by that host.

LUN access modes

The fibre-channel architecture enables any fibre-channel initiator to access any fibre-channel device without access restrictions. However, in some environments this kind of flexibility can represent a security exposure. Therefore, the ESS allows you to restrict this type of access when the SSR sets the access mode for your ESS during initial configuration. There are two types of fibre-channel LUN access modes:

Access-any mode: The access-any mode gives all fibre-channel attached host systems that do not have an access profile access to all non-AS/400 open-system logical volumes that you defined in the ESS.

Warning: If you connect the ESS to host systems on multiple platforms, and use the access-any mode without setting up an access profile for the hosts, the data in a LUN used by one open-systems host might be inadvertently corrupted by a second open-systems host. Certain host systems insist on overwriting specific LUN tracks during the LUN discovery phase of the operating system start-up process.

Access-restricted mode: The access-restricted mode prevents all fibre-channel attached host systems that do not have an access profile from accessing any volumes that you defined in the ESS. This mode is the default.

Your SSR can change the LUN access mode. However, changing the LUN access mode is a disruptive process, and it requires that you shut down and restart both clusters of the ESS.

Access profiles

Whichever access mode you choose, any fibre-channel attached host system that has an access profile can access only those volumes that are defined in its profile. Depending on the capability of the particular host system (that is, if the host software supports the SCSI command **Report LUNs**), an access profile can contain up to 256 or up to 4096 volumes.

When you use the ESS Specialist to configure the hosts and volumes in the ESS, the following actions affect the access profile:

- When you define a new fibre-channel-attached host system specifying its worldwide port name (WWPN) using the Modify Host Systems panel in the ESS Specialist, the access profile for that host system is automatically created. Initially the profile is empty; that is, it contains no volumes. When the profile is empty, the host cannot access any of the logical volumes that are already defined in the ESS.
- When you add new logical volumes to the ESS using the Add Fixed-Block Volumes panel, the new volumes are assigned to the host that you select. The new volumes are created and automatically added to the access profile of the selected host.
- When you assign volumes to fibre-channel-attached hosts using the Modify Volume Assignments panel, the selected volumes are automatically added to the access profile of the selected host.
- When you remove a fibre-channel-attached host system using the Modify Host Systems panel, you delete both the host and its access profile.

Anonymous host

When you run the ESS in access-any mode, the ESS Specialist displays a dynamically created pseudo-host, which is identified by the name *Anonymous*. This is not a real host system connected to the storage server, but is intended to represent all fibre-channel-attached host systems (if any) that are connected to the ESS that do not have an access profile defined. This is a visual reminder that certain logical volumes can be accessed by hosts that have not been specifically identified to the ESS.

AS/400 configuration

This section discusses the AS/400 configuration:

- ESS Specialist selections for the AS/400
- AS/400 host system attachment types
- AS/400 volume placement
- AS/400 volume size

ESS Specialist selections for the AS/400

The ESS Specialist provides two AS/400 host-type selections:

- Use AS/400_A choice for OS/400 release levels V3R1 or V3R6. This choice supports LUN size 4.190 GBs for SCSI attachment.
- Use AS/400_B choice for OS/400 release level V3R7 or higher. This choice supports LUN size 8.589 GBs and up for SCSI or fibre-channel attachment.

AS/400 host system attachment types

AS/400 host system attachment type choices are SCSI-3 and SCSI to fibre channel (SCSI-FCP).

AS/400 SCSI-3 attachment

You can have one to eight LUNs for each SCSI-3 attachment to a specific ESS host adapter port. The LUN serial number is eight characters in the format '0L0PPNNN', where:

0 Represents a field of eight characters, where the character positions indicated by 0 are always the character 0. This is a serial number character string, not a numeric value.

L The LUN number, which is 0 - 7.

PP The ESS host port number, which is 1 - 32.

NNN The low-order three characters of the ESS unit serial number, or a unique three character value that service personnel enter with an ESS service panel menu option.

SCSI-3 attached LUNs are identified as emulating the 9337 device type.

Note: The 70.564-GB LUN size is not available for the SCSI-3 attachment.

When adding ESS volumes for an AS/400 SCSI-3 attachment, create the volumes from arrays (RAID 5 or RAID 10) that are common to a single ESS device adapter. Volumes cannot be spread across arrays that are attached to multiple device adapters.

AS/400 SCSI-FCP attachment

The 4.190-GB LUN size is not available for the SCSI-FCP attachment. You can have one to 32 LUNs for each attachment to an AS/400 SCSI-FCP port. The LUN serial number is eight characters in the format '0LLLLNNN', where:

0 A field of eight characters, where the character positions indicated by 0 are always the character 0. This is a serial number character string, not a numeric value.

LLLL The LUN number, which is 0 - 31.

NNN The low-order three characters of the ESS unit serial number, or a unique three character value that service personnel enter with an ESS service panel menu option.

SCSI-FCP attached LUNs are identified as the 2105 device type.

AS/400 volume placement

AS/400 volume placement in ESS storage arrays is determined by the selected host system attachment type. For a SCSI-3 attachment, place the volumes in ESS RAID-5 storage arrays that are common to a single ESS device adapter. The volumes cannot be spread across arrays that are attached to multiple device adapters. For a SCSI-FCP attachment, the volumes can be placed in any RAID-5 storage array that has available capacity. The volumes can be spread across arrays that are attached to multiple device adapters.

AS/400 volume size

AS/400 volume size choices are allowed according to AS/400 release level and SCSI-3 or SCSI-FCP attachment type. Refer to Table 4 on page 20 for the supported volume sizes. The maximum volume size that can be created is also determined by the largest available ESS storage array capacity. The number of volumes that can be created is determined by the attachment type, and by the available ESS storage array capacity.

- 1 - 8 volumes can be created for a SCSI-3 attachment.
- 1 - 32 volumes can be created for an AS/400 SCSI-FCP attachment.

AS/400 device model choices are protected and unprotected, which determines the model number for the 9337 or 2105 device type. Refer to Table 4 on page 20 for the protected and unprotected device model numbers for the 9337 and 2105 device types and volume sizes. With the OS/400 a user can establish mirroring for the unprotected device type models. Device mirroring is not supported for the protected device type models.

Table 4. Protected and unprotected device model numbers for AS/400

AS/400 Models for SCSI-3 attach				
LUN Size	**Type**	**Protected Model**	**Unprotected Model**	**Release Support**
4.190 GBs	9337	48C	48A	V3R1 or V3R6
8.589 GBs	9337	59C	59A	Protected model support by V3R7 and up. Unprotected model support by V4R3 and up with PTF.
17.548 GBs	9337	5AC	5AA	
35.165 GBs	9337	5CC	5CA	
36.003 GBs	9337	5BC	5BA	
AS/400 Models for SCSI-FCP attach (fibre channel)				
LUN Size	**Type**	**Protected Model**	**Unprotected Model**	**Release Support**
8.59 GBs	2105	A01	A81	OS/400 V5R1 and up
17.548 GBs	2105	A02	A82	
35.165 GBs	2105	A05	A85	
36.003 GBs	2105	A03	A83	
70.564 GBs	2105	A04	A84	

Determining which configuration process to use

You can configure the ESS in either of two ways:

- Standard configuration
- Custom configuration

If you are using the standard configuration, use the ESS Batch Configuration tool and finalize the configuration using the ESS Specialist. The standard configuration process is a simplified configuration method, which provides support for the most common open-system LUN sizes. If the ESS Batch Configuration tool supports the volumes required for configuring the ESS, use the standard configuration process.

Alternatively, if the ESS Batch Configuration tool does not support the S/390 volume types or open-system SCSI bus type or LUN size that you require, use the custom configuration process with the ESS Specialist. The Batch Configuration tool does not support RAID 10. Use the custom configuration work sheets for RAID-10 configuration. For more information about custom configuration, see Chapter 6, “Open-systems custom configuration,” on page 75.

Table 5 helps the SSR or the help-line personnel decide which configuration process should be used. The first column in Table 5 lists some of the possible configuration types that are found in the storage requirements tables. The second column in Table 5 lists the configuration process to use for the configuration type listed in the first column. After you complete Table 3 on page 14, the SSR or help-line personnel use the corresponding sections in the table to complete the necessary work sheets.

Table 5. Configuration processes

Configuration Types	Configuration Process	Notes
• Open-systems with RAID 5 • LUN size 4, 8, or 16 GB • LUN size 8.59 GB (AS/400) • Maximum LUN size • Storage requirements listed in Table 2 on page 11	Open-systems standard configuration	Finalize configuration using the ESS Specialist.
• LUN sizes not supported by the standard configuration process • RAID 10 • Storage requirements listed in Table 3 on page 14	Open-systems custom configuration using the ESS Specialist	If you satisfy all the criteria for standard configuration and the storage requirements in Table 3 on page 14 are not too complex, consider the open-systems standard configuration.
Mixed S/390 and open-systems: • S/390 with RAID 5 • S/390 Control Unit 3990-6 • S/390 device type 3390-3 or 3390-9	Use ESS Specialist for: • S/390 standard configuration • Open-systems custom configuration	

Chapter 5. Open-systems standard configuration

This chapter describes the open-systems standard configuration process. For open systems, the ESS Batch Configuration tool creates RAID-5 disk groups and partitions them into logical unit numbers (LUNs) of the specified size. Use the ESS Specialist to assign LUNs to SCSI or to fibre-channel host adapters. The ESS Batch Configuration tool does not support the ESS Model 750, Model 800, or RAID-10.

Note: The ESS Batch Configuration tool does not support the arrays across loops feature. The Model 800 with LIC at level 2.3.0 or later supports the arrays across loops feature. The ESS Batch Configuration tool is not supported with LIC at level 2.3.0 or later.

Creating RAID-10 disk groups is a custom configuration. See Chapter 6, “Open-systems custom configuration,” on page 75 for information about custom configuration and examples. See Appendix B, “Open-systems custom configuration,” on page 273 for the work sheets.

The planning process

To implement a standard configuration for open systems, you must also provide the information requested in Table 2 on page 11 and a copy of the order form. If you need help completing the following steps, call your SSR or the help-line personnel:

1. Select the Batch Configuration tool work sheet that applies for the standard configuration feature code. Based on the information provided in the Table 2 on page 11, decide the type of configuration for each storage partition. The SSR uses this work sheet to configure RAID-5 disk groups and to split them into LUNs.
2. Based on the information provided in the storage requirements table, complete the Modify Host Systems work sheet (see Table 7 on page 26). The SSR uses the ESS Specialist and the information in this work sheet to configure the hosts that will be attached to the ESS.

   Note: You can also use the ESS Specialist for ESS configuration.
3. If SCSI host adapters are installed in the ESS, complete the Configure SCSI Ports work sheet. See Table 8 on page 28 for the Model 800 and Table 9 on page 29 for the E and F models.
4. If fibre-channel host adapters are installed in the ESS, complete the Configure ESS Fibre-Channel Ports work sheet (see Table 11 on page 31).
5. Complete the Shared Storage Access work sheet (see Table 12 on page 32) using the information provided in the storage requirements table about alternate path software and whether or not storage is to be shared with another host. The SSR uses the Shared Storage Access work sheet at the end of the configuration process to configure share access to LUNs.
6. Complete the Storage Planning work sheet (see Table 13 on page 33). Based on the storage capacity requirements and the level of isolation required for the LUNs on a given host, choose the device adapter pairs and cluster that will be used to configure the desired capacity. The SSR does not need the Storage Planning work sheets. They help you gather the information for the Modify Volume Assignment work sheet.
7. Map the information in all the Storage Planning work sheets into the Modify Volume Assignments work sheet (see Table 14 on page 34). This is a

reorganization of all the information from the Storage Planning work sheet so that the information matches the format that the ESS Specialist presents. The SSR uses the Modify Volume Assignment work sheet for entries in the ESS Specialist.

Work sheets for the Batch Configuration tool

Use the Batch Configuration tool work sheet that is appropriate for the standard hardware configuration feature code. Each column on the right side of the work sheet represents the storage capacity that one of the SSA device adapter cards manages. The naming convention used in this document (and also in the ESS Specialist) is that an SSA adapter is identified by specifying the device adapter pair (1, 2, 3, or 4) and a cluster number (1 or 2). One and only one X should be made in each column of the Device Adapter Pair and Cluster set of columns to specify the type of configuration that is required for the storage that the given SSA adapter manages.

A light-gray background on a column and row combination indicates that if this option is selected, only the RAID-5 disk groups on Loop A will be configured by the ESS Batch Configuration tool. The remaining capacity has to be configured using the ESS Specialist. If you need to leave part of the available storage as raw capacity, choosing one of these fields might be the best way to reserve raw capacity for future use.

Note: RAID 10 cannot be configured with the ESS Batch Configuration tool. RAID 10 requires a custom configuration; see Appendix B, “Open-systems custom configuration,” on page 273.

Columns and rows that are shaded with dark gray do not apply to a specific configuration and cannot be selected because the physical storage does not exist in the configuration. If the No Assignment option is selected for a column, all the capacity for the corresponding SSA adapter is left as raw capacity. The remaining capacity has to be configured using the ESS Specialist. This option can be selected if part of the capacity of the ESS has to be configured using a LUN size that the Batch Configuration tool does not support.

Table 6 on page 25 is an example of a configuration with a total of 12 possible RAID-5 disk groups. Four out of the eight device adapters will own two RAID-5 disk groups and the other four device adapters will own only one RAID-5 disk group. For this reason, some of the choices in some of the columns are not possible; therefore, those fields are shaded in dark gray.

Table 6. Example of an Open-systems Batch Configuration tool work sheet

12 x 18-GB Arrays (feature code 21X2, quantity 12)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Finalizing open-systems configurations

Open-systems configurations are finalized using the ESS Specialist. The SSR uses several panels in the ESS Specialist to accomplish this task. This section discusses the work sheets that the SSR or help-line personnel use to record the information that the SSR needs. Complete the following work sheets with your SSR:

1. Modify Host Systems work sheet
2. Configure SCSI Ports work sheet
3. Configure Fibre-Channel Ports work sheet
4. Shared Storage Access work sheet
5. Storage Planning work sheet
6. Modify Volume Assignment work sheet

Modify Host Systems work sheet

To complete the Modify Host Systems work sheet, (Table 7 on page 26) use the storage requirements table (Table 2 on page 11) to identify all unique host system names that will be attached to the ESS. Identify each host system, host type, and attachment type (SCSI or fibre channel). The host type must match one of the selections available in the ESS Specialist. For the latest list of supported hosts, refer to the IBM Web site at:

http://www.storage.ibm.com/disk/ess/index.html?/supserver.htm

For each host system with SCSI-only connections, select a single host nickname. For each host system with fibre-channel connections, select a different nickname for each fibre-channel host adapter in the host system. If a host system has both types of connections (SCSI and fibre channel), select a single host nickname to represent all the SCSI connections and select a different host nickname for each fibre-channel host adapter. Use the Fibre-Channel Ports column to specify the ESS fibre-channel ports through which this host will access its LUNs in the ESS. Specify a bay number (B*n*) and an adapter number (A*m*) for each ESS Fibre port through which this host will access its LUNs. Specify All if the host will access its LUNs through all installed fibre ports in the ESS. The worldwide port name (WWPN) of each fibre-channel host adapter is required to configure the ESS subsystem. Refer to the *IBM Enterprise Storage Server Host Systems Attachment Guide* for details about how to obtain this information.

Table 7. Modify Host Systems work sheet

Host Name or IP Address	Host Nickname	Host System Type	Attachment Type SCSI or Fibre	Fibre-Channel Ports	WWPN for Fibre-Channel Host Adapter

Configure SCSI Ports work sheet

Use the Configure SCSI Ports work sheet to describe the mapping of ESS SCSI ports to the host. The work sheet contains one row per possible ESS SCSI port. To complete this work sheet, you must know the number of ESCON, fibre-channel, and SCSI host adapters that were ordered for the ESS. You can find this information on the ESS order form. Use the information from the storage requirements table (Table 3 on page 14) to guide your choices. For example, host system adapters that share access to a common set of LUNs should connect to the ESS SCSI ports located in different bays, such as connecting to ports located in adapter-bay pairs 1 and 4 or adapter-bay pairs 2 and 3. This type of configuration provides access availability and balances processor activity.

To assist with the decisions involved in completing this work sheet, refer to the Installed Sequence column from Table 8 on page 28 for ESS model 800 and Table 9 on page 29 for the E and F models. The number in the Installed Sequence column reflects the order in which the ESS host adapter cards are installed in the machine during the manufacturing process.

For the Model 800 the ESS host adapters are installed in the following sequence:

1. ESCON
2. fibre channel
3. SCSI

For example, if you order four fibre-channel host adapters and four SCSI host adapters:

- The Fibre-channel host adapters correspond to the entries with the numbers 1 - 4 in the Installed Sequence column.
- The SCSI adapters correspond to the entries with the numbers 5 - 8.

For the Model 750 the ESS host adapters are installed in the following sequence:

1. ESCON
2. fibre channel

For example, if you order four fibre-channel host adapters and four ESCON host adapters:

- The four ESCON host adapters correspond to the entries with the numbers 1 - 4 in the Installed Sequence column.
- The fibre-channel host adapters correspond to the entries with the numbers 5 - 8.

Note: For the Model 750, the maximum number of ESCON and fibre-channel cards is 6.

For the E and F Models the ESS host adapters are installed in the following sequence:

1. ESCON
2. SCSI
3. fibre channel

For example, if you order four fibre-channel host adapters and four SCSI host adapters:

- The four SCSI host adapters correspond to the entries with the numbers 1 - 4 in the Installed Sequence column.
- The fibre-channel host adapters correspond to the entries with the numbers 5 - 8.

If you order four ESCON host adapters and four SCSI host adapters:

- The four ESCON host adapters correspond to the entries with the numbers 1 - 4 in the Installed Sequence column.
- The SCSI host adapters correspond to the entries with the numbers 5 - 8.

This example is valid for all ESS models.

Table 8. Configure SCSI Ports work sheet for Model 800 with Adapter Installation Sequence

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for Model 800
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A						4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Table 9. Configure SCSI Ports work sheet for E and F models with Adapter Installation Sequence

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for E and F Models
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A						2
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						6
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						10
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						14
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						4
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						8
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						12
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						16
		Bay 4 Adapter 4 Port B						

Configure Fibre-Channel Ports work sheet

Use the Configure Fibre-Channel Ports work sheet (Table 10 on page 30) to enter the attributes of the fibre-channel ports. The work sheet contains one row for each possible fibre-channel single-port adapter. Complete the information in this work sheet for every bay-adapter row that has a fibre-channel host adapter installed in your ESS.

Note: Fabric and switches are transparent to the ESS logical configuration. Specify the type of connection for the ESS fibre-channel port. If the ESS fibre-channel port is connected to a switch or a switched fabric, specify point to point.

You must know the number of ESCON, SCSI, and fibre-channel host adapters that were ordered with the ESS. You can find this information on the ESS order form.

For Models 750 and 800: To assist with the decisions involved in completing this work sheet, refer to the Installed Sequence column of the work sheet. The number in the column reflects the order in which the ESS host adapter cards are installed in the ESS during the manufacturing process. Remember that on the Model 750, ESCON host adapters are installed first, followed by the fibre-channel adapters. On the Model 800, ESCON host adapters are installed first, followed by the fibre-channel adapters, and finally the SCSI adapters. For each fibre-channel port, make sure that you specify the fibre-channel port attribute (point-to-point or arbitrated loop) and the port protocol (FICON or SCSI-FCP).

Note: The Model 750 does not support SCSI adapters.

Table 10. Configure ESS Fibre-Channel Ports work sheet for 750 and 800 Models

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for 750 and 800 Models
			Point to Point		Arbitrated Loop SCSI-FCP		
			FICON	SCSI-FCP			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					4
		Bay 3 Adapter 2					8
		Bay 3 Adapter 3					12
		Bay 3 Adapter 4					16
	Bay 4	Bay 4 Adapter 1					2
		Bay 4 Adapter 2					6
		Bay 4 Adapter 3					10
		Bay 4 Adapter 4					14

For E and F Models: To assist with the decisions involved in completing the Fibre-Channel Ports work sheet, refer to the Installed Sequence column. The number in the column reflects the order in which the ESS host adapter cards are installed in the server during the manufacturing process. Remember that on the E and F Models, ESCON host adapters are installed first, followed by the SCSI adapters, and finally the fibre-channel adapters. For each fibre-channel port, make sure that you specify the fibre-channel port attribute and the port protocol.

Table 11. Configure ESS Fibre-Channel Ports work sheet for E and F Models

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for E and F Models
			Point to Point		Arbitrated Loop SCSI-FCP		
			FICON	SCSI-FCP			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					2
		Bay 3 Adapter 2					6
		Bay 3 Adapter 3					10
		Bay 3 Adapter 4					14
	Bay 4	Bay 4 Adapter 1					4
		Bay 4 Adapter 2					8
		Bay 4 Adapter 3					12
		Bay 4 Adapter 4					16

Shared Storage Access work sheet

Refer to the open systems Storage Requirements table (Table 2 on page 11) to determine whether or not the storage for a given host needs to be shared. Perform the following steps to complete the Shared Storage Access work sheet (Table 12 on page 32):

1. Check the column labeled Load-Balancing Software in the Storage Requirements table. If the information in this column is `Yes`, the storage for a given host has to be shared between multiple ports for that host.
2. If `Yes`, divide the ESS ports for the host into pairs and record the information in the Shared Storage Access work sheet, Table 12 on page 32.
3. Check the SHARED LUNs column in the storage requirements table to determine if storage is to be shared with another host. This might be the case for parallel database applications such as the Oracle Parallel Server that support the share-everything criteria or an HACMP configuration that shares data from one host to a second host.
4. If storage is to be shared between two hosts, match each one of the ports from host 1 with the ports from host 2 and enter the information in the Shared Storage Access work sheet in Table 12 on page 32.

Table 12. Shared Storage Access work sheet

Primary-Access Connection				Secondary-Access Connection			
Host Nickname (See Note.)	ESS SCSI Port (SCSI only)			Host Nickname (See Note.)	ESS SCSI Port (SCSI only)		
	Bay	Adapter	Port		Bay	Adapter	Port
Note: For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.							

Storage Planning work sheet

The Storage Planning work sheet (Table 13 on page 33) helps you make decisions about the mapping of the LUNs to SCSI or fibre-channel hosts attached to the ESS. This is the information you need to complete the Modify Volumes Assignment work sheet.

You can find some of the entries for the Storage Planning work sheet in the Batch Configuration tool work sheets for the standard hardware configuration feature codes. See “Unique work sheets for the open-systems Batch Configuration tool” on page 105 for the feature codes for the disk eight packs that you can select. This section gives a unique Batch Configuration tool work sheet for each number of disk eight packs, from four to 48, for each of the following DDM sizes:

- 18 GB
- 36 GB
- 72 GB

For each combination of device adapter pair and cluster, the Storage Planning work sheet shows Loop A and Loop B. Each combination of the device adapter pair, cluster, and loop represents an array. If you select an option in the Batch Configuration tool work sheet that configures only one of two arrays, you do not need to record any volumes for Loop B of the corresponding device adapter pair and cluster combination.

From the Batch Configuration tool work sheet that you select, record the volume IDs for the RAID-5 disk group in each loop. These IDs are also used in the Modify Volume Assignment work sheet (Table 14 on page 34) and must be accurate.

Enter the following information in the Storage Planning work sheet:

- For fibre-channel configurations, enter the host nickname and the volume IDs.
- For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs. For SCSI connections, enter the ESS ports that will be connected to specific volume IDs.

For example, if you want to attach four volumes from a host (Server 1) on SCSI port Bay 1, Adapter 1, Port A, enter the information in the Storage Planning work sheet. The field entries will be: Server 1 for the host, 1-1-A for the ESS port, and 0 - 3 for the Vol. IDs.

To make decisions about which volumes to attach to a given host fibre-channel adapter or SCSI adapter, you need to consider the spread criteria as well as the guidelines for the amount of storage per fibre-channel or SCSI host adapter. See Chapter 3, “Planning the capacity and performance of your ESS,” on page 7 for the required information.

Table 13. Storage Planning work sheet

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 13. Storage Planning work sheet (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Modify Volume Assignment work sheet

Copy the information in the Storage Planning work sheet to the Modify Volume Assignment work sheet (Table 14). The Modify Volume Assignments work sheet contains the same information as the Storage Planning work sheet, but it is in a tabular form that follows the order in which the SSR enters data into the Modify Volume Assignment panel in the ESS Specialist.

