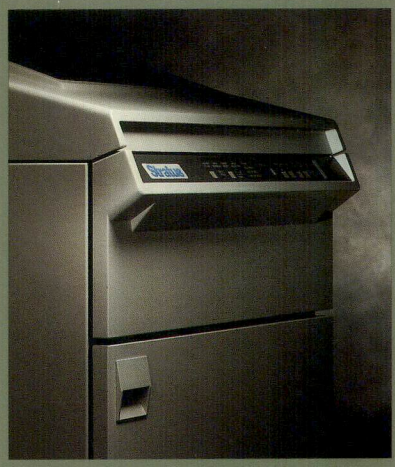
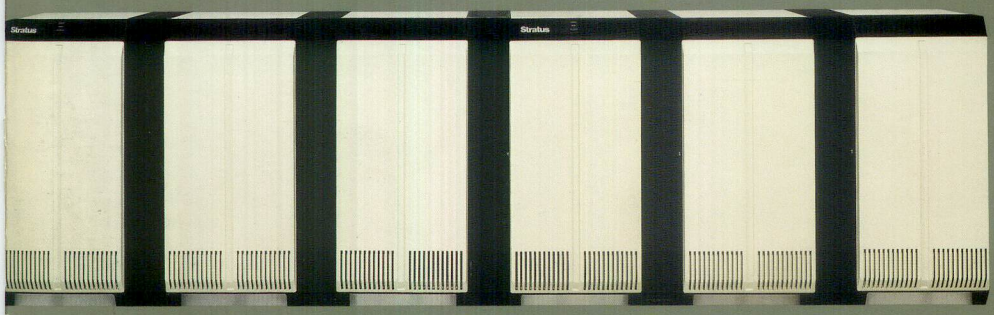
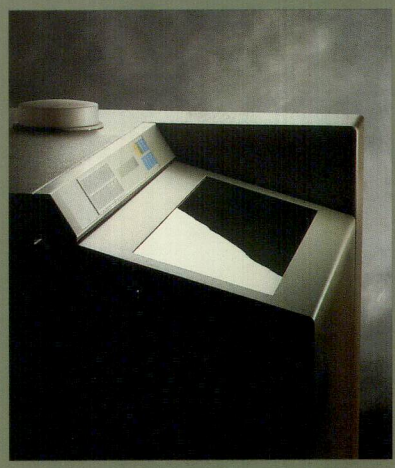
The Stratus Product Family







The widest spectrum of products
for critical online computing

Critical online computing is defined by any one of the following four criteria:

The availability of the application directly contributes to a business' profitability, revenue growth, or competitive advantage. Order entry or customer service are examples of this arena.

The system is the direct interface between a business and its customers. Automatic teller machines (ATMs) provided by retail banks are a classic example.

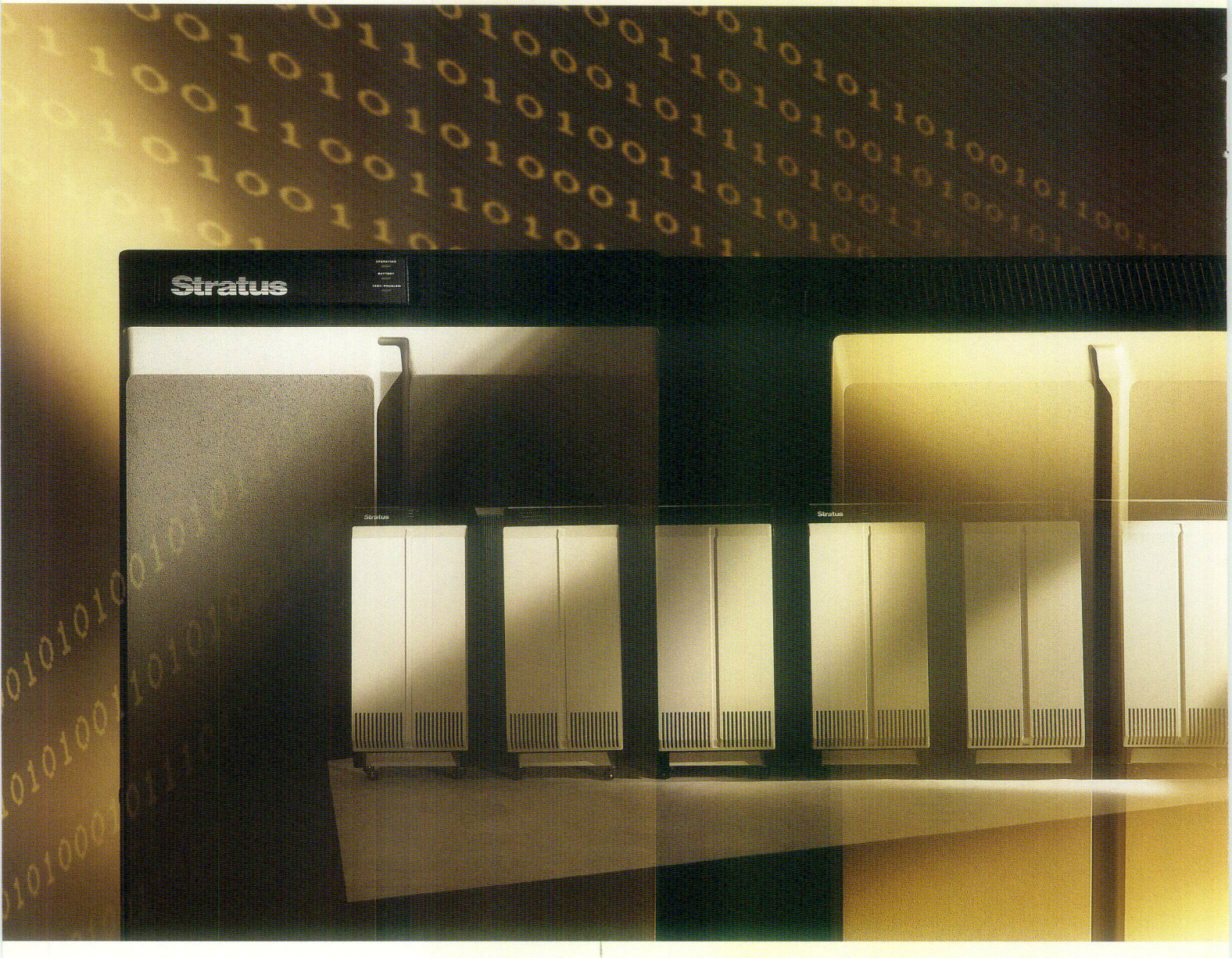
The system provides constantly changing data to many users making decisions in real time, as in stock quotation and order execution systems in brokerage firms, or just-in-time manufacturing.

The system is responsible for individual transactions of enormous financial value or business importance. Electronic funds transfer in wholesale banking is a good example; a single transaction can represent hundreds of millions of dollars.

The Stratus Product Family

The widest spectrum of products for critical online computing

Table of contents


Stratus
Stratus
Stratus

Stratus offers a product family designed specifically for critical online computing

From its founding in 1980, Stratus has focused on the growing business need for critical online computing.

Meeting the need for a new way of doing business

Critical online computing applications require the highest standards of uptime and extremely fast response times, and are increasingly central to the competitiveness, profitability, and success of business organizations.

