SiliconGraphics
Computer Systems

OCTANE™

Visual Workstation

Product Guide

It's about

PERFORMANCE

STANDARD FEATURES:

- Single or dual RI2000® processors
- Four high-speed XIO slots
- Autosensing I0Base-T and I00Base-TX Ethernet
- Entry 128MB base memory, upgradable to 4GB maximum memory
- One parallel port, two serial ports
- Ultra SCSI 40MB/sec internal system disk, two additional disk bays (total capacity 27GB)
- External Ultra SCSI port (40MB/sec)
- Stereo I/O, speakers, and microphone
- 20-inch monitor
- Keyboard, mouse
- OCTANE/SE, OCTANE/SSE, or OCTANE/MXE graphics

OCTANE workstations from Silicon Graphics deliver exceptional performance—empowering the next generation of visual computing solutions for manufacturing, entertainment, visual simulation, defense imaging, and the sciences. Professionals in these industries are using OCTANE to take control of larger, more complex, and growing data sets on the desktop. The revolutionary system architecture, with high-performance single or dual processors, means that OCTANE can simultaneously tackle more complex tasks such as design and analysis or motion modeling and behavior scripting. With more data and more tasks on the desktop, users can focus completely on any problem, work intuitively, gain insights, and get the job done better, faster.

Give Your Business a Competitive Edge

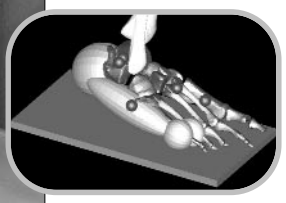
Silicon Graphics® workstations are tools that help companies achieve success. Animators working on the next box office hit, engineers developing an innovative product, and scientists who simulate military combat all have one thing in common: they use Silicon Graphics technology to create higher-quality products and bring them to market faster. OCTANE gives you the processing power and visualization needed to develop innovative solutions by integrating tasks, combining steps, and shortening the time needed to achieve your goals.

Preserve Your Investment

When you purchase an OCTANE system, you are investing in a long-term asset. Because of its modularity, you can upgrade OCTANE as your needs change. OCTANE lets you take full advantage of its advanced graphics, CPU, and I/O subsystems by providing a system architecture with low latency and high bandwidth (1.6GB per second for each XIO port). The upgradable, scalable bandwidth ensures that OCTANE can take advantage of future hardware technologies and can keep up with the increasing performance requirements of mainstream and leading-edge application software.

SIDE EFFECTS

Houdini software takes advantage of the OCTANE workstation's dual processor and high I/O bandwidth, allowing changes to fully lighted, textured scenes while simultaneously previewing the animation.



ADAMS

Simulations performed with ADAMS virtual prototyping software have helped Nike design new athletic footwear that will help prevent ankle injuries.