Table 14. Modify Volume Assignments work sheet

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					

Table 14. Modify Volume Assignments work sheet (continued)

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop B					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 1, Cluster 2, Loop B					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 1, Loop B					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 2, Loop B					
Device Adapter Pair 3, Cluster 1, Loop A					

Table 14. Modify Volume Assignments work sheet (continued)

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 2, Loop A					

Implementing the open-systems standard configuration

At installation time, the SSR uses the work sheets to implement the configuration. The SSR performs the following steps:

1. The SSR uses the ESS service panels and the Batch Configuration tool work sheet to identify the type of configuration required for each SSA adapter card (each device adapter and cluster combination).
2. The SSR uses the ESS Specialist to complete the logical configuration. The SSR:
   a. Uses the Modify Host Systems work sheet to configure all the servers that will be attached to the ESS. From the Storage Allocation panel, the SSR selects **Open Systems Storage** –> **Modify Host Systems** and enters the information from the work sheet.
   b. Uses the Configure SCSI Ports work sheet to establish the mapping between the ESS SCSI ports and the servers. From the Storage Allocation panel, the SSR clicks **Open Systems Storage** –> **Configure Host Adapter Ports** and uses the mapping in the work sheet to enter the information into the panel.
   c. Uses the Configure ESS Fibre-Channel Ports work sheet to specify the attributes of the ESS fibre-channel ports. From the Storage Allocation panel, the SSR clicks **Open Systems Storage** –> **Configure Host Adapter Ports**, and enters the options that you selected in the work sheet.
   d. Uses the Modify Volume Assignment work sheet to establish the mapping of logical volumes to ESS SCSI ports or to fibre-channel host nicknames. To accomplish this, the table in the panel can be sorted using the second column, labeled Location, as the first level sort. The display in the ESS Specialist now matches the layout in the work sheet.
   e. Uses the Shared Storage work sheet to configure the level of data sharing across ESS SCSI ports and servers or fibre-channel host nicknames.

Examples for open-systems standard configurations for ESS Model F20

This section gives some examples of the planning process for open-systems standard configurations for ESS Model F20. Each example identifies the information that needs to be available before trying to configure the ESS, and explains how to complete the work sheets for the SSR.

Example A: Two homogeneous servers, dedicated storage

This example outlines the configuration requirements for two homogeneous servers with dedicated RAID-5 storage:

1. Hardware
   - Four 18-GB disk packs are installed in an ESS Model F20.
   - Two SCSI host adapters are installed in the ESS.
   - Two fibre-channel host adapters are installed in the ESS.
   - Two RS/6000 servers are attached to the ESS:
     – A host server with two fibre I/O adapters
     – A host server with two SCSI I/O adapters
2. Configuration
   - The storage requirements for this example are shown in Table 15.

Table 15. Example A: Storage requirements

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load-Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server 1	RS/6000 AIX	2		190	No	No	8	No
Server 2	RS/6000 AIX		2	190	No	No	8	No
Configuration notes:								

The Example A Batch Configuration tool work sheet, (see Table 16 on page 38) shows four disk packs connected to Device Adapter Pairs 1 and 2 only. Therefore, the last four columns in the Batch Configuration tool work sheet are shaded dark gray. One X is in each of the columns that represent the storage for Device Adapter Pairs 1 and 2 (that is, the first four columns on the right side of the work sheet). The information shown in Table 15 determine where to place the appropriate X in Table 16 on page 38.

For this particular example, the hardware configuration allows for thirteen 8-GB LUNs per array for a total of 52 LUNs or a total of 416 GBs. The total storage capacity requirement from the storage requirements table is 380 GBs, which can be satisfied by 48 of the 52 LUNs. To meet that requirement, you need to configure all the available storage.

Table 16 shows how you would complete the Batch Configuration tool work sheet for this configuration.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 16. Example A: Batch Configuration tool work sheet

4 x 18-GB Arrays (feature code 21X2, quantity 4)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12		X	X	X	X				
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11									
		No Assignment											
SSR Information: ESS Batch Configuration tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Use the host names and host types recorded in the storage requirements table for the Modify Host Systems work sheet (Table 17 on page 39).

Table 17. Example A: Modify Host Systems work sheet

Host Name or IP Address	Host Nickname	Host System Type	Attachment Type SCSI or Fibre	Fibre-Channel Ports	WWPN for Fibre-Channel Host Adapter
Server_1	Server_1	RS/6000 AIX	SCSI		
Server_2	Server_2_fc_1	RS/6000 AIX	Fibre	B1A1	10000000C9215D93
Server_2	Server_2_fc_2	RS/6000 AIX	Fibre	B4A1	10000000C9215D94

The Configure SCSI Ports work sheet indicates how many SCSI ports will be configured to each of the servers. For Example A, the ESS hardware configuration has two SCSI host adapters installed. Table 18 on page 40 shows the selections made for this example. Load-balancing software is not used. (See “Example C: Two homogeneous hosts, dedicated storage, alternative path (SDD)” on page 49, for an example with SDD.)

Table 18. Example A: Configure SCSI Ports work sheet, Model F20

ESS Host Adapter Ports			Host Nickname	Host Type	Host I/O Adapter ID	Initiator ID (SCSI only)	ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for Model F20
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A	Server_2_fc_1	RS/6000/ AIX	fcs1		Fibre	1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A	Server_1	RS/6000/ AIX	SCSI_1	7	SCSI	3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 18. Example A: Configure SCSI Ports work sheet, Model F20 (continued)

ESS Host Adapter Ports			Host Nickname	Host Type	Host I/O Adapter ID	Initiator ID (SCSI only)	ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence for Model F20
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A	Server_1	RS/6000/ AIX	SCSI_2	7	SCSI	4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A	Server_2_fc_2	RS/6000/ AIX	fcs2		Fibre	2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Table 19 on page 42 shows the information for Example A for the Configure ESS Fibre-Channel Ports work sheet for Model F20. Fabric and switches are transparent to the ESS logical configuration. Specify the type of connection for the ESS fibre-channel port. If the ESS fibre-channel port is connected to a switch or a switched fabric, specify point to point.

Table 19. Example A: Configure ESS Fibre-Channel Ports work sheet, Model F20

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, Fibre Channel, or SCSI)	Installed Sequence
			Point-to-Point FICON	Point-to-Point SCSI-FCP	Arbitrated Loop SCSI-FCP		
Cluster 1	Bay 1	Bay 1 Adapter 1		X		Fibre	1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1				SCSI	3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1				SCSI	4
		Bay 3 Adapter 2					8
		Bay 3 Adapter 3					12
		Bay 3 Adapter 4					16
	Bay 4	Bay 4 Adapter 1		X		Fibre	2
		Bay 4 Adapter 2					6
		Bay 4 Adapter 3					10
		Bay 4 Adapter 4					14

Table 20 on page 43 shows the information for the Storage Planning work sheet for Example A. The 24 LUNs meet the 192-GB storage requirement for each host server. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs.

To balance performance across the available resources, this example shows Device Adapter Pair 1 on Cluster 1 and Device Adapter Pair 2 on Cluster 2 for Server 1. The remaining storage is configured to Server 2.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 20. Example A: Storage Planning work sheet, Model F20

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	SCSI Port	Vol. IDs
				Server_1	2-1-A	0 - 5					Server_2_ fc_1		0 - 5
				Server_1	3-1-A	6 - 11					Server_2_ fc_2		6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_2_ fc_2		0 - 5					Server_1	3-1-A	0 - 5
				Server_2_ fc_1		6 - 11					Server_1	2-1-A	6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 20. Example A: Storage Planning work sheet, Model F20 (continued)

Cluster 1	Location		Volume Assignments			Cluster 2	Location		Volume Assignments		
	DA Pair 3 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location		Volume Assignments				Location		Volume Assignments		
	DA Pair 4 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 21 on page 45 shows the final configuration information for Example A.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 21. Example A: Modify Volume Assignments work sheet, Model F20

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 5	2	1	A	Server_1
	6 - 11	3	1	A	Server_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 5	1	1		Server_2_fc_1
	6 - 11	4	1		Server_2_fc_2
Device Adapter Pair 2, Cluster 1, Loop A	0 - 5	4	1		Server_2_fc_2
	6 - 11	1	1		Server_2_fc_1
Device Adapter Pair 2, Cluster 2, Loop A	0 - 5	3	1	A	Server_1
	6 - 11	2	1	A	Server_1

Example B: Two homogeneous servers, dedicated storage, spread LUNs

Example B is almost the same as Example A except that the spread-LUNs option is specified in the Spread LUNs column of the storage requirement table. Table 22 on page 46 shows the storage requirements for Example B.

Table 22. Example B: Storage requirements

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load-Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server_1	RS/6000 AIX	2	0	190	No	No	8	Yes
Server_2	RS/6000 AIX	0	2	190	No	No	8	Yes
Configuration notes:								

The Batch Configuration tool, Modify Host Systems, Configure SCSI Ports, and Configure ESS Fibre-Channel Ports work sheets for Example B are the same as for Example A and are not included here. Also no Shared Storage Access work sheet is required for Example B. The difference between Example A and Example B is that the LUNs for a given host are spread across the four available arrays.

For Server 1, two ESS SCSI ports are configured with six LUNs each. A similar configuration was used for Server 2 by configuring the LUNs from all four arrays to the two fibre-channel ports. The Storage Planning work sheet lists the range of Volume IDs assigned to each port. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 23. Example B: Storage Planning work sheet, Model F20

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs	Cluster 2	DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	2-1-A	0 - 5					Server_2_ fc_2		0 - 5
				Server_2_ fc_1		6 - 11					Server_1	3-1-A	6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_2_ fc_1		0 - 5					Server_1	3-1-A	0 - 5
				Server_1	2-1-A	6 - 11					Server_2_ fc_2		6-11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 23. Example B: Storage Planning work sheet, Model F20 (continued)

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 3	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs	Cluster 2	DA Pair 3	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 24 on page 49 shows the final configuration information for Example B.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 24. Example B: Modify Volume Assignments work sheet, Model F20

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 5	2	1	A	Server_1
	6 - 11				Server_2_fc_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 5				Server_2_fc_2
	6 - 11	3	1	A	Server_1
Device Adapter Pair 2, Cluster 1, Loop A	0 - 5	2	1	A	Server_1
	6 - 11				Server_2_fc_1
Device Adapter Pair 2, Cluster 2, Loop A	0 - 5				Server_2_fc_2
	6 - 11	3	1	A	Server_1

Example C: Two homogeneous hosts, dedicated storage, alternative path (SDD)

Example C is almost the same as Example B except that SDD software is installed in the host systems to provide an alternate SCSI path to the data. Table 25 on page 50 shows the storage requirements for Example C.

Table 25. Example C: Storage requirements

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load -Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server_1	RS/6000 AIX	2	0	190	Yes	No	8	Yes
Server_2	RS/6000 AIX	0	2	190	Yes	No	8	Yes
Configuration notes:								

The Batch Configuration tool, Modify Host Systems, and Configure SCSI Ports work sheets for Example C are the same as for Example A and are not included here. Because the SDD feature is installed, LUNs from a given host have to be shared between the two SCSI ports. Table 26 shows the information for Example C. For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.

Table 26. Example C: Shared Storage Access work sheet, Model F20

Primary-Access Connection				Secondary-Access Connection			
Host Nickname	ESS SCSI Port (SCSI only)			Host Nickname	ESS SCSI Port (SCSI only)		
	Bay	Adapter	Port		Bay	Adapter	Port
Server_1	2	1	A	Server_1	3	1	A
Server_2_ fc_1				Server_2_ fc_2			

One of the ESS SCSI ports for Server 1 is the primary-access connection. The second SCSI port shares all the LUNs with the corresponding primary-access connection. In general, with the SDD feature, LUNs should be shared across at least two SCSI paths on a given host. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs. Table 27 on page 51 shows the storage allocated to the primary connection.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 27. Example C: Storage Planning work sheet, Model F20

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	2-1-A	0 - 5					Server_2_ fc_1		0 - 5
				Server_2_ fc_1		6 - 11					Server_1	2-1-A	6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_2_ fc_1		0 - 5					Server_1	2-1-A	0 - 5
				Server_1	2-1-A	6 - 11					Server_2_ fc_1		6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 27. Example C: Storage Planning work sheet, Model F20 (continued)

Cluster 1	Location		Volume Assignments			Cluster 2	Location		Volume Assignments		
	DA Pair 3 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location		Volume Assignments				Location		Volume Assignments		
	DA Pair 4 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 28 on page 53 shows the final configuration information for Example C.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 28. Example C: Modify Volume Assignments work sheet, Model F20

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 5	2	1	A	Server_1
	6 - 11				Server_2_fc_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 5				Server_2_fc_1
	6 - 11	2	1	A	Server_1
Device Adapter Pair 2, Cluster 1, Loop A	0 - 5	2	1	A	Server_1
	6 - 11				Server_2_fc_1
Device Adapter Pair 2, Cluster 2, Loop A	0 - 5				Server_2_fc_1
	6 - 11	2	1	A	Server_1

Example D: Two homogeneous servers with shared storage

Example D shows the same two hosts as Example C with the additional requirement that the hosts share storage. The Spread LUNs column on Table 29 identifies that the storage needs to be shared between Server 1 and Server 2.

Table 29. Example D: Storage requirements, Model F20

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load -Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server_1	RS/6000 AIX	2	0	380	Yes	Yes, Server_2	8	Yes
Server_2	RS/6000 AIX	0	2		Yes	Yes, Server_1		
Configuration notes:								

The Batch Configuration tool, Modify Host Systems, and Configure SCSI Ports work sheets for Example D are the same as for Example A and are not included here. The remaining work sheets for Example D are different because of the SDD feature and because LUNs are shared between hosts. Table 30 shows the information for Example D. For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.

Table 30. Example D: Shared Storage Access work sheet, Model F20

Primary-Access Connection				Secondary-Access Connection			
Host Nickname	ESS SCSI Port (SCSI only)			Host Nickname	ESS SCSI Port (SCSI only)		
	Bay	Adapter	Port		Bay	Adapter	Port
Server_1	2	1	A	Server_1	3	1	A
Server_1	2	1	A	Server_2_fc_1			
Server_1	2	1	A	Server_2_fc_2			

Because all storage is shared on all the ports, only one port is identified as primary. The other three ports are shared-access ports. In the Storage Planning work sheet, storage is only assigned to Server 1, ESS SCSI port 2-1-A. Table 31 shows the information for Example D. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 31. Example D: Storage Planning work sheet, Model F20

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	2-1-A	0 - 11					Server_1	2-1-A	0 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	2-1-A	0 - 11					Server_1	2-1-A	0 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 31. Example D: Storage Planning work sheet, Model F20 (continued)

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 3	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs	Cluster 2	DA Pair 3	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 32 on page 57 shows the final configuration information for Example D.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 32. Example D: Modify Volume Assignments work sheet, Model F20

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 11	2	1	A	Server_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 11	2	1	A	Server_1
Device Adapter Pair 2, Cluster 1, Loop A	0 - 11	2	1	A	Server_1
Device Adapter Pair 2, Cluster 2, Loop A	0 - 11	2	1	A	Server_1

Example E: High-availability configuration

This example outlines the custom configuration requirements for high-availability configuration:

1. Hardware
   - Four 18-GB disk packs are installed in an ESS Model F20.
   - Two RS/6000 servers with four SCSI ports each are installed in the HACMP environment.
   - Eight SCSI host adapters are installed in the ESS.
2. Configuration
   - Table 33 shows the storage requirements for Example E.

Table 33. Example E: Storage requirements

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load -Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server_1	RS/6000 AIX	4		360	No		16	Yes
Server_2	RS/6000 AIX	4			No	Server_1		
Configuration notes:								

Example E shows the same feature code that was used for Examples A and B. However, in this case the entire storage capacity of the ESS is configured to Server 1 and shared in standby mode with Server 2. Table 34 on page 59 shows how to complete the Batch Configuration tool work sheet for this example.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 34. Example E: Batch Configuration tool work sheet

4 x 18-GB Arrays (feature code 21X2, quantity 4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5		X	X	X	X				
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11									
		No Assignment											
SSR Information: ESS Batch Configuration tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Legend: A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration tool process. A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.													

Complete the work sheets that are needed to finalize the configuration process using the ESS Specialist. First use the server information provided in the storage requirements table to determine how to complete the Modify Host Systems and the Configure SCSI Ports work sheets. For this example, locate the SCSI ports selected for Server 1 in different bays than those selected for Server 2. This type of configuration meets the high-availability requirement.

Table 35 shows the completed Modify Host Systems work sheet for Example E. Table 36 on page 60 shows the completed Configure SCSI Ports work sheet for Example E.

Table 35. Example E: Modify Host Systems work sheet

Host Name or IP Address	Host Nickname	Host System Type	Attachment Type SCSI or Fibre	Fibre-Channel Port	WWPN for Fibre-Channel Host Adapter
Server_1	Server_1	RS/6000 AIX	SCSI		
Server_2	Server_2	RS/6000 AIX	SCSI		

Table 36 shows the completed Configure SCSI Ports work sheet for Example E.

Table 36. Example E: Configure SCSI Ports work sheet

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/ Fibre Channel)	Installed Sequence
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A	Server_1	RS/6000/ AIX	SCSI1	7	SCSI	1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A	Server_1	RS/6000/ AIX	SCSI2	7	SCSI	5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A	Server_2	RS/6000/ AIX	S2SCSI1	7	SCSI	3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A	Server_2	RS/6000/ AIX	S2SCSI2	7	SCSI	7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 36. Example E: Configure SCSI Ports work sheet (continued)

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/ Fibre Channel)	Installed Sequence
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A	Server_2	RS/6000/ AIX	S2SCSI3	7	SCSI	2
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A	Server_2	RS/6000/ AIX	S2SCSI4	7	SCSI	6
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						10
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						14
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A	Server_1	RS/6000/ AIX	SCSI3	7	SCSI	4
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A	Server_1	RS/6000/ AIX	SCSI4	7	SCSI	8
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						12
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						16
		Bay 4 Adapter 4 Port B						

Complete the Shared Storage Access work sheet. Because the environment is HACMP, all storage from Server 1 will be shared with Server 2. For this example, locate the SCSI ports for Server 1 in different bays on Cluster 1 and Cluster 2 than those selected for Server 2. Table 37 shows how you would complete the Shared Storage Access work sheet for this example. For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.

Table 37. Example E: Shared Storage Access work sheet

Primary-Access Connection				**Secondary-Access Connection**			
Host Nickname	**ESS SCSI Port (SCSI only)**			**Host Nickname**	**ESS SCSI Port (SCSI only)**		
	Bay	**Adapter**	**Port**		**Bay**	**Adapter**	**Port**
Server_1	1	1	A	Server_2	2	1	A
Server_1	1	2	A	Server_2	2	2	A
Server_1	4	1	A	Server_2	3	1	A
Server_1	4	2	A	Server_2	3	2	A

Because all storage is shared between the two hosts, you can configure storage for Server 1 and then share it with Server 2. Therefore, in the Storage Planning work sheet, you only need to show the storage allocation for Server 1. Use the Storage Planning work sheet to decide where to configure the storage for a given server and how to map the storage to the ESS port. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs. Table 38 shows a completed Storage Planning work sheet for this example.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 38. Example E: Storage Planning work sheet

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	1-1-A	0 - 5					Server_1	4-1-A	0 - 5
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	1-2-A	0 - 5					Server_1	4-2-A	0 - 5
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 38. Example E: Storage Planning work sheet (continued)

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 3	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs	Cluster 2	DA Pair 3	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 39 shows a completed Modify Volume Assignments work sheet. For fibre-channel configurations, enter the host nickname and Vol. IDs. For SCSI configurations, enter the host nickname, the ESS SCSI Port, and the Vol. IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 39. Example E: Modify Volume Assignments work sheet

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 5	1	1	A	Server_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 5	4	1	A	Server_1
Device Adapter Pair 2, Cluster 1, Loop A	0 - 5	1	2	A	Server_1
Device Adapter Pair 2, Cluster 2, Loop A	0 - 5	4	2	A	Server_1

Example F: four homogeneous AS/400 servers

This example outlines the custom configuration requirements for four homogeneous AS/400 servers:

1. Hardware
   - Four 18-GB disk packs are installed in the ESS Model F20.
   - Eight SCSI host adapters are installed in the ESS.
   - Four AS/400 servers with 2 SCSI ports each are attached to the ESS.
2. Configuration
   - Table 40 shows information for Example F.

Table 40. Example F: Storage requirements

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load -Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Server_1	AS/400 V3R7	2		102	No	No	8.59	No
Server_2	AS/400 V3R7	2		102	No	No	8.59	No
Server_3	AS/400 V3R7	2		102	No	No	8.59	No
Server_4	AS/400 V3R7	2		102	No	No	8.59	No
Configuration notes:								

For this particular example, the hardware configuration has twelve 8.59-GB LUNs per array. You can configure a total of four arrays, for a total of 12 x 4 x 8.59 = 412 GBs, which is enough to satisfy the storage capacity requirement. Because all four servers have a requirement for isolated 8.59-GB LUNs, you can configure one array per server. You can configure six LUNs per ESS SCSI port. Record this information in the Batch Configuration tool work sheet and in the Storage Planning work sheet. Table 41 on page 67 shows a completed Batch Configuration tool work sheet for this example.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 41. Example F: Batch Configuration tool work sheet

4 x 18-GB Arrays (feature code 21X2, quantity 4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11		X	X	X	X				
		No Assignment											
SSR Information: ESS Batch Configuration tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 42 shows the completed Modify Host Systems work sheet.

Table 42. Example F: Modify Host Systems work sheet

Host Name or IP Address	Host Nickname	Host System Type	Attachment Type SCSI or Fibre	Fibre-Channel Ports	WWPN for Fibre-Channel Host Adapter
Server_1	Server_1	AS/400 V3R7	SCSI		
Server_2	Server_2	AS/400 V3R7	SCSI		
Server_3	Server_3	AS/400 V3R7	SCSI		
Server_4	Server_4	AS/400 V3R7	SCSI		

Table 43 shows the completed Configure SCSI Ports work sheet for a Model F20.

Table 43. Example F: Configure SCSI Ports work sheet, Model F20

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A	Server_1	AS/400 V3R7	SCSI1	7	SCSI	1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A	Server_3	AS/400 V3R7	S3SCSI1	7	SCSI	5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A	Server_2	AS/400 V3R7	S2SCSI1	7	SCSI	3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A	Server_4	AS/400 V3R7	S4SCSI1	7	SCSI	7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 43. Example F: Configure SCSI Ports work sheet, Model F20 (continued)

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A	Server_2	AS/400 V3R7	S2SCSI2	7	SCSI	4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A	Server_4	AS/400 V3R7	S2SCSI2	7	SCSI	8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A	Server_1	AS/400 V3R7	SCSI2	7	SCSI	2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A	Server_3	AS/400 V3R7	S3SCSI2	7	SCSI	6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

For Example F, the Shared Storage Access work sheet is not required because there is no data sharing. Complete the Storage Planning work sheet. Copy the Volume IDs from the Batch Configuration tool work sheet. Configure one array per server. Table 44) shows a completed Storage Planning work sheet. For fibre-channel configurations, enter the host nickname and the volume IDs. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 44. Example F: Storage Planning work sheet

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_1	1-1-A	0 - 5					Server_2	2-1-A	0 - 5
				Server_1	4-1-A	6 - 11					Server_2	3-1-A	6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs 0 - 12	Host Nickname	ESS Port	Vol. IDs
				Server_3	1-2-A	0 - 5					Server_4	2-2-A	0 - 5
				Server_3	4-2-A	6 - 11					Server_4	3-2-A	6 - 11
		Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs			Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Table 44. Example F: Storage Planning work sheet (continued)

Cluster 1	Location		Volume Assignments			Cluster 2	Location		Volume Assignments		
	DA Pair 3 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 3 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 3 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	Location		Volume Assignments				Location		Volume Assignments		
	DA Pair 4 Loop A	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop A	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs
	DA Pair 4 Loop B	Group 2 Vol. IDs	Host Nickname	ESS Port	Vol. IDs		DA Pair 4 Loop B	Group 1 Vol. IDs	Host Nickname	ESS Port	Vol. IDs

Copy the information from the completed Storage Planning work sheet (Table 44 on page 71) to the tabular Modify Volume Assignments work sheet work sheet (Table 45). For fibre-channel configurations, enter the host nickname and Vol. IDs. For SCSI configurations, enter the host nickname, the ESS SCSI Port, and the Vol. IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 45. Example F: Modify Volume Assignments work sheet

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A	0 - 5	1	1	A	Server_1
	6 - 11	4	1	A	Server_1
Device Adapter Pair 1, Cluster 2, Loop A	0 - 5	2	1	A	Server_2
	6 - 11	3	1	A	Server_2
Device Adapter Pair 2, Cluster 1, Loop A	0 - 5	1	2	A	Server_3
	6 - 11	4	2	A	Server_3
Device Adapter Pair 2, Cluster 2, Loop A	0 - 5	2	2	A	Server_4
	6 - 11	3	2	A	Server_4

Chapter 6. Open-systems custom configuration

This chapter describes the planning process and the work sheets needed to implement the customized open-systems configuration. This chapter also includes an example of a custom configuration.

The custom configuration process for open systems is similar to the standard configuration process. References to Chapter 5, “Open-systems standard configuration,” on page 23 are included to illustrate these similarities. See “Preparing for a custom configuration” for an explanation of the tasks you need to complete for a custom configuration.

