NetVista N2200w Training

Integrated Components of the IBM NetVista N2200w, Thin Client for Windows-based Terminal Standard 1.5

BSQUARE Corporation

March, 2000

Preview

- Hardware: MediaGXm CPU

- OS: Microsoft Windows CE 2.12

- Platform: Microsoft Windows-based Terminal (WBT) Standard 1.5

- Citrix ICA

- Network Printing

- Remote Updater

Hardware Components: CPU

▌ CPU: MediaGXm (National/Cyrix)

  ▌ x86 architecture

  ▌ Clock speed: 233 MHz

Hardware Components: Memory

- RAM: 32 MB
- Flash: 16 MB Compact Flash

Hardware Components: Peripherals

- Video
  - Variety of resolutions and refresh rates
  - Video drivers written by BSQUARE
- Parallel
- Serial
- USB
  - Parallel/Serial to USB conversion by BSQUARE
  - Transparent
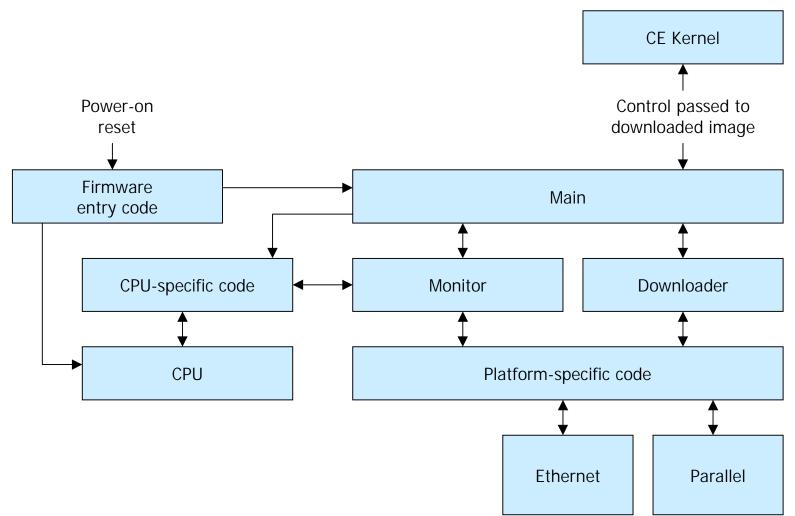- Modem

OS: Windows CE 2.12

- 32-bit multi-threaded OS
- Modular design
- Small footprint
- Multiple processors supported
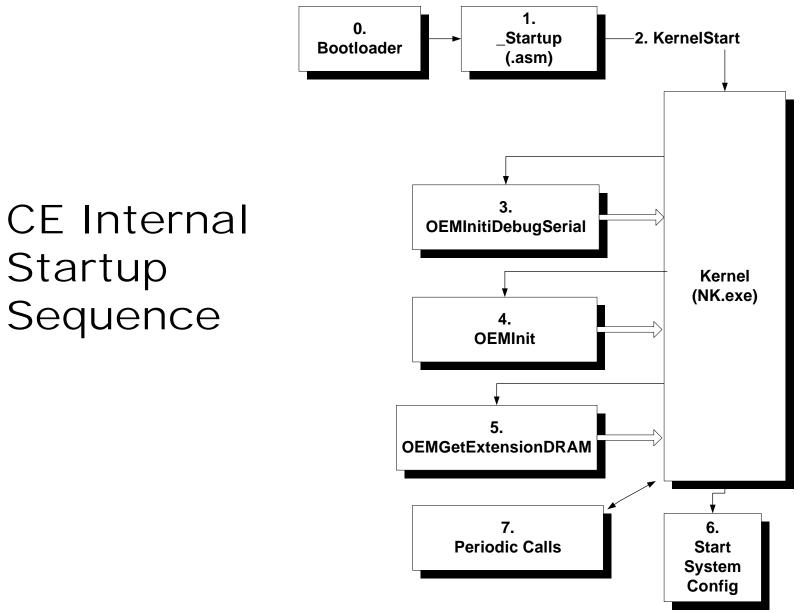- Strong communications support