www.sgi.com/octane

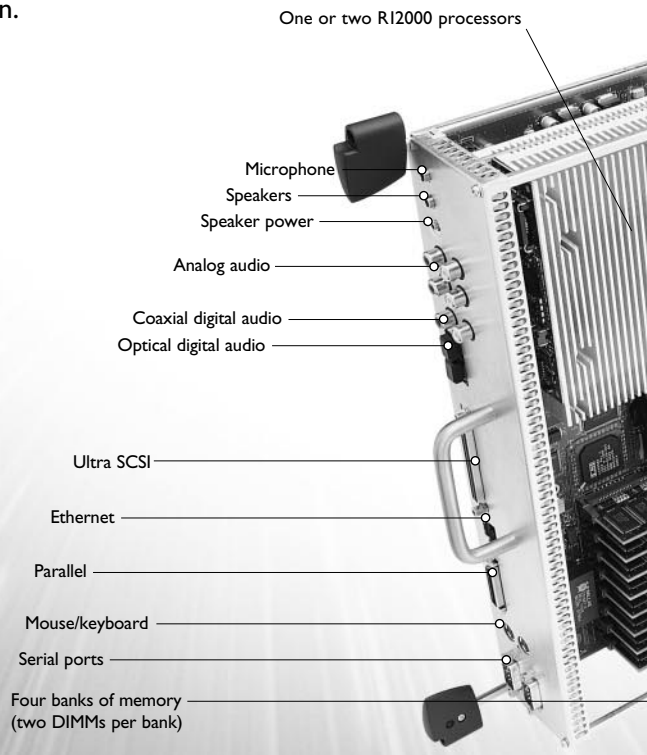
It's about

BANDWIDTH

Interactivity and responsiveness both depend on bandwidth. OCTANE employs one or two processors and a dramatic new architecture to shatter the bottlenecks associated with conventional systems and deliver large amounts of bandwidth. Application software can control the flow of data within the machine and can guarantee that a critical data transfer, such as loading a 3D model from memory to the screen, gets the necessary bandwidth to remain interactive. With the unique bandwidth management from Silicon Graphics, end users experience smooth, fluid operation.

KEY ARCHITECTURE FEATURES:

- 1.0GB/sec main memory peak bandwidth
- 1.6GB/sec peak, 1.2GB/sec sustained bandwidth between subsystems
- 64K primary cache, 2MB secondary cache
- 32- or 64-bit binaries
- Symmetric multiprocessing
- Priority I/O



Switching Away from Tradition

OCTANE incorporates a crossbar switch in place of a traditional shared bus. The crossbar can dynamically and directly link any two computer subsystems, giving them a high-speed path without interfering or competing with other system activity. Once established, a link provides 1.6GB-per-second throughput, and no amount of other system traffic can take away from that reserved bandwidth. This unique design scheme results in a system with extremely high bandwidth and very low latency for guaranteed application performance.

Dual Processors for Double the Power

With an architecture optimized for the advanced features of the MIPS® R12000 processor, the OCTANE compute engine can unleash the complete power of one or two R12000 processors to accelerate real-world application software. The symmetric multiprocessing (SMP) architecture gives users the choice of how to apply the power: use two processors to quickly solve one task or to simultaneously solve two previously separate problems such as engineering design and analysis.

Flexible Configurations

The OCTANE architecture expands and scales as your needs grow. Users can start with an entry-level single-processor OCTANE/SE system and later add more memory, texture, geometry, processor, and graphics upgrades to meet their changing system needs.

OCTANE I/O

Two full- and one half-size optional industry-standard PCI slots for 32- and 64-bit wide PCI devices
Three 3.5-inch Ultra SCSI drive bays
Four XIO slots for graphics, networking, and storage cards

PCI (requires PCI expansion unit)

Single-port 1000Base-TX
Single-port 100Base-TX
Single-port differential Ultra SCSI
Single-port single-ended Ultra SCSI
Single-port Fibre Channel
Single-attached FDDI
Dual-attached FDDI
ISDN basic rate interface
Digital audio

XIO

4-port Ultra SCSI (4 differential)
4-port 100Base-TX and 6 460Kb/sec serial ports
2-port Fibre Channel
OCTANE Channel Option
OCTANE Digital Video
OCTANE Personal Video (analog video)
NE Compression (JPEG compression)

It's about

GRAPHICS

GRAPHICS SPECIFICATIONS:

- Geometry Engine®: 1344 MFLOPS
- RDRAM frame buffer: 32-bit double buffer with Z
- Raster engine: high-performance pixel fill
- Texture engine: zoom, warp, rotate images
- Texture cache: 4MB upgrade can be added to any OCTANE/SE or OCTANE/SSE system

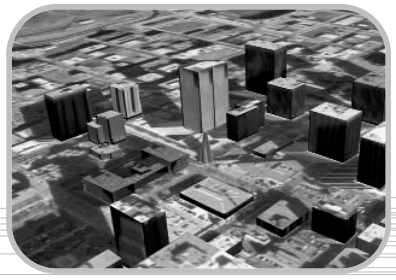
OCTANE takes graphics performance to the next level with the new E-Series graphics, available across the entire line. By making extensive use of dedicated processing hardware, OCTANE optimizes visualizations, clarifying problems and speeding your progress toward solutions. OCTANE graphics, combined with one or two R12000 compute engines, let you execute more tasks on your desktop—simultaneously tackle both design and analysis—with system responsiveness that can keep up with your thought process. Coupled with OpenGL®, the industry-standard open graphics library, OCTANE translates into optimal application performance for power users.