Preparing for a custom configuration

The SSR uses the work sheets in this section and the Storage Allocation panels in the ESS Specialist to accomplish custom configuration. (You can also use the ESS Specialist for ESS configuration.) Complete the following custom work sheets with your SSR:

Note:

1. Complete the Modify Hosts Systems work sheet using the input provided in the storage requirements table (see “Configuration planning for open-systems hosts” on page 11). This input identifies the host system names, host system nicknames, host type, attachment types (SCSI or fibre-channel) and, for fibre-channel connections, the WWPN of the fibre-channel host adapters.
2. Complete the Configure SCSI Ports work sheet to specify the host-to-SCSI port map for the ESS.
3. Complete the Configure Fibre-Channel Ports work sheet to enter the fibre-channel attributes of the ESS ports.
4. Complete one of the Define Disk Groups work sheets according to the storage configuration feature code that you have ordered. Use the Define Disk Groups work sheet to configure RAID-5 or RAID-10 disk groups and standard volumes.
5. For each server, complete a Host Add Volumes work sheet. First enter the information from steps 2, 3, and 4. Based on the storage capacity requirements and the level of isolation required for the LUNs on a given host, choose the device adapter pair and cluster combination that you need to configure the desired capacity.
6. In the Shared Storage Access work sheet, record the connections that will be shared with other previously configured ports. In this case, it is not necessary to create additional volumes for the connections that are shared. Identify the ESS SCSI ports and the fibre-channel host adapters. The process described in this document assumes that for a given pair of SCSI ports or fibre-channel host adapters, either all of the LUNs are shared or none of the LUNs are shared.

Custom configuration work sheets

The SSR uses several panels in the ESS Specialist to implement the open-systems custom configurations. This section provides work sheets in which to record the information that the SSR uses with the ESS Specialist panels to make the custom configuration selections.

Modify Host Systems work sheet

From the storage requirements table, identify all unique host system names that are attached to the ESS. For each host system, identify the host type and the attachment type.

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Modify Host Systems option to record the information from the Modify Host Systems work sheet (see Table 46).

The host type must match one of the selections available in the ESS Specialist. Refer to the *IBM TotalStorage Enterprise Storage Server: Web Interface User's Guide* for details. For the latest information on supported hosts, refer to the IBM Web site at:

http://www.storage.ibm.com/disk/ess/index.html?/supserver.htm

Perform the following steps to complete the work sheet:

1. For each host system with only SCSI connections, select a single host nickname.
2. For each host system with fibre-channel connections, select a different nickname for each fibre-channel host adapter in the host system.

   The WWPN of each fibre-channel host adapter is required to configure the ESS.
3. If a host system has both types of connections (SCSI and fibre channel), select a single host nickname to represent all the SCSI connections and select a different host nickname for each fibre-channel host adapter.
4. Use the Fibre-Channel Ports column to specify the ESS fibre-channel ports through which this host accesses its LUNs in the ESS. Specify a bay number (B*n*) and an adapter number (A*m*) for each ESS Fibre port through which this host accesses its LUNs. Specify All if the host accesses its LUNs through all installed fibre ports in the ESS.

Table 46. Modify Host Systems work sheet

Modify Host Systems work sheet					
Host Name or IP Address	**Host Nickname**	**Host System Type**	**Attachment Type (SCSI or Fibre)**	**Fibre-Channel Ports**	**WWPN for Fibre-Channel Host Adapter**

Configure SCSI Ports work sheet

Use the Configure SCSI Ports work sheet (Table 47 on page 78) to describe the mapping of ESS SCSI ports to the host. The work sheet contains one row per possible ESS SCSI port.

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Configure Host Adapter Ports option to choose a port to apply the information from this work sheet.

Perform the following steps to complete the work sheet. Use the information from the storage requirements table (Table 3 on page 14) to guide your choices:

1. Enter the number of ESS ESCON, SCSI, and fibre-channel host adapters that you ordered for the ESS. This information can be found on the ESS order form.
2. Connect host system adapters that share access to a common set of LUNs to the ESS SCSI ports located in different bays.

   Connecting to ports located in adapter-bay pairs 1 and 4 or adapter-bay pairs 2 and 3 will provide access availability and will also balance CPI activity.
3. Refer to the Installed Sequence column of the work sheet. The numbers in this column reflect the order in which the ESS host adapter cards are installed in the machine. For the Model 800, the ESCON host adapters are installed first, then the fibre-channel adapters, and finally the SCSI adapters. See “Configure SCSI Ports work sheet” on page 26 for more details.

Table 47. Configure SCSI Ports work sheet, Model 800 custom configuration

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ Fibre Channel/SCSI)	Installed Sequence for Model 800
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 47. Configure SCSI Ports work sheet, Model 800 custom configuration (continued)

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ Fibre Channel/SCSI)	Installed Sequence for Model 800
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A						4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Configure ESS Fibre-Channel Ports work sheet

The next step is to configure the ESS fibre-channel ports and servers. Use the Configure ESS Fibre-Channel Ports work sheet (Table 48) to enter the attributes of the fibre-channel ports. The work sheet contains one row for each possible ESS fibre-channel port.

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Configure Host Adapter Ports option to choose a port to apply the information from this work sheet.

Perform the following steps to complete the work sheet. Use the information from the storage requirements table (Table 3 on page 14) to guide your choices:

1. Enter the attributes of the fibre-channel ports (FICON or SCSI-FCP). The work sheet contains one row for each possible fibre-channel single-port adapter. Complete the information in this work sheet for every bay-adapter row that has a fibre-channel host adapter installed in your ESS. The number of fibre-channel host adapters that you ordered for the ESS can be found on the ESS order form.
2. Specify the type of connection (point-to-point or arbitrated loop) for the ESS fibre-channel port. If the ESS fibre-channel port is connected to a switch or a switched fabric, specify point to point.

Table 48. Configure ESS Fibre-Channel Ports work sheet, 750 and 800 Models Custom Configuration

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, SCSI, or Fibre-Channel)	Installed Sequence for 750 and 800 Models
			Point to Point		Arbitrated Loop FCP-Open		
			FICON	FC - Open			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					4
		Bay 3 Adapter 2					8
		Bay 3 Adapter 3					12
		Bay 3 Adapter 4					16
	Bay 4	Bay 4 Adapter 1					2
		Bay 4 Adapter 2					6
		Bay 4 Adapter 3					10
		Bay 4 Adapter 4					14

Define Disk Groups work sheet

You use the Define Disk Groups work sheet (Table 49) for the storage configuration feature code that was ordered for your machine. This work sheet contains a form segment for each installed disk group or array (RAID 5 or RAID 10).

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Configure Disk Group option to apply the information from this work sheet.

Perform the following steps to complete the work sheet. Use the information from the storage requirements table (Table 3 on page 14) to guide your choices:

1. Determine the number of disk groups that must be defined as RAID-5 or RAID 10 to meet the total amount of RAID storage capacity that you ordered for the ESS. The capacity information can be found on the ESS order form.
2. Identify each disk group as RAID 5 or RAID 10.
3. Distribute disk groups so that an equal number is controlled by each cluster and by as many device adapters as possible.

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 49. Define Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID-5 ____ or RAID-10 ____	1	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
2	A	2: RAID-5 ____ or RAID-10 ____	2	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5:
3	A	2: RAID-5 ____ or RAID-10 ____	3	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____

Table 49. Define Disk Groups work sheet (continued)

DA	Loop	Cluster 1	DA	Loop	Cluster 2
4	A	2: RAID-5 ____ or RAID-10 ____	4	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____

Host Add Volumes work sheet

Each row of the Host Add Volumes work sheet (Table 50) identifies the parameters that you use to create new ESS volumes. The ESS volumes are automatically assigned to the ESS SCSI port or fibre-channel host adapter that connects to the primary LUN-access path on a host system.

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Add Volumes panel. Using the Add New Volumes option in the ESS Specialist, the SSR can specify any number of volumes with the same or different GB capacity to generate a new volume list.

Perform the following steps to complete the work sheet. Use the information from the storage requirements table (Table 3 on page 14):

1. Enter the host nicknames in the Host Nicknames column.
2. Enter the ESS host system adapter and connection information in the ESS SCSI Port column.
3. Identify each storage type as RAID 5 or RAID 10 in the Storage Type column.
4. Identify disk group locations in the Disk Group column. Define the number of disk groups required to satisfy the storage capacity requirement for each host system adapter primary-access connection.
5. Use Storage Capacity and LUN Size values from the Storage Requirements table to calculate values for the Volume Size and Number of Volumes columns.
6. Identify volumes as sequentially grouped or as volumes that will be spread across the remaining array or disk capacity.

   If the LUNs are to be sequentially grouped, identify as many disk groups as are required to satisfy the storage capacity requirement. If the LUNs are to be spread across multiple arrays or disks, identify all the disk groups of appropriate storage type that will have available capacity after all sequentially assigned volumes are created.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 50. Host Add Volumes work sheet

Host Nickname	ESS SCSI Port	Storage Type	Disk Group(s)	Volume Size	Number of Volumes	Sequential or Spread
Host Nickname _____	Bay _____ Adapter___ Port_____	RAID-5 _____ RAID-10 _____	Cluster_____ Adapter____ Loop_____ Group_____	_____GB	_____	Sequential _____ Spread _____

Table 50. Host Add Volumes work sheet (continued)

Host Nickname	ESS SCSI Port	Storage Type	Disk Group(s)	Volume Size	Number of Volumes	Sequential or Spread
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________
Host Nickname __________	Bay ______ Adapter___ Port______	RAID-5 ___________ RAID-10 ___________	Cluster_____ Adapter____ Loop______ Group_____	________GB	__________	Sequential ________ Spread __________

Shared Storage Access work sheet

Use the Shared Storage Access work sheet (Table 51 on page 84) to define the storage that is to be accessed and shared by more than one host. Fill in one row of the work sheet for each shared storage access.

Note: The SSR uses the ESS Specialist to navigate to the Storage Allocation panel, select the Open-Systems Storage option, and then select the Modify Volume Assignments option. See "Instructions for the SSR for the Modify Volume Assignments panel" on page 84 for the instructions on using ESS Specialist for this configuration.

Perform the following steps to complete the work sheet. Use the information from the storage requirements table (Table 3 on page 14) for the host system adapter connections that provide shared access paths to ESS storage:

1. From the storage requirements table and the Configure SCSI Ports work sheet, identify the corresponding ESS SCSI port that is the primary-access path for each shared storage access connection. Complete the primary-access portion of the Shared Storage Access work sheet for each connection.

2. From the storage requirements table and the Configure SCSI Ports work sheet, identify the ESS SCSI port for each host system adapter shared-access connection. Complete the secondary access connection portion of the Shared Storage Access work sheet, one row for each connection.

Table 51. Shared Storage Access work sheet

Primary-Access Connection				Secondary-Access Connection			
Host Nickname (See Note.)	ESS SCSI Port (SCSI only)			Host Nickname (See Note.)	ESS SCSI Port (SCSI only)		
	Bay	Adapter	Port		Bay	Adapter	Port
Note: For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.							

Instructions for the SSR for the Modify Volume Assignments panel

Use the ESS Specialist Modify Volume Assignments panel to apply the information recorded in the Shared Storage Access work sheet. Perform the following steps to apply the configuration.

1. Select the host nickname as the first level of sort for the table.
2. Select the host port as the second level of sort for the table.
3. Select all the volumes assigned to a primary-access connection.
4. Select the Add option, and then select the appropriate host nickname. For SCSI, also select the shared access port from the list of available ports.
5. Click **Perform Configuration Update**. All the LUNs in the primary-access port storage map are copied to the shared-access port storage map.

Custom Example: Homogeneous servers with dedicated storage and shared access

This example outlines the custom configuration requirements for two homogeneous servers with dedicated storage and shared access. This example uses the following hardware:

- ESS Model 800 with four 36.4-GB disk packs installed.
- Two RS/6000 servers with two SCSI ports each are installed.
- Eight SCSI host adapters are installed in the ESS.

Table 52 on page 85 shows the storage requirements for the example.

Table 52. Custom Example: Storage requirements

Host Name and Type	Host System Adapter	Share Storage Access	Storage Type	Storage Capacity	LUN Size	Sequential or Spread LUNs
System No. 1 Name: _Server1___ Type: _RS/6000_ _AIX_____	**Adapter No. 1** SCSI:__X__ Initiator ID: ____7_____ Fibre:_____ Nickname: _____	System No. 2 Adapter No. 1	RAID-5 __X_____ RAID-10 _____	180 GB _____GB	12 GB _____GB	Sequential __X_____ Spread _____
	Adapter No. 2 SCSI:__X__ Initiator ID: ____7_____ Fibre:_____ Nickname: _____	System No. 2 Adapter No. 2	RAID-5 __X_____ RAID-10 _____	__140__GB _____GB	__12___GB _____GB	Sequential __X_____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID-5 _____ RAID-10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID-5 _____ RAID-10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____

Table 52. Custom Example: Storage requirements (continued)

System No. 2 Name: _Server2___ Type: _RS/6000_ _AIX_____	**Adapter No. 1** SCSI:__X__ Initiator ID: ____7_____ Fibre:_____ Nickname: _____	System No. 1 Adapter No. 1	RAID-5 __X_____ RAID-10 _____	__240__GB _____GB	__12___GB _____GB	Sequential __X_____ Spread _____
	Adapter No. 2 SCSI:__X__ Initiator ID: ____7_____ Fibre:_____ Nickname: _____	System No. 1 Adapter No. 2	RAID-5 ___X_____ RAID-10 _____	__240__GB _____GB	_____GB _____GB	Sequential ___X____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID-5 _____ RAID-10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID-5 _____ RAID-10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
Configuration notes:						

Complete the work sheets that the SSR needs to implement the configuration process using the ESS Specialist. First, use the server information provided in the storage requirement table to complete the Modify Host Systems work sheet. For an example, see Table 53.

Table 53. Custom Example: Modify Host Systems work sheet

Host Name or IP Address	Host Nickname	Host System Type	Attachment Type SCSI or Fibre	Fibre-Channel Ports	WWPN for Fibre-Channel Host Adapter
Server1	Server1	RS/6000 AIX	SCSI		
Server2	Server2	RS/6000 AIX	SCSI		

The Configure SCSI Ports work sheet indicates how many ports are to be configured to each of the servers. For this particular example, the requested

storage is 800 GBs. Two SCSI ports on each server are used to avoid performance bottlenecks. This should be adequate for most workloads. See Chapter 3, “Planning the capacity and performance of your ESS,” on page 7 for planning guidelines.

This example indicates that SDD or some other type of alternate path or load-balancing software will not be used by any of the hosts.

This example also indicates that the ESS hardware configuration has eight SCSI host adapters installed, which means that 16 SCSI ports are available to select from. Select a total of four SCSI ports. Use the Configure SCSI Ports work sheet (Table 54) to see how to make the assignments. The last column in the Configure SCSI Ports work sheet shows the sequence that manufacturing uses to determine where to install the SCSI cards. This installation sequence optimizes performance.

Table 54. Custom Example: Configure SCSI Ports work sheet, Model 800

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/ Fibre Channel)	Installed Sequence
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A	Server_1	RS/6000 AIX	Adapter 1	7	SCSI	1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A	Server_2	RS/6000 AIX	Adapter 1	7	SCSI	3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 54. Custom Example: Configure SCSI Ports work sheet, Model 800 (continued)

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/ Fibre Channel)	Installed Sequence
Cluster 2	Bay 3	Bay 3 Adapter 1 Port A	Server_2	RS/6000 AIX	Adapter 2	7	SCSI	4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A	Server_1	RS/6000 AIX	Adapter 2	7	SCSI	2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Table 55 on page 89 shows the example of the Define Disk Groups work sheet.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 55. Custom Example: Define Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID-5__X__ or RAID-10____	1	A	1: RAID-5__X__ or RAID-10____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
2	A	2: RAID-5 _X___ or RAID-10 ____	2	A	1: RAID-5 _X___ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
3	A	2: RAID-5 ____ or RAID-10 ____	3	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
4	A	2: RAID-5 ____ or RAID-10 ____	4	A	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____
	B	2: RAID-5 ____ or RAID-10 ____		B	1: RAID-5 ____ or RAID-10 ____
		4: RAID-5 ____ or RAID-10 ____			3: RAID-5 ____ or RAID-10 ____
		6: RAID-5 ____ or RAID-10 ____			5: RAID-5 ____ or RAID-10 ____

Table 56 on page 90 shows an example of Host Add Volumes work sheet.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 56. Custom Example: Host Add Volumes work sheet

Host Nickname	ESS SCSI Port	Storage Type	Disk Group(s)	Volume Size	Number of Volumes	Sequential or Spread
Server1	Bay ____1___ Adapter ____1___ Port__A__	RAID-5 ___X_____ RAID-10 __________	Cluster _1_____ Adapter _1_______ Loop __A_____ Group _2_____	12 GB	15	Sequential ___X____ Spread __________
Server1	Bay ___4_____ Adapter ___1____ Port__A__	RAID-5 ___X_____ RAID-10 __________	Cluster _1,2_____ Adapter __1______ Loop __A_____ Group _1,2_____	12 GB	12	Sequential ___X____ Spread __________
Server2	Bay ___2_____ Adapter __1_____ Port___A__	RAID-5 ___X_____ RAID-10 __________	Cluster_1,2__ Adapter_1,2__ Loop_A__ Group_1,2___	12 GB	20	Sequential ___X____ Spread __________
Server2	Bay ___3_____ Adapter __1_____ Port___A__	RAID-5 ___X____ RAID-10 __________	Cluster_1,2_ Adapter_2_ Loop_A__ Group_1,2__	12 GB	20	Sequential ___X____ Spread __________
_________________	Bay _________ Adapter _________ Port______	RAID-5 __________ RAID-10 __________	Cluster___ Adapter___ Loop____ Group_____	________GB	__________	Sequential _________ Spread __________
_________________	Bay ________ Adapter _________ Port______	RAID-5 __________ RAID-10 __________	Cluster___ Adapter___ Loop____ Group_____	________GB	__________	Sequential _________ Spread __________
_________________	Bay ________ Adapter _________ Port______	RAID-5 __________ RAID-10 __________	Cluster___ Adapter___ Loop____ Group_____	________GB	__________	Sequential _________ Spread __________
_________________	Bay ________ Adapter _________ Port______	RAID-5 __________ RAID-10 __________	Cluster___ Adapter___ Loop____ Group_____	________GB	__________	Sequential _________ Spread __________

Table 57 shows an example of the Shared Storage Access work sheet.

Table 57. Custom Example: Shared Storage Access work sheet

Primary-Access Connection				Secondary-Access Connection			
Host Nickname (See Note.)	**ESS SCSI Port (SCSI only)**			**Host Nickname (See Note.)**	**ESS SCSI Port (SCSI only)**		
	Bay	**Adapter**	**Port**		**Bay**	**Adapter**	**Port**
Server1	1	1	A	Server2	2	1	A
Server1	4	1	A	Server2	3	1	A
Note: For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.							

Appendix A. Open-systems standard configuration

This section is formatted as a PDF as part of the *IBM TotalStorage Enterprise Storage Server: Configuration Planner for Open-Systems Hosts*. It is also formatted in Word Pro® as a standalone document to simplify the use of the work sheets while editing, modifying, and configuring the ESS.

This section contains the instructions for using the work sheets to complete a standard configuration of the ESS for open-systems hosts. The unique work sheets are in order by feature code. This section has four sets of forms, as follows:

- Common work sheets
  - Storage requirements, Table A
  - Storage requirements, Table B
  - Modify Host Systems work sheet
  - Configure SCSI Ports work sheet
  - Configure ESS Fibre-Channel Ports work sheet
  - Shared Storage Access work sheet
- Unique work sheets for the Batch Configuration tool
- Unique work sheets for Storage planning
- Unique work sheets for Modify Volume

  All unique work sheets are in order by feature code.

Implementing the open-systems standard configuration

At installation time, the SSR uses the work sheets to implement the logical configuration. The steps that the SSR performs are explained briefly below.

- The SSR uses the service panels and the Batch Configuration Tool work sheet to indicate the type of configuration required for each SSA adapter card (each device adapter and cluster combination).
- The SSR uses the ESS Specialist to complete the logical configuration. For additional details on how to use each of the Specialist panels, refer to the *IBM TotalStorage Enterprise Storage Server: Web Interface User's Guide*.
  1. The SSR uses the Modify Host Systems work sheet to configure all the servers that will be attached to the ESS. Select the Open-systems Storage option in the Storage Allocation panel to bring up the Open-systems Storage panel. Then select the Modify Host Systems option. The Modify Host Systems panel appears. Use this panel to enter the information recorded in the Modify Host Systems work sheet.
  2. The SSR uses the Configure SCSI Ports work sheet to establish the mapping between the ESS SCSI ports and the servers. Select the Open-systems Storage option from the Storage Allocation panel. From the Open-systems Storage panel, select the Configure Host Adapter Ports option. Use the mapping described in the work sheet to enter the information into the panel.
  3. The SSR uses the Configure ESS fibre-channel Ports work sheet to specify the attributes of the ESS fibre-channel ports. Select the Open-systems Storage option from the Storage Allocation panel. From the Open-systems Storage panel, select the Configure Host Adapter Ports option. Enter the options selected in the work sheet.
  4. The SSR uses the Modify Volume Assignment work sheet to establish the mapping of logical volumes to ESS SCSI ports or to fibre-channel host

nicknames. To accomplish this, the table in the panel can be sorted using the second column, which is labeled Location, as the first level sort. In this way the display in the ESS Specialist will match the layout in the work sheet.

5. The SSR uses the Shared Storage work sheet to configure the level of data sharing across ESS SCSI ports or fibre-channel host nickname and servers. Use the ESS Specialist Storage Allocation panel, Modify Volume Assignments option to apply the information recorded in the Shared Storage Access work sheet. The following steps apply the configuration for a row in the work sheet.

- Select the Host Nickname as the first level of sort for the table.
- Select the Host Port as the second level of sort for the table.
- Select all the volumes assigned to a primary-access connection.
- Select the Add option and then select the appropriate host nickname.
- For SCSI connections, select the shared access port from the list of available ports.
- Press the Perform Configuration Update button. All the LUNs in the primary-access connection storage map are copied to the shared-access connection storage map.

Common work sheets

The following work sheets are for the open-systems common work sheets.

Table 58. Open-systems Storage requirements, Table A

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load-Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Configuration notes:								

Table 59. Open-systems Storage requirements, Table B

Host Name and Type	Host System Adapter	Share Storage Access	Storage Type	Storage Capacity	LUN Size	Sequential or Spread LUNs
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
Configuration notes:						

Table 60. Open-systems Modify Host Systems work sheet

Modify Host Systems work sheet					
Host Name or IP Address	**Host Nickname**	**Host System Type**	**Attachment Type SCSI or Fibre**	**Fibre-Channel Ports**	**WWPN for Fibre-Channel Host Adapter**

Table 61. Open-systems Configure SCSI Ports work sheet, Model 800 Standard Configuration

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence for Model 800
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 61. Open-systems Configure SCSI Ports work sheet, Model 800 Standard Configuration (continued)

Cluster 2	**Bay 3**	Bay 3 Adapter 1 Port A						4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Table 62. Open-systems Configure SCSI Ports work sheet for E and F Models

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence for E and F Models
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 62. Open-systems Configure SCSI Ports work sheet for E and F Models (continued)

Cluster 2	**Bay 3**	Bay 3 Adapter 1 Port A						2
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						6
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						10
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						14
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						4
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						8
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						12
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						16
		Bay 4 Adapter 4 Port B						

Fabric and switches are transparent to the ESS logical configuration. In Table 63 and Table 64 on page 102 specify the type of connection for the ESS fibre-channel port. If the ESS fibre-channel port is connected to a switch or a switched fabric, specify point to point.

Table 63. Open-systems Configure ESS Fibre-Channel Ports work sheet, 750 and 800 Models Standard Configuration

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, SCSI, or Fibre Channel)	Installed Sequence for 750 and 800 Models
			Point to Point		Arbitrated Loop FCP-Open		
			FICON	FCP-Open			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					4
		Bay 3 Adapter 2					8
		Bay 3 Adapter 3					12
		Bay 3 Adapter 4					16
	Bay 4	Bay 4 Adapter 1					2
		Bay 4 Adapter 2					6
		Bay 4 Adapter 3					10
		Bay 4 Adapter 4					14

Table 64. Open-systems Configure ESS Fibre-Channel Ports work sheet for E and F Models

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, SCSI, or Fibre Channel)	Installed Sequence for E and F Models
			Point to Point		Arbitrated Loop FCP-Open		
			FICON	FCP-Open			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					2
		Bay 3 Adapter 2					6
		Bay 3 Adapter 3					10
		Bay 3 Adapter 4					14
	Bay 4	Bay 4 Adapter 1					4
		Bay 4 Adapter 2					8
		Bay 4 Adapter 3					12
		Bay 4 Adapter 4					16

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 65. Open-systems Host Add Volumes work sheet

Host Nickname	ESS SCSI Port	Storage Type	Disk Group(s)	Volume Size	Number of Volumes	Sequential or Spread
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 ________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________
Host Nickname ____________	Bay _________ Adapter _________ Port______	RAID 5 _________	Cluster____ Adapter___ Loop_____ Group_____	_______GB	_________	Sequential ________ Spread _________

Table 66. Open-systems Shared Storage Access work sheet

Primary-Access Connection				Secondary-Access Connection			
Host Nickname (See Note.)	**ESS SCSI Port (SCSI only)**			**Host Nickname (See Note.)**	**ESS SCSI Port (SCSI only)**		
	Bay	**Adapter**	**Port**		**Bay**	**Adapter**	**Port**
Note: For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.							

Unique work sheets for the open-systems Batch Configuration tool

The following work sheets are for the open-systems batch configuration.

Note: The following worksheets are for Exx and Fxx models only.