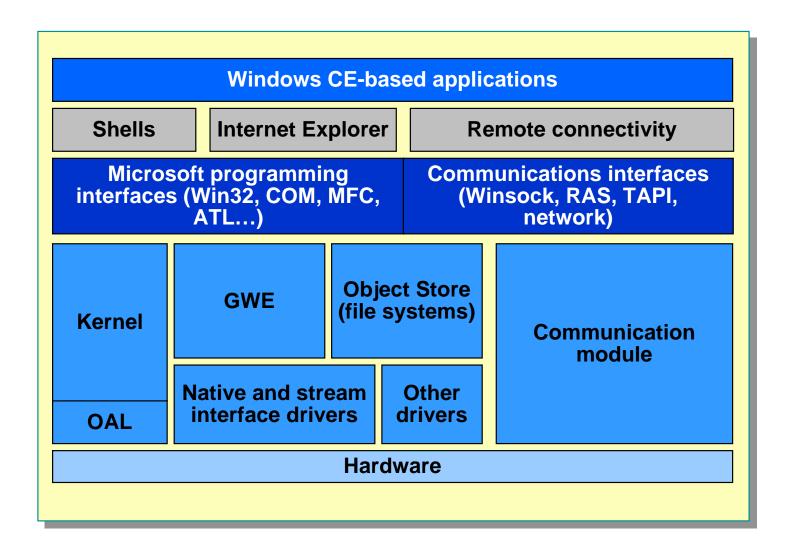# CE Bootloader / Monitor

▎ General purposes

   ▎ Downloads a Windows CE Image (NK.BIN) to RAM or Flash

   ▎ Replaces BIOS role in hardware initialization

▎ NetVista N2200w Loader

   ▎ Developed by IBM, integrated by BSQUARE

   ▎ Cold boot leads to Setup Wizard

      ▎ There configure DHCP, DNS, WINS, monitor, printer

CE Bootloader Process Diagram

CE Internal Startup Sequence

0. Bootloader → **1. _Startup (.asm)** — **2. KernelStart**

3. OEMInitiDebugSerial

4. OEMInit

5. OEMGetExtensionDRAM

Kernel (NK.exe)

7. Periodic Calls

6. Start System Config

Windows CE Architecture

Windows CE-based applications		
Shells	Internet Explorer	Remote connectivity
Microsoft programming interfaces (Win32, COM, MFC, ATL…)		Communications interfaces (Winsock, RAS, TAPI, network)

Kernel

GWE

Object Store (file systems)

Communication module

OAL

Native and stream interface drivers

Other drivers

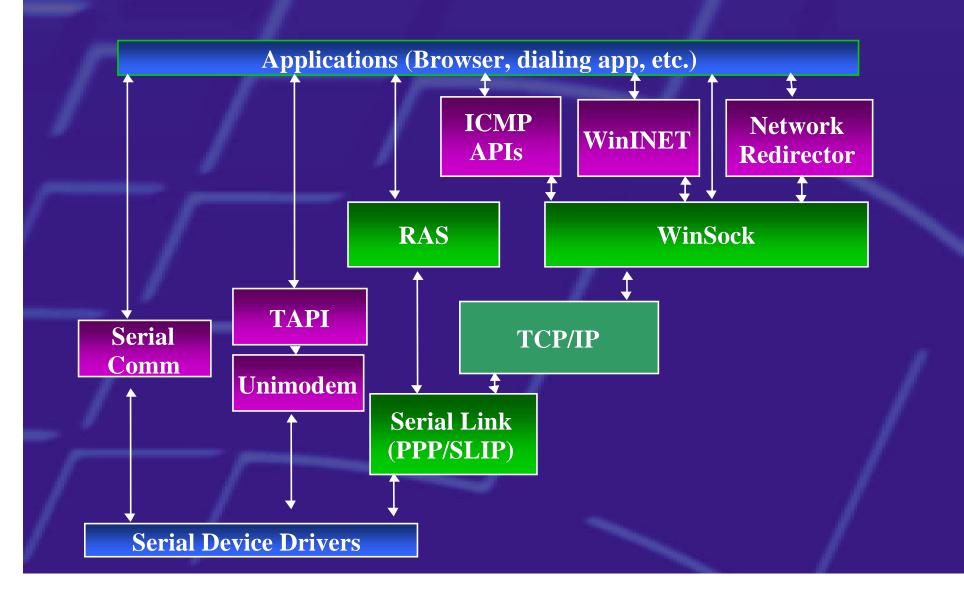**Hardware**

CE Communications Architecture
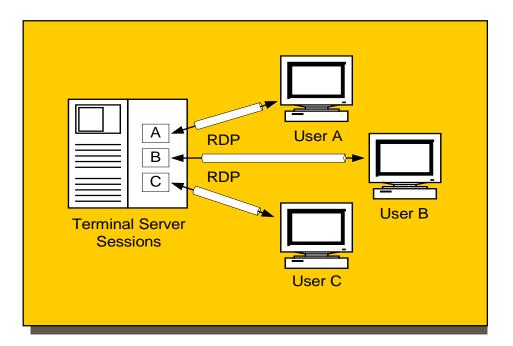
CE Device Drivers

