

Select the right rack and rack options for your IBM @server xSeries servers



Completing your server solution with IBM racks and rack options

No solution built from rack-ready IBM @server xSeries™ servers should be considered complete without an IBM rack. IBM offers an extensive range of industry-standard, EIA-compatible rack enclosures, expansion units and rack options that are designed to accommodate our line of rack-ready products, including the entire line of xSeries servers and storage options.

There are compelling reasons for purchasing IBM NetBAY racks and rack options instead of using rack products from other manufacturers, including:

- A fully configured, all-IBM rack solution—including power distribution units (PDUs), uninterruptible power supply (UPS), console switches and cables—can help you speed implementation with one-stop shopping and simplify installation with the assurance that all the pieces will work together out of the box.
- Ready-to-run solutions can also speed implementation and help reduce the workload on your staff. IBM can ship certain NetBAY racks preloaded with xSeries servers, server options and rack options.
- IBM racks offer the best thermal protection for your server investments by providing outstanding airflow and heat dissipation *without* relying on failure-prone fans or other mechanical components.
- IBM racks are competitively priced and offer exceptional value, with many standard features that many other manufacturers provide only as extra-cost options.
- IBM racks offer many choices, with value-priced standard racks in three sizes, a more rugged enterprise rack and a new 11U rack that can provide complete small business solutions.
- Customers can mix IBM and non-IBM servers and network storage solutions in a single rack or suite of racks, helping optimize space and simplify management. What's more, IBM rack solutions are fully modular, so you can buy from IBM with confidence that your investment will support business growth over the long term.

IBM rack solutions

IBM offers flexible rack solutions that help consolidate servers and save space, while permitting easy access to crucial components and superior cable management. The IBM family of rack solutions includes:

- **NetBAY42™ Enterprise Rack**
- **NetBAY42™ Standard Rack**
- **NetBAY25™ Standard Rack**
- **NetBAY11™ Standard Rack**
- **Rack options**
- **A full complement of xSeries server conversion kits**
- **IBM @server xSeries Rack Configurator software**

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Addressing customer requirements

Scalability. IBM rack solutions are fully modular and can be expanded readily to accommodate data center growth. With IBM rack solutions, you can implement enterprise-class systems with massive storage easily and cost-effectively.

Flexibility. With the IBM range of standard and enterprise rack offerings, customers can choose the solutions that best meet their budgets and their business needs. Customers can mix and match new rack-ready IBM products with existing EIA-compatible equipment.

Availability and reliability. PDUs that enable connectivity to redundant, diverse power sources, plus IBM UPS options, help increase system availability and reliability.

Manageability. The IBM @server xSeries Rack Configurator is an easy-to-use tool to aid in planning and to validate your installation. Plus, customers can plan and control *all* racked systems from a single console with IBM Director server management software.

Rapid implementation. Both NetBAY42 Enterprise Rack models, the NetBAY25 Standard Rack and the new NetBAY11 Standard Rack can be shipped fully equipped and ready to run.

Security. Lockable doors—a standard feature on IBM NetBAY racks—provide a more secure environment to better protect hardware, media and data.

Space optimization. Flexible rack solutions help consolidate servers and save space while permitting easy access to crucial components. The new NetBAY11 Standard Rack provides 11U of rack space—the capacity your small business may need to centralize your IT operations. That's flexibility and ease of use.

Cost-effective and cost-saving solutions. IBM rack solutions are competitively priced in the marketplace. These solutions can help deliver operational cost savings with simplified management, ease of configuration and installation, simplified cabling and potential reductions in costly office "real estate" for IT equipment.

Service and support. Customers purchasing an IBM rack and other rack and systems options along with xSeries servers get the benefit of one-stop shopping plus acclaimed service and support from IBM Business Partners and IBM HelpCenter® staff. IBM racks, plus IBM rack options installed at the time of purchase, come with a three-year limited warranty**.

Solutions for your business

- **Large data centers and rack-dense server installations.** Large enterprise customers, NetGen companies with large Web installations, telecommunications providers, ASPs (application service providers) and ISPs (Internet service providers) can all benefit from installing rack-dense xSeries servers in combination with IBM rack solutions
- **Branch office rollouts.** IBM can streamline the task of replicating a complete server/storage/backup/networking solution across multiple remote locations. With the compact NetBAY25 Standard Rack, IBM can preload the entire solution and ship cabinets that are ready to "plug and play" to each location.
- **Small business solution.** The new NetBAY11 Standard Rack provides the framework for complete small business solutions. Its 11U footprint and big rack features help customers squeeze more computing power in a smaller space.
- **Storage.** Using the 3U IBM EXP300 storage expansion unit and 73.4GB² hard disk drives, customers can pack more than 14TB² of storage in a single NetBAY42 rack³.
- **Clustered server configurations.** By consolidating redundant servers and shared storage in a single cabinet or rack suite, you can build a complete high-availability solution.
- **Space constraints.** With their space-saving footprint and exceptional cable management design, IBM rack solutions can significantly reduce the data center "real estate" required for computing resources.
- **Security concerns.** NetBAY racks include locking doors and side panels as standard equipment to help protect critical business data.

