Ultra™ Enterprise™

3000–6000

Just the Facts

Part 2 of 2

System Diagnostics

There are three types of system diagnostics tools available for the Ultra™ Enterprise™ 3000-6000 servers: the Sun™ Validation Test Suite (SunVTS™), Automatic System Recovery, and Remote Administration Control.

SunVTS™

SunVTS is the replacement product for SunDiag™. Like SunDiag, SunVTS is run at the UNIX“ level and is designed to exercise the entire system. It supports either a GUI or TTY user interface, and provides error and information logging. The key features of SunVTS are:

- **UNIX-level diagnostics.** System tests execute real UNIX code under the Solaris™ operating environment.
- **Automatic system probing.** The system configuration is displayed through the user interface.
- **Two user interfaces.** Both a graphical user interface and a character-based interface are available. The SunVTS kernel is cleanly separable from the user interface, such that multiple user interfaces can communicate with the same SunVTS kernel. The character-based interface permits the writing of shell scripts to control SunVTS.
- **Application programming interface (API)**. The API provides a defined interface into the SunVTS kernel from other processes, as well as the user interfaces. A SunVTS execution could be initiated in a `cron`-like fashion, with no direct user interface at all.
- **Advanced configuration and execution control.** Tests can be grouped together based on user requirements, with fine-grained execution control for status and logging information.

Automatic System Recovery

Automatic System Recovery (ASR) operates in the same way in Enterprise 3000–6000 servers as in the SPARCcenter™ 2000E server. ASR allows Enterprise 3000–6000 servers to recover after a component, such as a UltraSPARC™ module, CPU/memory board, SIMM, or I/O board, fails. Upon failure, the system reboots. While rebooting, ASR tests system components and identifies the failed component; the system reboots around the failed component.

ASR is driven by power-on self-test (POST) software. The POST software in Enterprise 3000–6000 systems includes two significant changes from the POST used in the SPARCcenter 2000E:

- **Uses a flash EPROM**. Flash EPROM makes it simple to update the OpenBoot™ PROM in the field. New PROM code can be installed from a CD-ROM while the system is running.
- **Uses a configurable rule-based expert system**. A configurable rule-base expert system allows the user to customize the boot/diagnostic control flow.

