

Overview

Server PC Product Family

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The Server PC product family is comprised of high-performance supermicrocomputers based on Intel's 80386 microprocessor. These systems are designed for maximum performance as departmental servers for networks of PCs and UNIX terminal users. With Server PCs, users have the flexibility of using thousands of DOS and UNIX software applications. The performance, expandability, and compatibility of Server PCs make them the perfect systems for departmental workgroups and small businesses.

Server PCs are designed to meet key computer industry standards. These standards include the UNIX System V release 3 operating system (SVID), and the Applications Binary Interface (ABI 386), SCSI peripheral interfacing for mass storage devices (both asynchronous and synchronous modes are supported), and backplane slots which are able to host PC AT compatible hardware options.

The optional PC Exchange software package, commonly used with PC-based workstations connected via Ethernet, provides extended functionality to PC users. PC Exchange services include mail, printer sharing, file sharing and access to communications gateways. Server PCs have the processing power to support sophisticated office automation and data processing tasks not available to single-user personal computers. As departmental servers, the top-of-the-line Model 200 is able to support up to 64 networked PC users, depending upon the actual application.

Server PCs run CTIX/386, Convergent's version of AT&T's UNIX System V Release 3 operating system. Under CTIX/386, Server PCs support DOS directly or in an integrated UNIX/DOS integrated environment (Merge 386). This ability to execute multiple operating systems simultaneously provides the user with great flexibility in selecting applications.

The Server PC family consists of two highly configurable basic systems which share many options. The systems include the newly-introduced, entry-level Model 100, and the well-established Model 200. Both offer a variety of configurations with outstanding price/performance.

With the addition of a keyboard and display hardware, Server PCs can be used as high-performance workstations. This makes them ideal systems for demanding applications, like computer-aided design, which require processing power not provided by standard desktop computers.

Model 100

The Model 100 uses an 80386 microprocessor operating at 16 MHz with interleaved memory. Configurations range from a 4-user base system with 2 MB memory, a 150 MB cartridge tape drive, a 1.2 MB floppy disk drive and a 40 MB hard disk drive, to a 28-port system, with 12 MB memory and over 400 MB of internal hard disk capacity. The SCSI bus also supports external mass storage devices.

Model 200

The Model 200 uses an 80386 at 20 MHz, supported by 64 KB of write-back cache. Base configurations range from a 3-user system with 4 MB memory, and an 80 MB hard disk, to a 43-port system with 64 MB of memory and a Gigabyte of internal storage. All configurations include a cartridge tape drive. The SCSI bus also supports external mass storage devices.

Product Positioning

Server PCs are positioned to meet the market needs of two classes of users: PC LAN users who want more powerful departmental server functions, and UNIX system users who want to incorporate PC personal productivity software into their workgroups.

The Server PC's superior performance provides support for larger networks. As network users' needs

become more sophisticated, users can tap the Server PC's multitasking, data processing, and advanced communications facilities.

Traditional minicomputer users can use the Server PC as a classical multiuser UNIX system and have the option of running DOS applications. Its price and performance makes it a very viable option for individuals requiring a departmental computer for up to 32 users. As a data processing system, the Server PC supports the UNIFY/E database and the ACCELL/E 4GL, as well as a full suite of languages and development tools.

The Server PC acts as a true bridge between the PC and UNIX minicomputer worlds. It offers value to each environment while enabling each to extend their capabilities.

Product Line Strengths

To OEMs

- Adherence to standards (UNIX SVID, ABI 386, PC/AT bus, SCSI bus)
- Flexibility of hardware (expansion slots) and software (UNIX and DOS)
- Performance
- LAN and communications capabilities

To VARs

- Price/performance
- Flexibility of hardware (expansion slots) and software (UNIX and DOS)
- Upgradability
- Easy portation of PC and UNIX applications to the Server PC

To End Users

- Runs a large number of applications
- Compatible with installed PCs and terminals
- Outstanding performance resulting in increased productivity

Target Markets

As a Departmental Server for PCs

- To users who need a powerful dedicated network server for a large number of PCs.
- To users who need to access centralized resources such as databases or communications software.
- To users who need to access both DOS and UNIX applications.

As a Multuser UNIX Server

- To users who need to run UNIX V Release 3 applications.
- To users who need to access centralized resources such as databases or communications software.
- To users who need to access both DOS and UNIX applications.

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Hardware

	Model 100	Model 200
Typical Users	16	32
Max Connections	28 ports	43 ports
Max RAM	12 MB	64 MB
Max Disk Storage	405 MB	975 MB
Cartridge Tape	60 MB (QIC-24) 150 MB (QIC-150)	60 MB (QIC-24) 150 MB (QIC-150)
Technology	16 MHz 80386 CPU	20 MHz 80386 CPU
Relative Performance	Interleaved memory 0.7	64 KB write-back cache 1.0

Software

Operating Environments	Development Tools	Communications	Networks**	Applications
CTIX/386™, System V.3 DOS 3.X Merge 386	Standard Languages ACCELL/E 4GL CTAM Window Environment	2780/3780 BSC 327X SNA 327X SNA RJE UUCP CU	TCP/IP PC Exchange RFS X.25 Ethernet	DOS applic. WGS/Office UNIFY/E PCX/Mail PCX/TE Multiplex

Server PC Product Line History

Early in 1986, Convergent identified the tactical and strategic importance of the Intel 80386 processor. Tactically, the company's extensive investment in its Intel-based NGEN product family would clearly evolve further with the advent of an 80386-based NGEN product. The opportunity to leverage Convergent's investment in Motorola-based UNIX products into a new Intel-based UNIX product line posed a strategic opportunity. The Intel processor design of the NGEN family coupled with the UNIX software technology of the S/Series machines had the potential to unite the product of Convergent Technologies into a synergistic product strategy for the future. It was on this premise that the Server PC family development was founded.