Critical online computing is defined by any one of the following four criteria:

- The availability of the application directly contributes to a business' profitability, revenue growth, or competitive advantage. Order entry or customer service are examples of this arena.
- The system is the direct interface between a business and its customers. Automatic teller machines (ATMs) provided by retail banks are a classic example.
- The system provides constantly changing data to many users making decisions in real time, as in stock quotation and order execution systems in brokerage firms, or just-in-time manufacturing.
- The system is responsible for individual transactions of enormous financial value or business importance. Electronic funds transfer in wholesale banking is a good example; a single transaction can represent hundreds of millions of dollars.

To keep a business' critical online applications up and running at the highest level of performance, the Stratus product family focuses on the two areas that are most essential to this type of computing: the continuous availability of applications and a versatile online environment.

Only Stratus gives you the continuous availability you need for critical online computing

Fault tolerance, advanced online service, and online administration keep applications available

Stratus makes sure applications will always be available to users by building hardware-based fault tolerance, online maintenance and administration, and advanced online remote service into every system.

Hardware-based fault tolerance makes Stratus systems the most reliable in the industry. Online maintenance and administration let systems managers perform these functions while applications run at peak performance and remain available to users; and advanced online remote service diagnoses and fixes errors while the system continues to run without degradation.

Stratus has always emphasized application availability, not just system uptime, as the key measure in determining continuous availability. Taken together, hardware-based fault tolerance, online administration, and advanced online service surpass the approaches to application availability employed by our competitors and instill much more confidence that both unplanned and planned outages will not occur.

Unplanned downtime occurs when the computer system unexpectedly goes offline. System crashes, power failures, and natural disasters constitute most reasons for unplanned downtime. Although unplanned downtime is costly and disruptive, it is still the smallest portion of total downtime.

More important to the productivity of online applications is planned downtime. Backups, upgrades, and system maintenance are just a few factors that require an application to be taken offline. For example, according to a recent report, a well-managed mainframe requires 18 hours a week of planned downtime for routine system maintenance and administration.

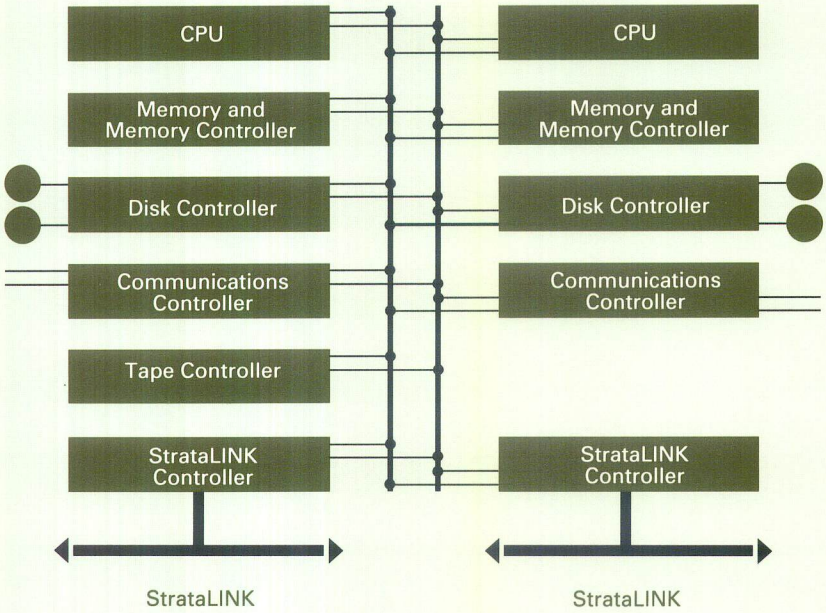
Hardware-based fault tolerance

Stratus achieves fault tolerance through a unique, two-part proprietary design. First, self-checking logic on each major circuit board detects and immediately isolates failures. And, second, Stratus duplicates processors, memory, I/O controllers, disks, power supplies, and buses so processing will continue should one of these components fail.

On each CPU board, a pair of processors process the same data at the exact same time. Also, each board has a twin, and both boards, like each pair of processors, work in lock step. The software, however, "sees" only one CPU.

Comparators on each circuit board compare and verify the operations of each processor on each clock cycle. If the results don't match, the board is taken offline and its partner continues processing with no damage to data or loss of processing performance.

Stratus System Architecture



In a Stratus system, CPUs, memory, I/O controllers including disks and communications controllers, disks, power supplies, and buses are all duplicated to maintain processing should one component fail.

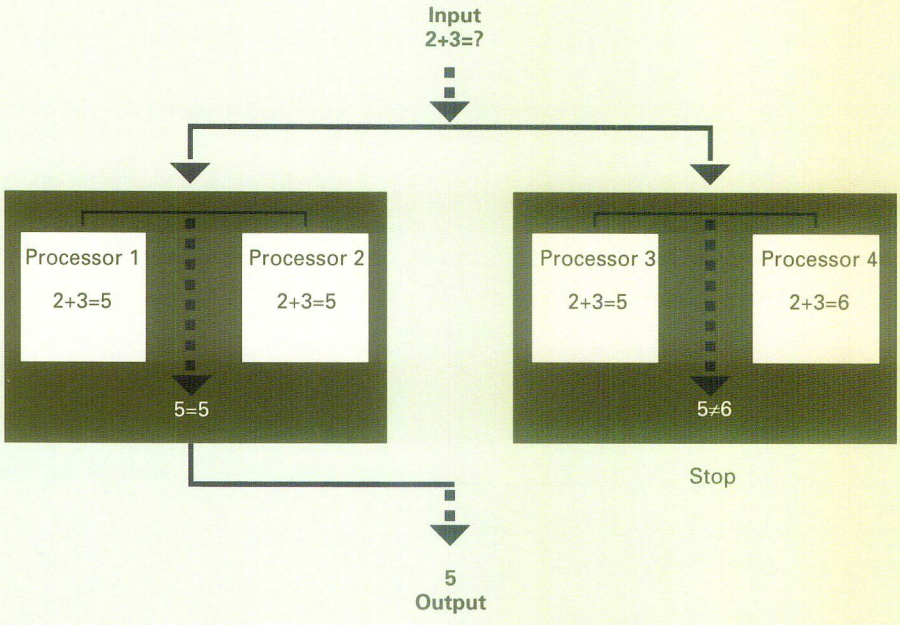
In the case of units that cannot be easily synchronized, such as disk drives, the redundant pair of disk adapters and drives does not operate in lock step. Instead, the operating system ensures that the two disks contain the same information by writing to both disks and reading to whichever disk is closest.

Whenever a write operation is requested, the operating system writes the data on both disks. When a read operation is required, the data comes from the disk whose read/write heads are closest to the data, minimizing access time and offering performance benefits in heavy read-oriented environments. If a failure occurs, all disk I/O operations continue on the good controller and the good drive until the malfunction is repaired. The application software, and therefore the user, is unaware of the failure. When the failure is repaired, the system automatically restores the disk.

One of the many advantages of the Stratus hardware-based, fault-tolerant approach is that it is better suited for catching transient errors than other methods. Transient errors occur when a component does not stop but for some reason produces an error. Since transient errors make up approximately 40

percent of all hardware errors, the Stratus solution—taking the board out of service—results in complete data integrity as well as the highest availability in the industry.

