

Paragon™ XP/E Supercomputer

*A new level of
affordability for
Paragon™ systems.*

Designed to provide entry level access to Paragon™ technology, Paragon XP/E systems scale to deliver the right compute power for dedicated applications and serve as development platforms for remote Paragon XP/S systems. Paragon XP/E systems offer the same standard hardware and software options as other Paragon systems, all in a single office environment cabinet.



Production Ready

- Familiar UNIX* environment
- Single system image
- Support for virtual memory
- Parallel File System layered on UFS
- IPSC®/860 and Concurrent File System compatibility
- Air-cooled
- Designed for high availability

Enhanced Programmability

- Fortran 77, C#, High Performance Fortran#, Ada
- Performance optimized single node and parallel libraries
- Interactive, graphical parallel development tools
- X Window System*, DGL*, OpenGL*, and Motif* graphics

External Connectivity

- Unitree* client support
- NFS* and TCP/IP protocols
- HiPPI and SCSI interfaces and HiPPI-VME#
- Ethernet and FDDI interfaces

The Paragon™ XP/E System

- Paragon XP/E systems are complete systems incorporating the same nodes, interconnect backplanes, card cages, operating systems, and programming environment available in the Paragon XP/S systems. To achieve aggressively low pricing, these elements are packaged in a single low-cost cabinet containing one or two card cage backplane assemblies along with power supplies and disk drives. The Paragon XP/E is scalable from 4 to 32 nodes.
- Provides a software development platform for large Paragon XP/S systems
 - Fully compatible – hardware and software – with Paragon XP/S systems
 - Performance scales to over 2 Gflops
 - Software developed on Paragon XP/E systems will scale to teraFLOPS
 - Accommodates all Paragon hardware and software options such as HiPPI, FDDI, etc.

intel®

PARAGON™ DEVELOPMENT ENVIRONMENT

Languages

Fortran-77
C
C++#
High Performance Fortran (HPF)
Validated Ada*

Tools

FORGE-90* parallelization tools (from APR)
Paragon ParAide toolset.
Interactive parallel debugger and performance analysis tools, with Motif visual interface

Sequential Libraries

BLAS, FFT, NAG*
Signal Processing Library (SEGLib)

Parallel Solvers & Libraries

ProSolver™ family of equation solvers
DES direct dense matrix solver
SES skyline sparse matrix solver
IES iterative sparse matrix solver
2D and 3D FFTs
*Available through a third-party supplier.

Paragon™ System Overview

The Paragon family of supercomputers are distributed-memory multi-computers based on Intel's teraFLOPS architecture, which has been developed over the course of four generations of parallel supercomputers and is implemented using Intel's advanced microprocessor and semiconductor process technology. A modular implementation allows for continuous technology insertion as new generations of microprocessors and advances in messaging technology becomes available.

Paragon™ System Architecture

To deliver maximum sustained performance, every aspect of the Paragon supercomputer is scalable and remains in balance as the system size increases.

The Paragon system's interconnect network offers high-bandwidth, low-latency communications and frees programmers from having to concern themselves with interconnect topology. Fixed function Mesh Router Controllers, arranged in a two-dimensional mesh, route messages between any two nodes at speeds approaching 175 MB/sec full duplex. All nodes appear to be connected to all other nodes: communications performance is uniform.

The Paragon supercomputer's computational node is designed around Intel's i860™ XP RISC microprocessor. Each node contains a single i860 XP dedicated to computation and a second i860 XP dedicated to improving latency and throughput of message passing operations. The second message co-processor is not involved in the system's performance ratings.

Distributed OSF*/1 Operating System

The Paragon operating system brings OSF*/1, the Open Software Foundation's industry standard version of the UNIX operating system,

PARAGON™ XP/E SYSTEMS SPECIFICATIONS

System Configuration

Model Number	XP/E-8N	XP/E-16N	XP/E-24N	XP/E-28N
Peak GFLOPS (64-bit)	0.6	1.2	1.8	2.1
Number of compute nodes	8	16	24	28
Number of I/O nodes	1	1	1	1
Number of Service/Ethernet nodes	one combination 32 MByte Service and Ethernet node			
Distributed Memory (MB)	128	256	384	448
Maximum Memory (GB)	1.2	2.5	3.8	4.5

I/O System

Disk Capacity (GB)	4.0	4.0	4.0	4.0
Standard Peripherals	one 4mm tape (2GB) and one Ethernet Interface.			

Physical Dimensions

Number of Cabinets**	1	1		
Width	20"		(0.54 m)	
Height	60"		(1.52 m)	
Depth	24"		(0.64 m)	
Required floor space	10 sq.'		(0.35 m ²)	

** Front panel LEDs not available

to the performance-driven environment of scalable, distributed-memory computing. It provides both the portability benefits of industry standard UNIX and a number of enhancements that increase applications performance and ease of use.

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