**See page 18 for additional information on limited warranty.¹

Shopping strategies

When you are shopping for rack solutions, be sure to keep the following points in mind:

1. IBM racks, rack options and the full line of xSeries servers and xSeries options have been **compatibility tested** under the IBM ServerProven® program. That means customers can configure IBM solutions with confidence that the **components will work well together** out of the box—simplifying installation and helping speed return on investment.
2. **Beware of fans!** Competing racks may offer optional fan kits, touting fans as effective “boosters” for handling thermal loads. **IBM racks offer exceptional cooling performance in a “fan free” environment.** Our racks are designed and tested to handle challenging thermal loads, including a cabinet full of heat-generating rack-dense servers—without requiring fans to enhance air flow. Why is this an advantage? Fans are mechanical devices that are prone to failure. **By eliminating fans through excellence in engineering, we have eliminated a potential point of failure and reduced the cost of the solution.**
3. **Underneath the covers, not all racks are alike.** Shopping for racks requires careful study of features, specs and options to achieve an apples-to-apples comparison. **IBM racks are competitively configured, with many standard features included in the base price** that are often add-on, extra-price options on racks from other vendors. Beware of hidden costs! (For real-world examples, refer to page 9 of this guide.)
4. **Space is expensive.** Rack-ready xSeries servers and storage components can pack an amazing amount of processing power plus terabytes of data into a very compact space, helping reduce the need for acquiring, air conditioning and powering office or data center real estate.
5. **Small business solution.** If you’re considering deployment of tower units in several locations, you should consider consolidating your IT operations in the new NetBAY11 Standard Rack. This unique rack provides 11U of rack space—just the capacity your small business may need to centralize your IT operations. Make flexibility and ease of use your ally.
6. **The more complex the solution, the more important the choice of rack solution.** For customers who are purchasing large-scale server solutions, a rack is no longer simply a convenient shelving system for organizing equipment and saving space. For example, 42 1U rack-dense servers can be installed per cabinet, generating **potentially damaging thermal loads.** And with clustered solutions, a rack can house terabytes of **business-critical data.** In these complex environments, the rack solution becomes a **critical tool for protecting your investment** in hardware and data and helping to ensure a reliable, highly available IT environment.

Selection considerations

Points to consider	Factors influencing purchase decisions
Has the rack you are planning to use been designed and tested to handle the high thermal loads placed on it by xSeries servers?	Temperature has been identified as one of the leading causes of data loss, hardware damage and downtime. Housing xSeries servers in a rack that cannot handle the challenging thermal loads of a cabinet full of heat-generating rack-dense servers can put your hardware and data investment at risk. IBM NetBAY racks have been tested to handle these thermal loads.
Are you confident that the rack you are planning to use offers the right cost/benefit for your organization?	With two families of racks—enterprise and standard—IBM offers customers who need only basic features and functions a price alternative that is unavailable from other vendors. NetBAY Standard Racks are some of the lowest priced racks in the marketplace (including after-market products), and are built to IBM quality standards.
In your cost comparisons between IBM and other vendors’ racks, have you factored in all of the options you will need to purchase for a complete solution?	Many competitors’ racks do not include the same standard features as IBM racks. Make sure you understand the add-on costs required to buy a fully configured rack. See details on page 10.
What is the value of your data and the business processes that your servers will house and run? How much would an outage cost your company? Have you included power protection in your solution configuration?	Every day businesses large and small are at risk of occasional power fluctuations and interruptions. It’s a reality that electric service cannot be guaranteed 24/7. APC UPS products from IBM help safeguard customers’ investments in technology and data by protecting your sensitive electronic equipment. IBM UPS products from APC offer surge protection, power conditioning, battery backup and peace of mind.

Products and solutions

IBM NetBAY product family

Key features

- **Availability and reliability** - Thermally balanced design provides fan-free environment and enhanced airflow to help protect equipment
- **Flexibility** - Sized to handle space requirements of deeper xSeries servers without requiring cabinet extenders, supporting a mix of new rack-ready IBM products with existing EIA-compatible equipment
- **Space optimization** - Zero-space optimization and improved cable management help maximize EIA space
- **Scalability** - Modular design makes it easy to add racks and servers as needed to accommodate data center growth
- **Rapid implementation** - Robust mechanical design enables shipping solutions ready to run
- **Security** - Lockable doors and heavy-duty slide-out component rails provide a more secure environment for equipment and data
- **Manageability** - Powerful yet easy-to-use configuration and management software from IBM helps simplify planning, installation and ongoing operation of data center environments
- **Cost-effective solutions** - Two rack families—NetBAY Enterprise and Standard—plus stackable enclosures, conversion kits and rack options offer a virtually unmatched set of price alternatives that help you deploy rack solutions that meet your business, technical and budget requirements



NetBAY42 Enterprise Rack

- 42U of fan-free rack space designed for enhanced air flow
- Four 1U sidewall compartments for power distribution and other components
- Generous space and easy rear access for cable management
- Outstanding ruggedness and stability with welded-steel construction and heavy-duty casters
- Fits easily through standard 2.03m (80") doorways
- **Can be shipped preloaded and ready to run, plus can be relocated easily even when fully loaded**



NetBAY42 Standard Rack

- 42U of fan-free rack space designed for enhanced air flow
- Six 1U sidewall compartments for power distribution and other components
- Value-priced rack for entry-level and midrange rack solutions



NetBAY25 Standard Rack

- 25U of full-function, EIA-compatible fan-free rack space designed for enhanced air flow
- Two 1U sidewall compartments for power distribution and other components
- Small rack cabinet ideal for branch office, small-business or space-constrained environments
- **Can be shipped preloaded and ready to run**
- Value-priced

Space-efficient protection for networked systems



NetBAY11 Standard Rack

- 11U of full-function, EIA-compatible fan-free rack space designed for enhanced air flow
- Big rack features and 11U capacity to help you squeeze more computing power into a smaller space
- Can provide the framework for complete small business solutions that are assembled, tested and ready to run
- Retractable stabilizer foot that allows components to slide forward for safe, easy service and configuration
- Provides a common building block for xSeries rack-to-tower conversions

