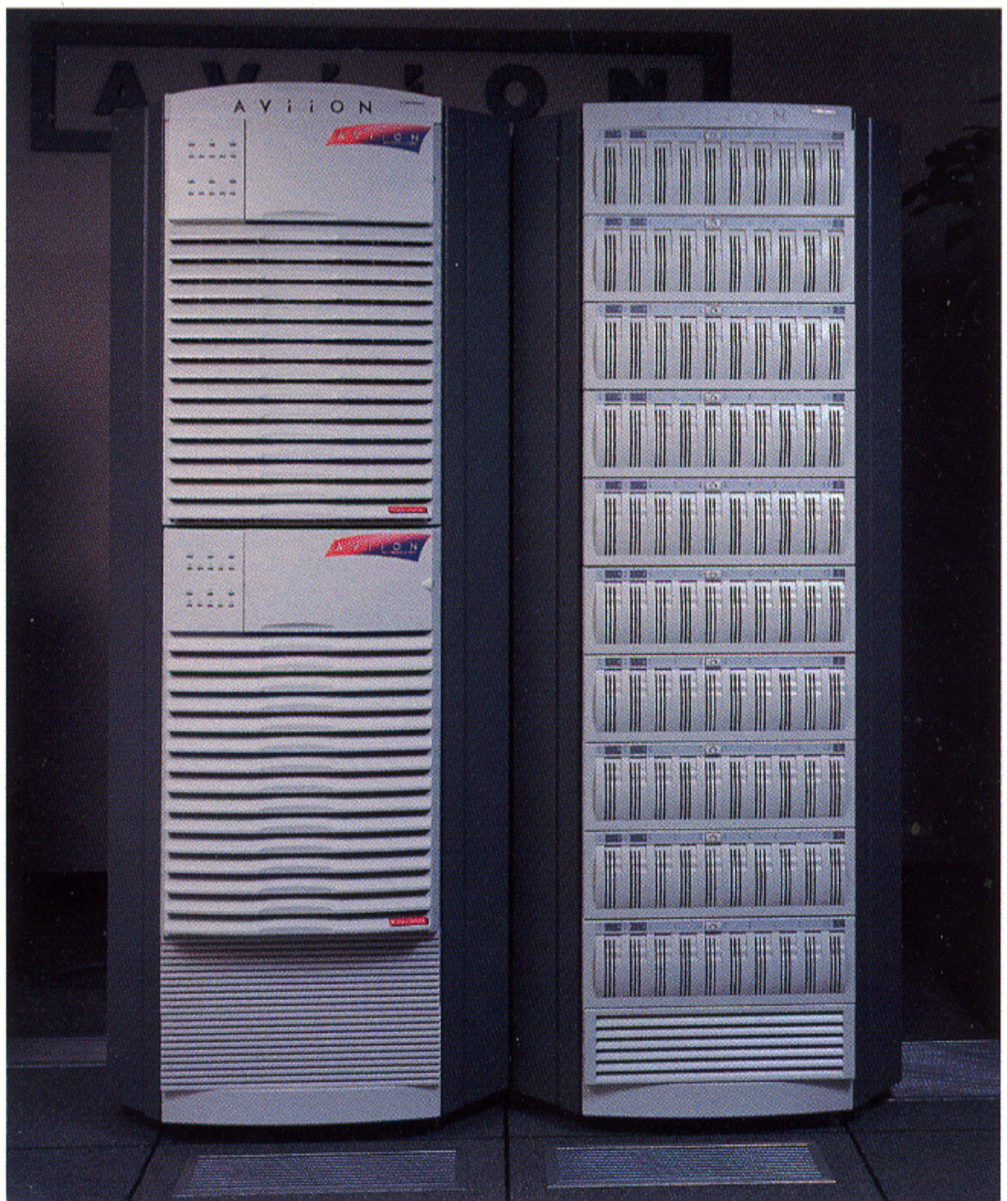
The AV 25000 ccNUMA server is the new high end of the AViiON® product line, bringing mainframe levels of scalability in processors, very large memory pools, and a hundred-terabyte CLARiiON® Fibre Channel storage capacity to Data General's family of enterprise-class servers. With third-generation NUMALiiNE™ technology based on Intel's high-performance Pentium® II Xeon™ processor, the AV 25000 augments the field-proven AV 20000 as the server of choice for the largest OLTP, ERP, or healthcare applications.