Hardware Checking of Duplex Components



Stratus systems are designed to survive component failure without any performance degradation. Self-checking logic detects errors and duplicate components work in lock step. If one component fails, its twin continues processing with no performance degradation.

In contrast, software-based fault tolerance attempts failure recovery through "checkpointing." In checkpointing, CPUs run separate programs. If one CPU fails, its partner must pick up the other's workload and work twice as hard, reducing system throughput.

Checkpointing requires very complex software that is costly to implement, reduces throughput, and wastes system resources. It also requires very extensive programming, and a developer never can be certain if checkpoints have been correctly coded since it is impossible to predict every failure scenario. Many users of software-based, fault-tolerant systems have disabled checkpointing rendering their systems vulnerable to failure.

Stratus hardware-based fault tolerance, however, is transparent to users and applications. There is no need to program for fault tolerance with the Stratus hardware-based approach. The time required to get an application up and running decreases substantially, and existing applications can be converted to run on a Stratus system without having to develop special fault recovery programming.

The best online service in the industry

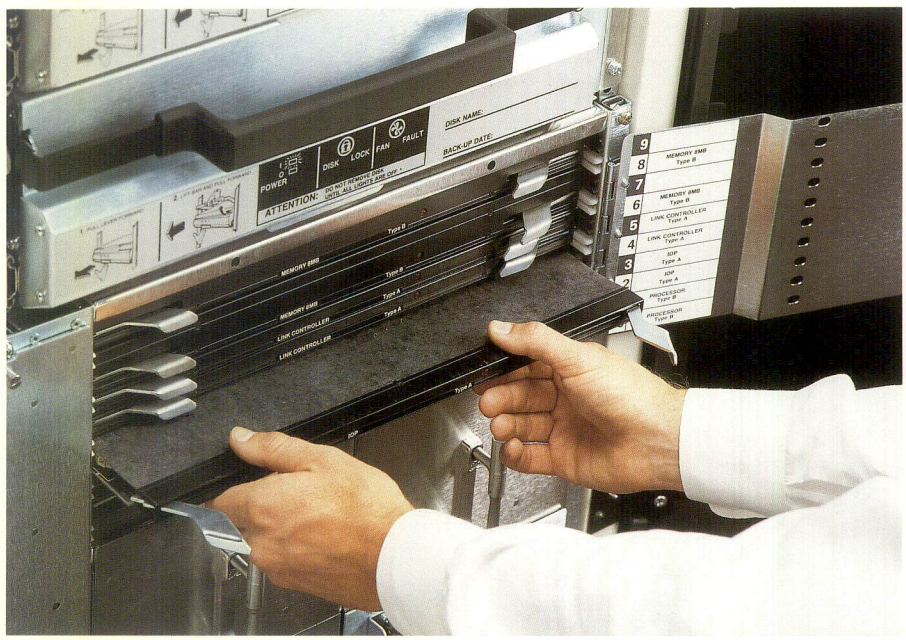
The time it takes to detect and fix failures directly affects overall applications availability. Together with Stratus hardware-based fault tolerance, Stratus' customer service approach plays a key role in providing 24-hour availability for online applications. And without exception, Stratus' remote service technology and entire service approach are the industry's most advanced solution.

Stratus' superior remote service approach is based on four critical areas: the XA™2000 architecture, the Stratus Remote Service Network (RSN™), Customer Assistance Centers (CACs), and a group of highly trained service engineers.

Stratus maintenance software, included with the operating system, runs concurrently with applications and transparently to users. When a logic board or attached peripheral fails, it immediately disconnects from the system and notifies the operating system. Processing is not interrupted. Although the failed board is taken out of service, its twin continues processing without any performance degradation.

When a component fails, the system immediately initiates self-testing procedures to determine if the failure is transient or permanent. If the failure is transient, the system automatically returns the board to service and logs the incident as a failure. If the error is not transient, the board or device is kept out of service while notification is automatically sent to selected administrative terminals and to a Stratus CAC via the Stratus highly secure worldwide RSN. Since application performance is unaffected, users are unaware that any problem existed.

Should any replacement part be required, the CAC immediately ships it directly to the site for user installation. Users easily replace failed components by sliding the failed board out of the chassis and sliding in the new board while the system continues to run at top speed. Software problems can usually be resolved by CAC personnel using a secured, built-in communications link.



Applications remain available while administration and maintenance are performed

Stratus keeps critical applications running at peak performance while upgrades, system maintenance such as disk and file backups, service, or the addition of components like I/O controllers, memory, peripherals, or CPUs are performed.

Additional CPUs, memory, I/O controllers, disks, and other peripherals can all be added online easily, while critical applications continue to run with absolutely no system performance degradation. Users can add boards by sliding the new boards into the chassis. New processors begin working immediately while the system stays running. There is no need for time-consuming systems generation, software conversions, or costly programming.

The most versatile environment for critical online computing

Adherence to openness and industry standards

Stratus provides the widest range of products designed specifically for critical online computing. Stratus originates its development strategy in three of its strengths: 1) openness and industry standards; 2) a broad family of hardware products designed specifically for critical online computing; and, 3) application platforms that are tailored to specific vertical markets.

Stratus is committed to openness and industry standards in communications, operating systems, databases, and utilities to ensure users will always have the most open environment to easily integrate all the pieces necessary to create sophisticated, online systems for critical online operations.

Stratus offers a multiple operating system environment composed of VOS, its proprietary operating system and FTX®, a UNIX® System V 3.2-compatible operating system. VOS is more open and supports more standards than any competitive proprietary operating system. With FTX, Stratus supports all relevant industry standards including System V, POSIX, and XPG and tracks X/Open. Stratus also offers Pick™ for critical data management operations.

Stratus designs, manufactures, and services its entire hardware product line specifically to address critical online applications' pressing requirements. Not only do Stratus systems offer continuous availability, they also provide symmetric multiprocessing for the most efficient online processing and transparent expandability.

Stratus' Third Party Programs, in conjunction with Stratus Industry Marketing and Stratus Independent Sales Division, offer application platforms tailored to specific market areas that provide a solid base for custom and commodity application development. These industry-specific solutions dramatically shorten development time while giving users the flexibility to change applications rapidly to meet new market opportunities.

