

Columbia Hardware Overview

Category: Columbia

Columbia Phase Out:

As of Feb. 27, 2013, the Columbia21, Columbia23, and Columbia24 nodes have been taken offline as part of the Columbia phase out process. Columbia22 is still available. If your script requires a specific node, please make the appropriate changes in order to ensure the success of your job.

The Columbia supercluster, which ranked 2nd (51.87 teraflops) in the November 2004 TOP500 list, has been in service at NAS for many years. Most of the earlier Columbia nodes (Columbia1 - Columbia20) have been retired. The remaining Columbia nodes (Columbia21-24) continue to serve the NASA community to achieve breakthroughs in science and engineering for the agency's missions and vision for Space Exploration.

Current Columbia System Facts

Manufacturer: SGI

List of nodes for Columbia system			
Nodes	Type	Speed	Cache
1 Altix 4700 (512 cores)	Montecito	1.6 GHz	9MB
1 Altix 4700 (2048 cores)	Montecito	1.6 GHz	9MB
2 Altix 4700 (1024 cores)	Montvale	1.6 GHz	9MB
4 Total Compute Nodes (4,608 Total Cores)			

System Architecture

- 40 compute node cabinets
- 30 teraflops theoretical peak (original 10,240 system: 63 teraflops)

Subsystems

- 1 front-end node

Memory

- Type - double data rate synchronous dynamic random access memory (DDR SDRAM)
- Per Processor (core) - 2GB
- Total Memory - 9TB

Interconnects

- SGI NUMalink interconnected single-system image compute nodes
- Internode
 - ◆ InfiniBand - 4x (Single Data Rate, Double Data Rate)
 - ◆ 10Gb Ethernet LAN/WAN interconnect
 - ◆ 1Gb Ethernet LAN/WAN interconnect

Storage

- Online - DataDirect Networks & LSI RAID, 1PB (raw)
 - ◆ 1 SGI CXFS domains
 - ◆ Local SGI XFS filesystems
- Archival - Attached to high-end computing SGI CXFS SAN filesystem

Operating Environment

- Operating system - SUSE Linux Enterprise
- Job Scheduler - PBS
- Compilers - C, Intel Fortran, SGI MPT

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<http://www.nas.nasa.gov/hecc/support/kb/entry/82/?ajax=1>