The AV 25000, built from highly modular quad-processor Scalable Building Blocks (SBBs), enables customers to incrementally grow their systems in terms of processors, memory, I/O, and interconnect to support business expansion, as needed. The AV 25000 is available in a range of configurations starting from an entry-level four-processor, ccNUMA-ready server, through an economical configuration optimized for eight processors, and up to as many as 64 Pentium II Xeon processors.

AVFlex

The AV 25000 is the foundation for Data General's AVFlex™ environment, a comprehensive set of services and products which provides customers with unprecedented levels of flexibility and investment protection in deploying UNIX and NT enterprise solutions. AVFlex allows customers to configure systems to meet their present requirements and easily reconfigure when application or business needs change. AVFlex delivers these benefits through modular growth, mixing of AV 20000 and AV 25000 building blocks, partitioned AV 25000 systems, DG/UX® and NT interoperability, integrated systems management, and implementation services.



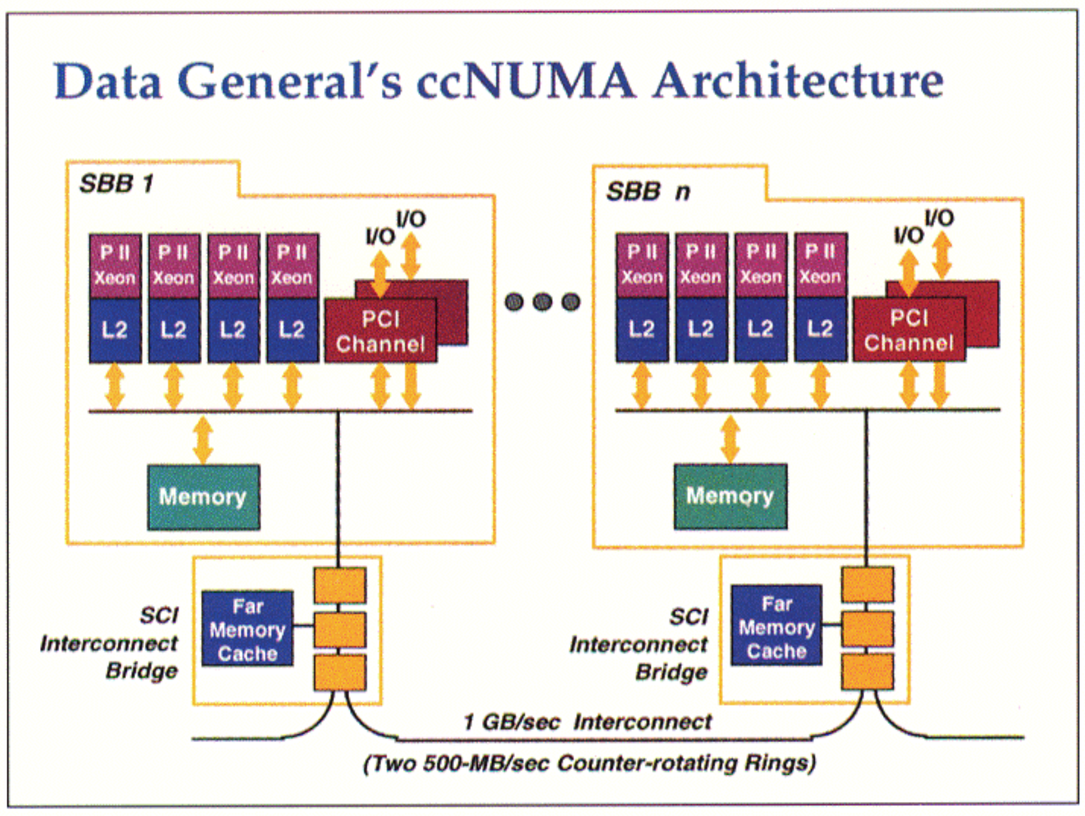
Benefits

- Flexibility
  - Adapt to changing workloads
    - Scales up to 64 Pentium II Xeon processors with cost-effective, modular growth
  - Entry-level quad-processor "NUMA-ready" system
  - Optimized eight-processor midrange configuration
  - Configurations grow with processor count
    - 10 PCI slots per building block, up to 160 slots total in 64-processor system
    - Very large memory support up to 64 GB of physical memory; up to 8 GB per SBB
    - Dual counter-rotating SCI rings interconnect SBBs with aggregate 1-GB/sec bandwidth
    - Large far memory cache, available in both standard and enhanced configurations, minimizes remote memory accesses across SBBs
    - Over 100 TB of fully connected CLARiiON disk storage using either SCSI or Fibre Channel arrays provides redundant high-performance connections between processors and data
    - Aggregate I/O bandwidth, up to 8.5 GB/sec in a 64-processor system
- Performance optimization and partitioning
  - Class Scheduling Facility (CSF) workload optimizer dynamically partitions DG/UX applications across SBBs
  - System can be partitioned to run multiple instances of a single operating system or multiple operating systems

(continued)

Benefits (continued)

- Supported by the DG/UX operating system
  - Optimized for the ccNUMA architecture, allowing applications to transparently benefit from ccNUMA performance and scalability
  - Very large memory and file system support large-scale databases
  - On-line storage management
  - On-line file resizing
  - Fast file recovery
  - Automated rebooting and restarting
- Adapt to New Applications
  - Prototype new applications with independent DG/UX partitions
  - Access Microsoft Windows NT Server applications in system partitioned into DG/UX and NT SBBs