Industry Solutions

Banking
- Cash management
- Balance reporting
- EDI
- Electronic window
- Funds transfer
- Communications interfaces
- Dealing systems

Retail Banking
- ATM
- POS

Retail
- Credit authorization
- Data collection
- Data distribution
- Network management
- EDI

Distribution
- Warehouse automation
- Warehouse management
- Order entry
- Order processing

Telecommunications
- Intelligent network
- Adjunct processor
- Intelligent peripheral
- Message switch

Securities
- Telekurs Ticker II
- Ticker IV
- Telerate
- Reuters
- Government Intradealer Brokers
- SIAC
- NASDAQ
- NASDAQ Level 2
- NASDAQ Level 3
- Futures/ Commodities Exchange
- Dow Jones News
- SOES
- Market data vendors
- Portfolio pricing services
- SIAC- CMS
- NASDAQ-SOES
- CBOE-RAES
- BSE-BEACON
- PHLX-PACE
- PSE-SCOREX
- MSE-MAX
- CEDEL
- OTC
- EuroClear
- ISCC
- NSCC

Manufacturing
- MRPII-production planning
- Financial scheduling
- Inventory control
- Material tracking
- Production maintenance
- Quality management
- Finished goods/ Distribution control
- Shop floor control
- Data management
- Device polling/ management
- Shop floor data collection
- Devices

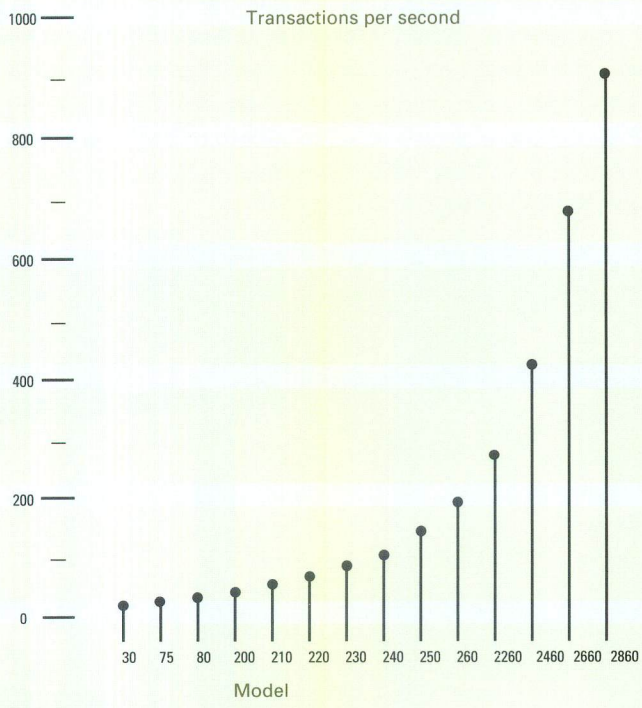
High performance through advanced design

Stratus offers 14 systems, including the four mainframe-class Models 2260, 2460, 2660, and 2860, the seven Series 200 Models 200 to 260, the Models 75 and 80, and the entry-level Model 30.

Stratus achieves high performance through the liberal use of multiple, industry-standard microprocessors distributed throughout the system. The multiple processors share the workload in a tightly-coupled architecture within a single module, while multiple modules are loosely coupled for distributed processing requirements. This tightly-coupled architecture lets a single copy of the operating system evenly distribute the workload on a priority basis to the intelligent processors through a process called "load balancing." The operating system dynamically allocates system resources to each user process on a priority basis. Highly interactive processes are allocated processing time more frequently, while batch-type processes are given longer but less frequent periods of CPU time. System administrators can customize the processing schedule to achieve the highest level of processing efficiency.

Stratus systems are based on the client-server computing model, which is generally accepted as the model for online computing in the 1990s. Stratus' two operating environments, VOS and FTX, optimize the performance of the systems, enabling all system resources—CPUs, disks, and communications interfaces—to be efficiently deployed and expanded. VOS provides a single-system view of all resources, enabling client, or user-associated, processes to transparently pass requests for transaction processing, data access, or communications operations to servers that may reside on any processor in the network. The client-server model allows users to add new client or server processes online without rewriting the application. It also enables users to incrementally add processors, memory, disk capacity, and communications lines dynamically without the cost and complexity of having to add entire new systems to the network.

XA2000 System Performance Range



From the entry-level Model 30 to the top of the line Model 2860, the Stratus XA2000 line of Continuous Processing Systems offers a full-range of performance for online applications. Users can easily upgrade their Stratus systems to receive the level of processing their business demands.

Systems

Models 2X60

The XA2000 Models 2X60 are the most powerful systems made by Stratus. These Motorola 68030 processor-based mainframe-class systems combine as many as 48 duplex processors in a system capable of handling hundreds of transactions per second. A Motorola 68882 coprocessor provides high-performance arithmetic capabilities to enhance the speed of floating point operations.

This line of computers includes the Model 2260 with 12 duplex processors; the Model 2460 with 24 duplex processors; the Model 2660 with 36 duplex processors; and the Model 2880 with 48 duplex processors. These models can expand to include a total of one gigabyte (GB) of duplex main memory, 250GB of duplex disk storage, and 3,576 communications lines in a fully configured Model 2860.

If necessary, users can expand beyond the capacity of the top-end Model 2860 by incrementally adding central electronic complex (CEC) cabinets that contain additional CPU boards and provide more main memory, disk drives, and communications lines.

Series 200

The XA2000 Series 200, which includes the Models 210, 220, 230, 240, 250, and 260, has the online speed and raw performance power to handle intensive online workloads.

The Series 200 is a multiprocessor design based on the Motorola 68030 processor. To supplement the Motorola 68030 instruction set, a Motorola 68882 coprocessor provides high-performance arithmetic capabilities to enhance the speed of floating point operations. All Series 200 models include a 128KB onboard cache, the capability to address memory capacities of up to 256MB of duplex memory when 4Mbit dynamic memory technology is commercially available, and up to 440 communications lines.

Model 200

The Model 200 provides an affordable and fully compatible entry into the Series 200 processor family and is ideal for medium transaction loads. The XA2000 Model 200 is based on the Motorola 68020 processor with a single logical processor pair and incorporates the Motorola 68881 floating point processor. The Model 200 will support up to 128MB of duplex memory and up to 440 communications lines. When workloads require, the Model 200 can be upgraded to the Models 210 to 260.

Models 75 and 80

The Models 75 and 80 are one- and two-processor midrange systems that span the range of performance and expansion capabilities between the entry-level Model 30 and the high-performance Series 200.

The Models 75 and 80 use the Motorola 68020 microprocessor and the Motorola 68881 coprocessor. The Model 75 contains one duplicate pair of processor boards; the Model 80 contains two duplicate pairs of processor boards. The memory for these systems is offered in duplex capacities of 8MB, 16MB, and 32MB. Both models support up to 96 communications lines.

Model 30

The Model 30 was designed to be both installed and serviced by non-technical users, making it the perfect processor for distributed applications.

The Model 30's internal chassis and outer shell are lightweight molded plastic construction. The chassis contains six main board slots for the CPUs, memory, and I/O processor which are inserted vertically. All boards and components are encased in plastic and are user-replaceable.

The Model 30 uses the Motorola 68030 processor and 68882 coprocessor. The memory is single-board, and is offered in 8MB, 16MB, 24MB, or 32MB capacities. The Model 30 supports up to 80 asynchronous communications lines.

The Integrated Peripheral Package (IPP) is unique to the Model 30 and contains the disk/tape adapter card, the power supply, and the choice of 5-1/4 inch hard disk storage devices (152MB, 319MB, 638MB, and 1.3GB) in one user-serviceable unit.

Also unique to the Model 30 is selectable fault tolerance, which gives customers the option of choosing the level of fault tolerance required at their site. Customers can choose selectable fault tolerance when they require: 1) the continuous availability and online service of fault-tolerant systems at some, but not all, distributed sites; 2) consistent architecture and applications in all distributed sites; 3) the ability to move to a fully fault-tolerant configuration when the need for constant computing without downtime becomes a necessity.

By adding user-installable components, users can easily upgrade to higher levels of fault tolerance without interrupting operations.