IBM @server xSeries Rack Configurator software

The variety of sizes, access, component cabling and power supply requirements of servers, accessories and storage components make it a challenge to configure a complex networked system. The IBM @server xSeries Rack Configurator provides a tool that helps design the optimum layout. The configurator helps you check, correct and report the following:

- Components by product number and position
- Infrastructure specifications, including weight, power, volt-amps (VA), heat (BTU/hr), bays, EIA, outlets and console ports
- Width and depth; front, rear and side clearances; total weight and top clearance
- Cables and connectors by component position

Overview

xSeries Rack Options, ranging from cables to power distribution units to console switches, help you optimize rack layouts with space-saving designs. IBM rack-mountable components allow you to complete the most efficient rack solution with confidence. All xSeries and rack options are ServerProven for compatibility. Highlights of key rack options follow. For a detailed parts list, see page 11 of this guide.

IBM rack options

Console support

IBM NetBAY KVM products: IBM ACT or Traditional KVM

The IBM family of console switches consist of the new ACT family as well as an array of traditional KVM products. Both product sets allow multiple users access to your entire solution. All these products take switching to the next level with intuitive GUI interfaces- point and click to switch from one server to another. These switches offer:

- Exceptional flexibility, with support for multiple users, platforms and languages
- Flash-upgradable firmware (via serial port) helps ensure future hardware compatibility
- Universal voltage (100-240V AC, 50-60Hz)

See the WW Rack Web page at ibm.com/pc/ww/eserver/xseries/rack for more information on ACT and the other NetBAY Console products.

Flat panel monitor console kits



IBM Flat Panel Monitor Console Kits deliver solutions to help solve critical space problems. The NetBAY 1U Flat Panel Monitor Console Kit and the 2U Flat Panel Monitor Console Kit allow IT professionals to administer their systems without sacrificing rack space.

When rack real estate is crucial, choose the NetBAY 1U Flat Panel Monitor Console Kit. This addition to the NetBAY Flat Panel Monitor family provides a sleek, contoured design with integrated tray, keyboard and monitor that's 50% smaller than the 2U solution. Its slender 1U form factor helps provide maximum system density, while its easy-to-install, preloaded configuration offers a complete solution that's ready to run. With two models available—one with a U.S. keyboard and the other without the keyboard (for National Language Support)—you can choose your desired setup and pay for only what you need.

Ideal for high-density IT solutions, the NetBAY 1U Flat Panel Monitor Console Kit completes your rack-optimized infrastructure. The 1U product offers:

- Complete integrated design ready to install
- High-quality 15" TFT active matrix screen with 1024x768 resolution
- Standard VGA connector and onscreen display adjustments
- Universal power supply that allows operation at 100-240V, 50-60Hz



If conserving maximum rack space is not as important, consider the more affordable 2U Flat Panel Monitor Console Kit. This 2U unit is a complete solution and is a proven winner with its high-quality display, easy operation and the ServerProven® assurance of interoperability. To save time and make operation easier, the kits mount on industry-standard 19" rails, and both units pair a 15" flat panel monitor with the IBM Space Saver II keyboard built around the IBM TrackPoint® device. NLS keyboards are available for a wide variety of languages.

Power distribution **NetBAY Rack Power Distribution Units**

IBM offers four NetBAY Rack PDU models. These PDUs support any size configuration, from a few servers up to 42 1U servers in a single rack, a large array of multiple rack-optimized servers or clustered 8-way enterprise servers. NetBAY PDUs offer these key features:

- **Zero space** - The PDUs can be installed in 1U sidewall compartments in NetBAY racks to minimize required rack space.
- **High availability** - NetBAY PDUs can be configured to provide redundant power distribution, eliminating points of failure and increasing data availability. The Rack PDU and Server Dual-Cord PDUs can be used in combination with IBM rack-mountable UPS products to provide an advanced fault-tolerant power distribution system.
- **Scalability** - Innovative modular design allows units to be mixed together to accommodate growth of power distribution needs.

Rack Power Distribution Unit. This low-cost, basic PDU supports:

- Universal voltage (100-240V) AC power input
- Seven outputs

Server Dual-Cord Power Distribution Unit. A dual-cord PDU with automatic bus transfer switch, this PDU supports:

- Universal voltage (100-240V) AC power distribution for one server from either of two power sources
- Power failure sensing - automatically switches from primary power source to backup power source circuit
- Power sources from either UPS or wall source

Single-Phase Front-End Power Distribution Unit. A low-cost, front-end wiring unit that:

- Adapts to high current circuits (3-wire, single phase, and 5-wire, three phase)
- Available in both 30amp and 60amp versions
- Provides three single-phase output circuits
- Includes nonreplaceable fuse for protection

Three-Phase Front-End Power Distribution Unit. A low-cost, front-end wiring unit that:

- Adapts to high current circuits (5-wire, three phase 200-415V AC, 30/32 amp)
- Provides three single-phase output circuits
- Includes nonreplaceable fuse for protection

Uninterruptible power supplies (UPS)

IBM offers a selection of UPS products that have been tested for compatibility with xSeries systems. Both IBM Logoed solutions as well as a select list of APC products are offered to match most every situation. UPS products from IBM help protect customers' valuable investments in technology and data. This line of rack-ready and tower UPS products offers surge protection, power conditioning and battery backup.

Purchasing UPS products from IBM offers these advantages:

- PowerChute Plus software for advanced UPS power management and diagnostics provides easy integration with IBM Director server management software.
- PowerNet SNMP Snap-Ins ensure smooth integration with IBM Director and Tivoli® TME 10™ Network Management solutions, offering central control of all UPS systems across monitored LANs.
- Both IBM and APC products purchased from IBM carry a three-year limited warranty**.
- All IBM UPS products are color matched (black) to xSeries, Netfinity® and NetBAY products.