  - DG/UX and NT interoperability provides "best of both worlds" application services
- Investment Protection
  - Intel Processor Progression
    - Easily add AV 25000 Pentium II Xeon processor-based building blocks to installed AV 20000 Pentium Pro processor-based system running a single copy of the operating system
    - Re-use investments in systems packaging, memory, mass storage, and I/O
    - Incorporate future enhancements to Intel processor roadmap
  - Storage
    - CLARiiON CL3000 protects SCSI disk investments
    - CLARiiON CL3000, FC3000, and FC5000 investments carry forward
  - Protect critical information and maintain application availability
    - AV 25000 High Availability
      - Hot-swappable, N+1 power and cooling (independent in each block)
      - Deconfiguration of individual SBBs upon failure
      - ECC memory
      - Dedicated diagnostic and server management board in each SBB
      - Optional second memory board per block for redundancy and performance
      - Dual, redundant SCI rings
      - Automated, intelligent system monitoring and diagnostics
      - Soft error thresholding
      - AV/Alert℠ diagnostic support service initiates alerts to service centers and dispatches support as needed
      - Redundant server management consoles
    - CLARiiON fault-tolerant disk array subsystems
      - Fibre Channel technology improves performance, reliability, and connectivity
      - N+1 power, cooling, and storage processors
      - RAID or mirrored disks options to safeguard information
    - DG/UX Clusters for continuous application availability
      - AV 25000 QuickClusters™: factory-configured and tested
      - Failover Clusters
      - Disaster Recovery Clusters
  - Reduce system management costs
    - Powerful, easy-to-use, integrated systems management console includes Web-based M3W™ server management, and Navisphere™ for management of CLARiiON storage
    - Optionally integrates with other systems management software, including NTerprise Manager™, and Data General Enterprise Management (DGEM) products for the DG/UX operating system, such as DG/UX Manager™
  - Reduce application development costs
    - SMP applications run without changes
    - Shared memory model is familiar to developers



ccNUMA Architecture

The AV 25000 achieves excellent scalability, easy upgradability, and industry-leading price/performance through the use of the ccNUMA architecture, an extension to symmetric multiprocessing (SMP), that is the foundation for today's large-scale systems. Data General's ccNUMA architecture, capable of supporting up to 1,024 processors, is implemented in the AV 25000 as commodity processing SBBs based on Intel Standard High Volume (SHV) motherboards, interconnected by a high-speed link. Built upon industry standards, the AV 25000 uses the latest Intel enterprise server technology and will continue to aggressively incorporate future technology enhancements.