▌ Unlike Windows NT or Windows 98, Windows CE drivers not widely available

  ▌ Young OS

  ▌ Multiple CPU issue

  ▌ Drivers usually custom written

▌ NetVista N2200w device drivers

  ▌ Written by BSQUARE - best of breed

  ▌ Video, Ethernet, serial, parallel, USB

Platform: Microsoft WBT 1.5

■ Key components:
- ■ Terminal Server
- ■ Remote Display Protocol
- ■ Terminal Server Client

■ Note: 1.5 version very recently released by Microsoft

A
B
C

RDP

RDP

User A

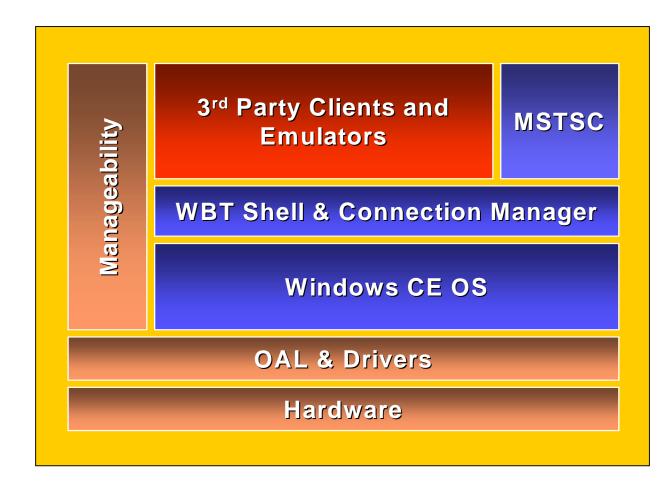User B

User C

Terminal Server
Sessions

Windows Terminal Server (WTS)

- Extension of Windows NT Server
- Multi-user server core
- Applications run 100% on the server
- Supports RDP natively
- Supports ICA via Citrix Add-on

Capacity planning rule of thumb

- Single Pentium Pro, 15-25 simultaneous users
- Dual-processor server, 30-50 simultaneous users.

- Tip: Watch the Microsoft site for an updated white paper at
  http://www.microsoft.com/ntserver/terminalserver/deployment/

WBT Client Architecture

Manageability	3rd Party Clients and Emulators	MSTSC
	WBT Shell & Connection Manager	
	Windows CE OS	

OAL & Drivers

Hardware

Remote Display Protocol

▌ Based on International Telecommunications Union's T.120 protocol

▌ RDP 4.0 is native to Terminal Server(NT 4.0)

▌ RDP 5.0 is in Windows 2000 Terminal Services

▌ Backwards compatible: both RDP 4.0 and 5.0 clients connect to either NT4 or Win2000

▌ The NetVista N2200w is an RDP 5.0 client

Citrix ICA Protocol

- "Independent Computing Architecture"
- Citrix Says:
    - ICA Separates the user interface from the application while keeping 100% of the logic on the server. By doing this, only screen updates, mouse clicks and keystrokes travel the network.

    - Microsoft Says:
        - MetaFrame ICA clients build upon the base functionality of Terminal Server and extend it with such client-side features as client drive mapping, client printer mapping, client com port redirection, and local remote clipboard support.

RDP vs ICA Comparison

RDP

- Native to Windows
- Windows clients only
- Dial-up using RAS
- Local print (RDP5 only)
- No application publishing

ICA

- Citrix Add-on
- Unix, DOS, Mac, Java clients
- Dial-up connect directly
- Local print
- Server apps advertised to client desktop

Discussion Question

▌ Can you think of any situations where a customer might benefit from choosing to use RDP and not ICA? Or vice versa?