Graphics Engine and Texture Memory

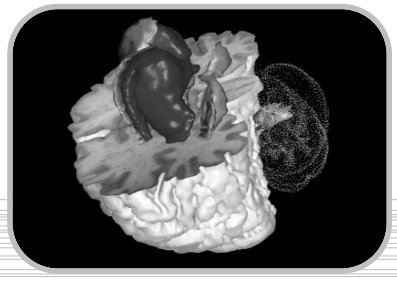
The OCTANE system's improved E-Series graphics acceleration subsystem includes a hardware Geometry Engine processor, dedicated rasterization, and the ability to take advantage of a texturing engine if installed. The dedicated frame buffer memory is specifically tuned for handling 3D images and texture caching memory.

OCTANE/SE

For solid modeling applications, OCTANE/SE brings high-end desktop graphics performance to mainstream engineers and technical users. The entry-level OCTANE/SE system includes a single Geometry Engine processor and can be configured with a texture subsystem or later upgraded to add enhanced realism.



GEOGRAPHIC TERRAIN VISUALIZATION



INTERACTIVE 3D VOLUME RENDERING

REAL-TIME PLANT DESIGN

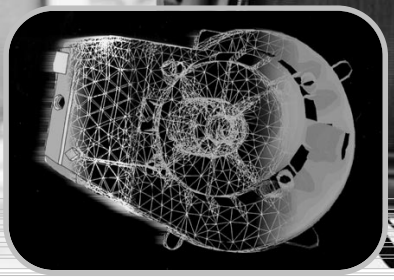
OCTANE/SSE

OCTANE/SSE uses two hardware Geometry Engine processors and two raster engines for twice the solid modeling performance of an OCTANE/SE system. OCTANE/SSE is the ideal machine for large solid modeling, mechanical analysis, pre- and post-production processing, and untextured 3D animation. If your requirements change—a new project or application—hardware texture support can be added at any time. It also supports HDTV resolutions.

OCTANE/MXE

OCTANE/MXE sets the graphics performance standard with the addition of a full-performance texture subsystem. An OCTANE/MXE system fills two XIO slots, leaving two more slots for high-speed networking and peripheral options. The right choice for users with demanding visualization needs, OCTANE/MXE lets you accomplish more on your desktop, whether you are working with digital prototypes, virtual reality, or the most complex 3D models. It also supports HDTV resolutions.