The ccNUMA architecture combines the best features of SMP and MPP (massively parallel processing) systems. Like MPP systems, ccNUMA systems' processors, I/O, and memory scale linearly as building blocks are added, and there is no monolithic backplane. Like SMP servers, ccNUMA systems maintain unified, global coherent memory, with all resources managed by a single copy of the operating system. As a result, today's SMP applications run on ccNUMA systems without change, and new applications can be developed without extensive re-tooling. A hardware-based cache coherency scheme ensures that data held in memory is consistent on a system-wide basis.

Successive Generations of ccNUMA Servers

The AV 25000 is Data General's third generation of ccNUMA systems. Data General pioneered the use of the ccNUMA architecture in commercial computer systems with the introduction of the AV 10000 in 1995. To date, Data General has deployed approximately 500 ccNUMA servers, supporting our customers' most demanding mission-critical applications.

Data General's first AViiON Intel processor-based system based on ccNUMA technology was the AV 20000, a four- to 32-processor shared-memory system constructed of one to eight Pentium Pro processor-based SBBs. The AV 25000 extends the product family with four- to 64-processor configurations based on up to 16 SBBs using Pentium II Xeon processors. Each block incorporates a quad-processor motherboard, I/O subsystem with ten PCI slots, 512 MB to 8 GB of memory, N+1 hot-swappable power and cooling, and SCI interconnect hardware.

Shared memory across multiple blocks is provided by an interconnect and cache coherency control system based on the IEEE standard SCI. Communications and mass storage connections are provided on I/O subsystem boards using standard PCI controllers selected for the high-throughput and connectivity demands of large data processing environments.

AV25000 System Components

Intel CPU Motherboard and Pentium II Xeon Processor. AV 25000 SBBs are built upon an Intel SHV motherboard with a 64-bit data, 36-bit address, split-transaction bus. Attached to this bus are four Pentium II Xeon processors, two Intel 82450NX PCI bus bridges, and a DRAM memory system interface to dual memory boards, as well as a connector for the SCI Board.

Very Large Memory Support. Typically, applications running on 32-bit systems can use only 4 GB of memory. Data General has overcome this memory limitation by using the 36-bit physical address capabilities of the Pentium II Xeon processor on the DG/UX operating system. As a result, the DG/UX operating system can support up to 64 GB of physical memory. This very large memory support can translate into transaction processing performance gains of up to 40 percent.

SCI Subsystem. The SCI interconnect and its associated software configure all of the SBBs in a system into a Virtual Computer System (VCS). The VCS runs a single copy of the operating system across all blocks.

The interconnect is provided by an SCI board that plugs into each block. This board contains a chip set that manages memory coherency access across blocks (forming individual block memory into a single shared Global Coherent Memory pool) and controls a large (up to 128 MB) Far Memory Cache. Similar to an L3 cache, the Far Memory Cache mitigates any latency effects while performing accesses to remote blocks. An associated Fabric Interconnect Board provides a reliable SCI transport service for the system and either directly connects two building blocks or provides an interface to the SCI rings depending upon the size of the system.

The AV 25000 uses two SCI buses operating at 500 MB/sec each to provide an aggregate bandwidth of 1 GB/sec to the system. Each SCI bus uses point-to-point connections to achieve the high signal integrity necessary for high-frequency data transport. The point-to-point net is implemented as rings for both availability and performance. The rings and the packet routing are configured to circulate in opposite directions for increased performance by choosing the ring with the shortest path to the target SBB.

Input/Output Subsystem. The AV 25000 server can be configured with up to ten PCI controllers per block using dual PCI bridges on the SBB motherboard. The PCI subsystem on each block has an aggregate bandwidth of 533 MB/sec.

