Bull HN Information Systems
UNIX Series Enhancement

Product Enhancement

Competition within the UNIX-based small business and departmental computing markets remains intense. Major vendors such as NCR, AT&T, and Unisys continue to gain significant market share. Meanwhile, others, such as Bull, Altos, Texas Instruments, Motorola, and Prime, are challenging the market leaders. Furthermore, the momentum behind major proprietary systems, such as the IBM AS/400, has played a role in limiting the sales of UNIX-based systems.

To meet this challenge, Bull HN (formerly known as Honeywell Bull) changed its UNIX-based, nonproprietary architecture to include:

- Two new XPS-100 models, the midrange XPS-100 Model X-25 and high-end XPS-100 Model X-45; and
- The US/500 Series, a new standards-based UNIX product line.

The X-25 and X-45 improve Bull's ability to protect the installed base of XPS-100 computers by offering more performance and upgrade options. An XPS-100 customer with midrange or high-end models, e.g., the X-22 and X-42, can easily migrate to the new midrange or high-end model through a field upgrade option which only involves swapping processor boards.

In addition, the X-25 and X-45 represent Bull's efforts to expand the XPS-100 base. They enable Bull to offer a more competitive system than previously possible.

The US/500 Series makes Bull HN more competitive with one of the most dominant, mainstream, brand-name proprietary system families in the small business and departmental computing marketplace. The US/500 Series is targeted at customers with an IBM System/34 or System/36 or that have requirements for IBM's strategic AS/400 small business and departmental systems. Using a System/3X-compatible RPG II programming language and application development system integral to the standard system, the US/500 is meant to take sales away from AS/400 prospects, who want to upgrade from System/34 and /36 installations.

New XPS-100 Models

Product Definition

The XPS-100 Model X-25 and Model X-45 are third-generation midrange and high-end XPS-100s that fill performance gaps at the upper-end of the product line. The Model 25 runs at 4.1 MIPS and accommodates 12 to 72 workstations. The Model 45 runs at 8 MIPS and supports 12 to 144 workstations. Both new XPS-100 versions remain object- and source-code compatible with all previously announced XPS-100 models.

Analysis

The new models strengthen Bull HN's ability to sell UNIX-based systems to VARs, government agencies, and end users. Both the Model X-25 and Model X-45 provide more speed and capacity than existing midrange and high-end XPS-100 models. Rated at 4.1 MIPS, the Model 25 is approximately 95 percent faster and accommodates up to 1.5 times more workstations than the Model X-22, a 2.1-MIPS, 48-user midrange XPS-100. When compared to the former high-end, 3.7-MIPS, 96-workstation X-42, the Model 45 offers approximately 2.2 times more MIPS and up to 1.5 times more workstations.

With these new models, present XPS-100 customers can expand computing capabilities without reinvesting in another architecture. Field upgradability and peripheral, communications, and software compatibility allow easy and cost-effective migration to the new models. Furthermore, the X-25 and X-45 series have a longer life expectancy than previous midrange and high-end offerings because they address a broad range of work loads. For example, the Model X-25 can grow to a 72-workstation system before a move to the X-45 is required. In contrast, the Model X-22 can only grow to a 48-workstation configuration.

The X-25 and X-45 also give Bull HN the capability to pursue accounts that have more demanding applications. They also allow Bull HN to pursue sales based on better price/performance. The X-25 provides 95 ▷

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percent more MIPS than the X-22 for only approximately 60 percent more money. The X-25 provides 120 percent more MIPS than the X-42 for only approximately 30 percent more money.

Although the X-25 and X-45 are aggressively positioned in capability and price, they will achieve the most success in sales to the installed base. Bull HN and its resellers can move customers with older or less-powerful models, such as the X-20 or X-22, to the X-25 or X-45 without the customers sacrificing investments in software, system packaging, or peripherals. Additionally, Bull and its resellers can sell customers on adding more XPS-100s to existing installations. By networking computers, customers can upgrade an installation without discarding previously installed systems. The compatibility between the models provides "smooth" communications—the networking scheme does not have to accommodate incompatibilities between distributed nodes.

Although the new XPS-100 systems can serve as replacements for competitive systems with similar architectures, their success at displacement will be somewhat limited. The disruption and financial cost of moving from one vendor to another is prohibitive. Furthermore, strategies employed by the major competitors keep customers from migrating to Bull HN.