MECHANICAL DESIGN AND ANALYSIS



VISUAL PROTOTYPING

REAL-TIME ANTHROPOMORPHIC SIMULATION

It's about

YOUR VISION

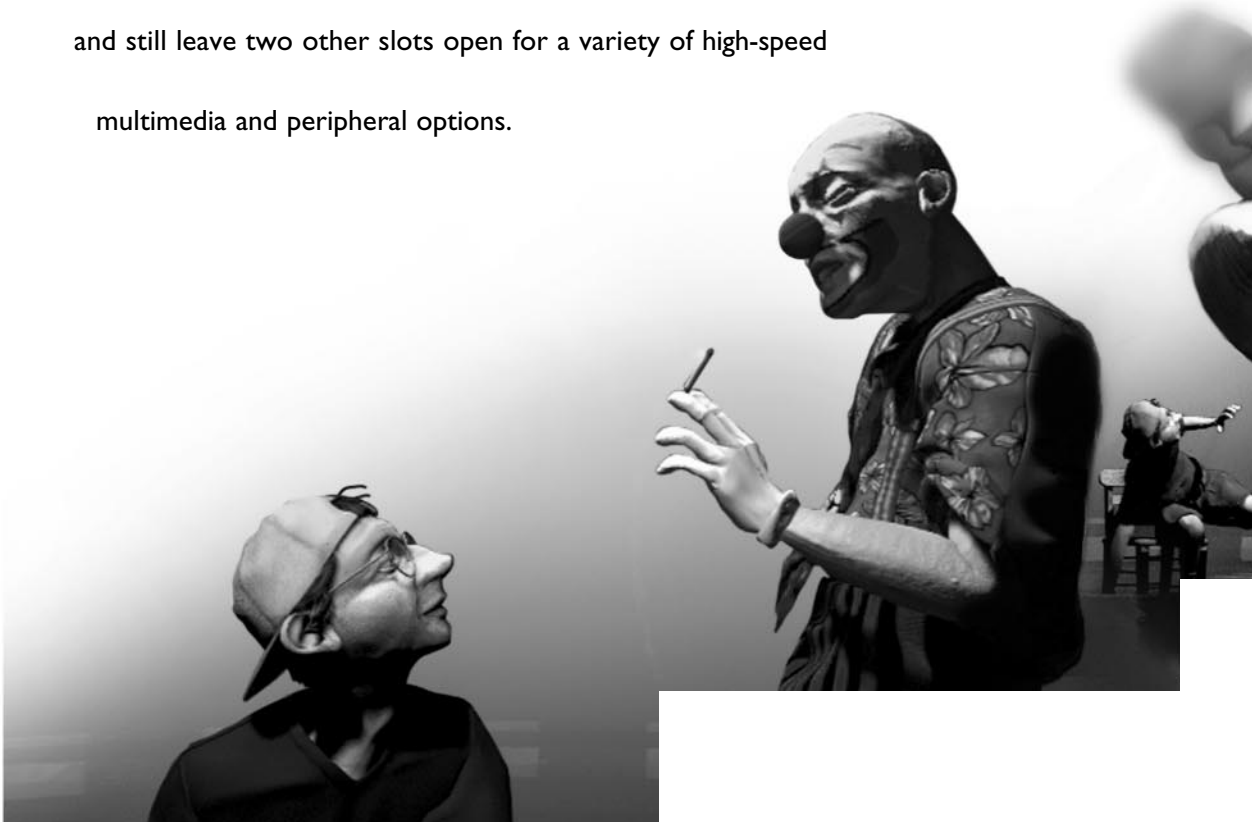
The highly flexible product design of OCTANE provides answers for the most demanding desktop configuration requirements. Four XIO slots directly connect into the high-speed system architecture of OCTANE. Users can fill up to two slots with graphics options and still leave two other slots open for a variety of high-speed multimedia and peripheral options.

DIGITAL MEDIA OPTIONAL FEATURES:

- Uncompressed real-time 8- or 10-bit serial digital I/O
- Two streams of JPEG compression at 2:1
- Low-cost analog video I/O
- Real-time color space conversion
- Video as a texture for effects
- Real-time graphics to video out

STANDARD AUDIO FEATURES:

- Microphone
- Stereo loudspeakers
- Line-level stereo I/O
- Eight channels of 24-bit digital audio I/O



Digital Media Capabilities

OCTANE manipulates digital media as effortlessly as any other type of data on the desktop. Digital media processing and I/O are integral parts of the architecture. This powerful integrated technology allows users to radically change the way they work and communicate. Mechanical designers can now make a movie of an interesting design concept, edit it, add titles and comments, and post it on the Web for the rest of the team to review. Similarly, animators of a high-end feature film can instantly preview their effects, creating a higher-quality product.

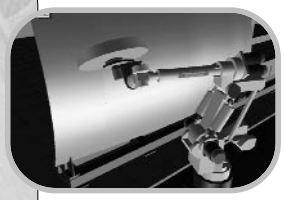
The following options are available on the OCTANE workstation:

- OCTANE Personal Video: a low-cost video processing card that allows users to create and manipulate content for a variety of uses ranging from collaboration to video conferencing and multimedia Web sites
- OCTANE Digital Video: Industry-leading multi-channel video performance with features such as video texturing for unique special effects and color space conversion for real-time translation between video formats
- OCTANE Compression: state-of-the-art compression capabilities that can be used for anything from Web-based moviemaking to high-end broadcast graphics

Audio

Every OCTANE workstation comes with an extensive suite of built-in audio capabilities. Each additional half-height multiple channel audio PCI card offers:

- ADAT Optical Input and Output (fiber-optic connector): eight additional channels of 24-bit digital audio
- AES3-1992 Input and Output (AES-3id BNC): two additional channels of 24-bit serial digital audio input/output; also serves as a synchronization source input/output (AES11) and provides professional jitter continuation
- Video Composite Sync Input ("black burst"): PAL or NTSC provides professional audio locked-to-video sample clock generation



DENEB

OCTANE enables Deneb's aerospace software users to interact with very large data sets to develop robotic process engineering enhancements.