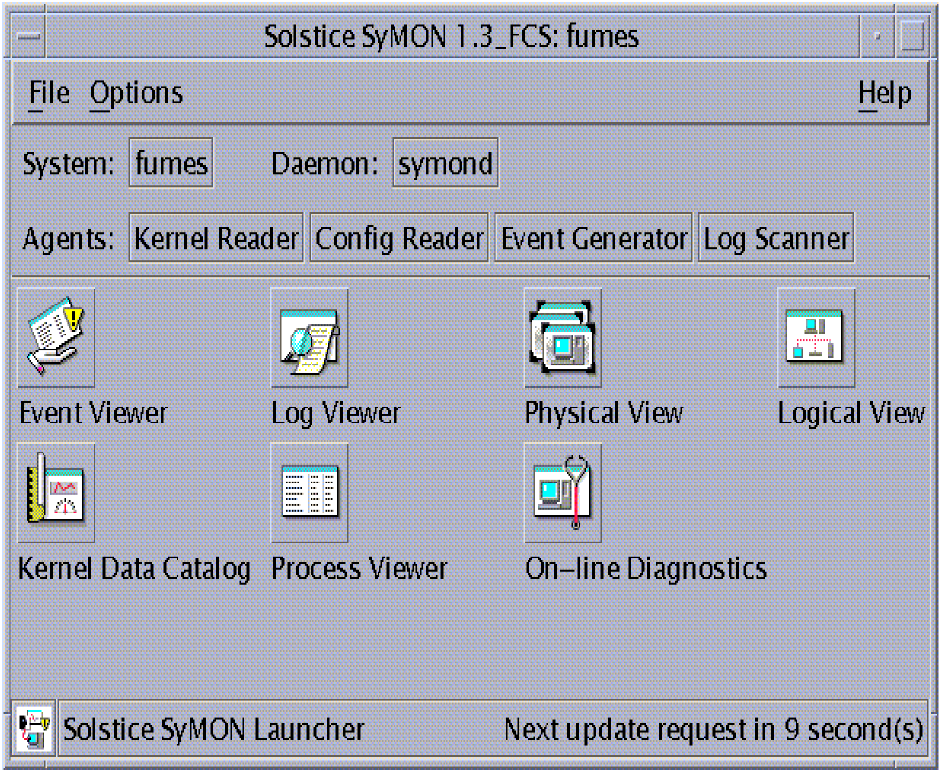
Remote Administration Control

The Remote Administration Control feature on Enterprise 3000–6000 servers allows a user to reboot, power-cycle, or perform extensive operating system debugging through one of the serial ports (serial port A only). A special serial processor on the system clock board scans the input for system commands.

This remote console functionality allows for true “lights out” management of a system, giving system administrators more flexibility in point of management and control. This also enhances the serviceability aspect of the systems by providing a method of retrieving the system state on “hung” systems.

Remote control can be disabled by putting the key switch in the “secure” position.

Solstice™ SyMON™ System Monitor



System: fumes

Daemon: symond

Next update request in 9 second(s)

Figure 8. Solstice™ SyMON™ window

Solstice™ SyMON™ System Monitor

Solstice™ SyMON™ is a comprehensive system-monitoring tool that is shipped with every Enterprise 3000–6000 server. Solstice SyMON has a full graphical user interface for monitoring nearly every "health" aspect of a server. Its many monitoring capabilities are designed to dramatically improve the uptime of the Enterprise 3000–6000 server.

The above figure illustrates the Solstice SyMON graphical user interface (GUI). The agents, shown in the upper half of the screen, are responsible for collecting information from the server being monitored. The seven icons pictured below the agents are called consoles. Consoles serve as vital-sign indicators of the monitored server by receiving information from the agents and displaying it to the user.

Solstice SyMON Features and Benefits

The following is an overview of the features and benefits that are provided by Solstice SyMON.

Feature	**Benefit**
A graphical user interface that conforms with all relevant Motif, CDE, and Solstice™ management style guidelines	The interface is easy to learn and easy to use.
Event Manager subsystem	Users can trap and view events that typically are not trapped by the system log. These events are recorded in the Event Log.
Rule-driven events	Users can define events that are meaningful to their particular system environment by simply modifying the rules.
Event Viewer	Users can easily view the Event Log.
Log Viewer	Users can easily view the system log. Also allows users to view the system log according to specific user-specified search criteria.
Physical View	Users can see the system's configuration without having to be physically at the system site.
Drill-down capability in the Physical and Logical Views.	Users can see component details without having to be at the system site.
Highlighted failed components	Users can quickly identify which component has failed and its location—increases serviceability.
Prioritized fault/event management	Red, yellow, or blue highlights allow the user to easily identify severity of failure—increases serviceability.
Logical View	Users can quickly see system components in a schematic hierarchy.
System performance graphs	Performance data is displayed in a meaningful and easy-to-understand format. Useful in performance monitoring, capacity planning, and maintaining reliability and serviceability of the server.
Process Viewer	Users can easily identify resource-intensive processes. Useful in performance monitoring and capacity planning.
On-line diagnostics	Users can easily perform diagnostics on system components before failures occur. Helps to increase system uptime.
SNMP traps	Enables SyMON to be used in conjunction with SNMP listeners, such as Solstice™ Enterprise Manager™. Provides users with a comprehensive system and network management solution.

Solstice SyMON System Monitor Q&A

Q. Solstice SyMON is a passive monitoring tool. What does that mean?

A. This means that Solstice SyMON monitors the state of the system and reports the information back to the user. Solstice SyMON currently cannot be used to change any system variables, to power down the system or to reboot.