IBM offers low- and high-voltage rack-ready UPS models from APC:

- **APC Smart-UPS 1400RMB** - 2U, 120V, 10amp, six NEMA 5-15R outlets
- **APC Smart-UPS 1400RMiB** - 2U, 220-240V, 10amp, four IEC320-C13 outlets
- **IBM UPS3000XLV** - 2U, 100-127V, 30amp, six IEC320-C13 outlets and one L-520 PDU outlet
- **IBM UPS 3000XHV products** - 2U, 200-240V, 23amp, seven IEC320-C13 outlets, one IEC320-C19 PDU outlet
- **APC Smart-UPS 5000RMB** - 5U, 208V, 22amp, eight IEC 320-C13 outlets, one IEC 320-C19 outlets
- **APC Smart-UPS 5000RMiB** - 5U, 220-240V, 22amp, eight IEC 320-C13 outlets, two IEC 320-C19 outlets

**See page 18 for additional information on limited warranty.^{1,4}

Additional options

IBM offers a comprehensive range of industry-standard options and accessories that help optimize space utilization within NetBAY racks and scale rack systems to meet growing requirements. Rack options include:

- Monitor compartment and a selection of CRT color monitors
- Blank filler panels that help maintain maximum airflow in racks that are not filled with equipment
- Fixed shelf to support up to 100 lb of equipment not configured for rack mounting

Conversion kits

Conversion kits allow customers to convert a rack-ready xSeries or Netfinity server to a tower configuration or convert a tower server to a rack. This affords an exceptional degree of flexibility and investment protection, simplifying the reallocation of server assets as business needs change.

The new NetBAY11 Standard Rack provides a common building block for xSeries rack-to-tower conversions. This rack is especially useful for high-end xSeries servers and options. The common building-block feature eliminates the need for multiple conversion kits, allowing you to simplify your IT operations and focus on more important business matters. The NetBAY11 can accommodate any rack-optimized xSeries server, option or storage product customers have deployed. That's flexibility and ease of use working for you.

In addition to the NetBAY11 IBM offers a complete suite of tower to rack conversion options

- 09N4300 4U x 24D Tower to Rack
- 59P4817 4U Extended Depth Tower to Rack
- 59P4211 5U x 24D Tower to Rack
- 32P1472 7U x 26D Tower to Rack

Service and support

IBM NetBAY rack solutions are backed by the acclaimed service and support of IBM.

- IBM racks and installed IBM rack options come with a three-year limited warranty**
- IBM offers services to help facilitate the planning, installation and configuration of rack solutions.
- ServicePac™ for SmoothStart™ Services are available from IBM Business Partners for stand-alone or clustered xSeries and Netfinity servers.
- IBM HelpCenter® locations provide telephone support around the clock.

**See page 18 for additional information on limited warranty.¹

Product specifications

IBM NetBAY racks

	NetBAY42 Enterprise Rack		NetBAY42 Standard Rack	
Part Number	930842S (stand-alone)		9306420 (stand-alone)	
	930842E (expansion)		9306421 (expansion)	
Industry-standard cabinet	EIA 310-D-Type A cabinet with universal hole spacing			
Door style	All models include a perforated doors standard			
Unit mounting capacity	42U, plus four 1U sidewall compartments		42U, plus six 1U sidewall compartments	
Side panels	Included with P/N 930842S		Included with P/N 9306420	
External dimensions (HxWxD)	202x65x110cm (79.5"x25.6"x43.3")		208x60x100cm (81.8"x23.6"x39.4")	
Internal dimensions (HxWxD)	187x45x96cm (73.5"x17.7"x38")		187.5x45x87.6cm (73.8"x17.7"x 34.5")	
Weight	930842S*	930842E*	9306420*	9306421*
Empty cabinet	261kg (575 lb)	235kg (516 lb)	137kg (301 lb)	105kg (231 lb)
Load capacity	932kg (2050 lb)	932kg (2050 lb)	909kg (2000 lb)	909kg (2000 lb)
Total	1193kg (2625 lb)	1166kg (2566 lb)	1046kg (2301 lb)	1014kg (22231 lb)
Shared console support option	Console server selector switch; 4, 8 ports per switch; two-level switch tiering; 8x8 = 64 ports maximum OR ACT products: LCM scalable to 64 servers (local only); RCM scalable to 256 servers local and remote			
Power distribution options (country-specific)	Power distribution units: 100-240V, 15A, seven IEC 320-C13 outlets; 100-240V, 30 amps, single-phase/three-p 100-240V, 15A-10A, four IEC 320-C13 outlets. Uninterruptible power source: 1400VA, 12V, 6 NEMA outlets; 1- NEMA outlets; 3000VA, 220-240V, 8 IEC outlets; 5000VA, 200-220V, 10 IEC connectors; 5000VA,220-240V, 1			
Supported devices	xSeries systems; IBM Netfinity servers; IBM storage expansion units; IBM tape libraries; IBM console devices; (including APC UPSs); Flat Panel Monitor Rack Mount Kits; user-defined components			
Planning aid	The IBM @server xSeries Rack Configurator			
Standard features	Lockable doors Lockable side panels (930842S only) Marriage kit (930842E only) Stabilizer foot		Lockable doors Lockable side panels (9306420 only) Marriage kit (9306421 only) Stabilizer foot Side stabilizers	
Limited warranty**	3-year			

*Load rating on casters, total includes rack only does not include pallet or packaging.