System Features

The Model 25 and Model 45 both achieve their performance through a central processing design that features:

- The 32-bit Motorola MC68020 microprocessor operating at 25MHz.
- The Motorola MC68881 floating point co-processor, which uses 32-bit internal registers and executes single- and double-precision operations.
- An electronically programmable read-only-memory (EPROM) with diagnostics and start-up routines.
- A high-performance, customized memory management unit (MMU) that accommodates virtual memory and demand paging.
- Dual-ported real memory implemented in 256K- and 1M-bit chips with a 100 nanosecond (ns.) access time.
- A dedicated bus for CPU-to-main memory communications.
- A 32-bit VMEbus for direct memory transfers and CPU-to-CPU and CPU-to-I/O communications.
- Distributed, microprocessor-based I/O controllers.
- Fixed disk drives with 18-millisecond (ms.) average seek times and 10M-bit-per-second transfer rates.

Both new XPS-100 models use Bull's version of the AT&T UNIX System V (UNIX V.3) operating system. The operating system is tuned for each specific XPS-100 model, while maintaining System V Interface Definition (SVID)-compatibility with AT&T UNIX V.3 and containing all its standard features.

Hardware Configurations

The Model 25, a monoprocessor, features one CPU containing a 25MHz MC68020 chip, a MC68881 co-processor, and an MMU. Also included as standard on the basic Model 25 are 4M bytes of real memory; one integrated peripheral controller with a 720K-/1.2M-byte diskette drive, one 325M-byte fixed disk drive, and a 60M-byte streamer cartridge tape drive; and a workstation/data communications controller with 12 serial ports and a parallel interface. Available options include 2M-, 4M-, and 8M-byte memory expansion cards; 325M-byte fixed disk drives; a 60M-byte or 150M-byte streamer cartridge tape drive; a tape drive controller for one or more GCR/PE reel-to-reel tape drives; 6-, 8-, or 12-port workstation/data communications controllers; and an intelligent Ethernet LAN interface. Through the options, the Model 25 can be expanded to a configuration that has:

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- A maximum of 16M bytes of real memory.
- A maximum fixed disk storage capacity of 1.95G bytes. The Model 25 accommodates up to six 325M-byte fixed disk drives.
- One or two 60M- or 150M-byte streamer cartridge tape drives.
- 0.5-inch, GCR/PE reel-to-reel tape units.
- Up to 72 serial communications ports. Each port supports one workstation device—a terminal, printer, or personal computer—or a single communications line for system-to-system communications.
- Up to six parallel interfaces. Each interface accommodates a printer with a Centronics parallel interface connection.
- One intelligent Ethernet interface.

A system cabinet and an optional expansion cabinet house the central system of the Model 25. The system cabinet contains the CPU, real memory, device controllers, I/O ports, and power supplies. Also, the diskette drive and one streamer cartridge tape drive are included within the system cabinet along with one to three 325M-byte fixed disk drives. The expansion cabinet houses additional 325M-byte disk drives or an optional streamer cartridge tape drive. Both the system cabinet and expansion cabinet are tightly coupled.

The Model 45, a dual processor, consists of two system cabinets tightly coupled together. Each cabinet contains processor components and storage peripherals. Up to three fixed disk drives and one streamer cartridge tape drive can be placed in each cabinet.

The Model 45 comes with two CPUs as standard. Each CPU includes a 25MHz MC68020 chip, a MC68881 co-processor, and a MMU. Other standard elements are 8M bytes of real memory; an integrated peripheral controller with a 720K-/1.2M-byte diskette drive, one 325M-byte fixed disk drive, and one 60M-byte streamer cartridge tape drive. Also, 12 serial communications ports and a parallel interface are included.

Expansion options similar to those for the Model 25 are available. Through these options, the basic Model 45 can be expanded to a configuration that features:

- A maximum of 32M bytes of main storage.
- Up to 1.95G bytes of fixed disk storage. Up to six 325M-byte fixed disk drives can be supported on the Model 45.
- One or two 60M- or 150M-byte streamer cartridge tape drives.
- 0.5-inch, GCR/PE reel-to-reel tape units.
- Up to 144 serial communications ports.
- Up to 12 parallel interfaces.
- One intelligent Ethernet interface.

Software Configurations

A runtime version of Bull's UNIX V.3-based XPS-100 Operating System comes with each XPS-100 model. Also, each entry package contains Bull's EasyLife, a menu-driven interface to the operating system. The development system for the XPS-100 Operating System is not included and must be acquired as an option. Furthermore, on-line instruction and a system tuner are options.