Table 67. Batch Configuration tool work sheet for four 18-GB eight packs (feature code 21X2)

4 x 18-GB Arrays (feature code 21X2)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 68. Batch Configuration tool work sheet for six 18-GB eight packs (feature code 21X2)

6 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 69. Batch Configuration tool work sheet for eight 18-GB eight packs (feature code 21X2)

8 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	1	96-GB LUNs	1	0									
OS/400	12	8.59-GB LUNs	1	0 - 11									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 70. Batch Configuration tool work sheet for ten 18-GB eight packs (feature code 21X2)

10 x 18-GB Arrays (feature code 21X2)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 71. Batch Configuration tool work sheet for twelve 18-GB eight packs (feature code 21X2)

12 x 18-GB Arrays (feature code 21X2)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 72. Batch Configuration tool work sheet for fourteen 18-GB eight packs (feature code 21X2)

14 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 73. Batch Configuration tool work sheet for sixteen 18-GB eight packs (feature code 21X2)

16 x 18-GB Arrays (feature code 21X2)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 74. Batch Configuration tool work sheet for eighteen 18-GB eight packs (feature code 21X2)

18 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	41	8-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	3	96-GB LUNs	3	0 2	1								
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 75. Batch Configuration tool work sheet for twenty 18-GB eight packs (feature code 21X2)

20 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	41	8-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	3	96-GB LUNs	3	0 2	1								
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 76. Batch Configuration tool work sheet for twenty-two 18-GB eight packs (feature code 21X2)

22 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	4-GB LUNs	1	0 - 25									
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	4-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	13	8-GB LUNs	1	0 - 12									
UNIX/NT	41	8-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	26	8-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	6	16-GB LUNs	1	0 - 5									
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	12	16-GB LUNs	2	0 - 5	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	1	96-GB LUNs	1	0									
UNIX/NT	3	96-GB LUNs	3	0 2	1								
UNIX/NT	2	96-GB LUNs	2	0	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	12	8.59-GB LUNs	1	0 - 11									
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
OS/400	24	8.59-GB LUNs	2	0 - 11	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 77. Batch Configuration tool work sheet for twenty-four 18-GB eight packs (feature code 21X2)

24 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51										
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27											
UNIX/NT	41	8-GB LUNs	3	0 - 12 26 - 40	13 - 25										
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12											
UNIX/NT	19	16-GB LUNs	3	0 - 5 13 - 18	6 - 11										
UNIX/NT	3	96-GB LUNs	3	0 2	1										
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25											
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 78. Batch Configuration tool work sheet for twenty-six 18-GB eight packs (feature code 21X2)

26 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	8-GB LUNs	4	0 - 12 27 - 40	13 - 26 41 - 55								
UNIX/NT	41	8-GB LUNs	3	0 - 12 27 - 40	13 - 26								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
UNIX/NT	3	96-GB LUNs	3	0 2	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	52	8.59-GB LUNs	4	0 - 11 24 - 37	12 - 23 38 - 51								
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 79. Batch Configuration tool work sheet for twenty-eight 18-GB eight packs (feature code 21X2)

28 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	8-GB LUNs	4	0 - 12 27 - 40	13 - 26 41 - 55								
UNIX/NT	41	8-GB LUNs	3	0 - 12 27 - 40	13 - 26								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
UNIX/NT	3	96-GB LUNs	3	0 2	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	52	8.59-GB LUNs	4	0 - 11 24 - 37	12 - 23 38 - 51								
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 80. Batch Configuration tool work sheet for thirty 18-GB eight packs (feature code 21X2)

30 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	4-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	8-GB LUNs	4	0 - 12 27 - 40	13 - 26 41 - 55								
UNIX/NT	41	8-GB LUNs	3	0 - 12 27 - 40	13 - 26								
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	19	16-GB LUNs	3	0 - 5 12 - 18	6 - 11								
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
UNIX/NT	3	96-GB LUNs	3	0 2	1								
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	52	8.59-GB LUNs	4	0 - 11 24 - 37	12 - 23 38 - 51								
OS/400	38	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 81. Batch Configuration tool work sheet for thirty-two 18-GB eight packs (feature code 21X2)

32 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111										
UNIX/NT	28	8-GB LUNs	2	0 - 12 13 - 27											
UNIX/NT	56	8-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55										
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12											
UNIX/NT	26	16-GB LUNs	4	0 - 5 13 - 18	6 - 11 19 - 25										
UNIX/NT	2	96-GB LUNs	2	0 1											
UNIX/NT	4	96-GB LUNs	4	0 2	1 3										
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25	12 - 23										
OS/400	52	8.59-GB LUNs	4	0 - 11 24 - 37	12 - 23 27 - 51										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 82. Batch Configuration tool work sheet for thirty-four 18-GB eight packs (feature code 21X2)

34 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	28	8-GB LUNs	2	0 - 5 13 - 18									
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	56	8-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 11 19 - 25								
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2									
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	66	8.59-GB LUNs	4	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								

Table 82. Batch Configuration tool work sheet for thirty-four 18-GB eight packs (feature code 21X2) (continued)

OS/400	52	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 83. Batch Configuration tool work sheet for thirty-six 18-GB eight packs (feature code 21X2)

36 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	28	8-GB LUNs	2	0 - 5 13 - 18									
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	56	8-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 11 19 - 25								
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2									
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	66	8.59-GB LUNs	4	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								

Table 83. Batch Configuration tool work sheet for thirty-six 18-GB eight packs (feature code 21X2) (continued)

OS/400	52	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 84. Batch Configuration tool work sheet for thirty-eight 18-GB eight packs (feature code 21X2)

38 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	4-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	4-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	28	8-GB LUNs	2	0 - 5 13 - 18									
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	56	8-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	13	16-GB LUNs	2	0 - 5 6 - 12									
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 11 19 - 25								
UNIX/NT	26	16-GB LUNs	4	0 - 5 12 - 18	6 - 11 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2									
UNIX/NT	2	96-GB LUNs	2	0 1									
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	96-GB LUNs	4	0 2	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	26	8.59-GB LUNs	2	0 - 11 12 - 25									
OS/400	66	8.59-GB LUNs	4	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								

Table 84. Batch Configuration tool work sheet for thirty-eight 18-GB eight packs (feature code 21X2) (continued)

OS/400	52	8.59-GB LUNs	3	0 - 11 24 - 37	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 85. Batch Configuration tool work sheet for forty 18-GB eight packs (feature code 21X2)

40 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	33	16-GB LUNs	5	0 - 5 13 - 18 26 - 32	6 - 11 19 - 25								
UNIX/NT	3	96-GB LUNs	3	1 2									
UNIX/NT	5	96-GB LUNs	5	24	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	66	8.59-GB LUNs	5	0 - 11 24 - 37 52 - 65	12 - 23 27 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 86. Batch Configuration tool work sheet for forty-two 18-GB eight packs (feature code 21X2)

42 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	4-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	8-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	40	16-GB LUNs	6	0 - 5 13 - 18 26 - 32	6 - 12 19 - 25 33 - 39								
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 12 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2	12 - 23 27 - 51								
UNIX/NT	6	96-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	80	8.59-GB LUNs	6	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51 66 - 79								
OS/400	66	8.59-GB LUNs	5	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Table 86. Batch Configuration tool work sheet for forty-two 18-GB eight packs (feature code 21X2) (continued)

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 87. Batch Configuration tool work sheet for forty-four 18-GB eight packs (feature code 21X2)

44 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	4-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	8-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	40	16-GB LUNs	6	0 - 5 13 - 18 26 - 32	6 - 12 19 - 25 33 - 39								
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 12 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2	12 - 23 27 - 51								
UNIX/NT	6	96-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	80	8.59-GB LUNs	6	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51 66 - 79								
OS/400	66	8.59-GB LUNs	5	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Table 87. Batch Configuration tool work sheet for forty-four 18-GB eight packs (feature code 21X2) (continued)

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 88. Batch Configuration tool work sheet for forty-six 18-GB eight packs (feature code 21X2)

46 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	4-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	4-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	8-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	71	8-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	40	16-GB LUNs	6	0 - 5 13 - 18 26 - 32	6 - 12 19 - 25 33 - 39								
UNIX/NT	33	16-GB LUNs	5	0 - 5 12 - 18 26 - 32	6 - 12 19 - 25								
UNIX/NT	3	96-GB LUNs	3	0 1 2	12 - 23 27 - 51								
UNIX/NT	6	96-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	96-GB LUNs	5	0 2 4	1 3								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	80	8.59-GB LUNs	6	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51 66 - 79								
OS/400	66	8.59-GB LUNs	5	0 - 11 24 - 37 52 - 65	12 - 23 38 - 51								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Table 88. Batch Configuration tool work sheet for forty-six 18-GB eight packs (feature code 21X2) (continued)

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 89. Batch Configuration tool work sheet for forty-eight 18-GB eight packs (feature code 21X2)

48 x 18-GB Arrays (feature code 21X2)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	86	4-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	4-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	43	8-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	8-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	20	16-GB LUNs	3	0 - 5 6 - 12 13 - 19									
UNIX/NT	40	16-GB LUNs	6	0 - 5 13 - 18 26 - 32	6 - 11 19 - 25 33 - 39								
UNIX/NT	3	96-GB LUNs	3	12									
UNIX/NT	6	96-GB LUNs	6	24	1 3 5								
OS/400	40	8.59-GB LUNs	3	0 - 11 12 - 25 26 - 39									
OS/400	80	8.59-GB LUNs	6	0 - 11 24 - 37 52 - 65	12 - 23 27 - 51 66 - 79								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 90. Batch Configuration tool work sheet for four 36-GB eight packs (feature code 21X3)

4 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	1	192-GB LUNs	1	0									
OS/400	24	8.59-GB LUNs	1	0 - 23									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 91. Batch Configuration tool work sheet for six 36-GB eight packs (feature code 21X3)

6 x 36-GB Arrays (feature code 21X3)														
Storage Allocations						**Device Adapter Pair**								
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	1	192-GB LUNs	1	0									
OS/400	24	8.59-GB LUNs	1	0 - 23									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 92. Batch Configuration tool work sheet for eight 36-GB eight packs (feature code 21X3)

8 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	1	192-GB LUNs	1	0									
OS/400	24	8.59-GB LUNs	1	0 - 23									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 93. Batch Configuration tool work sheet for ten 36-GB eight packs (feature code 21X3)

10 x 36-GB Arrays (feature code 21X3)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	104	4-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	1	192-GB LUNs	1	0									
UNIX/NT	2	192-GB LUNs	2	0	1								
OS/400	24	8.59-GB LUNs	1	0 - 23									
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 94. Batch Configuration tool work sheet for twelve 36-GB 8-Pack (feature code 21X3)

12 x 36-GB Arrays (feature code 21X3)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	104	4-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	1	192-GB LUNs	1	0									
UNIX/NT	2	192-GB LUNs	2	0	1								
OS/400	24	8.59-GB LUNs	1	0 - 23									
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 95. Batch Configuration tool work sheet for fourteen 36-GB eight packs (feature code 21X3)

14 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	52	4-GB LUNs	1	0 - 51											
UNIX/NT	104	4-GB LUNs	2	0 - 52	51 - 103										
UNIX/NT	26	8-GB LUNs	1	0 - 25											
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51										
UNIX/NT	13	16-GB LUNs	1	0 - 12											
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25										
UNIX/NT	1	192-GB LUNs	1	0											
UNIX/NT	2	192-GB LUNs	2	0	1										
OS/400	24	8.59-GB LUNs	1	0 - 23											
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 96. Batch Configuration tool work sheet for sixteen 36-GB eight packs (feature code 21X3)

16 x 36-GB Arrays (feature code 21X3)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	104	4-GB LUNs	2	0 - 51	51 - 103								
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	1	192-GB LUNs	1	0									
UNIX/NT	2	192-GB LUNs	2	0	1								
OS/400	24	8.59-GB LUNs	1	0 - 23									
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 97. Batch Configuration tool work sheet for eighteen 36-GB eight packs (feature code 21X3)

18 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	52	4-GB LUNs	1	0 - 51											
UNIX/NT	165	4-GB LUNs	3	0 - 51 103 - 163	52 - 103										
UNIX/NT	104	4-GB LUNs	2	0 - 51	52 - 103										
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	26	8-GB LUNs	1	0 - 25											
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51										
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51										
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27											
UNIX/NT	13	16-GB LUNs	1	0 - 12											
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25										
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25										
UNIX/NT	2	192-GB LUNs	2	0 1											
UNIX/NT	1	192-GB LUNs	1	0											
UNIX/NT	3	192-GB LUNs	3	0 2	1										
UNIX/NT	2	192-GB LUNs	2	0	1										
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51											
OS/400	24	8.59-GB LUNs	1	0 - 23											
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47										
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 98. Batch Configuration tool work sheet for twenty 36-GB eight packs (feature code 21X3)

20 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	165	4-GB LUNs	3	0 - 51 103 - 163	52 - 103								
UNIX/NT	104	4-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	1	192-GB LUNs	1	0									
UNIX/NT	3	192-GB LUNs	3	0 2	1								
UNIX/NT	2	192-GB LUNs	2	0	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	24	8.59-GB LUNs	1	0 - 23									
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 99. Batch Configuration tool work sheet for twenty-two 36-GB eight packs (feature code 21X3)

22 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	52	4-GB LUNs	1	0 - 51									
UNIX/NT	165	4-GB LUNs	3	0 - 51 103 - 163	52 - 103								
UNIX/NT	104	4-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	8-GB LUNs	1	0 - 25									
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	8-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	13	16-GB LUNs	1	0 - 12									
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	26	16-GB LUNs	2	0 - 12	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	1	192-GB LUNs	1	0									
UNIX/NT	3	192-GB LUNs	3	0 2	1								
UNIX/NT	2	192-GB LUNs	2	0	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	24	8.59-GB LUNs	1	0 - 23									
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
OS/400	48	8.59-GB LUNs	2	0 - 23	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 100. Batch Configuration tool work sheet for twenty-four 36-GB eight packs (feature code 21X3)

24 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	165	4-GB LUNs	3	0 - 51 103 - 163	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	3	192-GB LUNs	3	0 2	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 101. Batch Configuration tool work sheet for twenty-six 36-GB eight packs (feature code 21X3)

26 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	165	4-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	4	192-GB LUNs	4	0 2	1 3								
UNIX/NT	3	192-GB LUNs	3	0 2	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103								
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 102. Batch Configuration tool work sheet for twenty-eight 36-GB eight packs (feature code 21X3)

28 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	165	4-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	4	192-GB LUNs	4	0 2	1 3								
UNIX/NT	3	192-GB LUNs	3	0 2	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103								
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 103. Batch Configuration tool work sheet for thirty 36-GB eight packs (feature code 21X3)

30 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	165	4-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	8-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	41	16-GB LUNs	3	0 - 12 26 - 40	13 - 25								
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	4	192-GB LUNs	4	0 2	1 3								
UNIX/NT	3	192-GB LUNs	3	0 2	1								
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103								
OS/400	76	8.59-GB LUNs	3	0 - 23 48 - 75	24 - 47								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 104. Batch Configuration tool work sheet for thirty-two 36-GB eight packs (feature code 21X3)

32 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225										
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111										
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27											
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55										
UNIX/NT	2	192-GB LUNs	2	0 1											
UNIX/NT	4	192-GB LUNs	4	0 2	1 3										
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51											
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 105. Batch Configuration tool work sheet for thirty-four 36-GB eight packs (feature code 21X3)

34 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	3	192-GB LUNs	3	0 1 3									
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	192-GB LUNs	4	0 2	1 3								
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79									
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103								
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103								
		No Assignment											

Table 105. Batch Configuration tool work sheet for thirty-four 36-GB eight packs (feature code 21X3) (continued)

SSR Information: ESS Batch Configuration Tool SSA device card number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Legend: A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process. A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.								

Table 106. Batch Configuration tool work sheet for thirty-six 36-GB eight packs (feature code 21X3)

36 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						Device Adapter Pair									
						1	1	2	2	3	3	4	4		
Volume or LUN Allocations						Cluster									
System	Quantity	Types	Number of Arrays (RAID 5)	Vol. IDs Loop A	Vol. IDs Loop B	1	2	1	2	1	2	1	2		
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173											
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225										
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85											
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111										
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111										
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42											
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27											
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55										
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55										
UNIX/NT	3	192-GB LUNs	3	0 1 3											
UNIX/NT	2	192-GB LUNs	2	0 1											
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3										
UNIX/NT	4	192-GB LUNs	4	0 2	1 3										
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79											
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51											
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103										
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103										
		No Assignment													

Table 106. Batch Configuration tool work sheet for thirty-six 36-GB eight packs (feature code 21X3) (continued)

SSR Information: ESS Batch Configuration Tool SSA device card number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Legend: A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process. A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.								

Table 107. Batch Configuration tool work sheet for thirty-eight 36-GB eight packs (feature code 21X3)

38 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						Device Adapter Pair									
						1	1	2	2	3	3	4	4
Volume or LUN Allocations						Cluster							
System	Quantity	Types	Number of Arrays (RAID 5)	Vol. IDs Loop A	Vol. IDs Loop B	1	2	1	2	1	2	1	2
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	113	4-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	4-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	8-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	8-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	28	16-GB LUNs	2	0 - 12 13 - 27									
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	56	16-GB LUNs	4	0 - 12 26 - 40	13 - 25 41 - 55								
UNIX/NT	3	192-GB LUNs	3	0 1 3									
UNIX/NT	2	192-GB LUNs	2	0 1									
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	192-GB LUNs	4	0 2	1 3								
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79									
OS/400	52	8.59-GB LUNs	2	0 - 23 24 - 51									
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103								
OS/400	104	8.59-GB LUNs	4	0 - 23 48 - 75	24 - 47 76 - 103								
		No Assignment											

Table 107. Batch Configuration tool work sheet for thirty-eight 36-GB eight packs (feature code 21X3) (continued)

SSR Information: ESS Batch Configuration Tool SSA device card number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Legend: A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process. A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.								

Table 108. Batch Configuration tool work sheet for forty 36-GB eight packs (feature code 21X3)

40 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	3	192-GB LUNs	3	0 1 3									
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3								
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79									
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 109. Batch Configuration tool work sheet for forty-two 36-GB eight packs (feature code 21X3)

42 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	8-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	16-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	3	192-GB LUNs	3	0 1 3									
UNIX/NT	6	192-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3								
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79									
OS/400	160	8.59-GB LUNs	6	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103 132 - 159								
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 110. Batch Configuration tool work sheet for forty-four 36-GB eight packs (feature code 21X3)

44 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173											
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85											
UNIX/NT	172	8-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171										
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111										
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42											
UNIX/NT	86	16-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85										
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55										
UNIX/NT	3	192-GB LUNs	3	0 1 3											
UNIX/NT	6	192-GB LUNs	6	0 2 4	1 3 5										
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3										
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79											
OS/400	160	8.59-GB LUNs	6	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103 132 - 159										
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 111. Batch Configuration tool work sheet for forty-six 36-GB eight packs (feature code 21X3)

46 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	8-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	8-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42									
UNIX/NT	86	16-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85								
UNIX/NT	71	16-GB LUNs	5	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55								
UNIX/NT	3	192-GB LUNs	3	0 1 3									
UNIX/NT	6	192-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	192-GB LUNs	5	0 2 4	1 3								
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79									
OS/400	160	8.59-GB LUNs	6	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103 132 - 159								
OS/400	132	8.59-GB LUNs	5	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 112. Batch Configuration tool work sheet for forty-eight 36-GB eight packs (feature code 21X3)

48 x 36-GB Arrays (feature code 21X3)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	174	4-GB LUNs	3	0 - 51 52 - 112 113 - 173											
UNIX/NT	86	8-GB LUNs	3	0 - 25 26 - 55 56 - 85											
UNIX/NT	172	8-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171										
UNIX/NT	43	16-GB LUNs	3	0 - 12 13 - 27 28 - 42											
UNIX/NT	86	16-GB LUNs	6	0 - 12 26 - 40 56 - 70	13 - 25 41 - 55 71 - 85										
UNIX/NT	3	192-GB LUNs	3	0 1 3											
UNIX/NT	6	192-GB LUNs	6	0 2 4	1 3 5										
OS/400	80	8.59-GB LUNs	3	0 - 23 24 - 51 52 - 79											
OS/400	160	8.59-GB LUNs	6	0 - 23 48 - 75 104 - 131	24 - 47 76 - 103 132 - 159										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 113. Batch Configuration tool work sheet for four 72-GB eight packs (feature code 21X4)

4 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	1	420-GB LUNs	1	0									
OS/400	48	8.59-GB LUNs	1	0 - 47									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 114. Batch Configuration tool work sheet for six 72-GB eight packs (feature code 21X4)

6 x 72-GB Arrays (feature code 21X4)														
Storage Allocations						**Device Adapter Pair**								
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	1	420-GB LUNs	1	0									
OS/400	48	8.59-GB LUNs	1	0 - 47									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 115. Batch Configuration tool work sheet for eight 72-GB eight packs (feature code 21X4)

8 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	1	420-GB LUNs	1	0									
OS/400	48	8.59-GB LUNs	1	0 - 47									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 116. Batch Configuration tool work sheet for ten 72-GB eight packs (feature code 21X4)

10 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	105	4-GB LUNs	1	0 - 104											
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209										
UNIX/NT	52	8-GB LUNs	1	0 - 51											
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103										
UNIX/NT	26	16-GB LUNs	1	0 - 25											
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51										
UNIX/NT	1	420-GB LUNs	1	0											
UNIX/NT	2	420-GB LUNs	2	0	1										
OS/400	48	8.59-GB LUNs	1	0 - 47											
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 117. Batch Configuration tool work sheet for twelve 72-GB 8-Pack (feature code 21X4)

12 x 72-GB Arrays (feature code 21X4)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209								
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	1	420-GB LUNs	1	0									
UNIX/NT	2	420-GB LUNs	2	0	1								
OS/400	48	8.59-GB LUNs	1	0 - 47									
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 118. Batch Configuration tool work sheet for fourteen 72-GB eight packs (feature code 21X4)

14 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209								
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	1	420-GB LUNs	1	0									
UNIX/NT	2	420-GB LUNs	2	0	1								
OS/400	48	8.59-GB LUNs	1	0 - 47									
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 119. Batch Configuration tool work sheet for sixteen 72-GB eight packs (feature code 21X4)

16 x 72-GB Arrays (feature code 21X4)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209								
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	1	420-GB LUNs	1	0									
UNIX/NT	2	420-GB LUNs	2	0	1								
OS/400	48	8.59-GB LUNs	1	0 - 47									
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 120. Batch Configuration tool work sheet for eighteen 72-GB eight packs (feature code 21X4)

18 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226											
UNIX/NT	105	4-GB LUNs	1	0 - 104											
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209										
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	52	8-GB LUNs	1	0 - 51											
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103										
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103										
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	26	16-GB LUNs	1	0 - 25											
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51										
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51										
UNIX/NT	2	420-GB LUNs	2	0 1											
UNIX/NT	1	420-GB LUNs	1	0											
UNIX/NT	3	420-GB LUNs	3	0 2	1										
UNIX/NT	2	420-GB LUNs	2	0	1										
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104											
OS/400	48	8.59-GB LUNs	1	0 - 47											
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95										
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 121. Batch Configuration tool work sheet for twenty 72-GB eight packs (feature code 21X4)

20 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209								
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	1	420-GB LUNs	1	0									
UNIX/NT	3	420-GB LUNs	3	0 2	1								
UNIX/NT	2	420-GB LUNs	2	0	1								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	48	8.59-GB LUNs	1	0 - 47									
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95								
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 122. Batch Configuration tool work sheet for twenty-two 72-GB eight packs (feature code 21X4)

22 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	105	4-GB LUNs	1	0 - 104									
UNIX/NT	210	4-GB LUNs	2	0 - 104	105 - 209								
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	52	8-GB LUNs	1	0 - 51									
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	104	8-GB LUNs	2	0 - 51	52 - 103								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	26	16-GB LUNs	1	0 - 25									
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	52	16-GB LUNs	2	0 - 25	26 - 51								
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	1	420-GB LUNs	1	0									
UNIX/NT	3	420-GB LUNs	3	0 2	1								
UNIX/NT	2	420-GB LUNs	2	0	1								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	48	8.59-GB LUNs	1	0 - 47									
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95								
OS/400	96	8.59-GB LUNs	2	0 - 47	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 123. Batch Configuration tool work sheet for twenty-four 72-GB eight packs (feature code 21X4)

24 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	3	420-GB LUNs	3	0 2	1								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 124. Batch Configuration tool work sheet for twenty-six 72-GB eight packs (feature code 21X4)

26 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226											
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225										
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103										
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111										
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51										
UNIX/NT	2	420-GB LUNs	2	0 1											
UNIX/NT	4	420-GB LUNs	4	0 2	1 3										
UNIX/NT	3	420-GB LUNs	3	0 2	1										
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104											
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209										
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 125. Batch Configuration tool work sheet for twenty-eight 72-GB eight packs (feature code 21X4)

28 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81									
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	4	420-GB LUNs	4	0 2	1 3								
UNIX/NT	3	420-GB LUNs	3	0 2	1								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209								
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 126. Batch Configuration tool work sheet for thirty 72-GB eight packs (feature code 21X4)