**See page 18 for additional information on limited warranty.¹

Product specifications

IBM NetBAY racks

	NetBAY25 Standard Rack	NetBAY11 Standard Rack
Part Number	9306250 (stand-alone)	9306110 (stand-alone)
Industry-standard cabinet	EIA 310-D-Type A cabinet with universal hole spacing	
Door style	All models include a perforated door standard	
Unit mounting capacity	25U, plus four 1U sidewall compartments	11U
Side panels	Included with P/N 9306250	Not applicable
External dimensions (HxWxD)	202x65x110cm (79.5"x25.6"x43.3")	61x52x88cm (24"x20.4"x34.4")
Internal dimensions (HxWxD)	187x45x96cm (73.5"x17.7"x38")	49x45x77cm (19.3"x17.7"x 30.3")
Weight	On casters or leveling pads	
Empty cabinet	94kg (207 lb)	34kg (75 lb)
Load capacity	568kg (1250 lb)	185kg (407 lb)
Total	662kg (1457 lb)	219kg (482 lb)
Shared console support option	Console server selector switch; 4, 8 ports per switch; two-level switch tiering; 8x8 = 64 ports maximum OR ACT products: LCM scalable to 64 servers (local only); RCM scalable to 256 servers local and remote	
Power distribution options (country-specific)	Power distribution units: 100-240V, 15A, seven IEC 320-C13 outlets; 100-240V, 30 amps, single-phase/three-100-240V, 15A-10A, four IEC 320-C13 outlets. Uninterruptible power source: 1400VA, 12V, 6 NEMA outlets; 1 NEMA outlets; 3000VA, 220-240V, 8 IEC outlets; 5000VA, 200-220V, 10 IEC connectors; 5000VA,220-240V,	
Supported devices	xSeries systems; IBM Netfinity servers; IBM storage expansion units; IBM tape libraries; IBM console devices; (including APC UPSs); Flat Panel Monitor Rack Mount Kits; user-defined components	
Planning aid	The IBM @server xSeries Rack Configurator	
Standard features	Lockable doors Lockable side panels Stabilizer foot	Lockable front door Retractable stabilizer foot Complete set of filler panels
Limited warranty**	3-year	

**See page 18 for additional information on limited warranty.¹

Space-efficient protection for networked systems

Product summary **IBM 930842S/930842E**

IBM advantages

- More robust design with high load capacity
- More room at the rear for cable management
- Cable tie-down points included in the design of the rack
- Lower side covers can be removed without tools to access side pocket devices
- Front door opens more than 170 degrees, allowing easier access to equipment in the rack
- Rear door easy to remove and reinstall
- Superior stability (wider, deeper), with ballast built in
- Superior ship-loaded capacity
- Rack can be disassembled partially to reduce height for shipping

Product summary **IBM 9306420/9306421**

IBM advantages

- Lower price point for customers looking for a basic rack solution
- More room at the rear for cable management
- Side covers removed without tools
- Front and rear doors can be changed easily to swing from either direction
- More side pockets than Compaq rack for mounting 1U devices
- Superior tip resistance; plus, front and side stabilizers are easy to install

Product summary **IBM 9306250**

IBM advantages

- More space (3U) and lower cost than traditional half rack (22U)
- More room at rear for cable management
- Side covers can be removed without tools
- Front and rear doors can be changed easily to swing from either direction
- Superior ship-loaded capacity

Product summary **IBM 9306110**

IBM advantages

- 11U of rack space to deliver complete small business solutions
- Can help you eliminate multiple tower units and consolidate your IT operations into one centralized unit and squeeze more computing power into a smaller space
- Provides common building block for xSeries rack-to-tower conversions, simplifying your operations and allowing you to focus on more important matters
- Front door can be changed easily to swing from either direction
- This rack fits under most tables
- Superior ship-loaded capacity

Standard/option feature comparison⁵

Feature	NetBAY Enterprise Rack 930842S 930842E	NetBAY Standard Rack 9306420 9306421 9306250	Compaq 9000 series 9142 9136 9122
Side panels	Standard on 930842S	Standard on 9306420	Option: Added cost
Stabilizer foot	Standard	Standard	Option: Added cost
Extension kit	Not required*	Not required*	Option: Added cost
Marriage kits (baying kits)	Standard on 930842E	Standard on 9306421	Option: Added cost
Short rear door	Not required**	Not required**	Option: Added cost
Fan kit	Not required***	Not required***	Option: Added cost
Ship-loaded pallet	Standard	Standard on 9306250	Option: Added cost

* NetBAY Enterprise and Standard racks are 43.3" and 39.4" deep respectively; Compaq racks with the extension kit are 39.3".

** Cables can be easily routed through the top or bottom at the rear door of NetBAY Enterprise and Standard racks; Compaq racks require a special short rear door to allow cables to be routed out the bottom of the rack