Q. How does Solstice SyMON help with capacity planning?

A. Solstice SyMON can be used to help customers manage their system growth as their computing requirements grow. Performance meters can be used to identify bottlenecks in CPUs, I/O, or memory subsystems. Once bottlenecks are identified, Solstice SyMON can be used to monitor the existing system configuration and determine what additional resources can be added to the system in order to reduce the bottleneck.

Q. How can Solstice SyMON notify a service provider?

A. Solstice SyMON performs certain activities when certain events occur. A default set of activities and events are identified in Solstice SyMON, but the customer may modify these as needed. Thus, a customer may modify the activities and events such that whenever a disk fails, an e-mail can be sent directly to a particular administrator or SunService℠.

Q. Can SunService take advantage of Solstice SyMON? If so, how?

A. Yes. SunService offers a remote system-monitoring service that uses Solstice SyMON to monitor customer's systems remotely, resulting in faster problem identification and resolution. Check with SunService for the latest details.

Q. Does Solstice SyMON integrate with other enterprise management tools from Sun and other vendors?

A. Yes. Solstice SyMON does support SNMP connectivity to integrate with enterprise management tools such as Sun's Solstice™ Site Manager™ and Solstice™ Domain Manager™. It is Sun's goal to comply with industry standards that enable Solstice.

Q. How does Solstice SyMON improve serviceability?

A. Serviceability is improved because the various consoles, such as the physical view console, allow users to quickly identify where a problem is. For example, if a CPU/memory board fails, Solstice SyMON highlights that failed board in its physical view console. There is be no time wasted guessing which board failed. Solstice SyMON can also be used to perform diagnostics on server components.

Q. How does Solstice SyMON predict failures?

A. Solstice SyMON comes with a set of Predictive Failure Analysis (PFA) rules that help predict failures in the system. Solstice SyMON does this by maintaining records on certain parameters, such as error rates, for a set amount of time on various components. If a pattern emerges that signifies impending failures, then Solstice SyMON issues an alert. Customers may modify, delete, or add to the PFA rules.

Q. For which components can Solstice SyMON predict failure?

A. Solstice SyMON is able to predict failures of SIMMs and disk drives.

Solaris™ Operating Environment

The Ultra Enterprise servers run on the industry's leading enterprise operating system, Solaris 2.6. Built on the latest UNIX technology, the Solaris environment delivers unparalleled scalability and performance. With enterprise integration by design, Solaris provides easy access to a wide range of computing environments and network technologies. It delivers a competitive advantage to business through networked computing, scalability, and multi-architecture support. Solaris provides an advanced, superior solution for all customer IT needs, both technical and business. Solaris is an industrial-grade solution with the performance, quality, and robustness to deliver mission-critical reliability.

The following is included in Solaris 2.6 for servers:

- Base operating system
  - Includes naming services, basic communications, basic security, file and print, networking, basic administration and utilities, and so on.
- Solaris Web Start is a browser-based utility that guides users through installation.
- Common Desktop Environment (CDE)
- Java Virtual Machine 1.1 lays the foundation for deployment of Java applications on Solaris software.
- HotJava Browser
- WebNFS software enable file systems to be quickly accessible through the Web using the NFS protocol.
- Support has been added for large files up to one Tbyte on UFS.
- Year 2000 Compliance: uses unambiguous dates and follows the X/Open guidelines where appropriate.
- Solstice™ AdminSuite™ 2.3
- Solstice™ AutoClient™ 2.1 software.
- Solstice Data Backup Utility 4.1
- Solstice™ DiskSuite™ 4.1
- TotalNet Advanced Server is the network operating system software that enables Solaris machines to be scalable file, print, and applications servers for multi-platform environments with PC and Macintosh clients, regardless of client software and network protocol.
- Solstice Internet Mail Server 2.0 software, which provides an advanced mail solution for Solaris workgroups, with open, Internet mail, based on industry standards.
- Solstice NFS Client 3.1 for Windows 95 and Windows NT.
- Answerbook2 provides online documentation using a web browser interface.