OCTANE CADduo

OCTANE CADduo allows you to support two simultaneous CAD/CAE users on a dual-processor OCTANE workstation, significantly lowering your hardware and administrative costs per seat. OCTANE CADduo has the flexibility to adapt to your company's workflow. In addition, it can work as the ideal large assembly review station for a single user, providing access to dual CPUs and twice the memory and disk capacity of a standard CAD seat.

High-Resolution 24-Inch Monitor

Available as an upgrade to the standard 20-inch monitor for OCTANE/SSE and OCTANE/MXE workstations, the 24-inch monitor supports the display of virtually any output resolution or pixel timing. The high-resolution 24-inch monitor lets you handle requirements ranging from VGA to HDTV resolution. See technical specifications on back for details.

For applications that require additional screen space or two separate screens, OCTANE supports a dual-head option that includes a 24-bit graphics head and additional 20-inch monitor. Dual-head configurations offer independent windows on each head and give programmers the flexibility they need for advanced data modeling and analysis applications. One head might continuously display complex visual information such as seismic data, while the other head is reserved for the user interactions required to analyze and update the visual data.

It's about

INTEGRATION

OCTANE excels in today's complex computing environments. Following Silicon Graphics' tradition of fostering collaboration and creativity, all OCTANE systems include solutions for reaching beyond the desktop. A highly evolved operating system and versatile interoperability tools deliver seamless integration into heterogeneous environments. The attention paid to integration and interoperability translates into time and cost savings.

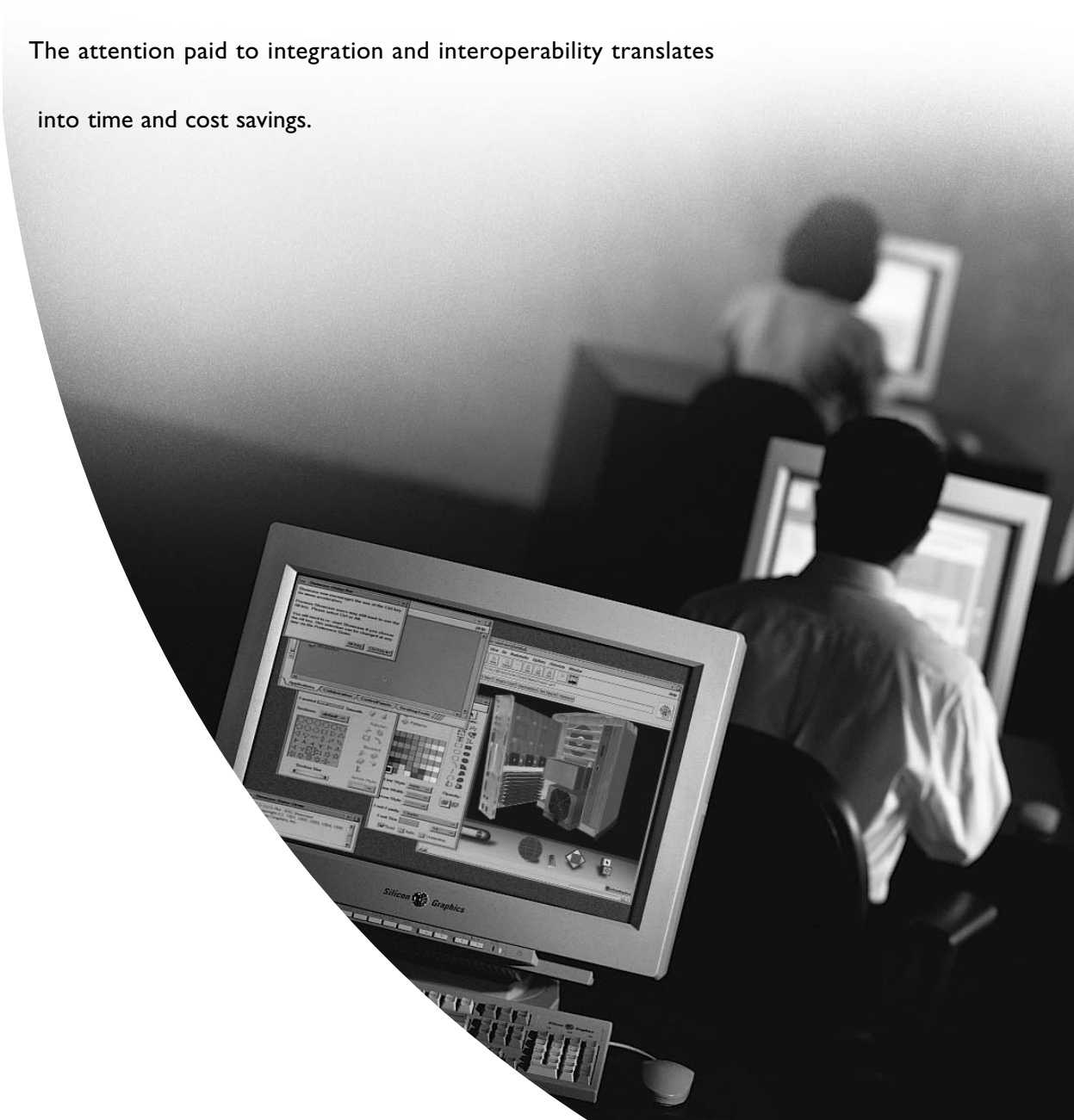
BUNDLED SOFTWARE FOR INTEGRATION:

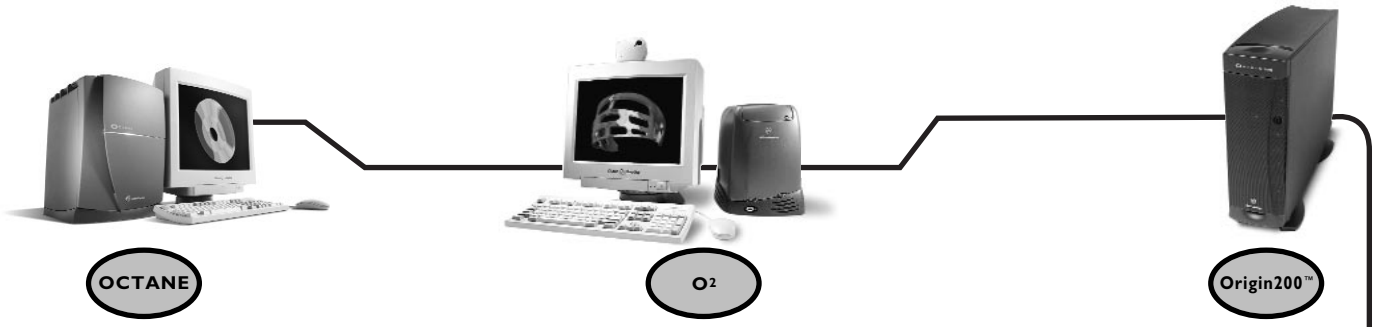
Connectivity

- XFS™
- ISDN/PPP support
- Novell NetWare™ Client
- Xinet AppleTalk®
- Samba

Collaboration

- Outbox
- InPerson®
- IRIS Annotator™
- IRIS Showcase™
- Netscape Communicator® 4.05
- Cosmo™ Player
- Cosmo™ Create
- Netscape® FastTrack Server
- Adobe® Acrobat Reader™
- InfoSearch
- SGI Meeting
- Teleffect





The World's Most Advanced Operating System

IRIX® 6.5, the Silicon Graphics mature 64-bit UNIX® operating system, maximizes the performance of your OCTANE workstation. The same IRIX operating system spans the Silicon Graphics UNIX product line from your O2™ system to your 128-processor Origin™ server. Most applications built on earlier releases of IRIX will run without recompilation. IRIX 6.5 is Year 2000 compliant and supports all major industry standards. IRIX 6.5 gives you the high reliability you demand from an operating system. With a focus on serviceability and a predictable maintenance schedule, IRIX gives you control over the administration and integration of your computing environment.