30 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	165	8-GB LUNs	3	0 - 51 104 - 164	52 - 103								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	82	16-GB LUNs	3	0 - 25 52 - 81	26 - 51								
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	4	420-GB LUNs	4	0 2	1 3								
UNIX/NT	3	420-GB LUNs	3	0 2	1								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209								
OS/400	153	8.59-GB LUNs	3	0 - 47 96 - 152	48 - 95								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 127. Batch Configuration tool work sheet for thirty-two 72-GB eight packs (feature code 21X4)

32 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 52 - 111								
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	4	420-GB LUNs	4	0 2	1 3								
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 128. Batch Configuration tool work sheet for thirty-four 72-GB eight packs (feature code 21X4)

34 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226											
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173											
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112											
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225										
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85											
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55											
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111										
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111										
UNIX/NT	3	420-GB LUNs	3	0 1 2											
UNIX/NT	2	420-GB LUNs	2	0 1											
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3										
UNIX/NT	4	420-GB LUNs	4	0 2	1 3										
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161											
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104											
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209										
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 129. Batch Configuration tool work sheet for thirty-six 72-GB eight packs (feature code 21X4)

36 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	420-GB LUNs	4	0 2	1 3								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 130. Batch Configuration tool work sheet for thirty-eight 72-GB eight packs (feature code 21X4)

38 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	227	4-GB LUNs	2	0 - 104 105 - 226									
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	113	8-GB LUNs	2	0 - 51 52 - 112									
UNIX/NT	226	8-GB LUNs	4	0 - 51 104 - 164	52 - 103 165 - 225								
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	56	16-GB LUNs	2	0 - 25 26 - 55									
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	112	16-GB LUNs	4	0 - 25 52 - 81	26 - 51 82 - 111								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	2	420-GB LUNs	2	0 1									
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3								
UNIX/NT	4	420-GB LUNs	4	0 2	1 3								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
OS/400	105	8.59-GB LUNs	2	0 - 47 48 - 104									
OS/400	210	8.59-GB LUNs	4	0 - 47 96 - 152	48 - 95 153 - 209								
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 131. Batch Configuration tool work sheet for forty 72-GB eight packs (feature code 21X4)

40 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 132. Batch Configuration tool work sheet for forty-two 72-GB eight packs (feature code 21X4)

42 x 72-GB Arrays (feature code 21X4)													
Storage Allocations						**Device Adapter Pair**							
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	16-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	6	420-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 133. Batch Configuration tool work sheet for forty-four 72-GB eight packs (feature code 21X4)

44 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	16-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	6	420-GB LUNs	6	0 2 4	1 3 5								
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 134. Batch Configuration tool work sheet for forty-six 72-GB eight packs (feature code 21X4)

46 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**		
Volume or LUN Allocations						**Cluster**									
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**		
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173											
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85											
UNIX/NT	172	16-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171										
UNIX/NT	142	16-GB LUNs	5	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111										
UNIX/NT	3	420-GB LUNs	3	0 1 2											
UNIX/NT	6	420-GB LUNs	6	0 2 4	1 3 5										
UNIX/NT	5	420-GB LUNs	5	0 2 4	1 3										
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161											
		No Assignment													
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**		

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Table 135. Batch Configuration tool work sheet for forty-eight 72-GB eight packs (feature code 21X4)

48 x 72-GB Arrays (feature code 21X4)															
Storage Allocations						**Device Adapter Pair**									
						1	**1**	**2**	**2**	**3**	**3**	**4**	**4**
Volume or LUN Allocations						**Cluster**							
System	**Quantity**	**Types**	**Number of Arrays (RAID 5)**	**Vol. IDs Loop A**	**Vol. IDs Loop B**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**2**
UNIX/NT	174	8-GB LUNs	3	0 - 51 52 - 112 113 - 173									
UNIX/NT	86	16-GB LUNs	3	0 - 25 26 - 55 56 - 85									
UNIX/NT	172	16-GB LUNs	6	0 - 25 52 - 81 112 - 141	26 - 51 82 - 111 142 - 171								
UNIX/NT	3	420-GB LUNs	3	0 1 2									
UNIX/NT	6	420-GB LUNs	6	0 2 4	1 3 5								
OS/400	162	8.59-GB LUNs	3	0 - 47 48 - 104 105 - 161									
		No Assignment											
SSR Information: ESS Batch Configuration Tool SSA device card number						**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

Legend:

A light-gray background indicates that if this option is selected, only the arrays on Loop A are configured during the ESS Batch Configuration Tool process.

A dark-gray background indicates that this option cannot be selected because the physical storage does not exist in the configuration.

Unique work sheets for open-systems storage planning

The following work sheets are for the open-systems storage planning. In the work sheets enter the host nickname and the volume IDs for fibre-channel configurations. For SCSI configurations, enter the host nickname, the ESS SCSI port, and the volume IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 136. Open-systems Storage Planning work sheet for 4 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs

Table 136. Open-systems Storage Planning work sheet for 4 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 137. Open-systems Storage Planning work sheet for 6 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 137. Open-systems Storage Planning work sheet for 6 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 138. Open-systems Storage Planning work sheet for 8 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 138. Open-systems Storage Planning work sheet for 8 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 139. Open-systems Storage Planning work sheet for 10 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 139. Open-systems Storage Planning work sheet for 10 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 140. Open-systems Storage Planning work sheet for 12 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 140. Open-systems Storage Planning work sheet for 12 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 141. Open-systems Storage Planning work sheet for 14 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 141. Open-systems Storage Planning work sheet for 14 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 142. Open-systems Storage Planning work sheet for 16 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Table 142. Open-systems Storage Planning work sheet for 16 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 3	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	Location			Volume Assignments				Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
	DA Pair 4	Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 143. Open-systems Storage Planning work sheet for 18 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 143. Open-systems Storage Planning work sheet for 18 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 143. Open-systems Storage Planning work sheet for 18 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
Cluster 1	DA Pair 3	Loop A	Group 4 Vol. IDs _____				Cluster 2	DA Pair 3	Loop A	Group 3 Vol. IDs _____			
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B	Group 4 Vol. IDs _____						Loop B3	Group 3 Vol. IDs _____			

Table 143. Open-systems Storage Planning work sheet for 18 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 144. Open-systems Storage Planning work sheet for 20 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 144. Open-systems Storage Planning work sheet for 20 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 144. Open-systems Storage Planning work sheet for 20 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 144. Open-systems Storage Planning work sheet for 20 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 145. Open-systems Storage Planning work sheet for 22 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 145. Open-systems Storage Planning work sheet for 22 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 145. Open-systems Storage Planning work sheet for 22 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop A							Loop A				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
Cluster 1	DA Pair 3						Cluster 2	DA Pair 3					
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B							Loop B3				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 145. Open-systems Storage Planning work sheet for 22 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 146. Open-systems Storage Planning work sheet for 24 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 146. Open-systems Storage Planning work sheet for 24 eight packs (continued)

Location				Volume Assignments			Location				Volume Assignments		
Cluster 1	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs	Cluster 2	DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 146. Open-systems Storage Planning work sheet for 24 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 146. Open-systems Storage Planning work sheet for 24 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 147. Open-systems Storage Planning work sheet for 26 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			

Table 147. Open-systems Storage Planning work sheet for 26 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 147. Open-systems Storage Planning work sheet for 26 eight packs (continued)

Location				Volume Assignments				Location				Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop A							Loop A				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
Cluster 1	DA Pair 3		Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs	Cluster 2	DA Pair 3		Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop B							Loop B				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 147. Open-systems Storage Planning work sheet for 26 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 148. Open-systems Storage Planning work sheet for 28 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 148. Open-systems Storage Planning work sheet for 28 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 148. Open-systems Storage Planning work sheet for 28 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 148. Open-systems Storage Planning work sheet for 28 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 149. Open-systems Storage Planning work sheet for 30 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 149. Open-systems Storage Planning work sheet for 30 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 149. Open-systems Storage Planning work sheet for 30 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 149. Open-systems Storage Planning work sheet for 30 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 150. Open-systems Storage Planning work sheet for 32 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 150. Open-systems Storage Planning work sheet for 32 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			

Table 150. Open-systems Storage Planning work sheet for 32 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Table 150. Open-systems Storage Planning work sheet for 32 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 151. Open-systems Storage Planning work sheet for 34 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 3 Vol. IDs _____							Group 4 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 151. Open-systems Storage Planning work sheet for 34 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 151. Open-systems Storage Planning work sheet for 34 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 151. Open-systems Storage Planning work sheet for 34 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 152. Open-systems Storage Planning work sheet for 36 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 152. Open-systems Storage Planning work sheet for 36 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 152. Open-systems Storage Planning work sheet for 36 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop A							Loop A				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
Cluster 1	DA Pair 3		Group 6 Vol. IDs _____				Cluster 2	DA Pair 3		Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 152. Open-systems Storage Planning work sheet for 36 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 153. Open-systems Storage Planning work sheet for 38 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 153. Open-systems Storage Planning work sheet for 38 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 153. Open-systems Storage Planning work sheet for 38 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 153. Open-systems Storage Planning work sheet for 38 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 154. Open-systems Storage Planning work sheet for 40 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 154. Open-systems Storage Planning work sheet for 40 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 154. Open-systems Storage Planning work sheet for 40 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs	Cluster 2	DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 154. Open-systems Storage Planning work sheet for 40 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 155. Open-systems Storage Planning work sheet for 42 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 4 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 155. Open-systems Storage Planning work sheet for 42 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 155. Open-systems Storage Planning work sheet for 42 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
Cluster 1	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs	Cluster 2	DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 155. Open-systems Storage Planning work sheet for 42 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 156. Open-systems Storage Planning work sheet for 44 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 156. Open-systems Storage Planning work sheet for 44 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 156. Open-systems Storage Planning work sheet for 44 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 3	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 3	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 156. Open-systems Storage Planning work sheet for 44 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 157. Open-systems Storage Planning work sheet for 46 eight packs

Location				Volume Assignments			Location				Volume Assignments		
Cluster 1	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs	Cluster 2	DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 157. Open-systems Storage Planning work sheet for 46 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			
		Loop B	Group 2 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs ____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs ____							Group 3 Vol. IDs ____			
			Group 6 Vol. IDs ____							Group 5 Vol. IDs ____			

Table 157. Open-systems Storage Planning work sheet for 46 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop A							Loop A				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
Cluster 1	DA Pair 3		Group 6 Vol. IDs _____				Cluster 2	DA Pair 3		Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 157. Open-systems Storage Planning work sheet for 46 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 158. Open-systems Storage Planning work sheet for 48 eight packs

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 1	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 1	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 158. Open-systems Storage Planning work sheet for 48 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 2	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 2	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 158. Open-systems Storage Planning work sheet for 48 eight packs (continued)

	Location			Volume Assignments				Location			Volume Assignments		
			Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs				Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
		Loop A							Loop A				
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
Cluster 1	DA Pair 3		Group 6 Vol. IDs _____				Cluster 2	DA Pair 3		Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Table 158. Open-systems Storage Planning work sheet for 48 eight packs (continued)

Cluster 1	Location			Volume Assignments			Cluster 2	Location			Volume Assignments		
	DA Pair 4	Loop A	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs		DA Pair 4	Loop A	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			
		Loop B	Group 2 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs			Loop B	Group 1 Vol. IDs _____	Host Nickname	SCSI Port	Vol. IDs
			Group 4 Vol. IDs _____							Group 3 Vol. IDs _____			
			Group 6 Vol. IDs _____							Group 5 Vol. IDs _____			

Unique work sheets for open-systems Modify Volume

The following work sheets are for the open-systems Modify Volume. In the work sheets enter the Host nickname and Vol. IDs fdor fibre-channel configurations. For SCSI configurations, enter the Host nickname, ESS SCSI Port, and Vol. IDs.

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 159. Open-systems Modify Volume work sheet for 4 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 160. Open-systems Modify Volume work sheet for 6 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 3, Cluster 1, Loop A					
Device Adapter Pair 3, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 161. Open-systems Modify Volume work sheet for 8 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 3, Cluster 1, Loop A					
Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 162. Open-systems Modify Volume work sheet for 10 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 1, Loop B					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 1, Cluster 2, Loop B					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 3, Cluster 1, Loop A					

Table 162. Open-systems Modify Volume work sheet for 10 eight packs (continued)

Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 163. Open-systems Modify Volume work sheet for 12 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 1, Loop B					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 1, Cluster 2, Loop B					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 1, Loop B					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 2, Loop B					

Table 163. Open-systems Modify Volume work sheet for 12 eight packs (continued)

Device Adapter Pair 3, Cluster 1, Loop A					
Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 164. Open-systems Modify Volume work sheet for 14 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 1, Loop B					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 1, Cluster 2, Loop B					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 1, Loop B					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 2, Loop B					

Table 164. Open-systems Modify Volume work sheet for 14 eight packs (continued)

Device Adapter Pair 3, Cluster 1, Loop A					
Device Adapter Pair 3, Cluster 1, Loop B					
Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 3, Cluster 2, Loop B					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 2, Loop A					

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 165. Open-systems Modify Volume work sheet for 16 to 48 eight packs

Device Adapter Pair, Cluster, Loop	Volume IDs	SCSI Port Only			Host Nickname
		Bay	Adapter	Port	
Device Adapter Pair 1, Cluster 1, Loop A					
Device Adapter Pair 1, Cluster 1, Loop B					
Device Adapter Pair 1, Cluster 2, Loop A					
Device Adapter Pair 1, Cluster 2, Loop B					
Device Adapter Pair 2, Cluster 1, Loop A					
Device Adapter Pair 2, Cluster 1, Loop B					
Device Adapter Pair 2, Cluster 2, Loop A					
Device Adapter Pair 2, Cluster 2, Loop B					

Table 165. Open-systems Modify Volume work sheet for 16 to 48 eight packs (continued)

Device Adapter Pair 3, Cluster 1, Loop A					
Device Adapter Pair 3, Cluster 1, Loop B					
Device Adapter Pair 3, Cluster 2, Loop A					
Device Adapter Pair 3, Cluster 2, Loop B					
Device Adapter Pair 4, Cluster 1, Loop A					
Device Adapter Pair 4, Cluster 1, Loop B					
Device Adapter Pair 4, Cluster 2, Loop A					
Device Adapter Pair 4, Cluster 2, Loop B					

Appendix B. Open-systems custom configuration

This section is formatted as a PDF as part of the *IBM TotalStorage Enterprise Storage Server: Configuration Planner for Open-Systems Hosts*. It is also formatted in Word Pro as a standalone document to simplify the use of the work sheets while editing, modifying, and configuring the ESS.

This section contains the instructions for using the work sheets to complete a custom configuration of the ESS for the open-systems hosts. This section has two sets of forms, as follows:

- Common work sheets
  - Storage requirements, Table A
  - Storage requirements, Table B
  - Modify Host Systems work sheet
  - Configure SCSI Ports work sheet
  - Configure ESS Fibre-Channel Ports work sheet
  - Host Add Volumes work sheet
  - Shared Storage Access work sheet
- Define Disk Groups work sheet
  - These work sheets are in order by feature code

Implementing the open-systems custom configuration

At installation time, the SSR uses the work sheets and the ESS Specialist to implement the configuration. The steps that the SSR performs are explained briefly below. For additional details on how to use each of the Specialist panels, refer to the *IBM TotalStorage Enterprise Storage Server: Web Interface User's Guide*.

1. Use the Modify Host Systems work sheet to configure all the servers that will be attached to the ESS. Select the open-systems Storage option in the Storage Allocation panel to bring up the open-systems Storage panel. Then select the Modify Host Systems option. The Modify Host Systems panel appears. Use this panel to enter the information recorded in the Modify Host Systems work sheet.
2. Use the Configure SCSI Ports work sheet to establish the mapping between the ESS SCSI ports and the servers. Select the open-systems Storage option from the Storage Allocation panel. From the open-systems Storage panel, select the Configure Host Adapter Ports option. Use the mapping described in the work sheet to enter the information into the panel.
3. Use the Configure ESS Fibre-Channel Ports work sheet to specify the attributes of the ESS fibre-channel ports. Select the open-systems Storage option from the Storage Allocation panel. From the open-systems Storage panel, select the Configure Host Adapter Ports option. Enter the options selected in the work sheet.
4. Use the Define Disk Groups work sheet to specify the disk groups that will be configured as RAID 5 or RAID 10. Select the open-systems Storage option from the Storage Allocation panel. From the open-systems Storage panel, select the Configure Disk Groups option. To apply the information recorded in the work sheet, click a disk group and then select a storage type in the Storage Type field. Select the disk row to define its track format as fixed block. When all entries are complete, click **Perform Configuration Update** to apply.

Note: The Specialist enforces the rule that each loop that contains an array must contain up to two spare DDMs for each disk group capacity. If the user has specific requirements for which disk groups contain the spare DDMs, ensure that you configure those arrays first on a session on this panel. Before you attempt to configure 7 + P or 4 x 2 arrays, verify in the Storage Allocation graphical view that the loops are already configured with two spare DDMs. Go back to the Configure Disk Groups panel to configure the 7 + P or 4 x 2 arrays.

5. Use the Host Add Volumes work sheet to define the volumes for each host nickname. Select the Open System Storage option from the Storage Allocation panel. From the Open System Storage panel, select the Add Volumes option to apply the information recorded in the Host Add Volumes work sheet. The following steps apply the configuration for a row in the work sheet.
   a. Select the Host Nickname.
   b. Select the port.
   c. Select the disk group or disk groups.
   d. Select the Next option.
   e. Select the volume size and number of volumes.
   f. Select Volume Placement, either Sequential or Spread.
   g. Select the Add option.
   h. Press the Perform Configuration Update button.
6. Use the Shared Storage work sheet to configure the level of data sharing across ESS SCSI ports or fibre-channel host nickname and servers. Select the open-systems Storage option from the Storage Allocation panel. From the open-systems Storage panel, select the Modify Volume Assignments option to apply the information recorded in the Shared Storage Access work sheet. The following steps apply the configuration for a row in the work sheet.
   a. Select the Host Nickname as the first level of sort for the table.
   b. Select the Host Port as the second level of sort for the table.
   c. Select all the volumes that are assigned to a primary-access connection.
   d. Select the Add option and then select the appropriate host nickname. For SCSI connections, select the shared- access port from the list of available ports.
   e. Press the Perform Configuration Update button. All the LUNs in the primary-access connection storage map are copied to the shared-access connection storage map.

Common work sheets

The following work sheets are for the open-systems common work sheets.

Table 166. Open-systems Storage requirements, Table A

Host System Name	Host System Type	Number of Host Adapters		Storage Requirement (GBs)	Load-Balancing Software? (Yes/No)	Shared Storage? (Yes/No) Which host?	LUN Size GBs (optional)	Spread LUNs? (Yes/No) (optional)
		SCSI	Fibre					
Configuration notes:								

Table 167. Open-systems Storage requirements, Table B

Host Name and Type	Host System Adapter	Share Storage Access	Storage Type	Storage Capacity	LUN Size	Sequential or Spread LUNs
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____ GB _____ GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
System No. _____ Name: _____ Type: _____	**Adapter No. 1** SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 2 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 3 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
	Adapter No. 4 SCSI:_____ Initiator ID: _____ Fibre:_____ Nickname: _____	System No. _____ Adapter No. _____	RAID 5 _____ RAID 10 _____	_____GB _____GB	_____GB _____GB	Sequential _____ Spread _____
Configuration notes:						

Table 168. Open-systems Modify Host Systems work sheet

Modify Host Systems work sheet					
Host Name or IP Address	**Host Nickname**	**Host System Type**	**Attachment Type SCSI or Fibre**	**Fibre-Channel Ports**	**WWPN for Fibre-Channel Host Adapter**

Table 169. Open-systems Configure SCSI Ports work sheet for Model 800

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence for Model 800
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 169. Open-systems Configure SCSI Ports work sheet for Model 800 (continued)

Cluster 2	**Bay 3**	Bay 3 Adapter 1 Port A						4
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						8
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						12
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						16
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						2
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						6
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						10
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						14
		Bay 4 Adapter 4 Port B						

Table 170. Open-systems Configure SCSI Ports work sheet for E and F Models

ESS Host Adapter Ports			Host Nickname	Host Type	Host Adapter ID	Initiator ID (SCSI only)	ESS HA Type (ESCON/ SCSI/Fibre Channel)	Installed Sequence for E and F Models
Cluster 1	Bay 1	Bay 1 Adapter 1 Port A						1
		Bay 1 Adapter 1 Port B						
		Bay 1 Adapter 2 Port A						5
		Bay 1 Adapter 2 Port B						
		Bay 1 Adapter 3 Port A						9
		Bay 1 Adapter 3 Port B						
		Bay 1 Adapter 4 Port A						13
		Bay 1 Adapter 4 Port B						
	Bay 2	Bay 2 Adapter 1 Port A						3
		Bay 2 Adapter 1 Port B						
		Bay 2 Adapter 2 Port A						7
		Bay 2 Adapter 2 Port B						
		Bay 2 Adapter 3 Port A						11
		Bay 2 Adapter 3 Port B						
		Bay 2 Adapter 4 Port A						15
		Bay 2 Adapter 4 Port B						

Table 170. Open-systems Configure SCSI Ports work sheet for E and F Models (continued)

Cluster 2	**Bay 3**	Bay 3 Adapter 1 Port A						2
		Bay 3 Adapter 1 Port B						
		Bay 3 Adapter 2 Port A						6
		Bay 3 Adapter 2 Port B						
		Bay 3 Adapter 3 Port A						10
		Bay 3 Adapter 3 Port B						
		Bay 3 Adapter 4 Port A						14
		Bay 3 Adapter 4 Port B						
	Bay 4	Bay 4 Adapter 1 Port A						4
		Bay 4 Adapter 1 Port B						
		Bay 4 Adapter 2 Port A						8
		Bay 4 Adapter 2 Port B						
		Bay 4 Adapter 3 Port A						12
		Bay 4 Adapter 3 Port B						
		Bay 4 Adapter 4 Port A						16
		Bay 4 Adapter 4 Port B						

In Table 171 and Table 172 on page 283 fabric and switches are transparent to the ESS logical configuration. Specify the type of connection for the ESS fibre-channel port. If the ESS fibre-channel port is connected to a switch or a switched fabric, specify point to point.

Table 171. Open-systems Configure ESS Fibre-Channel Ports work sheet for 750 and 800 Models

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, SCSI, or Fibre Channel)	Installed Sequence for 750 and 800 Models
			Point to Point		Arbitrated Loop FCP-Open		
			FICON	FCP-Open			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					4
		Bay 3 Adapter 2					8
		Bay 3 Adapter 3					12
		Bay 3 Adapter 4					16
	Bay 4	Bay 4 Adapter 1					2
		Bay 4 Adapter 2					6
		Bay 4 Adapter 3					10
		Bay 4 Adapter 4					14

Table 172. Open-systems Configure ESS Fibre-Channel Ports work sheet for E and F Models

ESS Host Adapter Ports			Fibre-Channel Port Attribute (Fibre only, select one)			ESS Host Adapter Type (ESCON, SCSI, or Fibre Channel)	Installed Sequence for E and F Models
			Point to Point		Arbitrated Loop FCP-Open		
			FICON	FCP-Open			
Cluster 1	Bay 1	Bay 1 Adapter 1					1
		Bay 1 Adapter 2					5
		Bay 1 Adapter 3					9
		Bay 1 Adapter 4					13
	Bay 2	Bay 2 Adapter 1					3
		Bay 2 Adapter 2					7
		Bay 2 Adapter 3					11
		Bay 2 Adapter 4					15
Cluster 2	Bay 3	Bay 3 Adapter 1					2
		Bay 3 Adapter 2					6
		Bay 3 Adapter 3					10
		Bay 3 Adapter 4					14
	Bay 4	Bay 4 Adapter 1					4
		Bay 4 Adapter 2					8
		Bay 4 Adapter 3					12
		Bay 4 Adapter 4					16

Table 173. Open-systems Host Add Volumes work sheet

Host Nickname	ESS SCSI Port	Storage Type	Disk Group(s)	Volume Size	Number of Volumes	Sequential or Spread
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________
Host Nickname _________	Bay ______ Adapter____ Port______	RAID 5 ________ RAID 10 ________	Cluster_____ Adapter____ Loop______ Group_____	________GB	_________	Sequential ________ Spread _________

Table 174. Open-systems Shared Storage Access work sheet

Primary-Access Connection				Secondary-Access Connection			
Host Nickname (See Note.)	**ESS SCSI Port (SCSI only)**			**Host Nickname (See Note.)**	**ESS SCSI Port (SCSI only)**		
	Bay	**Adapter**	**Port**		**Bay**	**Adapter**	**Port**
Note: For fibre-channel connections, only host nicknames are required. For SCSI connections, enter the host nicknames and the ESS SCSI ports.							

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 175. Open-systems Define 4 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 176. Open-systems Define 6 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 177. Open-systems Define 8 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 178. Open-systems Define 10 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 179. Open-systems Define 12 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 180. Open-systems Define 14 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 181. Open-systems Define 16 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 182. Open-systems Define 18 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 183. Open-systems Define 20 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 184. Open-systems Define 22 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 185. Open-systems Define 24 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 186. Open-systems Define 26 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 187. Open-systems Define 28 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 188. Open-systems Define 30 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 189. Open-systems Define 32 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 190. Open-systems Define 34 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 191. Open-systems Define 36 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 192. Open-systems Define 38 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 193. Open-systems Define 40 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 194. Open-systems Define 42 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 195. Open-systems Define 44 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See "Arrays across loops feature" on page 6 for more information.