Terminal Emulation

- **WBT itself does not provide terminal emulation**
  - Customers want it for connection to non-Windows systems
  - It is provided by third parties
- **NetVista N2200w includes terminal emulation**
  - FutureSoft DCS product
  - Integrated by BSQUARE

BSQUARE IBM Training

NetVista N2200w Included Emulators

- IBM 3270, 5250
- ANSI-BBS
- Digital VT-Series
- Wyse

IBM Terminal Emulation

3270 Terminal (3278 & 3279)

Model	Columns	Rows
1	80	12
2	80	24
3	80	32
4	80	43
5	132	27

5250 Terminal

Model	Columns	Rows
2	80	24
5	132	27

ANSI Emulation

- TTY (teletypewriter - simplest)

- ANSI (American National Standards Institute).

  - Similar to ANSI.SYS device driver for DOS.

- SCO ANSI

  - An enhanced version of the ANSI emulation by Santa Cruz Operation, Inc.

VT Series Emulation

▌ DCS will emulate a Digital Equipment Corporation (DEC) terminal:

  ▌ VT52,

  ▌ VT100,

  ▌ VT101,

  ▌ VT102,

  ▌ VT220, or

  ▌ VT420.

Wyse Emulation

▌ DCS will emulate a Wyse 50 or Wyse 60 terminal.

▌ These emulations do not offer all of the terminal's functions

- ▌ do not set transmission speed or other port configurations,

- ▌ do not set the scrolling speed in a session,

- ▌ do not turn off the monitor's display.

▌ These functions are handled by other parts of DCS or by Windows.

Network Printing

❚ Printing across a network from NetVista N2200w is now supported three ways:

> ❚ Microsoft RDP printing (new in WBT 1.5)
>
> ❚ Citrix ICA (requires ICA Server)
>
> ❚ FutureSoft NetPrint (requires NetPrint Server)

FutureSoft NetPrint Print Server

▌ Formatted and pre-formatted (raw pass-through) print requests

▌ Multiple print servers and multiple printers per server

▌ Supports any networked Windows NT 4.0-compliant printer

▌ Centralized print administration and management for all CE-based devices

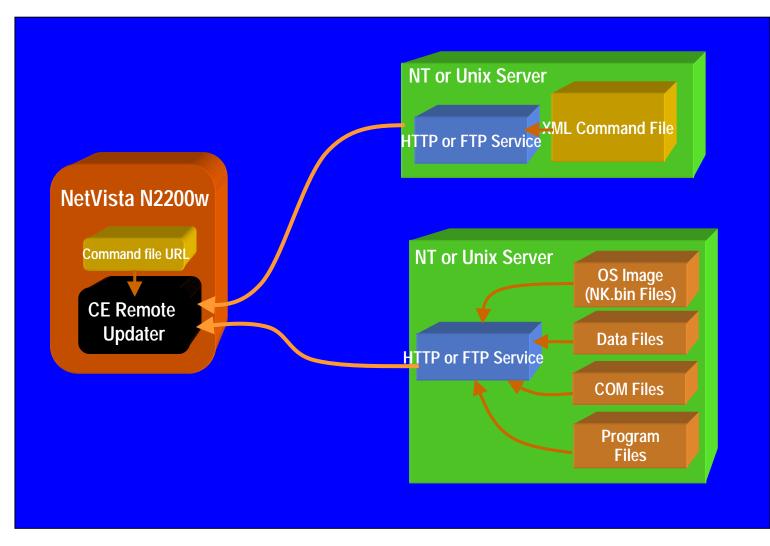▌ Server software component that runs as a Windows NT 4.0 service

BSQUARE CE Remote Updater

❚ Enables terminal to "pull" updates from a remote site using an XML command file.

❚ Enables updating the terminal's . . .

   ❚ Data and Applications

   ❚ Registry information

   ❚ Operating System Image

   ❚ Itself

How the Remote Updater works

▌ Terminal operator enters network location of an XML command file

▌ Command file contains all directives and info about the update to be performed

▌ Remote Updater parses the XML file and executes the update directives

CE Remote Updater Diagram

Summary: NetVista N2200w Components

- National MediaGXm CPU

- Microsoft Windows CE 2.12 & WBT 1.5

- Citrix ICA and Microsoft RDP

- FutureSoft Emulation and Printing

- BSQUARE XML Remote Updater

Questions?

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