Fully Connected I/O. CLARiiON disk array subsystems are fully connected to each SBB to maximize system and I/O performance as well as system availability. Hubs or switches maximize available bandwidth and serviceability. Fully connected I/O provides high-performance direct connections between every CPU and disk array subsystem without using any SCI interconnect bandwidth resources.

System Management

Server Management Software. M3W (Monitor, Manage, and Maintain) Web-based server management provides control, configuration, and status reporting. The M3W Management Console is the primary interface for server management operations such as power up, booting, configuration, and service. It interfaces to an AV 25000 through a 3D (Diagnosis, Device management, and information Display) board that is a standard component of every SBB. A single M3W management console is capable of managing multiple AV 25000 servers. Management functions can also be accessed from remote locations using a standard Web browser interface.

Enterprise Management

For managing other aspects of the system, M3W can be combined with Navisphere Manager for AViiON systems and DGEM components such as DG/UX Manager to manage all of the hardware from a single workstation.

Navisphere for AViiON Systems provides complete graphical management of CLARiiON Fibre Channel disk array products. (Management capabilities for key SCSI CLARiiON disk array models will be added in the future.) Navisphere is required for all AV 20000 and AV 25000 systems connected to Fibre Channel arrays.

DGEM gives an even higher level system management functionality that encompasses the operating system, network, clustering, and security. DG/UX Manager, DG/UX Graphical FileSystem Manager™, and DG/UX Cluster Manager™ provide familiar Windows-based graphical monitoring of AV 25000 resources within an enterprise, delivering the capability of "lights out" management of resources wherever they reside within a worldwide network. For enterprise-wide management of multi-vendor computing environments, Data General offers products, such as Unicenter TNG and Tivoli.

In AVFlex configurations that include an Windows NT Server partition, NTerprise Manager software is also integrated into the management console.

Reliability, Availability, and Serviceability

Reliability. Like all other Data General enterprise servers, the AV 25000 is the product of a carefully planned design methodology and exhaustive testing. The design and test process includes:

- Complete system and multi-system testing, not just component testing
- Working with many vendors to find robust components, such as PCI cards, capable of functioning in enterprise configurations
- Highest quality manufacturing processes and procedures, certified under ISO 9000.

Availability. With the AV 25000, Data General continues its focus on high availability by providing a reliable hardware base that helps avoid extended downtime through the addition of redundant components. Data General's high-availability approach is to be able to deconfigure a system's failed component while resuming processing with the remaining components.

In general, AV 25000 component deconfiguration is at the SBB level since this results in minimum system reboot cycles and downtime in multi-block systems. The AV 25000 also has hot-swappable N+1 power and cooling, ECC memory, and the ability to deconfigure individual components such as processors within individual blocks.

In addition to hardware availability, the AV 25000 takes full advantage of the capabilities of the DG/UX operating system which include fast file recovery as well as automatic rebooting. These capabilities are superior to those provided by other implementations of the UNIX operating system.

DG/UX Clusters

Clustering is supported on the AV 25000, providing the highest availability and performance for the largest business-critical computing applications. DG/UX Clusters™ software provides shared file, batch, and print services, application failover, and shared database servers. Data General offers three clustering approaches to meet customer operational requirements:

Failover Clusters. Failover Clusters simplify DG/UX Clusters installations for the customer who is using clustering for availability and does not have "cluster-aware" applications such as Oracle Parallel Server Option.

QuickClusters. AV 25000 QuickClusters simplify cluster configuration and installation by bringing together hardware, software, and implementation services in a single package. QuickClusters consist of two four-CPU, two eight-CPU, two 16-CPU, two 32-CPU, or two 64-CPU AV 25000 systems, together with all other components, such as 100 GB of CLARiiON Fibre Channel storage, a management station, DGEM software, DG/UX, and DG/UX Clusters Planning and Implementation Services.