Table 196. Open-systems Define 46 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Note: If the arrays across loops feature is enabled, do not specify loop names. See “Arrays across loops feature” on page 6 for more information.

Table 197. Open-systems Define 48 Disk Groups work sheet

DA	Loop	Cluster 1	DA	Loop	Cluster 2
1	A	2: RAID 5____ or RAID 10____	1	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
2	A	2: RAID 5____ or RAID 10____	2	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
3	A	2: RAID 5____ or RAID 10____	3	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
4	A	2: RAID 5____ or RAID 10____	4	A	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____
	B	2: RAID 5____ or RAID 10____		B	1: RAID 5____ or RAID 10____
		4: RAID 5____ or RAID 10____			3: RAID 5____ or RAID 10____
		6: RAID 5____ or RAID 10____			5: RAID 5____ or RAID 10____

Appendix C. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

Features

These are the major accessibility features in the IBM TotalStorage Enterprise Storage Server information:

1. You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. IBM Home Page Reader version 3.0 has been tested.
2. You can operate features using the keyboard instead of the mouse.

Navigating by keyboard

You can use keys or key combinations to perform operations and initiate menu actions that can also be done through mouse actions. You can navigate the IBM TotalStorage Enterprise Storage Server information from the keyboard by using the shortcut keys for your browser or Home Page Reader. See your browser Help for a list of shortcut keys that it supports. See the following Web site for a list of shortcut keys supported by Home Page Reader:

`http://www-306.ibm.com/able/solution_offerings/keyshort.html`

Accessing the publications

You can find HTML versions of the IBM TotalStorage Enterprise Storage Server information at the following Web site:

`http://www.ehone.ibm.com/public/applications/publications/cgibin/pbi.cgi`

You can access the information using IBM Home Page Reader 3.0.

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Glossary

This glossary includes terms for the IBM TotalStorage Enterprise Storage Server (ESS) and other Seascape solution products.

This glossary includes selected terms and definitions from:

- The *American National Standard Dictionary for Information Systems*, ANSI X3.172–1990, copyright 1990 by the American National Standards Institute (ANSI), 11 West 42nd Street, New York, New York 10036. Definitions derived from this book have the symbol (A) after the definition.
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- The *Information Technology Vocabulary* developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC1/SC1). Definitions derived from this book have the symbol (I) after the definition. Definitions taken from draft international standards, committee drafts, and working papers that the ISO/IEC JTC1/SC1 is developing have the symbol (T) after the definition, indicating that final agreement has not been reached among the participating National Bodies of SC1.

This glossary uses the following cross-reference forms:

See Refers the reader to one of two kinds of related information:

- A term that is the expanded form of an abbreviation or acronym. This expanded form of the term contains the full definition.
- A synonym or more preferred term

See also
Refers the reader to one or more related terms.

Contrast with
Refers the reader to a term that has an opposite or substantively different meaning.

Numerics

750. A model of the Enterprise Storage Server featuring a 2-way processor with limited physical storage capacity. This model can be updated to the model 800.

800. A model of the Enterprise Storage Server featuring a standard processor or an optional Turbo processor. The Model 800 supports RAID 5, RAID 10, and 15000 rpm drives. Model 800 supersedes Model F20.

2105. The machine number for the IBM TotalStorage Enterprise Storage Server (ESS). Models of the ESS are expressed as the number 2105 followed by "Model <xxx>", such as 2105 Model 800. The 2105 Model 100 is an ESS expansion enclosure that is typically referred to simply as the Model 100. See also *IBM TotalStorage Enterprise Storage Server* and *Model 100*.

3390. The machine number of an IBM disk storage system. The ESS, when interfaced to IBM S/390 or zSeries hosts, is set up to appear as one or more 3390 devices, with a choice of 3390-2, 3390-3, or 3390-9 track formats.

3990. The machine number of an IBM control unit.

7133. The machine number of an IBM disk storage system. The Model D40 and 020 drawers of the 7133 can be installed in the 2105-100 expansion enclosure of the ESS.

8-pack. See *disk eight pack*.

A

access. (1) To obtain the use of a computer resource. (2) In computer security, a specific type of interaction between a subject and an object that results in flow of information from one to the other.

access-any mode. One of the two access modes that can be set for the ESS during initial configuration. It enables all fibre-channel-attached host systems with no defined access profile to access all logical volumes on the ESS. With a profile defined in ESS Specialist for a particular host, that host has access only to volumes that are assigned to the WWPN for that host. See also *pseudo host* and *worldwide port name*.

ACK. See *request for acknowledgment and acknowledgment*.

active Copy Services server. The Copy Services server that manages the Copy Services domain. Either the primary or the backup Copy Services server can be

the active Copy Services server. The backup Copy Services server is available to become the active Copy Services server if the primary Copy Services server fails. See also *Copy Services client* and *primary Copy Services server*. Contrast with *backup Copy Services server*.

agent. A program that automatically performs some service without user intervention or on a regular schedule. See also *subagent*.

alert. A message or log that a storage facility generates as the result of error event collection and analysis. An alert indicates that a service action is required.

allegiance. In Enterprise Systems Architecture/390, a relationship that is created between a device and one or more channel paths during the processing of certain conditions. See also *implicit allegiance*, *contingent allegiance*, and *reserved allegiance*.

allocated storage. In an ESS, the space that is allocated to volumes but not yet assigned. Contrast with *assigned storage*.

American National Standards Institute (ANSI). An organization of producers, consumers, and general interest groups that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

Anonymous. In ESS Specialist, the label on an icon that represents all connections that are using fibre-channel adapters between the ESS and hosts and that are not completely defined to the ESS. See also *anonymous host*, *pseudo host*, and *access-any mode*.

anonymous host. Synonym for *pseudo host*. Contrast with *Anonymous* and *pseudo host*.

ANSI. See *American National Standards Institute*.

APAR. See *authorized program analysis report*. (GC)

arbitrated loop. A fibre-channel topology that enables the interconnection of a set of nodes. See also *point-to-point connection* and *switched fabric*.

array. An ordered collection, or group, of physical devices (disk drive modules) that is used to define logical volumes or devices. In the ESS, an array is a group of disks that the user designates to be managed by the RAID technique. See also *redundant array of independent disks*.

ASCII. (American National Standard Code for Information Interchange) The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), that is used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A) Some organizations, including IBM, have used the parity bit to expand the basic code set.

assigned storage. On an ESS, the space allocated to a volume and assigned to a port.

asynchronous cascading PPRC. An optional feature of the Enterprise Storage Server (ESS) that uses a third ESS to allow a secondary PPRC volume to become a primary PPRC volume or a primary PPRC volume to become a secondary volume to another primary PPRC volume. See also *synchronous PPRC* and *asynchronous PPRC*.

asynchronous PPRC. An optional feature of the Enterprise Storage Server that provides a 2-site extended distance remote copy. Data that is written by the host to the ESS at the local site is automatically maintained at the remote site. See also *synchronous PPRC*.

authorized program analysis report (APAR). A request for correction of a defect in a current release of an IBM-supplied program. (GC)

availability. The degree to which a system or resource is capable of performing its normal function. See *data availability*.

B

backup Copy Services server. One of two Copy Services servers in a Copy Services domain. The other Copy Services server is the primary Copy Services server. The backup Copy Services server is available to become the active Copy Services server if the primary Copy Services server fails. A Copy Services server is software that runs in one of the two clusters of an ESS and manages data-copy operations for that Copy Services server group. See also *Copy Services client* and *primary Copy Services server*. Contrast with *active Copy Services server*.

bay. In the ESS, the physical space used for installing SCSI, ESCON, and fibre-channel host adapter cards. The ESS has four bays, two in each cluster. See also *service boundary*.

bit. (1) Either of the digits 0 or 1 when used in the binary numeration system. (T) (2) The storage medium required to store a single binary digit. See also *byte*.

block. (1) A string of data elements recorded or transmitted as a unit. The elements may be characters, words, or physical records. (T) (2) In the ESS, a group of consecutive bytes used as the basic storage unit in fixed-block architecture (FBA). All blocks on the storage device are the same size (fixed size). See also *fixed-block architecture* and *data record*.

byte. (1) A group of eight adjacent binary digits that represent one EBCDIC character. (2) The storage medium required to store eight bits. See also *bit*.

C

cache. A special-purpose buffer storage, smaller and faster than main storage, used to hold a copy of instructions and data obtained from main storage and likely to be needed next by the processor. (T)

cache fast write. In the ESS, a form of the fast-write operation in which the storage server writes the data directly to cache, where it is available for later destaging.

cache hit. An event that occurs when a read operation is sent to the cluster, and the requested data is found in cache. The opposite of *cache miss*.

cache memory. Memory, typically volatile memory, that a storage server uses to improve access times to instructions or data. The cache memory is typically smaller and faster than the primary memory or storage medium. In addition to residing in cache memory, the same data also resides on the storage devices in the storage facility.

cache miss. An event that occurs when a read operation is sent to the cluster, but the data is not found in cache. The opposite of *cache hit*.

call home. A communication link established between the ESS and a service provider. The ESS can use this link to place a call to IBM or to another service provider when it requires service. With access to the machine, service personnel can perform service tasks, such as viewing error logs and problem logs or initiating trace and dump retrievals. See also *heartbeat* and *remote technical assistance information network*.

cascading. (1) Connecting network controllers to each other in a succession of levels, to concentrate many more lines than a single level permits. (2) In high-availability cluster multiprocessing (HACMP), cascading pertains to a cluster configuration in which the cluster node with the highest priority for a particular resource acquires the resource if the primary node fails. The cluster node relinquishes the resource to the primary node upon reintegration of the primary node into the cluster.

catcher. A server that service personnel use to collect and retain status data that an ESS sends to it.

CCR. See *channel command retry*.

CCW. See *channel command word*.

CD. See *compact disc*.

CEC. See *computer-electronic complex*.

channel. In Enterprise Systems Architecture/390, the part of a channel subsystem that manages a single I/O interface between a channel subsystem and a set of control units.

channel command retry (CCR). In Enterprise Systems Architecture/390, the protocol used between a channel and a control unit that enables the control unit to request that the channel reissue the current command.

channel command word (CCW). In Enterprise Systems Architecture/390, a data structure that specifies an I/O operation to the channel subsystem.

channel path. In Enterprise Systems Architecture/390, the interconnection between a channel and its associated control units.

channel subsystem. In Enterprise Systems Architecture/390, the part of a host computer that manages I/O communication between the program and any attached control units.

channel-subsystem image. In Enterprise Systems Architecture/390, the logical functions that a system requires to perform the function of a channel subsystem. With ESCON multiple image facility (EMIF), one channel subsystem image exists in the channel subsystem for each logical partition (LPAR). Each image appears to be an independent channel subsystem program, but all images share a common set of hardware facilities.

CKD. See *count key data*.

CLI. See *command-line interface*. See also *Copy Services command-line interface*.

cluster. (1) In the ESS, a partition capable of performing all ESS functions. With two clusters in the ESS, any operational cluster can take over the processing of a failing cluster. (2) In the AIX operating system, a group of nodes within a complex.

cluster processor complex (CPC). In the ESS, the unit within a cluster that provides the management function for the ESS. It consists of cluster processors, cluster memory, and related logic.

command-line interface (CLI). An interface provided by an operating system that defines a set of commands and enables a user (or a script-like language) to issue these commands by typing text in response to the command prompt (for example, DOS commands or UNIX shell commands). See also *Copy Services command-line interface*.

compact disc. An optically read disc, typically storing approximately 660 MB. CD-ROM (compact disc read-only memory) refers to the read-only format used to distribute ESS code and documentation.

compression. (1) The process of eliminating gaps, empty fields, redundancies, and unnecessary data to shorten the length of records or blocks. (2) Any encoding that reduces the number of bits used to represent a given message or record. (GC)

computer-electronic complex (CEC). The set of hardware facilities associated with a host computer.

concurrent copy. A facility on a storage server that enables a program to make a backup of a data set while the logical volume remains available for subsequent processing. The data in the backup copy is frozen at the point in time that the server responds to the request.

concurrent installation of licensed internal code. Process of installing licensed internal code on an ESS while applications continue to run.

concurrent maintenance. Service that is performed on a unit while it is operational.

concurrent media maintenance. Service performed on a disk drive module (DDM) without losing access to the data.

configure. In storage, to define the logical and physical configuration of the input/output (I/O) subsystem through the user interface that the storage facility provides for this function.

consistency group. A group of volumes participating in FlashCopy relationships in a logical subsystem, across logical subsystems, or across Model 2105 Enterprise Storage Servers that must be kept in a consistent state to ensure data integrity.

consistency group interval time. The value in seconds that indicates the length of time between the formation of consistency groups.

consistent copy. A copy of a data entity (a logical volume, for example) that contains the contents of the entire data entity at a single instant in time.

console. A user interface to a server, for example, the interface provided on a personal computer. See also *IBM TotalStorage ESS Master Console*.

contingent allegiance. In Enterprise Systems Architecture/390, a relationship that is created in a control unit between a device and a channel when the channel accepts unit-check status. The allegiance causes the control unit to guarantee access; the control unit does not present the busy status to the device. The allegiance enables the channel to retrieve sense data that is associated with the unit-check status on the channel path associated with the allegiance.

control path. The route that is established from the master ESS to the subordinate ESS when more than one ESS participates in the asynchronous PPRC session. If there is only one ESS (the master ESS) in the asynchronous PPRC session, no control path is required.

control unit (CU). (1) A device that coordinates and controls the operation of one or more input/output devices, and synchronizes the operation of such devices with the operation of the system as a whole. (2) In Enterprise Systems Architecture/390, a storage server with ESCON, FICON, or OEMI interfaces. The control unit adapts a native device interface to an I/O interface that an ESA/390 host system supports. (3) In the ESS, the portion of the ESS that supports the attachment of emulated count key data devices over ESCON, FICON, or OEMI interfaces. See also *cluster*.

control-unit image. In Enterprise Systems Architecture/390, a logical subsystem that is accessed through an ESCON or FICON I/O interface. One or more control-unit images exist in each control unit. Each image appears as an independent control unit, but all control-unit images share a common set of hardware facilities. The ESS can emulate 3990-3, TPF, 3990-6, or 2105 control units.

control-unit-initiated reconfiguration (CUIR). A software mechanism that the ESS uses to request that an operating system of a zSeries or S/390 host verify that one or more subsystem resources can be taken offline for service. The ESS can use this process to automatically vary channel paths offline and online to facilitate bay service or concurrent code installation. Depending on the operating system, support for this process might be model dependent, might depend on the IBM TotalStorage Enterprise Storage Server Subsystem Device Driver, or might not exist.

Coordinated Universal Time (UTC). The international standard of time that is kept by atomic clocks around the world.

Copy Services CLI. See *Copy Services command-line interface*.

Copy Services client. Software that runs on each ESS cluster in the Copy Services server group and that performs the following functions:

- Communicates configuration, status and connectivity information to the Copy Services server
- Performs data-copy functions on behalf of the Copy Services server

See also *active Copy Services server*, *backup Copy Services server*, and *primary Copy Services server*.

Copy Services command-line interface (Copy Services CLI). In the ESS, command-line interface software provided with ESS Copy Services and used for invoking Copy Services functions from host systems attached to the ESS. See also *command-line interface*.

Copy Services domain. A collection of user-designated ESS clusters participating in Copy Services functions managed by a designated active Copy Services server. See also *Copy Services server*, *dual-active server*, and *single-active server*.

Copy Services server. An ESS cluster that the Copy Services administrator designates to perform the ESS Copy Services functions. See also *active Copy Services server*, *backup Copy Services server*, and *primary Copy Services server*.

Copy Services server group. A collection of user-designated ESS clusters participating in Copy Services functions that a designated, active, Copy Services server manages. A Copy Services server group is also called a Copy Services domain. See also *active Copy Services server*, *backup Copy Services server*, and *primary Copy Services server*.

count field. The first field of a count key data (CKD) record. This eight-byte field contains a four-byte track address (CCHH). It defines the cylinder and head that are associated with the track, and a one-byte record number (R) that identifies the record on the track. It defines a one-byte key length that specifies the length of the record's key field (0 means no key field). It defines a two-byte data length that specifies the length of the record's data field (0 means no data field). Only the end-of-file record has a data length of zero.

count key data (CKD). In Enterprise Systems Architecture/390, a data-record format employing self-defining record formats in which each record is represented by up to three fields: a *count* field identifying the record and specifying its format, an optional *key* field that can be used to identify the data area contents, and an optional *data* field that typically contains the user data. For CKD records on the ESS, the logical volume size is defined in terms of the device emulation mode (3390 or 3380 track format). The count field is always 8 bytes long and contains the lengths of the key and data fields, the key field has a length of 0 to 255 bytes, and the data field has a length of 0 to 65 535 or the maximum that will fit on the track. See also *data record*.

CPC. See *cluster processor complex*.

CRC. See *cyclic redundancy check*.

CU. See *control unit*.

CUIR. See *control-unit initiated reconfiguration*.

custom volume. In the ESS, a volume in count-key-data (CKD) format that is not a standard volume, which means that it does not necessarily present the same number of cylinders and capacity to its assigned logical control unit as provided by one of the following standard S/390 volume types: 3390-2, 3390-3, 3390-9, 3390-2 (3380-track mode), or 3390-3 (3380-track mode). See also *count-key-data*, *interleave*, *standard volume*, and *volume*.

CUT. See *Coordinated Universal Time*.

cyclic redundancy check (CRC). A redundancy check in which the check key is generated by a cyclic algorithm. (T)

cylinder. A unit of storage on a CKD device with a fixed number of tracks.

D

DA. See *device adapter*. See also *SSA adapter*.

daisy chain. See *serial connection*.

DASD. See *direct access storage device*.

DASD fast write (DFW). A function of a storage server in which active write data is stored in nonvolatile cache, thus avoiding exposure to data loss.

data availability. The degree to which data is available when needed, typically measured as a percentage of time that the system would be capable of responding to any data request (for example, 99.999% available).

data compression. A technique or algorithm used to encode data such that the encoded result can be stored in less space than the original data. The original data can be recovered from the encoded result through a reverse technique or reverse algorithm. See also *compression*.

Data Facility Storage Management Subsystem (DFSMS). An operating environment that helps automate and centralize the management of storage. To manage storage, DFSMS provides the storage administrator with control over data class, storage class, management class, storage group, and automatic class selection routine definitions.

data field. The optional third field of a count key data (CKD) record. The count field specifies the length of the data field. The data field contains data that the program writes.

data record. The basic unit of S/390 and zSeries storage on an ESS, also known as a count-key-data (CKD) record. Data records are stored on a track. The records are sequentially numbered starting with 0. The first record, R0, is typically called the track descriptor record and contains data that the operating system normally uses to manage the track. See also *count-key-data* and *fixed-block architecture*.

data set FlashCopy. An option of the Enterprise Storage Server that allows a volume to participate in multiple concurrent FlashCopy relationships at one time.

data sharing. The ability of multiple host systems to concurrently utilize data that they store on one or more storage devices. The storage facility enables configured storage to be accessible to any, or all, attached host systems. To use this capability, the host program must be designed to support data that it is sharing.

DDM. See *disk drive module*.

DDM group. See *disk eight pack*.

dedicated storage. Storage within a storage facility that is configured such that a single host system has exclusive access to the storage.

demote. To remove a logical data unit from cache memory. A storage server demotes a data unit to make room for other logical data units in the cache or because the logical data unit is not valid. The ESS must destage logical data units with active write units before they can be demoted.

destaging. Movement of data from an online or higher priority to an offline or lower priority device. The ESS stages incoming data into cache and then destages it to disk.

device. In Enterprise Systems Architecture/390, a disk drive.

device adapter (DA). A physical component of the ESS that provides communication between the clusters and the storage devices. The ESS has eight device adapters that it deploys in pairs, one from each cluster. DA pairing enables the ESS to access any disk drive from either of two paths, providing fault tolerance and enhanced availability.

device address. In Enterprise Systems Architecture/390, the field of an ESCON or FICON device-level frame that selects a specific device on a control-unit image.

device ID. In the ESS, the unique two-digit hexadecimal number that identifies the logical device.

device interface card. A physical subunit of a storage cluster that provides the communication with the attached device drive modules.

device number. In Enterprise Systems Architecture/390, a four-hexadecimal-character identifier, for example 13A0, that the systems administrator associates with a device to facilitate communication between the program and the host operator. The device number is associated with a subchannel.

device sparing. A subsystem function that automatically copies data from a failing device drive module to a spare device drive module. The subsystem maintains data access during the process.

DFS. See *distributed file service*.

DFSMS. See *Data Facility Storage Management Subsystem*.

direct access storage device (DASD). (1) A mass storage medium on which a computer stores data. (2) A disk device.

disk cage. A container for disk drives. Each disk cage supports eight disk eight packs (64 disks).

disk drive. Standard term for a disk-based nonvolatile storage medium. The ESS uses hard disk drives as the primary nonvolatile storage media to store host data.

disk drive module (DDM). A field replaceable unit that consists of a single disk drive and its associated packaging.

disk drive module group. See *disk eight pack*.

disk eight pack. In the ESS, a group of eight disk drive modules (DDMs) installed as a unit in a DDM bay.

disk group. In the ESS, a collection of disk drives in the same SSA loop set up by the ESS to be available to be assigned as a RAID-formatted array. A disk group can be formatted as count key data or fixed block, and as RAID or non-RAID, or it can be left unformatted. A disk group is a logical assemblage of eight disk drives. Contrast with *disk eight pack*.

distributed file service (DFS). A service that provides data access over IP networks.

DNS. See *domain name system*.

domain. (1) That part of a computer network in which the data processing resources are under common control. (2) In TCP/IP, the naming system used in hierarchical networks. (3) A Copy Services server group, in other words, the set of clusters the user designates to be managed by a particular Copy Services server.

domain name system (DNS). In TCP/IP, the server program that supplies name-to-address translation by mapping domain names to internet addresses. The address of a DNS server is the internet address of the server that hosts the DNS software for the network.

dotted decimal notation. A convention used to identify IP addresses. The notation consists of four 8-bit numbers written in base 10. For example, `9.113.76.250` is an IP address that contains the octets 9, 113, 76, and 250.

drawer. A unit that contains multiple device drive modules and provides power, cooling, and related interconnection logic to make the device drive modules accessible to attached host systems.

drive. (1) A peripheral device, especially one that has addressed storage media. See also *disk drive module*. (2) The mechanism used to seek, read, and write information on a storage medium.

duplex. (1) Regarding ESS Copy Services, the state of a volume pair after PPRC has completed the copy operation and the volume pair is synchronized. (2) In general, pertaining to a communication mode in which data can be sent and received at the same time.

dynamic sparing. The ability of a storage server to move data from a failing disk drive module (DDM) to a spare DDM while maintaining storage functions.

E

E10. The predecessor of the F10 model of the ESS. See also *F10*.

E20. The predecessor of the F20 model of the ESS. See also *F20*.

EBCDIC. See *extended binary-coded decimal interchange code*.

EC. See *engineering change*.

ECKD. See *extended count key data*.

eight pack. See *disk eight pack*.

electrostatic discharge (ESD). An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

emergency power off (EPO). A means of turning off power during an emergency, usually a switch.

EMIF. See *ESCON multiple image facility*.

enclosure. A unit that houses the components of a storage subsystem, such as a control unit, disk drives, and power source.

end of file. A coded character recorded on a data medium to indicate the end of the medium. On a count-key-data direct access storage device, the subsystem indicates the end of a file by including a record with a data length of zero.

engineering change (EC). An update to a machine, part, or program.

Enterprise Storage Server. See *IBM TotalStorage Enterprise Storage Server*.

Enterprise Systems Architecture/390 (ESA/390). An IBM architecture for mainframe computers and peripherals. Processor systems that follow the ESA/390 architecture include the ES/9000® family. See also *z/Architecture*.

Enterprise Systems Connection (ESCON). (1) An Enterprise Systems Architecture/390 and zSeries computer peripheral interface. The I/O interface uses ESA/390 logical protocols over a serial interface that configures attached units to a communication fabric. (2) A set of IBM products and services that provide a dynamically connected environment within an enterprise.

EPO. See *emergency power off*.

ERDS. See *error-recording data set*.

ERP. See *error recovery procedure*.

error-recording data set (ERDS). On S/390 and zSeries hosts, a data set that records data-storage and data-retrieval errors. A service information message (SIM) provides the error information for the ERDS.

error recovery procedure (ERP). Procedures designed to help isolate and, where possible, to recover from errors in equipment. The procedures are often used in conjunction with programs that record information on machine malfunctions.

ESA/390. See *Enterprise Systems Architecture/390*.

ESCD. See *ESCON director*.

ESCON. See *Enterprise System Connection*.

ESCON channel. An S/390 or zSeries channel that supports ESCON protocols.

ESCON director (ESCD). An I/O interface switch that provides for the interconnection of multiple ESCON interfaces in a distributed-star topology.

ESCON host systems. S/390 or zSeries hosts that attach to the ESS with an ESCON adapter. Such host systems run on operating systems that include MVS, VSE, TPF, or versions of VM.

ESCON multiple image facility (EMIF). In Enterprise Systems Architecture/390, a function that enables LPARs to share an ESCON channel path by providing each LPAR with its own channel-subsystem image.