Interoperability

In today's complex computing environment, where networks can involve PCs and Apple® Macintosh® systems alongside UNIX workstations, OCTANE has the right solution to fit into your network. OCTANE integrates seamlessly into existing networking environments such as Fast Ethernet, Gigabit Ethernet, ATM, and FDDI. With a variety of software products, OCTANE provides the right tools to enhance your workflow in a multi-OS environment.

Connectivity

Your OCTANE system comes bundled with software that enables files resident on OCTANE to be read and manipulated by Apple Macintosh, MS-DOS, Microsoft® Windows® 95, Windows NT®, or other UNIX workstations or servers as if they resided on the local computer. With bundled and optional software, OCTANE can also read and manipulate files that reside remotely on those same machines.

Collaboration

As a pioneer in collaboration solutions, Silicon Graphics has included software tools that make sharing of information and communication simple. Drag-and-drop intranet publishing and data conferencing tools make remote collaboration simple and easy.

Emulation

Technical and creative professionals can also use Microsoft personal productivity applications on OCTANE through a variety of bundled or third-party applications. Likewise, UNIX productivity applications can be run on a PC via third-party solutions.

Intuitive System Administration

With the personal administration tool, any user can manage some tasks right on the desktop, relieving the support staff of simple but time-consuming requests. Individuals can use the tool to add user accounts, back up and restore local disks, manage network traffic, and track disk usage.

OCTANE

Technical Specifications

BASE SYSTEM FEATURES

Processor Support	1-2 MIPS RISC 64-bit R12000 2MB L2 cache 1-2 MIPS RISC 64-bit R10000® 1MB or 2MB L2 cache
Memory Capacity	128MB–4GB synchronous DRAM (SDRAM)
System Graphics	Resolution (with double-buffered 32-bit color): •OCTANE/SE 1280x1024 at 72 Hz •OCTANE/SSE 1920x1035 at 60 Hz •OCTANE/MXE 1920x1035 at 60 Hz Formats: •8-bit, 12-bit, 24-bit RGB single-buffered, z-buffered •24-bit, 36-bit RGB double-buffered, z-buffered •16-bit, 32-bit RGBA double-buffered, z-buffered, stereo
Graphics Features	Texture cache: •4MB standard for OCTANE/MXE •4MB optional upgrade on OCTANE/SE and OCTANE/SSE Alpha blending, accumulation buffer, anti-aliased RGB lines and points, texture mapping, fog, lighting features (spot lighting, eight light sources, two-sided lighting, ambient, diffused, and specular), arbitrary clipping planes, depth cueing, soft shadow and depth of field, subpixel positioning, stenciling, stereo graphics, pan and zoom, X11 pixel operations
Storage and I/O	Crossbar: 1.6GB/sec/port (6 ports) Internal single-ended SCSI controller External single-ended SCSI controller 4 XIO board slots 3 internal 3.5" storage bays Single half-height, dual full-height PCI slots with optional PCI cardcage
Communication	Single 10Base-T/100Base-TX port Dual serial RS422/RS423 DB-9 ports Single bidirectional parallel port Six audio I/O ports

DISPLAY OPTIONS

Monitors	20" color monitor standard 24" color monitor option with OCTANE/SSE and OCTANE/MXE
Graphics	Dual-head and CADduo configurations: •OCTANE/SE and OCTANE/SE •OCTANE/SE+texture and OCTANE/SE+texture •OCTANE/SE and OCTANE/SSE •OCTANE/SE and OCTANE/MXE