Horizontal and network expansion

Up to 32 Stratus central electronic complex (CEC) cabinets (192 logical processors) can be connected horizontally in one system via StrataLINK™, a high-speed bus that transfers data at up to 22.4MBPS. CECs can be placed up to 1500 feet apart and extenders increase the maximum intercabinet distance to more than 20 miles. The operating system provides a single, transparent system view of this grouping of CECs so that applications can expand without change as demand by users increases.

For businesses that need to connect widely dispersed operations, Stratus CECs running VOS, capable of processing thousands of transactions per second, can be connected via leased lines or public data networks using StrataNET®, a software package based on the X.25 protocol. As with StrataLINK, the operating system provides a transparent system view so that applications, users, and data can be distributed throughout the network even though the application is designed to run in a traditional single-processor architecture.

Operating Systems

VOS

VOS, Stratus' reliable, highly advanced proprietary operating system, takes full advantage of the Stratus multiprocessor architecture and combines convenient program development facilities with efficient system and user resource scheduling and allocation.

VOS features system security, transaction processing, forms management, three types of hierarchical file organizations, and transparent communications interfaces for both Stratus and non-Stratus equipment.

VOS also provides a software environment for the development of online applications. Users can write applications in six standard programming languages, and VOS supports a variety of internationally used terminal devices and character sets.

VOS combines convenient program development facilities with efficient system and user resource scheduling and allocation, along with system security, networking, and fault tolerance. VOS's broad range of quality features creates both a versatile environment for program development and a strong production environment for commercial online applications.

FTX

FTX, Stratus' fault-tolerant UNIX, is fully compliant with AT&T's System V, Release 3.2. FTX runs on the Model 30 through the Model 260, and supports hardware-based fault tolerance, symmetric multiprocessing, online performance upgrades, online component replacement, online maintenance and service, and Stratus' Remote Service Network.

FTX provides systems developers and integrators, OEMs, end users, and third-party software vendors with a stable, interoperable, System V Interface Definition (SVID)-compliant platform.

FTX is a native UNIX operating system, and its robustness has been enhanced by extensions rather than changes to the UNIX kernel. Stratus is committed to supporting industry standards for operating systems, including AT&T's System V Interface Definition and POSIX.

FTX incorporates some of the strongest features of the Berkeley Software Distribution (BSD) including Fast File System, Symbolic Links, and selected utilities including C-shells.

FTX lets users extend their UNIX-based applications by supporting a variety of industry-standard communications protocols including Sun's Network File System (NFS), STREAMS-based X.25 for wide area network support, the ability to write custom STREAMS-based protocols using the programmable UCOMM I/O Adapter, System V STREAMS and Transport Level Interface (TLI), BSD Networking subsystem featuring 'r' commands and the DARPA suite, socket-based TCP/IP networks on Ethernet, and asynchronous (tty) communications.

Product Support by Operating System

VOS	FTX	
•		2X60
•	•	Series 200
•	•	Models 75 & 80
•	•	Model 30
•		Network Express
•		SYBASE
•	•	ORACLE
	•	INFORMIX
	•	UNIFY
•		TPF
•	•	JYACC
	•	FMS
•		BASIC
•	•	C
	•	C++
•	•	COBOL
•	•	FORTRAN
•		PL/I
•	•	Pascal
	•	ADA
•	•	Symbolic Debugger
•		Multiprocess Symbolic Debugger
•		Coverage Analyzer
•		CPU Analyzer
•		OFFICE/2000 Plus
•		PMRS (Performance Monitoring & Reporting System)

Pick Open Architecture

Stratus' implementation of the Pick Open Architecture™, Version 2.0, is compatible with Pick R83, ensuring applications portability. Stratus has integrated standard Pick OA and VOS without compromising the performance or functionality of either system. Pick OA supports a powerful database environment for more than 3,000 applications. VOS supports Stratus' hardware-based fault-tolerant architecture while offering a wealth of industry-standard communications and networking capabilities, and a broad range of programming languages.

The Interprocess Data Bridge supports message and data passing between operating systems. Stratus provides a standard Pick user interface for consistency and protection for the user environment.

Communications

A proven commitment to openness and connectivity

Stratus' commitment to open and flexible industry-standard communications is based on providing users with a platform for critical online network applications that will integrate quickly and easily into both their current and future corporate networks.

Stratus' major communications offerings include five product areas: IBM networking, Open Systems Interconnection (OSI), Local Area Networking and Wide Area Networking, and industry-specific protocols.

Stratus' approach to efficient network communications begins with the system's communications hardware, subsystems of intelligent communications controllers, and line adapter cards that combine rich functionality with comprehensive fault-tolerant operations. In the Stratus communications hardware architecture, all major components are duplicated including I/O controllers and StrataLINK controllers so users never have to worry about programming for fault tolerance.

The communications software offers a full range of functionality including peer-to-peer networking, device emulation, and terminal connectivity. Stratus' communications offering ranges from ASCII terminal and personal computer connectivity, to fully distributed computer networks including IBM SNA, OSI, and LAN support, for applications and protocols for the financial, retail, and manufacturing industries.

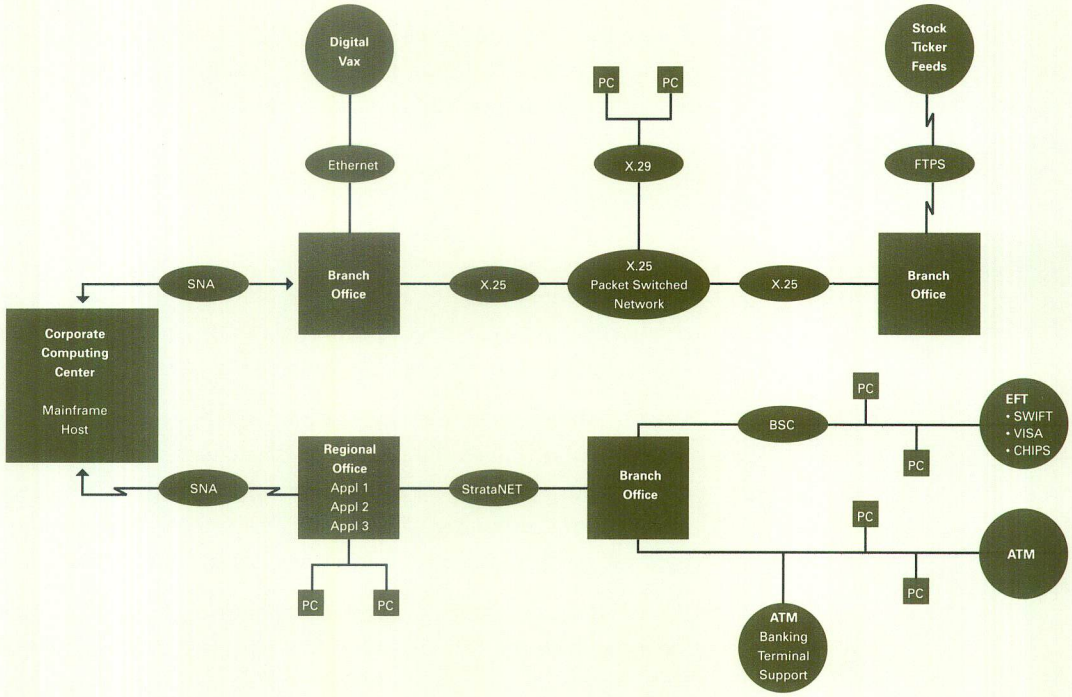
The Stratus SNA family includes a full range of communications products that lets any Stratus system function transparently in an IBM SNA networking environment. These products provide the full benefit of Stratus' transaction processing capability and fault tolerance.