Disk Options

Disk Options

The preferred disk solution for the Ultra™ Enterprise™ X000 servers depends on the server model as well as the customer’s environment. The following is a summary of the disk options available:

• **Server**	• **Disk Option**
– Enterprise 3000	– Internal, 2.1-GB, 4.2-GB, or 9.1-GB 3.5-inch SCSI disk drive(s)
– Enterprise 4000	– Internal, 4.2-GB disk board
	– StorEdge A5000
	– SPARCstorage™ Array™ Model 100 Series
	– External SCSI disk options
– Enterprise 5000	– Internal, 4.2-GB disk board
	– StorEdge A5000
	– SPARCstorage™ RSM™ Tray
	– Differential SCSI Disk Tray
	– SPARCstorage Array Model 100 and 200 Series
	– RSM Array 2000
– Enterprise 6000	– Internal, 4.2-GB disk board
	– StorEdge A5000
	– SPARCstorage RSM Tray
	– Differential SCSI Disk Tray
	– SPARCstorage Array Model 100 and 200 Series
	– RSM Array 2000

Keep in mind that the above list is not complete. For example, an Enterprise 3000 may also boot from external disk drives, but the internal SCSI disk drives is the most commonly chosen option.

The disk board is designed to be used only as a system disk. Its capacity is not large enough for anything else. It also does not make sense to use several system slots for internal capacity. External disk options can also be used as system disks.

Refer to *Enterprise 3000–6000 Servers System Options* for a list of supported disk options.

For Enterprise X000 servers with certain internal disk options, Solstice JumpStart™ Boot Image may be factory-installed at no charge. JumpStart may be installed on the following disk storage products:

- Internal SCSI disk drives on the Enterprise 3000
- 4.2-GB disk board in the Enterprise 4000, 5000, and 6000
- Internal SPARCstorage RSM trays in the Enterprise 5000 and Enterprise 6000
- Internal, differential SCSI disk trays in the Enterprise 5000 and Enterprise 6000

JumpStart™ is not compatible with SPARCstorage Array subsystems.

Upgrades

Board and Module

The following board and processor module upgrades are common to all Ultra™ Enterprise™ 3000 through 6000 systems:

- UltraSPARC™ module upgrades
- System board upgrades for SPARCserver™ 1000(E) and SPARCcenter™ 2000(E)
- Clock board upgrades

System board upgrades and UltraSPARC module upgrades from previous-generation systems are factory-configured and intended to be used in conjunction with chassis upgrades.

UltraSPARC module upgrades from 167-MHz and 250-MHz UltraSPARC modules are shipped separately for field installation only.

Clock board upgrades are shipped separately for field installation only.

From	Receive	Return
UltraSPARC Module Upgrade Order:	UltraSPARC Processor module:	
UG-M2510,	167-MHz, 1-MB E-Cache	SuperSPARC™ processor module
UG-M2530,	250-MHz, 1-MB E-Cache	SuperSPARC processor module
UG-M2510-M2530,	250-MHz, 1-MB E-Cache	167-MHz 512-KB E-Cache
UG-M2550,	250-MHz, 4-MB E-Cache	SuperSPARC processor module
UG-M2510-M2550	250-MHz, 4-MB E-Cache	167-MHz, 512-KB or 1-MB E-cache
UG-M2560	336-MHz, 4-MB E-Cache	SuperSPARC processor module
UG-M2530-2560	336-MHz, 4-MB E-Cache	250-MHz, 1-MB or 4-MB E-Cache
UG-M2510-M2560	336-MHz, 4-MB E-Cache	167-MHz, 512-KB or 1-MB E-cache
SPARCserver 1000 System Board Upgrade Order:		
UGSB1000-X-256M	CPU/memory board, with 256 MB of RAM	SPARCserver 1000 system board with 256 MB of RAM
SPARCcenter 2000 System Board Upgrade Order:		
UGSB2000-X-0M-A UGSB2000-X-256M-A	CPU/memory board, with no memory or 256 MB of RAM	SPARCcenter 2000 system board with no memory or 256 MB of RAM
Clock Board Upgrade Order:		
UG-ENT-CLOCKBD	Clock board that supports modules faster than 167 MHz	Clock board that supports only 167-MHz modules
CPU/Memory Board Upgrade Order:		
UGSB2600-2601-A	CPU/memory board—supports processor modules with greater than 2 MB of E-cache (X2601A)	One CPU/memory board (X2600A)