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A complete library of system applications is available. Programming languages include several versions of Cobol, Fortran, Pascal, and Basic; C; and a standard RPG II, MUMPS, and DBL. Relational database management resources are provided by Oracle, Informix, Ingres, Unify, and Progress. Available communications applications provide communications within public and proprietary environments. VIP, BSC, SNA, X.25, LU6.2, TCP/IP, and TTY communications are supported. Software also is available for PC integration. Office automation can be provided by Uniplex-II, Alis, or Q-Office.

System Upgrades

Field upgrade packages are available to:

- Move from the X-22, the formerly midrange XPS-100 model, to the X-25, and
- Migrate from the X-42, the former high-end XPS-100, to the X-45.

Furthermore, the new X-25 can be field upgraded to the new X-45 when the X-25 reaches its limitations.

Prices

The basic Model X-25, complete with CPU, 4M-byte memory, basic I/O control, minimum disk, minimum tape storage, and the basic operating system, is priced at $32,670. A Model X-25 with a typical 32-user base configuration, including 8M bytes of memory and 650M bytes of disk, costs $47,120.

The basic Model X-45, complete with two CPUs, 8M bytes of memory, basic I/O control, minimum disk, minimum tape, and the basic operating system, is priced at $54,170. A Model X-45 with a typical 72-user base configuration, including 8M bytes of memory and 650M bytes of disk, costs $95,020.

US/500 Series

Product Definition

The Bull US/500 Series is a line of XPS-100 supermicros that have been repackaged and positioned to provide a cost effective, performance alternative to IBM System/34 and System/36 systems. The standards-based supermicro series, designed, engineered, and manufactured by Bull, consists of five models—the Model 25, Model 35, Model 45, Model 55, and Model 65.

Analysis

When compared to the System/3X and AS/400, the US/500 Series offers more capability than the System/34 and /36 and is competitive with smaller-sized IBM AS/400 models, its chief competitors in capability and price. It will, however, have only limited success as a replacement for the System/34 or /36, or in filling requirements for an AS/400.

The US/500 family does not have the visibility or the momentum of the well-known AS/400. Furthermore, the AS/400 gives current IBM System/34 and /36 customers a more-effective upgrade path. The AS/400 maintains a greater degree of upward compatibility with its predecessors—the System/34 and /36. Applications from the System/34 and /36 can run on the AS/400 without modification. Even though the US/500 comes standard with an integral RPG II application porting and development tool, RPG applications moved from the System/34 or /36 to the US/500 will still have to undergo modification in almost all cases.

Additionally, the disruption and financial cost involved when moving from one brand or type of computer to another is somewhat prohibitive. Moving between diverse computer architectures requires almost a complete reinvestment in hardware as well as system software. Furthermore, a switch to a new architecture requires the customer to reinvest in programming, system administration, and end-user training.

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The US/500 will have the greatest success when customers want to leave their System/3X-compatible application environment and move to a UNIX-based open system to gain advantages in portability and standardization. This, however, will not happen too often in the System/3X world. Like the UNIX environment, the System/3X world is filled with many systems and offers access to many third-party products. Furthermore, IBM has effectively demonstrated its commitment to System/3X customers with the announcement of the strategic AS/400. This commitment should keep most System/34 and /36 customers in the System/3X and AS/400 domain.

System Features

The US/500 Series provides 2.1 to 8.0 MIPS and supports from 4 to 144 workstations. It achieves its performance with:

- One or two CPUs that each contain:

  —A 16.67MHz or 25MHz MC68020 microprocessor.

  —A 32-bit MC68881 floating-point co-processor.

  —A 256K-byte EPROM.

  —A high-performance, customized MMU (memory management unit).

  —A 16K- or 64K-byte cache memory.

- Dual-ported real memory implemented in 256K- and 1M-bit chips with a 100-ns. access time.
- A dedicated bus for CPU-to-main memory communications.
- A 32-bit VMEbus for direct memory transfers and CPU-to-CPU and CPU-to-I/O communications.
- Distributed, microprocessor-based I/O controllers.
- Fixed disk drives with 18-millisecond (ms.) average seek times and 10M-bit-per-second transfer rates.