Disaster Recovery Clusters. Disaster Recovery Clusters protect user data against accidents that affect entire sites. Using software mirroring, optical Fibre Channel switch technology, and CLARiiON Fibre Channel arrays, Disaster Recovery Clusters allow customers to replicate critical data in a different building within a campus or even a different site. With Ethernet repeaters for heartbeat and Distributed Lock Manager traffic together with FC3000 or FC5500 disk arrays, cluster nodes and storage can be separated by up to 500m in a distributed cluster which can ride through failures affecting an entire data processing facility.

For environments requiring greater distance, FC5500 disk arrays, Fibre Channel switches, and long-distance Fibre Channel interconnect technology can be used to remotely mirror data to a remote CLARiiON disk array up to 10km away. Combined with a duplicate system on standby, customers can use this capability to recover quickly from natural and manmade accidents affecting an entire site with the minimum of disruption.

Serviceability. The AV/Alert diagnostic support service, standard with every AV 25000 server, alerts Data General service experts at the Customer Support Centers (CSCs) to help prevent or diagnose system failures. This capability allows Data General to deliver faster, more accurate, and more cost-effective service and support. The AV 25000 is installable, maintainable, and upgradable by Data General Account Engineering staff.

AV/Alert capabilities are enhanced in the AV 25000 by the separate 3D Board which has its own processor and is a standard part of every SBB. Through this board, each SBB is directly connected to the management console for fast, accurate problem diagnosis and status display.

DG/UX Operating System

The DG/UX operating system is the industry-leading implementation of commercial UNIX provided for the AViiON family of enterprise servers. DG/UX software is the result of years of intensive focus on the needs of commercial applications running across a spectrum of industries from healthcare and retail to government and manufacturing. The design and implementation of the DG/UX operating system have focused on the following customer requirements:

- Outstanding price/performance, allowing the full power of SMP and ccNUMA to be deployed
- Unsurpassed reliability and availability
- Excellent management of large amounts of information
- Industry-leading flexibility and investment protection through partitioning capabilities
- Enterprise-class systems management and administration
- Enterprise-class security features

A broad range of layered horizontal and vertical software products from leading vendors is available on the DG/UX operating system for the AViiON product line.

AVFlex Services

For customers who want to take advantage of the flexibility and investment protection that the AVFlex environment offers, Data General provides a comprehensive set of implementation services. These include:

INFRASTRUCTURE ANALYSIS **to understand and exploit the existing business-computing environment.**

Enterprise Technology Infrastructure (ETI) Consulting Service
Maps, analyzes, and characterizes the customer's computing infrastructure and facilitates selection of new technology that aligns with their business goals and inserts most efficiently into the existing infrastructure's architecture.

PLATFORM SERVICES **to custom-configure AVFlex components**

DG/UX Implementation Services for ccNUMA
Hardware installation as well as custom configuration of the basic AV 25000 or AV 20000 environment including the DG/UX operating system (single copy), and configuration of the management console.