***IBM NetBAY racks are designed to handle demanding thermal loads without a fan.

IBM rack options

Rack options overview

Part Number	Description	Information
28L4707	Netfinity Rack Keyboard Tray	Supports keyboards in racks
28L3644	Space Saver II Keyboard	1U, includes TrackPoint IV, requires Rack Keyboard Tray (P/N 28L4707)
94G7444	Monitor Compartment	For use with CRT monitors
32P1031	1U Flat Panel Console Kit	1U complete kit including a US Language keyboard
32P1032	1U Flat Panel Console Kit w/o KB	1U complete kit that ships without a keyboard
32P1702	2U Flat Panel Console Kit	2U complete kit including a US Language keyboard
32P1703	2U Flat Panel Console Kit w/o KB	2U complete kit that ships without a keyboard
1735R16	Remote Console Manager (RCM)	1U CAT5 based switch, scalable to 256 servers local and remote access and management.
1735L04	Local console Manager (LCM)	1U CAT5 based switch, scalable to 64 servers local only
32P1636	250mm KVM Conversion Option (Short KCO)	Converts KVM to CAT5 for use with RCM and LCM. Sold in four packs.
32P1652	1.5M KVM Conversion Option (Long KCO)	Converts KVM to CAT5 for use with RCM and LCM. Sold in four packs.
32P1637	C2T Conversion Option	Converts C2T Signals to CAT5 for use with RCM and LCM.
09N4290	NetBAY 1x4 Console Switch	1U, mounts in sidewall compartments, EIA space or monitor compartment; supports one to four servers, one console
09N4291	NetBAY 2x8 Console Switch	1U, mounts in sidewall compartments, EIA space or monitor compartment; supports one to eight servers, two consoles (only one console when installed in the monitor compartment)
09N4293	Console Cable Set -7ft	Connects servers to console switch
94G7447	Console Cable Set -12ft	Connects servers to console switch
94G6666	100-120V Power Distribution Unit	1U, 100-120V, 12 amps, mounts in sidewall compartment or EIA space, eight NEMA 5-15R outlets, requires one L5-15R wall receptacle
37L6866	NetBAY Rack PDU (US)	1U, 100-240V, 15 amps, mounts in sidewall compartment or EIA space, seven IEC 320-C13 outlets, requires one NEMA L5-20R or L6-20R wall receptacle
37L6865	NetBAY Server Dual-Cord PDU (US)	1U, 100-240V, 15/10 amps, mounts in sidewall compartment or EIA space, four IEC 320-C13 outlets, requires two NEMA L5-20R or L6-20R wall receptacles
37L6883	NetBAY 100-127V Single-Phase Front-End PDU (US)	1U, 100-127V, shared 30 amps, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one NEMA L5-30R wall receptacle
37L6884	NetBAY 200-240V Single-Phase Front-End PDU (US)	1U, 200-240V, shared 20 amps, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one NEMA L6-30R wall receptacle
37L6886	NetBAY 3-phase Front-End PDU (US)	1U, 380-415V, shared 30 amps, mounts in sidewall compartment, three IEC 320-C19 outlets, requires one NEMA L21-30R wall receptacle
94G6670	Blank Filler Panel Kit	Consists of one 5U, one 3U, and two 1U blank filler panels
94G7442	Fixed Shelf	Supports up to 100 lb
94G6667	Rack Power Cord -Type A14	IEC 320-C13 to NEMA 5-15P (14ft)
94G7448	Rack Power Cord -Type C12	IEC 320-C13 to IEC 320-C14 (14ft)
A complete selection of rackable UPS products (see UPS section, page 14)		

Space-efficient protection for networked systems

Console switches

	1x4 Console Switch	2x8 Console Switch
Part number	09N4290	09N4291
Number of ports	<ul style="list-style-type: none">• Supports up to 4 servers, in a tiered configuration up to 32 servers	<ul style="list-style-type: none">• Supports up to 8 servers, in a tiered configuration up to 64 servers
Dimensions (HxWxD)	<ul style="list-style-type: none">• 44mm x 432mm x 203mm (1.7"x 17"x 8")	<ul style="list-style-type: none">• 44mm x 432mm x 203mm (1.7"x 17"x 8")
Weight	2.38kg (5.25 lb)	2.38kg (5.25 lb)
Operating temperature	0C-70C (32F-158F)	0C-70C (32F-158F)
Power	100-240VAC	100-240VAC
Rack mounting	<ul style="list-style-type: none">• Sidewall mounting• Mounting on monitor shelf• Mounting behind flat panel above keyboard tray• In EIA space, brackets not included	<ul style="list-style-type: none">• Sidewall mounting• Mounting on monitor shelf• Mounting behind flat panel above keyboard tray• In EIA space, brackets included
Interface	OSCAR® menu (On-Screen Configuration and Activity Reporting)	Graphical interface
Locking cable connectors	Optional and available in 2m (7ft) (P/N 09N4293) and 3.6m (12ft) (P/N 94G7447)	
Compatibility	Compatible with previous IBM switches as well as all new ACT based switches	
Video resolution	1600x1280 video resolution	
Flash software updates	Yes	Yes
Password protection	Yes	Yes
Limited warranty**	3-year limited warranty when installed in an IBM NetBAY rack or used with xSeries servers	

**See page 18 for additional information on limited warranty.¹

For more information on the IBM ACT switches see the Decision Maker's Guide to Connectivity Options available on the World Wide Rack web page.

NetBAY Flat Panel Monitor Console Kits

	IBM 1U	IBM 2U
Part numbers	32P1031 with U.S. keyboard 32P1032 without keyboard	32P1702 with US keyboard 32P1703 without keyboard
Form factor	1U	2U
Monitor size	15"	15"
Monitor design	Flip forward	Flip forward
Monitor garage	Yes	No
Limited warranty**	3-year	3-year
Rack shippable	Yes	No
KVM mounting in same amount of space	Yes	No
Slide length	24"	22"
Cable management arm	Yes	No