Stratus is strongly committed to industry standards, and believes users should have maximum flexibility in designing their communications and networking systems. Stratus supports the Open Systems Interconnection (OSI) model and its products provide a flexible interface for applications that can take advantage of OSI protocols.

Stratus LAN support gives users direct, efficient access to standard LAN connectivity. Stratus systems, operating as a LAN server, provide the fault tolerance required by many network-based, distributed applications. The hardware and networking software provided by Stratus LAN support lets Stratus systems communicate with a variety of computers connected to Ethernet and Token Ring LANs, including terminal servers, PCs, workstations, and host computers.

Stratus also accommodates the growing number of personal computers and intelligent, high-performance workstations now being connected to networks and running critical applications. Stratus developed the Stratus Workstation Architecture and offers the connectivity to take advantage of this type of client-server computing. The Stratus Workstation Architecture integrates XA2000 systems with a broad range of workstations and personal computers including Sun and Apollo workstations, IBM PCs and PS/2s, and Apple Macintosh.

Stratus Communications Products in a Distributed Systems Network



Network Express

Network Express® is a comprehensive communications platform that provides application protocol-independent connectivity between hosts, terminals, devices, databases, and applications in a multivendor environment.

Network Express consists of three components: ASSIST, Network Express' development environment; Communications and Applications Interface (CAI), the network manager; and AWARE, Network Express' network monitor.

ASSIST gives users a standardized development environment that encourages programmers to write code in a structured and well-defined way. Applications are written in the client-server model. Developers write ASSIST applications in any of six high-level programming languages supported by VOS: BASIC, C, COBOL, FORTRAN, PL/I, and Pascal.

ASSIST provides a set of application programming interfaces (APIs) and a subroutine library that are the same for all communications protocols supported by Network Express. This reduces development time because programmers are given an application skeleton and are not required to learn a different API for each communications protocol the application will use. The subroutine library also speeds application development time because programmers do not need to be concerned with low-level logic such as message queuing and event processing.

The Communications and Applications Interface (CAI) is an overseer process responsible for monitoring and maintaining the integrity of the network. By constantly monitoring the status of the network, the CAI is aware of any process, failure, or changes in the network. If it detects any failures or changes, it takes the appropriate action.

AWARE is Network Express' powerful and sophisticated network monitor. It gives system administrators a snapshot view of the Network Express environment by letting them monitor any system, device, application, or application thread connected to the Network Express environment.

Database Management

Four industry-standard online databases are offered including SYBASE®, ORACLE®, INFORMIX, and UNIFY, in addition to memory-resident databases and other information management options.

A choice of industry-leading information management systems

SYBASE

SYBASE is an extremely powerful relational database management system developed to meet the specific demands of critical online computing. It is compatible with all standard implementations of SYBASE and runs on all Stratus systems with VOS. FTX will suport SYBASE in the future.

SYBASE provides the high level of performance users seek in a transaction-intensive environment by utilizing a client-server architecture. This server architecture is based on a multithreaded design and allows users to separate integrity and transaction logic from data presentation logic in order to provide optimal performance and to facilitate incremental growth.

Stored procedures enhance performance by centrally storing organization-wide business rules and transactions. This method results in dramatically reduced network communications and, since they are compiled already, processing times are reduced. Database-enforced integrity reduces development and maintenance costs, improves performance and reliability, and preserves central control while allowing distributed access.

The multithreaded design accommodates more users and processes tasks from many users at the same time. SYBASE SQL Server acts like a "database operating system," performing tasks most popular RDBMSs delegate to the operating system such as scheduling, task switching, disk caching, and locking.

To complement Stratus' fault-tolerant hardware, SYBASE supports database backups, diagnostics, design changes, and integrity changes while users are still accessing the database.

ORACLE

ORACLE is an ANSI-standard, Structured Query Language (SQL)-based, high-performance relational database management system that runs under VOS and FTX. The ORACLE RDBMS running on Stratus Continuous Processing® Systems provides an ideal environment for mission critical online applications in multivendor data processing networks. The linear scalability of both ORACLE's high-performance, multiserver architecture and Stratus' multiprocessor architecture combine to provide users with an easy growth path to higher levels of performance and support for high volumes of transactions.

Stratus' communications strengths, coupled with ORACLE's SQL*Net connectivity products, provide for the easy integration of Stratus systems supporting ORACLE-based applications in a corporate network. Users can easily move ORACLE applications and databases to Stratus systems and enjoy the benefits of ORACLE with the assurance of complete fault-tolerant operations.

The ORACLE RDBMS comprises the kernel, an integrated data dictionary, and a variety of all-purpose database utilities to handle all generalized database management system operations. The SQL Query Language is at the heart of the RDBMS, with many optional facilities for tailoring the ORACLE environment. ORACLE also provides a complete set of software development productivity tools in an integrated application development environment designed to increase data processing professionals' productivity and allow end users to achieve a high level of self-sufficiency. The DP professional has a faster and more cost-effective approach to the implementation of new systems. End users have immediate access to their data and get information when they need it.

INFORMIX

INFORMIX-Online is a high-performance database management system (DBMS) supported by FTX, Stratus' UNIX operating system. INFORMIX-Online is the first DBMS to combine continuous availability functions with support for multimedia database applications. Users can integrate information objects such as word processing documents, graphs, spreadsheets, scanned and digitized images, facsimiles, and voice into a UNIX-based relational DBMS.

Also available from Stratus are the INFORMIX-4GL family of fourth generation programming tools which dramatically reduce application development time; INFORMIX-SQL, a menu-driven relational database management system; and INFORMIX-ESQL family of development tools for embedding SQL in C and COBOL programs.

UNIFY

UNIFY 2000 is a high-performance, ANSI-compliant SQL relational database management system designed for high-volume, transaction-oriented, multiuser applications that require 100% uptime. It provides for online backup, online modifications to the database, and automatic recovery in the event of a system failure. UNIFY provides a wide range of application development tools including a menu handler, screen painter, query-by-forms, report generator, and structured query language (SQL).

UNIFY incorporates support for binary storage enabling the user to store any digitized image, program, or sound. Additionally, UNIFY includes support for variable-length text for document storage and custom message control for developer-defined prompts.

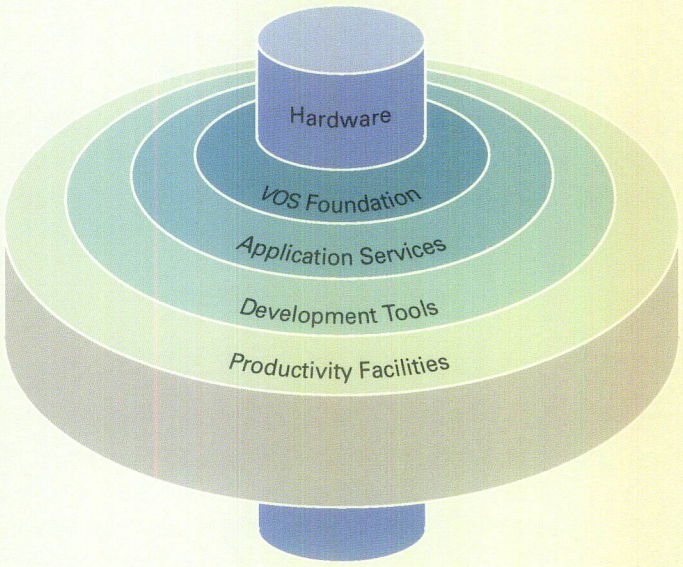
UNIFY provides five access methods: direct access, hashing, links, btrees, and buffered sequential. It delivers more than 100 configuration options to tune the performance of your specific environment.