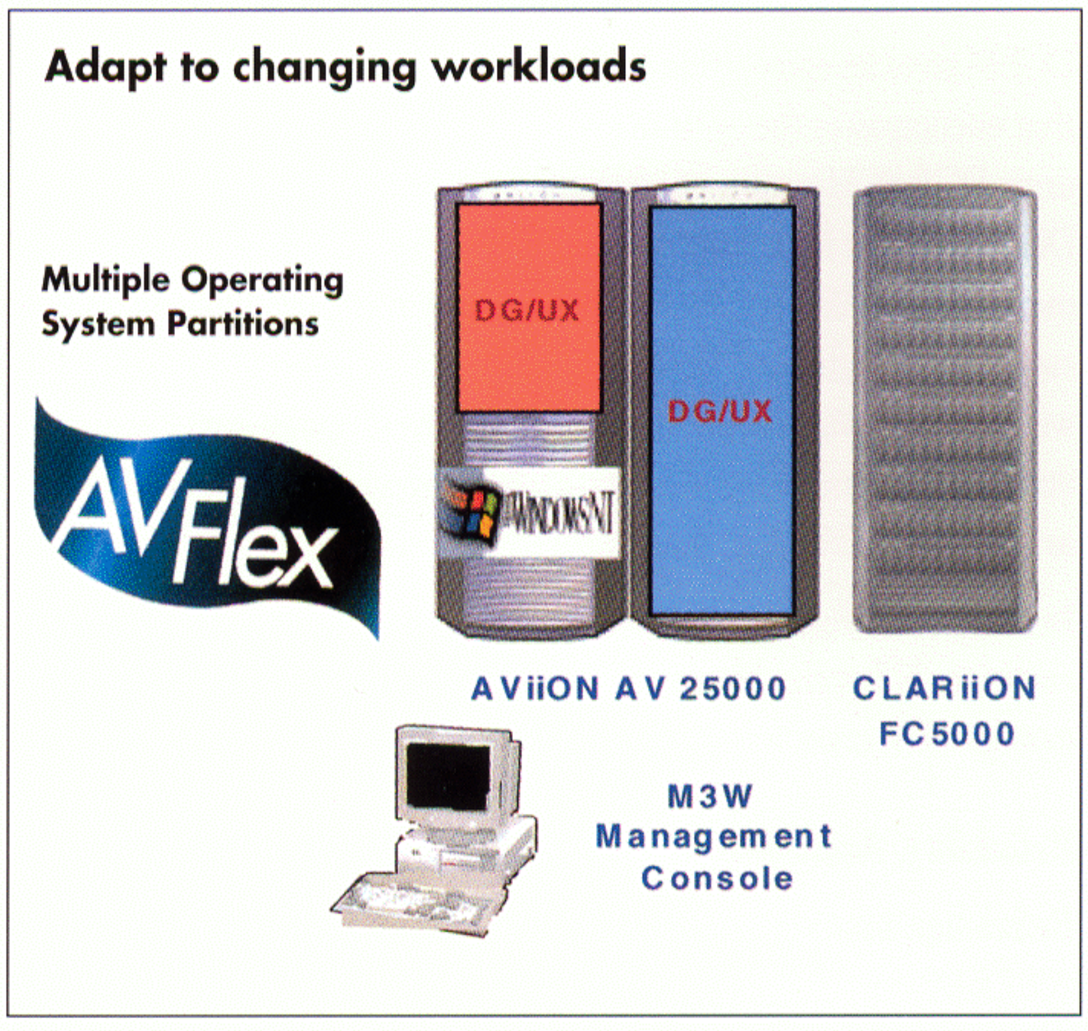
Fibre CLARiiON for AViiON Services
Hardware installation and custom configuration of Fibre Channel disk arrays; migration service from SCSI CLARiiON to Fibre CLARiiON is available at at custom quote.

DG/UX Clustering Services for ccNUMA
Hardware installation and custom configuration of DG/UX Clusters operating environment consisting of clusters of AV 20000, AV 25000, or mixed-block ccNUMA systems.

AVFLEX SERVICES **to design and configure the best combination for your unique situation and needs, maximizing the flexibility provided by this sophisticated technology.**

AVFlex Partitioning Services
Customized services that include planning, configuration, and system management review for AV 25000 servers including:

- Single DG/UX to Multiple DG/UX partitions
- DG/UX and Windows NT partitions
- CSF to optimize application performance on mixed-block systems



AViiON Systems; CLARiiON storage

AViiON systems have been designed to help customers get the maximum value from their business-critical applications. AViiON servers leverage the power of the Intel architecture to provide customers with a broad and scalable family of high-performance systems featuring comprehensive security, high availability, and serviceability.

AViiON servers are an excellent platform for enterprise applications. Data General's DG/UX operating system is one of the most technically advanced UNIX operating systems on the market.

The company's CLARiiON family of advanced storage systems enables customers to maximize data and application availability virtually anywhere in the enterprise. CLARiiON products support AViiON servers, all of the leading UNIX platforms, Microsoft Windows NT Server, Novell NetWare, and mainframe systems.

Simplifying complex technology for our customers has long been a hallmark of Data General. We use the best commodity technologies to design advanced systems that enable customers to ride new price/performance curves. We build software alliances with the world's leading software companies to deliver complete enterprise solutions. And, we provide comprehensive integration services to design, implement, and support business solutions.