Furthermore, each US/500 runs the US/500 Operating System, Bull's version of AT&T UNIX V.3. The operating system is tuned for each specific model, while maintaining System V Interface Definition (SVID)-compatibility with UNIX V.3 and containing all its standard features.

The RPG II/36 Development System or the RPG II/36 Runtime System is coupled with the US/500 Operating System. The RPG II/36 Development System is an extensive set of tools for transporting RPG II applications from the System/34 and System/36 to the US/500 with little modification. The RPG II/36 Runtime System executes the applications produced, ported, and maintained under the RPG II/36 Development System environment.

Hardware Configurations

The Model 25, the smallest US/500, is a monoprocessor running at 2.1 MIPS with support for up to 32 workstations.

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One system cabinet houses the central system. The main elements include the CPU with a 16.67MHz MC68020 chip, a MC68881 co-processor, and an MMU. Real memory is 4M bytes. The I/O portion consists of one integrated peripheral controller with a 720K-/1.2M-byte diskette drive, one 325M-byte fixed disk drive, and a 150M-byte streamer cartridge tape drive. A workstation/data communications controller with eight serial ports and a parallel interface is also provided on the basic model. Options include a 16K-byte cache; 2M-, 4M-, and 8M-byte memory expansion cards; 325M-byte fixed disk drives; a tape drive controller for one or more GCR/PE reel-to-reel tape drives; four-, six-, or eight-port workstation/data communications controllers; and an intelligent Ethernet LAN interface. A fully configured Model 25 can contain:

- Up to 16M bytes of real memory.
- A maximum fixed disk storage capacity of 975M bytes. The Model 25 accommodates up to three 325M-byte fixed disk drives.
- One streamer cartridge tape drive.
- 0.5-inch, GCR/PE reel-to-reel tape units.
- Up to 32 serial communications ports. Each port supports one workstation device or a single communications line for remote applications.
- One to four parallel interfaces.
- One intelligent Ethernet interface.

The Model 35, a larger Model 25, runs at 2.7 MIPS, supports from 8 to 48 workstations, and features one 16.67MHz MC68020-based CPU with a 16K-byte cache. The basic model also includes 4M bytes of real memory; one integrated peripheral controller with a 720K-/1.2M-byte diskette drive, two 325M-byte fixed disk drives, and a 150M-byte streamer cartridge tape drive; and a workstation/data communications controller with eight serial ports and a parallel interface. With the available options, the basic Model 35 can be expanded to a configuration that has:

- Up to 16M bytes of real memory.
- A maximum fixed disk storage capacity of 1.95G bytes. Up to six 325M-byte fixed disk drives can be supported by the Model 35.
- One or two 150M-byte streamer cartridge tape drives.
- 0.5-inch, GCR/PE reel-to-reel tape units.
- Up to 48 serial communications ports.
- Up to six parallel interfaces.
- One intelligent Ethernet interface.

The Model 35 is contained in a system cabinet and an optional expansion cabinet. The system cabinet holds the CPU, real memory, device controllers, I/O ports, and power supplies. Also, the diskette drive and one streamer cartridge tape drive are included within the system cabinet along with one to three 325M-byte fixed disk drives. The expansion cabinet houses additional 325M-byte disk drives or an optional streamer cartridge tape drive. Both the system cabinet and expansion cabinet are tightly coupled.

The Model 45, the midrange of the US/500 product line, is a monoprocessor which runs at 4.1 MIPS and supports 12 to 72 workstations. It consists of a system cabinet that holds:

- One CPU that features a 25MHz MC68020 chip, a MC68881 co-processor, an MMU, and a 16K-byte cache.

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- 4M to 16M bytes of real memory.
- Two or three 325M-byte fixed disk drives.
- One 150M-byte streamer cartridge tape drive.
- One controller for 0.5-inch, GCR/PE reel-to-reel tape units.
- 12 to 72 serial communications ports.
- One to six parallel interfaces.
- One intelligent Ethernet interface.

The Model 45 also can include an expansion cabinet that holds:

- Two or three 325M-byte fixed disk drives.
- One 150M-byte streamer cartridge tape drive.
- One controller for 0.5-inch, GCR/PE reel-to-reel tape units.

The Model 55 is an upgrade for the Model 45 and an entry point for the Model 65. The Model 55 has a dual processor configuration rated at 5.2 MIPS and accommodates 16 to 96 workstations. It is composed of two system cabinets tightly coupled together. Each cabinet contains processor components and storage peripherals. Up to three fixed disk drives and one streamer cartridge tape drive can be placed in each cabinet.