NetBAY Flat Panel Monitor Technical Specifications

	1U Flat Panel Monitor	2U Flat Panel Monitor
Panel		
Type	TFT active matrix LCD	TFT active matrix LCD
Size	15"	15"
Pixel pitch	0.297mm	0.297mm
Brightness	200cd/m2	250cd/m2
Contrast ratio	250:1	300:1
Viewing angle	120°/110° (H/V)	120°/110° (H/V)
Scanning frequency		
Horizontal rate	30-61KHz	
Vertical rate	50-75Hz	
Maximum pixel rate	80MHz	
Controls	Brightness, contrast, H/V-position, coarse, fine, auto adjustment, color temperature, color cont OSD position and OSD display time	
Resolution		
Maximum	1,024x768	
Native	1,024x768	
Color		
Maximum	16 million	
Signal input		
Video input	Analog RGB (0.7Vp-p)	
Sync. type	H and V separate	
Connector	15-pin D-sub	
Power		
On working	25W maximum	30W maximum
Off	<2W	<2W
OSD control	Yes, in English, French, Spanish, German, Italian and Swedish	Yes, in English, French, Spanish, German, and Italian

**See page 18 for additional information on limited warranty.¹

Space-efficient protection for networked systems

Power distribution units

	Rack PDU	Server Dual-Cord PDU	Single-Phase Front-End PDU	Three-Phase Front-End PDU
Part number	37L6866	37L6865	37L6883/84	37L6886
Form factor	Rack/1U, half width	Rack/1U, half width	Rack/1U, half width	Rack/1U, half width
Description	Universal voltage general purpose PDU	Universal voltage redundant power switch for servers with multiple power supplies	Wiring unit for adapting a three-wire, single-phase circuit to three single-phase branch circuits	Wiring unit for adapting a five-wire, three-phase circuit to three single-phase branch circuits
Capacity				
Low voltage	• Up to 1700W	• Up to 2400W	• Up to 2300W	• NA
High voltage	• Up to 3100W	• Up to 2400W	• Up to 4800W	• Up to 5400W
Device support	• 7 IEC outlets • Supports up to 7 devices	• 4 IEC outlets • Supports 1 server from either of 2 power sources	• 3 IEC outlets • Supports up to 3 Rack or Server Dual-Cord PDUs	• 3 IEC outlets • Supports up to 3 Rack or Server Dual-Cord PDUs
Cord capabilities	• One line cord	• Two line cords	• One line cord	• One line cord
Plug type				
Low voltage	• NEMA L5-20P	• NEMA L5-20P (two each)	• NEMA L5-30P	
High voltage	• NEMA L6-20P	• NEMA L6-20P (two each)	• NEMA L6-30P	• NEMA L21-30P
Power source	100-240Vac, 50/60Hz (single phase)	100-240Vac, 50/60Hz (single phase)	100-240Vac, 50/60Hz (single phase)	200-250Vac, 50/60Hz (three phase)
Mounting option	Sidewall or EIA space	Sidewall or EIA space	Sidewall	Sidewall
Protection	15amp circuit breaker	NA (built into xSeries system)	Non-replaceable fuse included with each output circuit for protection	Non-replaceable fuse included with each output circuit for protection
Dimensions	43x192x221mm (1.7x7.5x8.7")	43x192x221mm (1.7x7.5x8.7")	43x192x221mm (1.7x7.5x8.7")	43x192x221mm (1.7x7.5x8.7")
Service and support	3-year onsite limited warranty** when installed in an IBM NetBAY rack			
Configuration software	IBM @server xSeries Rack Configurator ibm.com/pc/us/eserver/xseries/library/configtools.html			

Rackable UPS options

	APC Smart-UPS 1400RMB, 1400RMiB	IBM UPS 3000XLV, 3000XHV, Extend Run	APC Smart-UPS 5000RMB, 5000RMiB
UPS attributes			
Part number	32P1020, 32P1022	2130R30, 2130R31, 32P1692	37L6861, 37L6862
Unit height	2U	2U	5U
Limited warranty**	3-year	3-year	3-year
Color	Black	Black	Black
Emergency power -off cable	No	Yes	Yes
Rail kit	Yes	Yes	Yes
UPS expander card AP9607	No	Not required- built in 10/100 Ethernet connectivity	Yes
US models			
Line input	NEMA L5-15P	NEMA L5-30P	NEMA L6-30P
Output receptacles	6 NEMA 5-15R	6 IEC320 C13 (10 amp) 1 Nema L5-20R (20 amp)	8 IEC 320-C13 (10amp) 2 IEC320-C19 (16amp)
International Models			
Line Input	IEC 320-C14 (10amp)	IEC 320-C20 (16amp)	Hardwire
Output Receptacles	4 IEC 320-C13 (10amp)	7 IEC 320-C13 (10amp) 1 IEC 320-C19 (16amp)	8 IEC 320-C13 (10amp) 2 IEC 320-C19 (16amp)

**See page 18 for additional information on limited warranty¹.

Sizing guide for UPS options

Step 1:
Identify the devices contained in the rack configuration

Step 2:
Sum the total load (watts) of all devices in the configuration, using either Maximum Load for minimum runtime or Typical Load for typical runtime.