EsconNet. In ESS Specialist, the label on a pseudo host icon that represents a host connection that uses the ESCON protocol and that is not completely defined on the ESS. See also *pseudo host* and *access-any mode*.

ESD. See *electrostatic discharge*.

eserver. See *IBM @server*.

ESS. See *IBM TotalStorage Enterprise Storage Server*.

ESS Batch Configuration tool. A program that automatically configures an ESS. The configuration is based on data that IBM service personnel enter into the program.

ESS Copy Services. In the ESS, a collection of optional software features, with a Web-browser

interface, used for configuring, managing, and monitoring data-copy functions.

ESS Copy Services CLI. See *Copy Services Command-Line Interface*.

ESS Expert. See *IBM TotalStorage Enterprise Storage Server Expert*.

ESS Master Console. See *IBM TotalStorage ESS Master Console*.

ESSNet. See *IBM TotalStorage Enterprise Storage Server Network*.

ESS Specialist. See *IBM TotalStorage Enterprise Storage Server Specialist*.

Expert. See *IBM TotalStorage Enterprise Storage Server Expert*.

extended binary-coded decimal interchange code (EBCDIC). An IBM-developed coding scheme used to represent various alphabetic, numeric, and special symbols with a coded character set of 256 eight-bit codes.

extended count key data (ECKD). An extension of the count key data (CKD) architecture.

Extended Remote Copy (XRC). A function of a storage server that assists a control program to maintain a consistent copy of a logical volume on another storage facility. All modifications of the primary logical volume by any attached host are presented in order to a single host. The host then makes these modifications on the secondary logical volume.

extent. A continuous space on a disk that is occupied by or reserved for a particular data set, data space, or file. The unit of increment is a track. See also *multiple allegiance* and *parallel access volumes*.

F

F10. A model of the ESS featuring a single-phase power supply. It has fewer expansion capabilities than the Model F20.

F20. A model of the ESS featuring a three-phase power supply. It has more expansion capabilities than the Model F10, including the ability to support a separate expansion enclosure.

fabric. In fibre-channel technology, a routing structure, such as a switch, receives addressed information and routes to the appropriate destination. A fabric can consist of more than one switch. When multiple fibre-channel switches are interconnected, they are said to be *cascaded*.

failback. Pertaining to a cluster recovery from failover following repair. See also *failover*.

failover. In the ESS, pertaining to the process of transferring all control to a single cluster when the other cluster in the ESS fails. See also *cluster*.

fast write. A write operation at cache speed that does not require immediate transfer of data to a disk drive. The subsystem writes the data directly to cache, to nonvolatile storage, or to both. The data is then available for destaging. A fast-write operation reduces the time an application must wait for the I/O operation to complete.

FBA. See *fixed-block architecture*.

FC. See *feature code*. **Note**: *FC* is a common abbreviation for fibre channel in the industry, but the ESS customer documentation library reserves *FC* for feature code.

FC-AL. See *Fibre Channel-Arbitrated Loop*.

FCP. See *fibre-channel protocol*.

FCS. See *fibre-channel standard*.

feature code (FC). A code that identifies a particular orderable option and that is used by service personnel to process hardware and software orders. Individual optional features are each identified by a unique feature code.

fibre channel. A data-transmission architecture based on the ANSI fibre-channel standard, which supports full-duplex communication. The ESS supports data transmission over fiber-optic cable through its fibre-channel adapters. See also *fibre-channel protocol* and *fibre-channel standard*.

Fibre Channel-Arbitrated Loop (FC-AL). An implementation of the fibre-channel standard that uses a ring topology for the communication fabric. Refer to American National Standards Institute (ANSI) X3T11/93-275. In this topology, two or more fibre-channel end points are interconnected through a looped interface. The ESS supports this topology.

fibre-channel connection (FICON). A fibre-channel communications protocol designed for IBM mainframe computers and peripherals.

fibre-channel protocol (FCP). A protocol used in fibre-channel communications with five layers that define how fibre-channel ports interact through their physical links to communicate with other ports.

fibre-channel standard (FCS). An ANSI standard for a computer peripheral interface. The I/O interface defines a protocol for communication over a serial interface that configures attached units to a communication fabric. The protocol has two layers. The IP layer defines basic interconnection protocols. The upper layer supports one or more logical protocols (for example, FCP for SCSI command protocols and

SBCON for ESA/390 command protocols). Refer to American National Standards Institute (ANSI) X3.230-199x. See also *fibre-channel protocol*.

fibre-channel topology. An interconnection topology supported on fibre-channel adapters. See also *point-to-point connection*, *switched fabric*, and *arbitrated loop*.

FICON. See *fibre-channel connection*.

FiconNet. In ESS Specialist, the label on a pseudo host icon that represents a host connection that uses the FICON protocol and that is not completely defined on the ESS. See also *pseudo host* and *access-any mode*.

field replaceable unit (FRU). An assembly that is replaced in its entirety when any one of its components fails. In some cases, a field replaceable unit might contain other field replaceable units. (GC)

FIFO. See *first-in-first-out*.

File Transfer Protocol (FTP). In TCP/IP, an application protocol used to transfer files to and from host computers. See also *Transmission Control Protocol/Internet Protocol*.

firewall. A protection against unauthorized connection to a computer or a data storage system. The protection is usually in the form of software on a gateway server that grants access to users who meet authorization criteria.

first-in-first-out (FIFO). A queuing technique in which the next item to be retrieved is the item that has been in the queue for the longest time. (A)

fixed-block architecture (FBA). An architecture for logical devices that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (fixed size). The subsystem can access them independently.

fixed-block device. An architecture for logical devices that specifies the format of the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (fixed size); the subsystem can access them independently. This is the required format of the logical data units for host systems that attach with a SCSI or fibre-channel interface. See also *fibre channel* and *small computer systems interface*.

FlashCopy. An optional feature for the ESS that can make an instant copy of data, that is, a point-in-time copy of a volume.

FlashCopy sequence number. A 4-byte value passed as input on an Establish FlashCopy command that is associated with the established FlashCopy relationship. Withdraw FlashCopy commands can use this number to coordinate Withdraw FlashCopy actions only with FlashCopy relationships that have matching sequence numbers.

FRU. See *field replaceable unit*.

FTP. See *File Transfer Protocol*.

full duplex. See *duplex*.

fuzzy copy. A function of the PPRC Extended Distance feature wherein modifications to the primary logical volume are performed on the secondary logical volume at a later time. The original order of update is not strictly maintained. See also *PPRC Extended Distance*.

G

GB. See *gigabyte*.

GDPS. See *Geographically Dispersed Parallel Sysplex*.

Geographically Dispersed Parallel Sysplex (GDPS). An S/390 multisite application- availability solution.

gigabyte (GB). A gigabyte of storage is 10^9 bytes. A gigabyte of memory is 2^{30} bytes.

group. In ESS documentation, a nickname for two different kinds of groups, depending on the context. See *disk eight pack* or *Copy Services server group*.

H

HA. See *host adapter*.

HACMP. See *High-Availability Cluster Multi-Processing*.

hard disk drive (HDD). (1) A storage medium within a storage server used to maintain information that the storage server requires. (2) A mass storage medium for computers that is typically available as a fixed disk (such as the disks used in system units of personal computers or in drives that are external to a personal computer) or a removable cartridge.

Hardware Configuration Data (HCD). An OS/390 and z/OS application used to define the I/O configuration to both the host operating system and the cluster-processor complex within the channel subsystem. The configuration program is available in three versions: stand-alone, VM/370, and MVS.

hardware service manager (HSM). An option on an AS/400 or iSeries host that enables the user to display and work with system hardware resources and to debug input-output processors (IOP), input-output adapters (IOA), and devices.

HCD. See *Hardware Configuration Data*.

HDA. See *head and disk assembly*.

HDD. See *hard disk drive*.

hdisk. An AIX term for storage space.

head and disk assembly (HDA). The portion of an HDD associated with the medium and the read/write head.

heartbeat. A status report sent at regular intervals from the ESS. The service provider uses this report to monitor the health of the call home process. See also *call home*, *heartbeat call home record*, and *remote technical assistance information network*.

heartbeat call home record. Machine operating and service information sent to a service machine. These records might include such information as feature code information and product logical configuration information.

hierarchical storage management. (1) A function in storage management software, such as Tivoli Storage Management or Data Facility Storage Management Subsystem/MVS (DFSMS/MVS), that automatically manages free space based on the policy that the storage administrator sets. (2) In AS/400 storage management, an automatic method to manage and distribute data between the different storage layers, such as disk units and tape library devices.

High-Availability Cluster Multi-Processing (HACMP). Software that provides host clustering, so that a failure of one host is recovered by moving jobs to other hosts within the cluster.

high-speed link (HSL). A hardware connectivity architecture that links system processors to system input/output buses and other system units.

home address (HA). A nine-byte field at the beginning of a track that contains information that identifies the physical track and its association with a cylinder. In the ESS, the acronym HA is shared between home address and host adapter. See also *host adapter*.

hop. Interswitch connection. A hop count is the number of connections that a particular block of data traverses between source and destination. For example, data traveling from one hub over a wire to another hub traverses one hop.

host. See *host system*.

host adapter (HA). A physical subunit of a storage server that provides the ability to attach to one or more host I/O interfaces. The Enterprise Storage Server has four HA bays, two in each cluster. Each bay supports up to four host adapters.

In the ESS, the acronym HA is shared between home address and host adapter. See also *home address*.

host name. The Internet address of a machine in the network. In the ESS, the host name can be entered in the host definition as the fully qualified domain name of the attached host system, such as `mycomputer.city.company.com`, or as the subname of the fully qualified domain name, for example, `mycomputer`. See also *host system*.

host processor. A processor that controls all or part of a user application network. In a network, the processing unit in which the data communication access method resides. See also *host system*.

host system. A computer, either of the mainframe (S/390 or zSeries) or of the open-systems type, that is connected to the ESS. S/390 or zSeries hosts are connected to the ESS through ESCON or FICON interfaces. Open-systems hosts are connected to the ESS by SCSI or fibre-channel interfaces.

hot plug. Pertaining to the ability to add or remove a hardware facility or resource to a unit while power is on.

HSL. See *high-speed link*.

HSM. See *hierarchical storage management* or *Hardware Service Manager*.

I

IBM @server. The IBM brand name for a series of server products that are optimized for e-commerce. The products include the iSeries, pSeries, xSeries, and zSeries.

IBM product engineering (PE). The third-level of IBM service support. Product engineering is composed of IBM engineers who have experience in supporting a product or who are knowledgeable about the product.

IBM TotalStorage. The brand name used to identify storage products from IBM, including the IBM TotalStorage Enterprise Storage Server (ESS). See also *IBM TotalStorage Enterprise Storage Server* and *IBM TotalStorage Enterprise Storage Server Specialist*.

IBM TotalStorage Enterprise Storage Server (ESS). A member of the Seascape product family of storage servers and attached storage devices (disk drive modules). The ESS provides for high-performance, fault-tolerant storage and management of enterprise data, providing access through multiple concurrent operating systems and communication protocols. High performance is provided by multiple symmetrical multiprocessors, integrated caching, RAID support for the disk drive modules, and disk access through a high-speed serial storage architecture (SSA) interface.

IBM TotalStorage Enterprise Storage Server Expert (ESS Expert). Formerly called IBM StorWatch Enterprise Storage Server Expert, the software that gathers performance data from the ESS and presents it through a Web browser.

IBM TotalStorage Enterprise Storage Server Specialist (ESS Specialist). Software with a Web-browser interface for configuring the ESS.

IBM TotalStorage Enterprise Storage Server Network (ESSNet). A private network providing Web browser access to the ESS. IBM installs the ESSNet software on an IBM workstation called the IBM TotalStorage ESS Master Console, supplied with the first ESS delivery.

IBM TotalStorage ESS Master Console (ESS Master Console). An IBM workstation (formerly named the ESSNet console) that IBM installs to provide the ESSNet facility when they install the ESS. It includes a Web browser that provides links to the ESS user interface, including ESS Specialist and ESS Copy Services.

IBM Subsystem Device Driver (SDD). Software that is designed to support the multipath configuration environments in the ESS. SDD resides in a host system with the native disk device driver.

ID. See *identifier*.

inband FlashCopy. An option of the Enterprise Storage Server that establishes and withdraws FlashCopy pairs at the remote site without having a Copy Services Web interface connection to the remote site.

incremental FlashCopy. An option of the Enterprise Storage Server that creates a point-in-time data copy without copying an entire volume for each point-in-time copy.

identifier (ID). A unique name or address that identifies things such as programs, devices, or systems.

IML. See *initial microcode load*.

implicit allegiance. In Enterprise Systems Architecture/390, a relationship that a control unit creates between a device and a channel path when the device accepts a read or write operation. The control unit guarantees access to the channel program over the set of channel paths that it associates with the allegiance.

initial microcode load (IML). The action of loading microcode for a computer into that computer's storage.

initial program load (IPL). The action of loading software into a computer, typically an operating system that controls the computer.

initiator. A SCSI device that communicates with and controls one or more targets. An initiator is typically an I/O adapter on a host computer. A SCSI initiator is analogous to an S/390 channel. A SCSI logical unit is analogous to an S/390 device. Contrast with *target*.

i-node. The internal structure in an AIX operating system that describes the individual files in the operating system. It contains the code, type, location, and owner of a file.

input/output (I/O). Pertaining to (a) input, output, or both or (b) a device, process, or channel involved in data input, data output, or both.

input/output configuration data set. A configuration definition built by the I/O configuration program (IOCP) and stored on disk files associated with the processor controller.

interleave. In the ESS, to automatically create two striped partitions across the drives in a RAID-5 array, both of which use the count-key-data (CKD) record format.

Internet Protocol (IP). In the Internet suite of protocols, a protocol without connections that routes data through a network or interconnecting networks and acts as an intermediary between the higher protocol layers and the physical network. The upper layer supports one or more logical protocols (for example, a SCSI-command protocol and an ESA/390 command protocol). Refer to ANSI X3.230-199*x*. The IP acronym is the IP in TCP/IP. See also *Transmission Control Protocol/Internet Protocol*.

invalidate. To remove a logical data unit from cache memory because it cannot support continued access to the logical data unit on the device. This removal might be the result of a failure within the storage server or a storage device that is associated with the device.

I/O. See *input/output*.

I/O adapter (IOA). In the ESS, an input-output adapter on the PCI bus.

IOCDS. See *input/output configuration data set*.

IOCP. See *I/O Configuration Program*.

I/O Configuration Program (IOCP). A program that defines to a system all the available I/O devices and channel paths.

I/O device. An addressable read and write unit, such as a disk drive device, magnetic tape device, or printer.

I/O interface. An interface that enables a host to perform read and write operations with its associated peripheral devices.

I/O Priority Queueing. A facility in the Workload Manager of OS/390 that enables the system

administrator to set priorities for queueing I/Os from different system images. See also *multiple allegiance* and *parallel access volume*.

I/O processor (IOP). Controls input-output adapters and other devices.

I/O sequential response time. The time an I/O request is queued in processor memory waiting for previous I/Os to the same volume to complete.

IOSQ. See *I/O sequential response time*.

IP. See *Internet Protocol*.

IPL. See *initial program load*.

iSeries. An IBM @server product that emphasizes integration. It is the successor to the AS/400 family of servers.

J

Java Virtual Machine (JVM). A software implementation of a central processing unit (CPU) that runs compiled Java code (applets and applications). (GC)

JVM. See *Java Virtual Machine*.

K

KB. See *kilobyte*.

key field. The second (optional) field of a count key data record. The key length is specified in the count field. The key length determines the field length. The program writes the data in the key field and use the key field to identify or locate a given record. The subsystem does not use the key field.

kilobyte (KB). (1) For processor storage, real, and virtual storage, and channel volume, 2^{10} or 1024 bytes. (2) For disk storage capacity and communications volume, 1000 bytes.

Korn shell. Interactive command interpreter and a command programming language.

KPOH. See *thousands of power-on hours*.

L

LAN. See *local area network*.

last-in first-out (LIFO). A queuing technique in which the next item to be retrieved is the item most recently placed in the queue. (A)

LBA. See *logical block address*.

LCU. See *logical control unit*.

least recently used (LRU). (1) The algorithm used to identify and make available the cache space that contains the least-recently used data. (2) A policy for a caching algorithm that chooses to remove from cache the item that has the longest elapsed time since its last access.

LED. See *light-emitting diode*.

LIC. See *licensed internal code*.

licensed internal code (LIC). Microcode that IBM does not sell as part of a machine, but licenses to the customer. LIC is implemented in a part of storage that is not addressable by user programs. Some IBM products use it to implement functions as an alternate to hard-wired circuitry.

LIFO. See *last-in first-out*.

light-emitting diode (LED). A semiconductor chip that gives off visible or infrared light when activated.

link address. On an ESCON or FICON interface, the portion of a source or destination address in a frame that ESCON or FICON uses to route a frame through an ESCON or FICON director. ESCON or FICON associates the link address with a specific switch port that is on the ESCON or FICON director. Equivalently, it associates the link address with the channel subsystem or control unit link-level functions that are attached to the switch port.

link-level facility. The ESCON or FICON hardware and logical functions of a control unit or channel subsystem that allow communication over an ESCON or FICON write interface and an ESCON or FICON read interface.

local area network (LAN). A computer network located on a user's premises within a limited geographic area.

local e-mail. An e-mail configuration option for storage servers that are connected to a host-system network that does not have a domain name system (DNS) server.

logical address. On an ESCON or FICON interface, the portion of a source or destination address in a frame used to select a specific channel-subsystem or control-unit image.

logical block address (LBA). The address assigned by the ESS to a sector of a disk.

logical control unit (LCU). See *control-unit image*.

logical data unit. A unit of storage that is accessible on a given device.

logical device. The facilities of a storage server (such as the ESS) associated with the processing of I/O operations directed to a single host-accessible emulated

I/O device. The associated storage is referred to as a logical volume. The logical device is mapped to one or more host-addressable units, such as a device on an S/390 I/O interface or a logical unit on a SCSI I/O interface, such that the host initiating I/O operations to the I/O-addressable unit interacts with the storage on the associated logical device.

logical partition (LPAR). In Enterprise Systems Architecture/390, a set of functions that create the programming environment in which more than one logical partition (LPAR) is established on a processor. An LPAR is conceptually similar to a virtual machine environment except that the LPAR is a function of the processor. Also, the LPAR does not depend on an operating system to create the virtual machine environment.

logical path. (1) The relationship between a channel image and a control-unit image that designates the physical path to be used for device-level communications between these images. The logical path is established as part of the channel and control-unit initialization procedures by the exchange of link-level frames. (2) In the ESS with the Peer-to-Peer Remote Copy (PPRC) feature, the relationship between a source logical subsystem (LSS) and a target LSS that is created over a physical path through the interconnection fabric used for PPRC functions. An LSS is a primary control unit, which performs the functions of a channel image.

logical subsystem (LSS). In the ESS, a topological construct that consists of a group of up to 256 logical devices. An ESS can have up to 16 CKD-formatted logical subsystems (4096 CKD logical devices) and also up to 16 fixed-block logical subsystems (4096 fixed-block logical devices). The logical subsystem facilitates configuration of the ESS and might have other implications relative to the operation of certain functions. There is a one-to-one mapping between a CKD logical subsystem and an S/390 control-unit image.

For S/390 or zSeries hosts, a logical subsystem represents a logical control unit (LCU). Each control-unit image is associated with only one logical subsystem. See also *control-unit image*.

logical unit. In open systems, a logical disk drive.

logical unit number (LUN). In the SCSI protocol, a unique number used on a SCSI bus to enable it to differentiate between a maximum of eight separate devices, each of which is a logical unit.

logical volume. The storage medium associated with a logical disk drive. A logical volume typically resides on one or more storage devices. The ESS administrator defines this unit of storage. The logical volume, when residing on a RAID-formatted array, is spread over the drives in the array.

logical volume manager (LVM). A set of system commands, library routines, and other tools that allow the user to establish and control logical volume storage. The LVM maps data between the logical view of storage space and the physical disk drive module.

longitudinal redundancy check (LRC). (1) A method of error checking during data transfer that involves checking parity on a row of binary digits that are members of a set that forms a matrix. Longitudinal redundancy check is also called a longitudinal parity check. (2) In the ESS, a mechanism that the ESS uses for locating errors. The LRC checks the data as it progresses from the host, through the ESS controller, into the device adapter, and to the array.

longwave laser adapter. A connector used between a host and the ESS to support longwave fibre-channel communication.

loop. The physical connection between a pair of device adapters in the ESS. See also *device adapter*.

LPAR. See *logical partition*.

LRC. See *longitudinal redundancy check*.

LRU. See *least recently used*.

LSS. See *logical subsystem*.

LUN. See *logical unit number*.

LVM. See *logical volume manager*.

M

machine level control (MLC). A database that contains the EC level and configuration of products in the field.

machine reported product data (MRPD). Product data gathered by a machine and sent to a destination such as an IBM support server or RETAIN. These records might include such information as feature code information and product logical configuration information.

mainframe. A computer, usually in a computer center, with extensive capabilities and resources to which other computers may be connected so that they can share facilities. (T)

maintenance analysis procedure (MAP). A hardware maintenance document that gives an IBM service representative a step-by-step procedure for tracing a symptom to the cause of a failure.

Management Information Base (MIB). (1) A collection of objects that can be accessed by means of a network management protocol. (GC) (2) In the ESS, the MIB record conforms to the Open Systems Interconnection (OSI) standard defined by the International Organization

for Standardization (ISO) for the exchange of information. See also *simple network management protocol*.

MAP. See *maintenance analysis procedure*.

Master Console. See *IBM TotalStorage ESS Master Console*.

master ESS. The ESS that controls the creation of consistency groups in the asynchronous PPRC session. The master ESS sends commands to subordinate ESSs. An ESS can be a master for only one asynchronous PPRC session. Contrast with *subordinate ESS*.

maximum consistency group drain time. The value in seconds that indicates the maximum time that writes from the local site are delayed to the remote site while the current consistency group is being formed at the remote site. When this time is exceeded, the current attempt to form a consistency group is ended and another attempt is started. If this time is exceeded five times, this maximum time is ignored on the next attempt to form a consistency group. The default value is the larger of four minutes or two times the consistency group interval time if this value is set to zero.

maximum coordination time. The value in milliseconds that indicates the maximum time that is allowed for host I/O to be delayed during the coordination of the primary volumes of an asynchronous PPRC session. The default is 50 milliseconds if this value is set to zero.

MB. See *megabyte*.

MCA. See *Micro Channel architecture*.

MDM. See *Multiple Device Manager*.

mean time between failures (MTBF). (1) A projection of the time that an individual unit remains functional. The time is based on averaging the performance, or projected performance, of a population of statistically independent units. The units operate under a set of conditions or assumptions. (2) For a stated period in the life of a functional unit, the mean value of the lengths of time between consecutive failures under stated conditions. (I) (A)

medium. For a storage facility, the disk surface on which data is stored.

megabyte (MB). (1) For processor storage, real and virtual storage, and channel volume, 2^{20} or 1 048 576 bytes. (2) For disk storage capacity and communications volume, 1 000 000 bytes.

MES. See *miscellaneous equipment specification*.

MIB. See *management information base*.

Micro Channel architecture (MCA). The rules that define how subsystems and adapters use the Micro Channel bus in a computer. The architecture defines the services that each subsystem can or must provide.

Microsoft Internet Explorer (MSIE). Web browser software manufactured by Microsoft.

migration. In the ESS, the replacement of a system or subsystem with a different type of system or subsystem, such as replacing a SCSI host adapter with a fibre-channel host adapter. When used in the context of data migration regarding the ESS, the transfer of data from one storage facility to another, such as from a 3390 to the ESS.

MIH. See *missing-interrupt handler*.

mirrored pair. Two units that contain the same data. The system refers to them as one entity.

mirroring. In host systems, the process of writing the same data to two disk units within the same auxiliary storage pool at the same time.

miscellaneous equipment specification (MES). IBM field-installed change to a machine.

missing-interrupt handler (MIH). An MVS and MVS/XA facility that tracks I/O interrupts. MIH informs the operator and creates a record whenever an expected interrupt fails to occur before a specified elapsed time is exceeded.

MLC. See *machine level control*.

mobile solutions terminal (MoST). The mobile terminal used by service personnel.

mode conditioning patch cable. A cable that converts a single-mode signal from a longwave adapter into a light signal that is appropriate for multimode fibre. Another mode conditioning patch cable is required at the terminating end of the multimode fibre to convert the signal back to a single-mode signal for a longwave adapter.

Model 100. A 2105 Model 100, often simply referred to as a Mod 100, is an expansion enclosure for the ESS. See also *2105*.

MoST. See *mobile solutions terminal*.

MRPD. See *machine reported product data*.

MSA. See *multiport serial adapter*.

MSIE. See *Microsoft Internet Explorer*.

MTBF. See *mean time between failures*.

multiple allegiance. An ESS hardware function that is independent of software support. This function enables multiple system images to concurrently access the

same logical volume on the ESS as long as the system images are accessing different extents. See also *extent* and *parallel access volumes*.