Standard on the basic Model 55 are two CPUs, each with a 16.67MHz MC68020 chip, MC68881 co-processor, MMU, and 16K-byte cache.

Real memory on the basic Model 55 is 8M bytes. It can be expanded to 32M bytes with one to three 2M-, 4M- or and 8M-byte memory expansion options.

Basic disk storage consists of one 720K-/1.2M-byte diskette drive and two 325M-byte fixed disk drives. Expansion options are available to increase fixed disk storage to include six 325M-byte disk drives.

One 150M-byte streamer cartridge tape drive comes with the Model 55. Options are available to add another streamer cartridge tape drive or 0.5-inch, GCR/PE reel-to-reel tape units.

Also included as standard with the basic Model 55 are two workstation/data communications controllers, each with eight serial ports and a parallel interface. With the addition of optional controllers, the number of serial communications ports and parallel interfaces can be expanded to a maximum of 96 and 12, respectively.

The Model 65, the high-end of the US/500 product line, is configured as a dual-processor, 8-MIPS system that supports from 24 to 144 workstations. It consists of two system cabinets tightly coupled together, each containing processor components and storage peripherals.

Each CPU has a 25MHz MC68020 chip, MC68881 co-processor, MMU, and a 64K-byte cache. Basic real memory is 8M bytes. An integrated peripheral controller is standard along with a 720K-/1.2M-byte diskette drive, two 325M-byte fixed disk drives, and one 150M-byte streamer cartridge tape drive. Additionally, two workstation/data data communications controllers are standard. Each controller has 12 serial communications ports and one parallel interface.

Available options include 2M-, 4M-, and 8M-byte memory expansion cards; 325M-byte fixed disk drives; a tape drive controller for one or more GCR/PE reel-to-reel tape drives; 6-, 8-, or 12-port workstation/data communications controllers; and an intelligent Ethernet LAN interface. A fully configured Model 65 can contain:

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- Up to 32M bytes of real memory.
- Up to 1.95G bytes of fixed disk storage. The Model 65 accommodates from two to six 325M-byte fixed disk drives.
- One 150M-byte streamer cartridge tape drive.
- 0.5-inch, GCR/PE reel-to-reel tape units.
- Up to 144 serial communications ports.
- Up to 12 parallel interfaces.
- One intelligent Ethernet interface.

Software Configurations

Basic system software for the US/500 includes a runtime version US/500 Operating System and either the development or runtime version of RPG II/36, the RPG II application porting tool. Also, each basic operating software package contains Bull's EasyLife menu-driven interface. The development system for the US/500 Operating System, which contains a complete set of UNIX V.3 program development tools, is not provided and must be acquired as an option. Furthermore, on-line instruction and a system tuner are options.

To support the US/500's role as a UNIX-based open system, Bull gives the US/500 access to a broad range of system applications. Available programming languages include: several versions of Cobol, Fortran, Pascal, and Basic; C; and a standard RPG II, MUMPS, and DBL. Relational database management resources are provided by Oracle, Informix, Ingres, Unify, and Progress. Available communications applications provide communications within public and proprietary environments. VIP, BSC, SNA, X.25, LU6.2, TCP/IP, and TTY communications are supported. Software also is available for PC integration. Office automation is provided by Uniplex-II, Alis, or Q-Office.

System Upgrades

Each model of the US/500 family is field upgradable to the next higher model through the use of the appropriate expansion kit. All US/500 models are object-code compatible.

Prices

The basic Model 25, complete with CPU, 4M-byte memory, and minimum disk, costs $21,245. The basic Model 35, with the CPU, 4M bytes of real memory, and two 325M-byte fixed disks, starts at $32,015. A basic Model 45, complete with CPU, 4M bytes of real memory, and two 325M-byte fixed disks, costs $39,400. The basic Model 55, with two CPUs, 8M bytes of real memory, and two 325M-byte fixed disk drives, starts at $49,115. A Model 65 entry configuration contains two CPUs, 8M bytes of real memory, and two 325M-byte fixed disk drives.

The basic system software package for monoprocessor US/500 configurations begins at $4,135, and the basic system software for the dual-processor US/500s starts at $10,315. Both versions include the runtime version of the US/500 Operating System, the RPG II/36 Runtime System, and one year of basic support. □