AV 25000 Specifications

Processor	
Intel Pentium II Xeon	32-bit CPU with 64-bit data bus; Intel slot-2 architecture; 36-bit physical address bus
Up to 64 CPUs in 16 SBBs	Pipelined, SuperScalar architecture with Dynamic Execution
Cache (per CPU)	
L1	32-KB (16-KB code, 16-KB data) on-chip, four-way associative code, two-way associative data
L2	512 KB or 2 MB; four-way set associative Full CPU speed, 64-bit interface
Operating System Support	DG/UX System R4.20
Main Memory	
Maximum	64 GB (up to 4 GB per block with 128-MB DIMM, up to 8 GB with 256-MB DIMM)
128-MB Memory DIMM	TSOP packaging, EDO 64-Mbit with ECC; 512-MB increments with four-way interleave
Memory Boards	One standard, second optional per building block
Interconnect	SCI (ANSI/IEEE 1596-1992)
Max bandwidth	1GB/sec (500MB/sec per ring on dual counter-rotating rings)
Far Memory Data Cache	32 MB standard, 128 MB enhanced
PCI Bus	
160-slot maximum	Ten slots per SBB (4 x 64-bit, 5 x 32-bit) on dual Intel 82450NX PCI bridges
I/O Bandwidth (peak)	133-MB/sec 32-bit channel; 267-MB/sec 64-bit; 533-MB/sec/SBB; 8.5-GB/sec/64-processor system
Internal Mass Storage	CD-ROM, QIC tape, 4mm tape, 8mm tape, 9-GB disk
External Mass Storage	CLARiiON Fibre Channel and SCSI disk arrays; DLT libraries and arrays; Combined Storage Subsystem for 4mm, 8-mm, DLT 4000 and 7000 and QIC tapes; reel-to-reel tape. All disk array storage is fully and redundantly connected to each SBB
Diagnostics	AV/Alert machine-initiated callout diagnostic support service, 3D board in each SBB for extended diagnostics support and server management interface
Support	Installable, maintainable, and upgradable by Data General account engineering. Hardware installation included in purchase price.

AC Power (per block)	
AC voltage input	120/240V VAC -10/+15%
AC frequency input	47 - 63 Hz
VA Rating	1155 VA (max.)
Input watts	1132 watts (max.)
Power factor	.98 (minutes at full power)
Heat dissipation	3865 BTU/hr max.
Inrush current	70 A max for 1/2 line cycle
AC inlet	C 22 Appliance Coupler
Temperature	
Operating with mass storage	10°C to 38°C (50°F to 100°F)
Non-operating	-40°C to 65°C (-40°F to 160°F)
Rate of change per hour	10°C or 20°F
Relative Humidity	
Operating	20 - 80 percent
Non-operating	10 - 90 percent
Altitude	
Operating	2,438 meters (8,000 feet) Derate max temp by 1.5°C (2.7°F) for every 305 meters or 1,000 feet above normal altitude limits
Acoustics	
Operating (single frame)	6.8 Bels, 55 dBA
Operating (system max)	7.0 Bels, 60 dBa
Idle (single frame)	6.6 bels, 50 dBA
Dimensions	
for Frame	
Height	71.1 cm (28 inches)
Width	44.7 cm (17.6 inches)
Depth	74.9 cm (29.5 inches)
Weight	
Frame	61.3 kg (135 lbs.)
SBB	31.8 kg (70 lbs.)
Agency Approvals	
Safety	UL 1950 CSA C22.2-950 EN60950 (TUV)/IEC 950 Swedish Norm 26.2
Acoustics	
Electromagnetic Emissions and Immunity	FCC part 15 A VCC Class I (Japan) C108.9-1983 (Canada) EN55022 Class A (Europe) IEC 801-2 (ESD) IEC 801.3 (RAD IMM) IEC 801.4 (EFT) IEC 801.5 (HET) IEC-555-2/EN60555 (harmonics) CE Mark - Reference 108-000596

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