Multiple Device Manager (MDM). A component of the IBM TotalStorage Productivity Center that allows administrators to configure, manage, and monitor the performance of SAN storage devices from a single console.

multiple relationship FlashCopy. An option of the Enterprise Storage Server that creates backup copies from one source to multiple targets by simultaneously establishing multiple FlashCopy relationships.

multiple virtual storage (MVS). Implies MVS/390, MVS/XA, MVS/ESA, and the MVS element of the OS/390 operating system.

multiplex. The action of transmitting simultaneously.

multiport serial adapter (MSA). An adapter on the ESS Master Console that has multiple ports to which ESSs can be attached.

multiprocessor. A computer that includes two or more processors that have common access to a main storage. For the ESS, the multiprocessors operate in parallel.

MVS. See *multiple virtual storage*.

N

name server. A server that stores names of the participating ESS clusters.

Netfinity. IBM Intel-processor-based server; predecessor to the IBM xSeries server.

Netscape Navigator. Web browser software manufactured by Netscape.

network manager. A program or group of programs that is used to monitor, manage, and diagnose the problems of a network. (GC)

node. The unit that is connected in a fibre-channel network. An ESS is a node in a fibre-channel network.

non-RAID. A disk drive set up independently of other disk drives and not set up as part of a disk eight pack to store data using the redundant array of disks (RAID) data-striping methodology.

nonremovable medium. A recording medium that cannot be added to or removed from a storage device.

nonvolatile storage (NVS). In the ESS, memory that stores active write data to avoid data loss in the event of a power loss.

NVS. See *nonvolatile storage*.

O

octet. In Internet Protocol addressing, one of the four parts of a 32-bit integer presented in dotted decimal notation. See also *dotted decimal notation*.

OEMI. See *original equipment manufacturer's information*.

open system. A system whose characteristics comply with standards made available throughout the industry and that therefore can be connected to other systems complying with the same standards. Applied to the ESS, such systems are those hosts that connect to the ESS through SCSI or FCP protocols. See also *small computer system interface* and *fibre-channel protocol*.

organizationally unique identifier (OUI). An IEEE-standards number that identifies an organization with a 24-bit globally unique assigned number referenced by various standards. OUI is used in the family of 802 LAN standards, such as Ethernet and Token Ring.

original equipment manufacturer's information (OEMI). A reference to an IBM guideline for a computer peripheral interface. The interface uses ESA/390 logical protocols over an I/O interface that configures attached units in a multidrop bus topology.

OS/390. The IBM operating system that includes and integrates functions that many IBM software products (including the MVS operating system) previously provided for the IBM S/390 family of enterprise servers.

OS/400. The IBM operating system that runs the IBM AS/400 and iSeries @server families of servers.

OUI. See *organizationally unique identifier*.

P

panel. The formatted display of information that appears on a display screen.

parallel access volume (PAV). An advanced function of the ESS that enables OS/390 and z/OS systems to issue concurrent I/O requests against a count key data logical volume by associating multiple devices of a single control-unit image with a single logical device. Up to eight device addresses can be assigned to a PAV. The PAV function enables two or more concurrent write operations to the same logical volume, as long as the write operations are not to the same extents. See also *extent*, *I/O Priority Queueing*, and *multiple allegiance*.

parity. A data checking scheme used in a computer system to ensure the integrity of the data. The RAID implementation uses parity to re-create data if a disk drive fails.

path group. In ESA/390 architecture, a set of channel paths that are defined to a control unit as being associated with a single logical partition (LPAR). The channel paths are in a group state and are online to the host. See also *logical partition*.

path group identifier. In ESA/390 architecture, the identifier that uniquely identifies a given logical partition (LPAR). The path group identifier is used in communication between the LPAR program and a device. The identifier associates the path group with one or more channel paths, thereby defining these paths to the control unit as being associated with the same LPAR. See also *logical partition*.

PAV. See *parallel access volume*.

PCI. See *peripheral component interconnect*.

PDU. See *protocol data unit*.

PE. See *IBM product engineering*.

Peer-to-Peer Remote Copy (PPRC). A function of a storage server that constantly updates a secondary copy of a logical volume to match changes made to a primary logical volume. The primary and secondary volumes can be on the same storage server or on separate storage servers. See also *synchronous PPRC* and *PPRC Extended Distance*.

peripheral component interconnect (PCI). An architecture for a system bus and associated protocols that supports attachments of adapter cards to a system backplane.

physical path. A single path through the I/O interconnection fabric that attaches two units. For Copy Services, this is the path from a host adapter on one ESS (through cabling and switches) to a host adapter on another ESS.

pinned data. Data that is held in cache until either an error condition is corrected and it can be moved to disk storage or until the data is discarded by a host command. Pinned data conditions can only occur on an ESS Model 800 during fast-write or dual-copy functions.

point-to-point connection. A fibre-channel topology that enables the direct interconnection of ports. See also *arbitrated loop* and *switched fabric*.

port. In the ESS, a physical connection on a host adapter to the cable that connects the ESS to hosts, switches, or another ESS. The ESS uses SCSI and ESCON host adapters that have two ports per adapter, and fibre-channel host adapters that have one port. See also *ESCON*, *fibre channel*, *host adapter*, and *small computer system interface*.

POST. See *power-on self test*.

power-on self test (POST). A diagnostic test that servers or computers run when they are turned on.

PPRC. See *Peer-to-Peer Remote Copy*.

PPRC Extended Distance. An optional feature for the ESS that maintains a fuzzy copy of a logical volume on the same ESS or on another ESS. In other words, all modifications that any attached host performs on the primary logical volume are also performed on the secondary logical volume at a later point in time. The original order of update is not strictly maintained. See also *Peer-to-Peer Remote Copy (PPRC)* and *synchronous PPRC*.

PPRC-XD. See *PPRC Extended Distance*.

predictable write. A write operation that can cache without knowledge of the existing format on the medium. All write operations on FBA DASD devices are predictable. On CKD DASD devices, a write operation is predictable if it does a format write operation for the first data record on the track.

primary control unit. The ESS to which a PPRC primary device is physically attached.

primary Copy Services server. One of two Copy Services servers in a Copy Services server group. The primary Copy Services server is the active Copy Services server until it fails; it is then replaced by the backup Copy Services server. A Copy Services server is software that runs in one of the two clusters of an ESS and performs data-copy operations within that group. See *active Copy Services server* and *backup Copy Services server*.

primary device. One of the devices in a dual-copy or remote-copy volume pair. All channel commands to the logical volume are directed to the primary device. The data on the primary device is duplicated on the secondary device. See also *secondary device.*

product engineering. See *IBM product engineering*.

program. On a computer, a generic term for software that controls the operation of the computer. Typically, the program is a logical assemblage of software modules that perform multiple related tasks.

program-controlled interruption. An interruption that occurs when an I/O channel fetches a channel command word with the program-controlled interruption flag on.

program temporary fix (PTF). A temporary solution to, or bypass of, a problem diagnosed by IBM as the result of a defect in a current unaltered release of a licensed program. (GC)

promote. To add a logical data unit to cache memory.

protected volume. In AS/400, a disk storage device that is protected from data loss by RAID techniques. An AS/400 host does not mirror a volume configured as a protected volume, while it does mirror all volumes configured as unprotected volumes. The ESS, however, can be configured to indicate that an AS/400 volume is protected or unprotected and give it RAID protection in either case.

protocol data unit (PDU). A unit of data specified in the protocol of a given layer and consisting of protocol control information for the layer and, possibly, user data for the layer.

pSeries. The product name of an IBM @server product that emphasizes performance. It is the successor to the RS/6000 family of servers.

pseudo host. A host connection that is not explicitly defined to the ESS and that has access to at least one volume that is configured on the ESS. The FiconNet pseudo host icon represents the FICON protocol. The EsconNet pseudo host icon represents the ESCON protocol. The pseudo host icon labelled `Anonymous` represents hosts connected through the FCP protocol. *Anonymous host* is a commonly used synonym for *pseudo host*. The ESS adds a pseudo host icon only when the ESS is set to access-any mode. See also *access-any mode*.

PTF. See *program temporary fix*.

PV Links. Short for Physical Volume Links, an alternate pathing solution from Hewlett-Packard that provides for multiple paths to a volume, as well as static load balancing.

R

R0. See *track-descriptor record*.

rack. See *enclosure*.

RAID. See *redundant array of independent disks*. RAID is also commonly expanded to redundant array of *inexpensive* disks. See also *array*.

RAID 5. A type of RAID that optimizes cost-effective performance while emphasizing use of available capacity through data striping. RAID 5 provides fault tolerance for up to two failed disk drives by distributing parity across all the drives in the array plus one parity disk drive. The ESS automatically reserves spare disk drives when it assigns arrays to a device adapter pair (DA pair). See also *device adapter*, *RAID 10*, and *redundant array of independent disks*.

RAID 10. A type of RAID that optimizes high performance while maintaining fault tolerance for up to two failed disk drives by by striping volume data across several disk drives and mirroring the first set of disk drives on an identical set. The ESS automatically reserves spare disk drives when it assigns arrays to a device adapter pair (DA pair). See also *device adapter*, *RAID 5*, and *redundant array of independent disks*.

random access. A mode of accessing data on a medium in a manner that requires the storage device to access nonconsecutive storage locations on the medium.

rank. See *array*.

redundant array of independent disks (RAID). A methodology of grouping disk drives for managing disk storage to insulate data from a failing disk drive.

remote technical assistance information network (RETAIN). The initial service tracking system for IBM service support, which captures heartbeat and call-home records. See also *support catcher* and *support catcher telephone number*.

REQ/ACK. See *request for acknowledgment and acknowledgment*.

request for acknowledgment and acknowledgment (REQ/ACK). A cycle of communication between two data transport devices for the purpose of verifying the connection, which starts with a request for acknowledgment from one of the devices and ends with an acknowledgment from the second device. The REQ and ACK signals help to provide uniform timing to support synchronous data transfer between an initiator and a target. The objective of a synchronous data transfer method is to minimize the effect of device and cable delays.

reserved allegiance. In Enterprise Systems Architecture/390, a relationship that is created in a control unit between a device and a channel path when the device completes a Sense Reserve command. The allegiance causes the control unit to guarantee access (busy status is not presented) to the device. Access is over the set of channel paths that are associated with the allegiance; access is for one or more channel programs until the allegiance ends.

RETAIN. See *remote technical assistance information network*.

S

S/390. IBM enterprise servers based on Enterprise Systems Architecture/390 (ESA/390). *S/390* is the currently accepted shortened form of the original name *System/390*.

S/390 storage. (1) Storage arrays and logical volumes that are defined in the ESS as connected to S/390 servers. This term is synonymous with count-key-data storage. (2) In ESS documentation, when noted, the term can refer to both S/390 and zSeries storage. See also *zSeries storage*.

SAID. See *system adapter identification number*.

SAM. See *sequential access method*.

SAN. See *storage area network*.

SBCON. See *Single-Byte Command Code Sets Connection*.

screen. The physical surface of a display device upon which information is shown to users.

SCSI. See *small computer system interface*.

SCSI device. A disk drive connected to a host through an I/O interface using the SCSI protocol. A SCSI device is either an initiator or a target. See also *initiator* and *small computer system interface*.

SCSI-FCP. Synonym for fibre-channel protocol, a protocol used to transport data between an open-systems host and a fibre-channel adapter on an ESS. See also *fibre-channel protocol* and *small computer system interface*.

SCSI host systems. Host systems that are attached to the ESS with a SCSI interface. Such host systems run on UNIX, OS/400, Windows NT, Windows 2000, or Novell NetWare operating systems.

SCSI ID. A unique identifier assigned to a SCSI device that is used in protocols on the SCSI interface to identify or select the device. The number of data bits on the SCSI bus determines the number of available SCSI IDs. A wide interface has 16 bits, with 16 possible IDs.

SDD. See *IBM Subsystem Device Driver*.

Seascape architecture. A storage system architecture that IBM developed for open-systems servers and S/390 and zSeries host systems. It provides storage solutions that integrate software, storage management, and technology for disk, tape, and optical storage.

secondary control unit. The ESS to which a PPRC secondary device is physically attached.

secondary device. One of the devices in a dual-copy or remote-copy volume pair that contains a duplicate of the data on the primary device. Unlike the primary device, the secondary device might only accept a limited subset of data. See also *primary device.*

self-timed interface (STI). An interface that has one or more conductors that transmit information serially between two interconnected units without requiring any clock signals to recover the data. The interface performs clock recovery independently on each serial data stream and uses information in the data stream to determine character boundaries and inter-conductor synchronization.

sequential access. A mode of accessing data on a medium in a manner that requires the storage device to access consecutive storage locations on the medium.

sequential access method (SAM). An access method for storing, deleting, or retrieving data in a continuous sequence based on the logical order of the records in the file.

serial connection. A method of device interconnection for determining interrupt priority by connecting the interrupt sources serially.

serial storage architecture (SSA). An IBM standard for a computer peripheral interface. The interface uses a SCSI logical protocol over a serial interface that configures attached targets and initiators in a ring topology. See also *SSA adapter*.

server. (1) A host that provides certain services to other hosts that are referred to as clients. (2) A functional unit that provides services to one or more clients over a network. (GC)

service boundary. A category that identifies a group of components that are unavailable for use when one of the components of the group is being serviced. Service boundaries are provided on the ESS, for example, in each host bay and in each cluster.

service information message (SIM). A message sent by a storage server to service personnel through an S/390 operating system.

service personnel. A generalization referring to individuals or companies authorized to service the ESS. The terms *service provider*, *service representative*, and *IBM service support representative (SSR)* refer to types of service personnel. See also *service support representative*.

service processor. A dedicated processing unit used to service a storage facility.

service support representative (SSR). Individuals or a company authorized to service the ESS. This term also refers to a service provider, a service representative, or an IBM service support representative (SSR). An IBM SSR installs the ESS.

session. A collection of volumes within a logical subsystem that are managed together during the creation of consistent copies of data. All volumes in a session must transfer their data successfully to the remote site before the increment can be called complete.

shared storage. In an ESS, storage that is configured so that multiple hosts can concurrently access the storage. The storage has a uniform appearance to all hosts. The host programs that access the storage must have a common model for the information on a storage

device. The programs must be designed to handle the effects of concurrent access.

shortwave laser adapter. A connector used between host and ESS to support shortwave fibre-channel communication.

SIM. See *service information message*.

Simple Network Management Protocol (SNMP). In the Internet suite of protocols, a network management protocol that is used to monitor routers and attached networks. SNMP is an application layer protocol. Information on devices managed is defined and stored in the application's Management Information Base (MIB). (GC) See also *management information base*.

simplex volume. A volume that is not part of a FlashCopy, XRC, or PPRC volume pair.

Single-Byte Command Code Sets Connection (SBCON). The ANSI standard for the ESCON or FICON I/O interface.

small computer system interface (SCSI). A standard hardware interface that enables a variety of peripheral devices to communicate with one another. (GC)

smart relay host. A mail relay or mail gateway that has the capability to correct e-mail addressing problems.

SMIT. See *System Management Interface Tool*.

SMP. See *symmetrical multiprocessor*.

SNMP. See *Simple Network Management Protocol*.

SNMP agent. A server process that resides on a network node and is responsible for communicating with managers regarding that node. The node is represented as a managed object, which has various fields or variables that are defined in the appropriate MIB.

SNMP manager. A managing system that runs a managing application or suite of applications. These applications depend on Management Information Base (MIB) objects for information that resides on the managed system. Managers generate requests for this MIB information, and an SNMP agent on the managed system responds to these requests. A request can either be the retrieval or modification of MIB information.

software transparency. Criteria applied to a processing environment that states that changes do not require modifications to the host software in order to continue to provide an existing function.

spare. A disk drive on the ESS that can replace a failed disk drive. A spare can be predesignated to allow automatic dynamic sparing. Any data preexisting on a disk drive that is invoked as a spare is destroyed by the dynamic sparing copy process.

spatial reuse. A feature of serial storage architecture that enables a device adapter loop to support many simultaneous read/write operations. See also *serial storage architecture*.

Specialist. See *IBM TotalStorage Enterprise Storage Server Specialist*.

SSA. See *serial storage architecture*.

SSA adapter. A physical adapter based on serial storage architecture. SSA adapters connect disk drive modules to ESS clusters. See also *serial storage architecture*.

SSID. See *subsystem identifier*.

SSR. See *service support representative*.

stacked status. In Enterprise Systems Architecture/390, the condition when the control unit is in a holding status for the channel, and the last time the control unit attempted to present the status, the channel responded with the stack-status control.

stage operation. The operation of reading data from the physical disk drive into the cache.

staging. To move data from an offline or low-priority device back to an online or higher priority device, usually on demand of the system or on request of the user.

standard volume. In the ESS, a volume that emulates one of several S/390 volume types, including 3390-2, 3390-3, 3390-9, 3390-2 (3380-track mode), or 3390-3 (3380-track mode), by presenting the same number of cylinders and capacity to the host as provided by the native S/390 volume type of the same name.

STI. See *self-timed interface*.

storage area network. A network that connects a company's heterogeneous storage resources.

storage complex. Multiple storage facilities.

storage device. A physical unit that provides a mechanism to store data on a given medium such that it can be subsequently retrieved. See also *disk drive module*.

storage facility. (1) A physical unit that consists of a storage server integrated with one or more storage devices to provide storage capability to a host computer. (2) A storage server and its attached storage devices.

storage server. A physical unit that manages attached storage devices and provides an interface between them and a host computer by providing the function of one or more logical subsystems. The storage server can provide functions that the storage device does not provide. The storage server has one or more clusters.

striping. A technique that distributes data in bit, byte, multibyte, record, or block increments across multiple disk drives.

subagent. An extension to an SNMP agent that permits a user to dynamically add, or in some cases replace, additional management variables in the local MIB, thereby providing a means of extending the range of information that network managers can access. See also *agent*.

subchannel. A logical function of a channel subsystem associated with the management of a single device.

subordinate ESS. The ESS that receives commands from the master ESS and is specified when an asynchronous PPRC session is started. The subordinate ESS forms consistency groups and performs other asynchronous PPRC processing. A subordinate ESS can only be controlled by one ESS master. Contrast with *master ESS*.

Subsystem Device Driver. See *IBM TotalStorage Enterprise Storage Server Subsystem Device Driver*.

subsystem identifier (SSID). A number that uniquely identifies a logical subsystem within a computer installation.

support catcher telephone number. The telephone number that connects the support catcher server to the ESS to receive a trace or dump package. See also *support catcher* and *remote technical assistance information network*.

switched fabric. A fibre-channel topology in which ports are interconnected through a switch. Fabric switches can also be interconnected to support numerous ports on a single network. See also *arbitrated loop* and *point-to-point connection*.

symmetrical multiprocessor (SMP). An implementation of a multiprocessor computer consisting of several identical processors configured in a way that any subset of the set of processors is capable of continuing the operation of the computer. The ESS contains four processors set up in SMP mode.

synchronous PPRC. A function of a storage server that maintains a consistent copy of a logical volume on the same storage server or on another storage server. All modifications that any attached host performs on the primary logical volume are also performed on the secondary logical volume. See also *Peer-to-Peer Remote Copy* and *PPRC Extended Distance*.

synchronous write. A write operation whose completion is indicated after the data has been stored on a storage device.

System/390. See *S/390*.

system adapter identification number (SAID). In the ESS, the unique identification number automatically assigned to each ESS host adapter for use by ESS Copy Services.

System Management Interface Tool (SMIT). An interface tool of the AIX operating system for installing, maintaining, configuring, and diagnosing tasks.

System Modification Program. A program used to install software and software changes on MVS systems.

T

TAP. See *Telocator Alphanumeric Protocol*.

target. A SCSI device that acts as a subordinate to an initiator and consists of a set of one or more logical units, each with an assigned logical unit number (LUN). The logical units on the target are typically I/O devices. A SCSI target is analogous to an S/390 control unit. A SCSI initiator is analogous to an S/390 channel. A SCSI logical unit is analogous to an S/390 device. See also *small computer system interface*.

TB. See *terabyte*.

TCP/IP. See *Transmission Control Protocol/Internet Protocol*.

Telocator Alphanumeric Protocol (TAP). An industry standard protocol for the input of paging requests.

terabyte (TB). (1) Nominally, 1 000 000 000 000 bytes, which is accurate when speaking of bandwidth and disk storage capacity. (2) For ESS cache memory, processor storage, real and virtual storage, a terabyte refers to 2^{40} or 1 099 511 627 776 bytes.

terminal emulator. In the ESS, a function of the ESS Master Console that allows it to emulate a terminal.

thousands of power-on hours (KPOH). A unit of time used to measure the mean time between failures (MTBF).

time sharing option (TSO). An operating system option that provides interactive time sharing from remote terminals.

TotalStorage. See *IBM TotalStorage*.

TPF. See *transaction processing facility*.

track. A unit of storage on a CKD device that can be formatted to contain a number of data records. See also *home address*, *track-descriptor record*, and *data record*.

track-descriptor record (R0). A special record on a track that follows the home address. The control program uses it to maintain certain information about the track. The record has a count field with a key length

of zero, a data length of 8, and a record number of 0. This record is sometimes referred to as R0.

transaction processing facility (TPF). A high-availability, high-performance IBM operating system, designed to support real-time, transaction-driven applications. The specialized architecture of TPF is intended to optimize system efficiency, reliability, and responsiveness for data communication and database processing. TPF provides real-time inquiry and updates to a large, centralized database, where message length is relatively short in both directions, and response time is generally less than three seconds. Formerly known as the Airline Control Program/Transaction Processing Facility (ACP/TPF).

Transmission Control Protocol (TCP). A communications protocol used in the Internet and in any network that follows the Internet Engineering Task Force (IETF) standards for internetwork protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It uses the Internet Protocol (IP) as the underlying protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP). (1) A combination of data-transmission protocols that provide end-to-end connections between applications over interconnected networks of different types. (2) A suite of transport and application protocols that run over the Internet Protocol. (GC) See also *Internet Protocol* and *Transmission Control Protocol*.

transparency. See *software transparency*.

TSO. See *time sharing option*.

turbo processor. In the ESS, a faster multiprocessor that has six processors with common access to the main storage.

U

UFS. UNIX filing system.

Ultra-SCSI. An enhanced small computer system interface.

unconfigure. To delete the configuration.

unit address. In Enterprise Systems Architecture/390, the address associated with a device on a given control unit. On ESCON or FICON interfaces, the unit address is the same as the device address. On OEMI interfaces, the unit address specifies a control unit and device pair on the interface.

unprotected volume. An AS/400 term that indicates that the AS/400 host recognizes the volume as an unprotected device, even though the storage resides on a RAID-formatted array and is, therefore, fault tolerant by definition. The data in an unprotected volume can be mirrored. Also referred to as an *unprotected device*.

upper-layer protocol. The layer of the Internet Protocol (IP) that supports one or more logical protocols (for example, a SCSI-command protocol and an ESA/390 command protocol). Refer to ANSI X3.230-199*x*.

UTC. See *Coordinated Universal Time*.

utility device. The ESA/390 term for the device used with the Extended Remote Copy facility to access information that describes the modifications performed on the primary copy.

V

virtual machine facility. A virtual data processing machine that appears to the user to be for the exclusive use of that user, but whose functions are accomplished by sharing the resources of a shared data processing system. An alternate name for the VM/370 IBM operating system.

vital product data (VPD). Information that uniquely defines the system, hardware, software, and microcode elements of a processing system.

VM. The root name of several IBM operating systems, such as VM/XA, VM/ESA, VM/CMS, and z/VM. See also *virtual machine facility*.

volume. In Enterprise Systems Architecture/390, the information recorded on a single unit of recording medium. Indirectly, it can refer to the unit of recording medium itself. On a nonremovable-medium storage device, the term can also indirectly refer to the storage device associated with the volume. When multiple volumes are stored on a single storage medium transparently to the program, the volumes can be referred to as logical volumes.

volume label. In the ESS, a unique identifier that a user assigns to a logical volume.

VPD. See *vital product data*.

VSE/ESA. IBM operating system, the letters of which represent virtual storage extended/enterprise systems architecture.

W

Web Copy Services. See *ESS Copy Services*.

worldwide node name (WWNN). A unique 64-bit identifier for a host that contains a fibre-channel port. See also *worldwide port name*.

worldwide port name (WWPN). A unique 64-bit identifier associated with a fibre-channel adapter port. It

is assigned in an implementation- and protocol-independent manner.

write hit. A write operation in which the requested data is in the cache.

write penalty. The performance impact of a classical RAID-5 write operation.

WWPN. See *worldwide port name*.

X

XD. See *PPRC Extended Distance*.

XRC. See *Extended Remote Copy*.

xSeries. The product name of an IBM @server product that emphasizes industry-standard server scalability and self-managing server technologies. It is the successor to the Netfinity family of servers.

Z

z/Architecture. An IBM architecture for mainframe computers and peripherals. The IBM @server zSeries family of servers uses the z/Architecture architecture. It is the successor to the S/390 and 9672 family of servers. See also *Enterprise Systems Architecture/390*.

z/OS. An operating system for the IBM @server product line that supports 64-bit real storage.

zSeries. (1) An IBM @server family of servers that emphasizes near-zero downtime. (2) IBM enterprise servers based on z/Architecture.

zSeries storage. Storage arrays and logical volumes that are defined in the ESS as connected to zSeries servers. See also *S/390 storage*.

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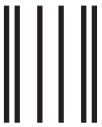

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