Implementing a brand new product line for a company of Convergent's size was not a trivial matter. The development of the company's current products could not be diluted with the distractions of a new development effort. Likewise, the aggressive development schedule planned for the Server PC could not be slowed by day-to-day operations involving current products. As a result, in June of 1986, a separate development team was formed to build the Server PC products. A facility physically removed from Convergent's headquarters was established, a small team of engineers and marketing professionals were recruited from within the company, and a rough charter was drafted: To build the world's best 80386-based departmental computer that would draw on Convergent's expertise in Intel CPU and Motorola technologies.

The summer of 1986 was consumed with product definition and prototype development. Many key Server PC decisions were made in that period, but the most significant of these was surely the strategy to adopt industry-standard solutions to the design. It was then that the commitment to PC/AT compatibility was made for both hardware, such as the bus, and for software, such as the ability to run off-the-shelf DOS applications. It was then that Convergent's speculative role in defining and implementing the Application Binary Interface (ABI) for the 80386 was elevated to a key product mandate. It was then that the decision to support the Small Computer System Interface (SCSI) bus for all mass-storage devices was adopted. All of these decisions were thematic; Convergent would support industry standards that are important in the departmental computing market.

It was also important that the Server PC product draw heavily on the investments Convergent already had made in its existing products. The company's NGEN product line illustrated the strategic commitment to SCSI storage; the technology developed for NGEN was applied readily to the Server PC. Today, the product lines continue to share many common peripherals. Convergent's S/Series was clearly aligned with the emerging AT&T System V Release 3 UNIX standard, replete with enhancements made over five years of development. The Server PC product family draws heavily on this investment and extends Convergent's presence in the V.3 marketplace on the 80386. Much of the additional technology developed for the Server PC feeds back into the company's traditional product lines, further minimizing the total development costs for all Convergent products.

In addition to technology borrowed from Convergent's other products, the Server PC family required extensive investment and research in new areas. New price/performance goals set for the Server PC required the design of a complex cached memory subsystem capable of controlling up to 64 Megabytes of high-speed system RAM. Support for both low-cost and high-performance floating Point Units (FPUs) was also added to the base design. The SCSI I/O subsystem was crafted with intelligent scatter/gather capabilities that sustain full-speed synchronous transfers to and from main memory. Furthermore, while the PC/AT bus offered unequalled price/performance and the widest selection of options in the industry, some of the highest-performance applications could not be accommodated on that 16-bit architecture. For this reason, an ultra-high performance system bus (MBUS) architecture was designed to control processor, memory, and SCSI I/O operations 32 bits at a time. Coupling state-of-the-art technology with a healthy respect for the industry standards provided the Server PC with the best of both.

By the fall of 1986, just a few months after the product team was established, the first Server PC prototypes were operational in the lab. Initial benchmarks run on these machines exceeded all predictions; the processor, memory, and cache designs proved able to sustain massive instruction and data throughput. Intel began touting the Server PC Model 200 as the fastest implementation of their 20 MHz 80386 operating at well over 9,000 Dhystones, a benchmark of general CPU performance in a non-floating point environment. Third party software developers and early customers consistently gave the Server PC kudos for its performance.

By February of 1987, just eight months after the Server PC concept was born, 25 systems were in the hands of

software developers, Server PC customers and other key users both inside and outside Convergent. The core development team had grown to include all the necessary support functions as well as a larger number of senior design engineers. The investments in product marketing and customer support were increased. The remainder of 1987 was spent producing pilot systems for pre-launch requirements. Hundreds of systems were built through the fall to supply the needs of OEMs, VARs, and ISVs alike. Ancillary product developments such as the intelligent QCP-100 Serial Communications Processor were launched.

In December of 1987, the product line moved into Convergent's high-volume manufacturing process where the company is better-equipped to meet the volume demands of this popular product. Each month of 1988, Convergent's high-volume manufacturing team has been called upon to produce an ever-increasing number of systems to meet customer demand. Today, hundreds of systems and thousands of options are produced and shipped every month. Convergent will ship well over 1,000 CPUs per month in the near future. The dollar value of the Server PC business represents a significant portion of Convergent Technologies' revenue base.

The company will announce multiple Server PC models in 1988 to provide an ever-widening range of price and performance. New I/O subsystems are being developed for applications requiring tremendous I/O bandwidth. Additional investment is being made in all Server PC software. For example, in Q1 '88, CTIX/386 Version 2.0, Merge 386 Version 1.0 (the integrated DOS-UNIX environment), four IBM communications protocols, two LAN products and many third-party applications were released for shipment. The future for the Server PC is very bright indeed. Convergent will continue to aggressively enhance and expand the Server PC product line as the flagship of its Intel/UNIX strategy for the future.

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