Application Development Environment

Stratus' Application Development Environment: Oriented to mission-critical applications

Stratus organized its Application Development Environment (ADE) into a set of products and services specifically designed to ease the development and implementation of mission-critical applications. The environment is built around Stratus' hardware-based fault tolerance which frees development staffs from integrity issues. Surrounding the hardware are product groups that make up the software components of the development environment. These groups are the VOS Foundation, Stratus Application Services, Stratus Development Tools, and Stratus Productivity Facilities.

Platform Infrastructure



Surrounding the hardware core are groups of products specifically designed to ease the development and implementation of mission-critical applications.

The VOS foundation

The core of the ADE is the underlying strength and flexibility of VOS. The VOS user and programmer interface simplifies the development environment. English-like commands and viewable command parameters allow users to learn the system quickly. The VOS command macro facility provides logical command execution that reduces the need for program development or complex JCL. The macro language is enhanced by a powerful set of command functions giving users access and management over Stratus' systems under application control without 3GL program development.

The VOS protected environment provides a full set of commands, programmatic subroutines, communications protocols, and environments giving broad control over the Stratus module without risk to the system integrity. All areas of system, process, and program execution can be managed through utilities within VOS. File I/O and communications are similarly structured, and even device control is addressable by the command processor or programmatic interface. The most popular industry communications protocols are offered by Stratus, eliminating the need for programmers to develop their own drivers.

Applications Services

Stratus'ADE lets developers maximize their utilization of Stratus' architecture without having to develop custom routines to achieve the goals of their online systems.

TPF

Stratus' Transaction Processing Facility (TPF) was designed for applications characterized by a high degree of terminal interaction and critical online transactions. TPF gives developers control over all physical terminal operation, and performs forms handling, data management, and transaction control. TPF assures file protection and data integrity despite events which may affect application availability.

With the VOS Multitasking Facility, programmers can optimize process management without special programming considerations by maximizing resource utilization within a single process' address space. The multitasking facility allows multiple programs to be combined within a single process or allows a single program to be duplicated across a broad terminal community from one process. This results in the efficient control of the application environment in a transaction-oriented system.

JYACC and FMS

As online applications are characterized by a high degree of user interaction, Stratus offers two products for interactive terminal screen interface. JYACC and Forms Management System (FMS) provide a polished, professional image for Stratus applications, while reducing the development and maintenance costs associated with screen management.

Common highlights of JYACC and FMS include:

- Data type assignment
- Display picture assignment
- Cycle fields
- Required field enforcement
- Range checking
- User data validation procedures
- Video attributes assignment
- Function key usage
- Status line messaging
- Audible alarms
- Help facilities

JYACC's more advanced features include:

- Pop-up screens
- Nested windows
- Border selection
- Scrolling field
- Array management
- One-key option selection

Development tools

Stratus development tools provide high-level facilities to build, test, and implement applications on Stratus systems.

Languages

Users can write applications in eight standard programming languages: BASIC, C, C++, COBOL, FORTRAN, PL/I, Pascal, and Ada. All Stratus compilers translate source code into a Common Intermediate Code before generating optimized object code. The code optimizer is language independent, therefore it generates similar code regardless of the language used.

Symbolic Debugger

The Stratus Symbolic Debugger analyzes programs written in any of Stratus' languages. During a debugging session, the facility controls the execution of the program being tested. It enables the users to alter the program's logic flow, suspend the program, call procedures, evaluate functions, and continue program execution, all without changing the source code of the program. Break points can be set to specific statement number or to statements relative to the current statement. Variables can be examined and reset by referencing their source program names or their storage locations. The source program can be displayed at any time.

Multiprocess Symbolic Debugger

While the Symbolic Debugger executes only on a single process, the Multiprocess Symbolic Debugger can be used to diagnose an entire application environment. The Multiprocess Symbolic Debugger allows multiple programs to be opened simultaneously, even across CECs. In this debugging environment, testers can determine the interaction between programs and users in an OLTP application. The Multiprocess Symbolic Debugger is symbolic in nature, allowing variables to be accessed via their programmatic names. All other features of the standard Symbolic Debugger are supported.

Coverage Analyzer

Stratus' Coverage Analyzer is a mechanism by which programmers can perform the testing technique of code coverage. This facility indicates which source lines have been executed during a test run, providing figures as a percentage of the overall program.

CPU Analyzer

Stratus' CPU Analyzer gives programmers a view of the execution times of each line of code as it is resident on a CPU. Programmers are thus able to understand where bottlenecks are occurring within programs and take action to correct any performance issue. Each line of code is displayed in source code format with its corresponding CPU time measured in milliseconds.

Productivity Facilities

The Productivity Facilities are made up of products which substantially enhance the development of applications on Stratus' family of computers.

JAM

The JYACC Application Manager (JAM) complements JYACC's screen manager as its development facility for online applications.

JAM is a programmer's toolset to develop screen interfaces and prototype applications before 3GL coding is begun. The result of this function is the reduction of design errors during the application development process. JAM facilitates the creation of forms and the linking of hierarchical forms in support of multilevel, or menued, applications. JAM allows live, interactive testing of the screen shell without 3GL programming. End users may evaluate the application before coding begins.

JAM provides the ability to directly access VOS, ORACLE, or SYBASE databases simultaneously from the form, thus facilitating the creation of simple applications without 3GL code. The JYACC Procedural Language (JPL) is an interpretive, block structured language which allows programmers to attach special complex editing procedures to a field or form. These scripts can be written without leaving the JAM environment. The JYACC Data Dictionary aids in the identification, definition, and management of data throughout a JYACC-based application.

PMRS

Stratus' Performance Monitoring and Reporting System (PMRS) is Stratus' facility to streamline an application's execution. Via PMRS, programmers can achieve an understanding of an application's performance *before* the software goes into production.

PMRS allows System Administrators and developers to: 1) load balance applications across Stratus resources; 2) perform resource and capacity planning for an application or set of applications; 3) perform bottleneck identification; 4) achieve a high degree of application, or system, performance analysis.

OFFICE/2000 Plus

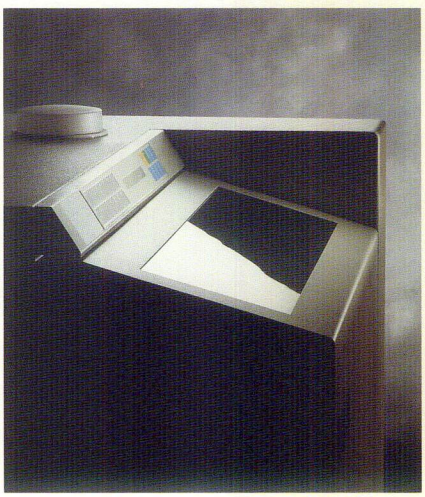
OFFICE/2000 Plus includes the OFFICE/2000 office system, the WordPerfect Version 4.2 Word Processing System, and the PC/Connect2 terminal emulation facility in a single package. OFFICE/2000 is an integrated office automation product which provides the following generic office applications: sending, receiving, answering, and filing mail; creating and editing letters for mailing; filing, organizing, and retrieving documents, letters, and files created on the PC; and printing documents.