Servers	# Power Cords	Std/Max Watts Load Max/Typical
xSeries 200	1/1	350/245
xSeries 205	1/1	485/340
xSeries 220	1/1	350/245
xSeries 232 (one 385W power supply)	1/1	400/280
xSeries 232 (two 250W power supplies)	2/3	450/315
xSeries 235	1/2	800/560
xSeries 240	2/3	450/315
xSeries 250	2/4	475/350
xSeries 255	2/4	1000/530
xSeries 300	1/1	200/140
xSeries 305	1/1	200/140
xSeries 330	1/1	200/140
xSeries 335	1/1	340/245
xSeries 342	1/2	390/270
xSeries 345	1/2	500/350
xSeries 350	1/3	525/365
xSeries 360	2/3	740/520
xSeries 370	3/3	1450/1015
xSeries 380	2/2	2000/1400
xSeries 440	2/2	950/950
Other Devices		
RXE-100 (8684-1RX)	2/2	370/260
EXP300 Storage Expansion Unit (3531)	2/2	360/285
FAStT200 Storage Server (35421RU)	2/2	390/275
FAStT200 HA Storage Server (35422RU)	2/2	390/275
FAStT500 Storage Server (35521RU)	2/2	200/140
FAStT700 Storage Server (17421RU)	2/2	390/275
FAStT EXP500 Storage Expansion Unit (35601RU)	2/2	350/245
FAStT EXP700 Storage Expansion Unit (17401RU)	2/2	350/245
SAN Fibre Channel Switch, 8-port (2109S08)	1/2	200/n/a
SAN Fibre Channel Switch, 16-port (2109S16, 2109F16)	1/2	200/n/a
TotalStorage SAN Switch F08, 8-port (3534F08)	1/1	50/n/a
SAN Data Gateway Router UltraSCSI LVD Port (2108R3L)	1/1	90/n/a
DLT Tape Autoloader and Library (3502)	1/1	135/n/a
Magstar® MP 3570 Tape Subsystem (C2x)	1/1	200/140
NetMEDIA Storage Expansion Unit EL (3551)	2/2	185/130
3600 Series Tape Autoloader and Library (3600xxx)	1/1	700/500

Space-efficient protection for networked systems

Step 3:

Find the Total Configuration Load In the table to the right

Step 4:

Select the most appropriate UPS model to achieve the desired runtime. If the Total Configuration Load is greater than the entries in the table, split the load across two or more UPS units.

Model	APC 700	APC 1000	APC 1500	APC 1400	IBM 3000X	APC 5000
Number	94G3134 94G4073	94G3135 944074	94G3136 94G4075	32P1020 32P1022	2130R30 2130R31	37L6861 37L6862
Load (Watts)	Runtime Minutes ⁹	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes	Runtime Minutes
200	22	38	62	45	144	240
250	17	28	43	34	84	200
300	12	22	34	25	84	166
350	9	18	29	22	58	145
400	7	14	23	18	52	125
450	5	12	20	15	45	110
500	-	11	18	13	38	97
550	-	9	16	11	38	87
600	-	8	13	10	31	76
650	-	7	12	9	29	68
700	-	6	11	8	26	63
750	-	-	10	8	25	59
800	-	-	9	7	22	55
850	-	-	8	7	20	51
900	-	-	7	6	18	47
950	-	-	6	5	18	43
1000	-	-	-	-	16	39
1100	-	-	-	-	14	34
1200	-	-	-	-	12	31
1300	-	-	-	-	12	28
1400	-	-	-	-	9	25
1500	-	-	-	-	9	22
1600	-	-	-	-	8	20
1800	-	-	-	-	7	17
2000	-	-	-	-	6	12
2200	-	-	-	-	5	11
2400	-	-	-	-	4	10
2600	-	-	-	-	4	9
2800	-	-	-	-	4	8

Conversion kit alternatives

Conversion kits

	09N4300 4Ux20D Tower-to- Rack Kit	59P4817 4U Ext- ended Depth Rack-to- Tower Kit	37L6858 5Ux24D Tower-to- Rack Kit	21P9593 5Ux24D Tower- to-Rack Kit II	59P4211 5Ux24D Tower- to-Rack Kit 3	10L7006 Tower-to- Rack Kit	32P1474 7Ux26D Tower-to- Rack Kit	NetBAY11 Standard Rack, xSeries Rack-to- Tower conversion
Servers								
xSeries 200	X							
XSeries 205	X							
xSeries 220	X							
xSeries 230			X					
XSeries 225		X						
xSeries 232				X				
xSeries 240			X					
XSeries 235					X			
XSeries 255							X	
xSeries 300								X
XSeries 305								X
xSeries 330								X
XSeries 335								X
xSeries 360								X
XSeries 440								X
Netfinity 5000						X		
Netfinity 5100			X					
Netfinity 5600			X					

For more information

For more specific information on all of the products briefly discussed in this document please see the world wide rack web page listed below. It contains Decision Maker's Guides to: Flat Panels, Power Distribution Options, Uninterruptible Power Supply Solutions, KVM switching products, and the all new IBM ACT Interconnect products.

IBM @server xSeries Racks and Rack Options

ibm.com/pc/ww/eserver/xseries/rack

IBM @server xSeries Options

ibm.com/pc/us/eserver/xseries/storage

IBM @server xSeries Rack Configurator

ibm.com/pc/us/eserver/xseries/library/configtools

IBM @server xSeries Configuration and Options Guide

ibm.com/pc/us/eserver/xseries/library

Tested xSeries Solutions

ibm.com/us/compat

Space-efficient protection for networked systems

Important notes and trademarks

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1) For terms and conditions or copies of the IBM limited warranty, call 1 800 772-2227 in the U.S. and in Canada call 1 800-426-2255. Limited warranty includes International Warranty Service in those countries where this product is offered. Registration is required. Telephone support may be subject to additional charges. For warranties including on site service, IBM sends a technician after attempting to resolve the problem remotely.

2) When referring to hard disk drive capacity, GB means 1,000,000,000 bytes and TB means 1,000,000,000,000 bytes. Total user-accessible capacity may vary depending on operating environments.

3) Assumes that the EXP300 storage expansion unit has all 14 bays loaded with 73.4GB HDDs for a total storage capacity of 1TB per EXP300. Fourteen EXP300 units can be loaded in a NetBAY42 rack for a total storage capacity of 14TB.

4) APC offers a three-year limited warranty when the APC UPS is purchased through IBM.

5) Data on competitive products is obtained from publicly available information that is subject to change without notice. Contact the manufacturer for the most recent information. Data is current as of March , 2002.

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