Note: *Customers with an Enterprise 3000 manufactured before December 1996 may need to order the clock board upgrade along with the 250-MHz 1-MB E-Cache module upgrade. The order part number of the base system with the clock board that supports the 250-MHz module ends with a 1, for example, E3001.*

Warranty

The Ultra™ Enterprise™ family of servers offers extensive warranties that can be enhanced through SunService's SunSpectrum product offering. The table below describes the Enterprise X000 server warranties (warranties may vary in different countries).

Table 1:

	Enterprise 3000	**Enterprise 4000**	**Enterprise 5000**	**Enterprise 6000**
Hardware	1 year	1 year	1 year	1 year
Software	90 days	90 days	90 days	90 days
Telephone Assistance	8-8, M-F 8-hour response	8-8, M-F 8-hour response	8-8, M-F 4-hour response	8-8, M-F 4-hour response
On-site Assistance	8-5, M-F next day	8-5, M-F next day	8-5, M-F 4-hour	8-5, M-F 4-hour
Installation	Basic	Basic	ServerStart℠ installation	ServerStart installation

Glossary

Circuit-switched bus	A bus in which a transaction is normally implemented in an automatic fashion. Simple and easy to construct, a circuit-switched bus is often less efficient than a comparable packet-switched bus. SBus is a circuit-switched bus.
ECC	Error checking and correcting. ECC code is used to verify the integrity of data and can be used to correct some data errors. The ECC code used in the Ultra™ Enterprise™ X000 servers is able to detect and correct single-bit errors, and detect double-bit errors.
Fault-resistant	Systems that are fault-resistant are able to withstand and recover from many types of system problems.
Fault-tolerant	Systems that are fault-tolerant are able to withstand and recover from any system problem and offer 100 percent uptime. These systems are typically more expensive that comparable fault-resistant systems.
Gigaplane™	Gigaplane is the centerplane bus that is used in the Enterprise 3000, 4000, 5000, and 6000 servers. The Gigaplane bus is a packet-switched bus offering a sustained data transfer rate of 2.5 GB/sec.
High availability	Availability is the time a particular resource, such as a system, application, or data is accessible and usable. High availability means the resource is accessible and usable a maximum amount of time.
Hot-plug	A hot-plug component means that it is electrically safe to remove or add that component while the machine is still running. Typically, the system must be rebooted before the hot-plug component is configured into the system.
Hot-swap	A hot-swap component can be installed or removed by simply pulling the component out and putting the new one in. The system will either automatically recognize the component change and configure itself as necessary or will require user interaction to configure the system; however, in neither case is a reboot required. All hot-swappable components are hot pluggable, but not all hot-pluggable components are hot-swappable.
Interleaved memory	Interleaved memory helps reduce memory access time by permitting multiple memory components to operate in parallel. In interleaved memory schemes, memory is divided into *n* banks arranged so that every *n*th byte is supplied by a different memory bank. In a two-way interleaved system, the first doubleword is supplied by bank 0 while the second is supplied by bank 1. Normally, the size and extent of interleave is arranged so that a single typical request is satisfied by as many banks as possible. This arrangement permits a single memory request to be fulfilled without waiting for memory recycle time.
OBP	OpenBoot™ PROM.