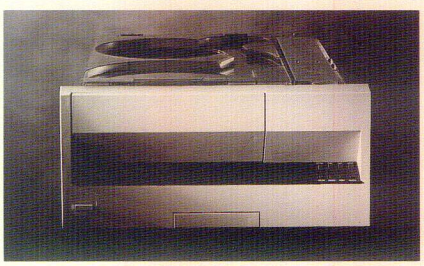
Peripherals

A full range of peripherals complement the product line

Stratus peripherals help users meet the high-performance demands of their critical online computing applications. Users have the full protection of Stratus' continuous availability and they can easily expand within the product line with the assurance of total software compatibility.

The Stratus range of peripherals products includes disks and disk subsystems, line printers, streaming magnetic tape drives and tape interfaces, and video terminals. All peripheral products are supported by Stratus' continuous online service. If a component fails, the system automatically diagnoses the problem without interrupting application processing. Connection to Stratus' worldwide network of Customer Assistance Centers (CAC) via the Remote Service Network (RSN) ensures that users receive factory-tested replacement parts by overnight delivery .





The Stratus product family:
Focus and options

The best platform for critical online computing

From its beginning, Stratus developed systems to specifically meet the demanding requirements of critical online computing. Today, Stratus offers the most versatile line of products to give you the highest level of application availability and the most alternatives implementing your most critical business applications. As the leader in critical online computing systems, Stratus is aggressively pursuing emerging technologies and rapidly incorporating the latest standards and developments in openness.

The Stratus open, multiprocessor architecture is not tied to any one chip instruction set. As newer and faster processors emerge, Stratus will quickly incorporate them into its hardware design, passing performance and cost-effectiveness gains on to the customer. As new standards are defined for communications, operating systems, databases, and utilities, Stratus will adhere to these standards to ensure that users will have the most open and flexible critical online computing environment in which to do business.

The following briefs are available for more in-depth information on Stratus products and services. Please contact your Stratus representative to obtain copies.

Remote Job Entry
VOS Symbolic Debugger
X.25/X.29 Networking Facility
SNA
StrataNET
Programming Languages
ORACLE
Customer Service
MAP Communications Support
Hardware/Software Communications
SNA Device Support
3270 Emulator Facility & Terminal Support
VOS
Peripherals
Stratus PC/Connect
D201 User-Serviceable Disks
SNA Secondary Communications Support
Universal Communications Adaptor
Ethernet
SYBASE
Intelligent Workstation Support
SNA Network Interface Support
Advanced Program-to-Program Communications
Primary Systems Network Architecture
Distributed System Services
Secondary Systems Network Architecture
Communications and Systems Management
Forms Management System
Transaction Processing Facility
OSI Server
Transportation Protocols
Channel Attach Subsystem
Network File System
Token Ring Products
Model 30
OFFICE/2000
JYACC (JAM)
FTX
Network Express
OSI
PMRS
Models 2X60
Series 200
Models 75/80
Programmable Ethernet
Pick

For more information regarding Stratus and its family of online products, contact your local Stratus representative.

In North America:

Albany
518-452-4288

Atlanta
404-392-1402

Baltimore
301-356-8847

Boston
617-890-5552

Chicago, Loop District
312-368-1717

Chicago, Suburban
312-449-7872

Cleveland
216-292-8180

Dallas
214-458-0402

Denver
303-779-8440

Detroit
313-591-6150

Edison, NJ
201-494-5300

Greensboro
919-668-3344

Hartford
203-523-8941

Houston
713-552-1723

Los Angeles
213-640-1771

Miami
305-670-3711

Minneapolis
612-854-9449

Montreal
514-982-2221

Nashville
615-391-5396

New York
212-530-0600

Philadelphia
215-660-9734

Phoenix
602-952-8262

Pittsburgh
412-787-3050

Richmond
804-346-9560

Rochester
716-777-4130

Sacramento
916-362-5064

St. Louis
314-576-6102

Salt Lake City
801-263-5536

San Francisco
415-433-9120

Seattle
206-451-9505

Tampa
813-281-1010

Toronto
416-947-9504

Washington, D.C.
703-448-8500

Westport, CT
203-454-2915

International:

Amsterdam
31-3465-7444

Brussels
32-2-242-4119

Frankfurt
49-6196-47250

Helsinki
358-0-35-11-144

Hong Kong
852-5-844-5200

Hounslow, England
44-081-570-4433

London
44-071-247-2988

Warrington, England
44-925-830-345

Madrid
34-1-393-91-03

Milan
39-2-2641-2609

Paris
33-1-42-67-03-03

Sydney
61-2-954-0655

Tokyo
81-3-234-5301

Stratus

Stratus Computer, Inc.
55 Fairbanks Boulevard
Marlboro, MA 01752
(508) 460-2000

Stratus Computer PTY, Ltd.
Level 14
99 Walker Street
North Sydney
New South Wales 2060
Australia

Stratus Computer S.A.
Tour Leopold 4th Floor
Rue de Geneve 10
1140 Brussels, Belgium

Stratus Computer Corporation
600 de Maisonneuve Blvd. Ouest
29e Étage C.P. 55
Montréal, Québec
Canada H3A 3J2

Stratus Computer Corporation
120 Adelaide Street West
Suite 2000
Toronto, Ontario
Canada M5H 1T1

Stratus Computer, OY
Malmin Kauppatie 8
00700 Helsinki, Finland

Stratus Computer S.A.
14 Rue de Prony
75017 Paris, France

Stratus GmbH
Frankfurter Strasse 63-69
6236 Eschborn TS
Federal Republic of Germany

Stratus Computer, Ltd.
Central House Lampton Road
Hounslow, London TW3 1HY

Stratus Computer (Hong Kong) Ltd.
1201 Two Pacific Place
88 Queensway
Hong Kong

Stratus Japan, K.K.
Shoei Rokubancho Building 4F
6 Rokubancho, Chiyoda-ku
Tokyo 102, Japan

Stratus Computers B.V.
P.O. Box 1300
3600 BH Maarssen
The Netherlands

Stratus Computer, S.A.
Avenida de Burgos, 8-5 planta
28036 Madrid
Spain

Stratus Italia, S.R.L.
Residenze "Le Querec" 801
Milano 2
20090 Segrate-Milan
Italy

Stratus, the Stratus logo, Continuous Processing, FTX, and StrataNET are registered trademarks, and XA, StrataLINK, and RSN are trademarks of Stratus Computer, Inc. All other registered trademarks and trademarks are properties of their respective holders.
ORACLE is a registered trademark of Oracle Corporation.
SYBASE is a registered trademark of Sybase, Inc.
Pick and Pick Open Architecture are trademarks of Pick Systems, Inc.
UNIX is a registered trademark of USL.
Network Express is a registered trademark of Scientific Software, Inc.

© 1990 Stratus Computer, Inc. X127