DIGITAL MEDIA FEATURES

Analog Audio (Standard)	Mono-microphone, self-powered stereo desktop loudspeakers with headphone output, stereo analog—10dBV line level (18-bit A to D and D to A)
Digital Audio (Standard)	16-bit analog stereo I/O (two channels), 24-bit AES-3id I/O (two channels), and 24-bit ADAT optical I/O (eight channels)
Digital Audio I/O (Optional)	8 channels, 24-bit ADAT optical I/O 2 channels, 24-bit AES-3id I/O AES11 synchronization
OCTANE Personal Video (Optional)	S-Video, composite, Silicon Graphics digital video input and output for NTSC and PAL standards; real-time graphics to video output
OCTANE Digital Video (Optional)	Two fully independent input and output channels of SMPTE 259M (CCIR 601 serial digital video) or single dual-link signal with key for NTSC and PAL (8 or 10 bits per component), real-time graphics to video output
OCTANE Compression (Optional)	Dual-stream M-JPEG compression as low as 2:1 for composite and S-Video or 601 when used with OCTANE Digital Video

EXPANSION OPTIONS

XIO	4-port Ultra SCSI (4 differential) 4-port 100Base-TX and 6 460Kb/sec serial ports 2-port Fibre Channel OCTANE Channel Option OCTANE Digital Video OCTANE Personal Video (S-Video and composite) OCTANE Compression (JPEG compression), lossless on IRIX 6.5 for JPEG
PCI (Requires PCI Expansion Unit)	Single-port 1000Base-TX Single-port 100Base-TX Single-port differential Ultra SCSI Single-port single-ended Ultra SCSI Single-port Fibre Channel Single-attached FDDI Dual-attached FDDI ISDN basic rate interface Digital audio

STORAGE OPTIONS

Internal	4GB Ultra Fast/Wide drive 9GB Ultra Fast/Wide drive 12GB 4 mm DAT drive
External	4GB Ultra Fast/Wide 9GB Ultra Fast/Wide 3.5" floppy drive 12GB 4 mm DAT drive 32X CD-ROM Digital linear tape

BUNDLED SOFTWARE

Collaboration	Outbox InPerson IRIS Annotator IRIS Showcase Cosmo Player Netscape Communicator 4.05 InfoSearch Netscape FastTrack Server Cosmo Create Adobe Acrobat Reader SGI Meeting Teleffect
Connectivity	NFS ISDN/PPP support Novell NetWare Client Xinet AppleTalk Samba
Digital Media	SoundEditor MovieMaker ImageWorks SoundTrack FX Builder MediaRecorder MediaPlayer CD/DAT Player Audio Panel Video Panel Synth Panel Media Convert
Run-Time Libraries	OpenGL Image Extensions OpenGL

PHYSICAL ENVIRONMENT

System	16.25" H x 11.0" W x 13.25" D 14.75" D (depth in localized area of power supply) 16.25" D (depth in localized area of optional PCI module) 54 lb 20" monitor 18.7" H x 18.9" W x 19.9" D
Voltage and Frequency	100-120/200-240 VAC
Heat Dissipation	2400 BTU/hour
Ambient Temperature	+13°C to +35°C operating -10°C to +65°C nonoperating
Relative Humidity	10% to 80% operating, no condensation 10% to 95% nonoperating, no condensation
Altitude	10,000 ft operating 40,000 ft nonoperating
Vibration	0.02", 5-19 Hz; 0.35G, 19-500 Hz

REGULATORY AGENCY

Electromagnetic Emission	FCC Class A Canada DOC Class A CISPR22 Class A VCCI Class A

OCTANE is part of the Silicon Graphics visual workstation product family, which includes the O², OCTANE, and Onyx2™ systems for UNIX and the Silicon Graphics 320 and Silicon Graphics 540 workstations for Windows NT.

SiliconGraphics Computer Systems

Corporate Office
2011 N. Shoreline Boulevard
Mountain View, CA 94043
(650) 960-1980
www.sgi.com

U.S. 1(800) 800-7441
Europe (44) 118-925.75.00
Asia Pacific (81) 3-54.88.18.11
Latin America 1(650) 933.46.37

Canada 1(905) 625-4747
Australia/New Zealand (61) 2.9879.95.00
SAARC/India (91) 11.621.13.55
Sub-Saharan Africa (27) 11.884.41.47

1280 (1/99)