

WHITE PAPER

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Compaq in the UNIX Marketplace

This paper provides information about Compaq technologies, partnerships and solutions in the UNIX marketplace.

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EXECUTIVE SUMMARY

Through selective partnerships, innovative strategies and technology initiatives, Compaq continues to be the platform leader in the growing X86 UNIX markets for large Enterprise-level organizations, small- to medium-sized businesses, and Replicated Sites.

Building on its reputation as the leader in new technology and price/performance, Compaq partners with SCO, Inc. to deliver leadership platforms for the demanding X86 UNIX market.

SCO is the X86 UNIX Operating System pioneer and market leader, and Compaq server end users worldwide take advantage of the close relationship between the two companies in a variety of ways: by installing integrated SCO operating systems and options through Compaq SmartStart; managing their UNIX networks with Compaq Insight Manager; and receiving seamless post-sales technical support.

Whether your needs are related to small and medium business or enterprise in scale, Compaq UNIX platforms meet them with high performance, highly manageable, industry standard platforms. For small and medium businesses and replicated sites, the Compaq Prosignia and ProLiant server products are ideally matched with SCO OpenServer and integrated application suites from Compaq and Business/21 partners.

At the midrange and enterprise levels, Compaq ProLiant servers running SCO UnixWare provide manageability, availability and excellent price:performance solutions that meet or exceed that of proprietary midrange systems at less than half the cost. With continued Compaq and partner efforts around SCO UnixWare as an industry standard for X86 architecture-based servers and advancements in Compaq server technology, your future growth with UNIX and Compaq systems is assured.

In addition, for end users choosing SunSoft Solaris as their UNIX network operating system, Compaq works closely with SunSoft, Inc. to deliver a variety product enhancements. These enhancements range from the latest driver support for Compaq server products straight out of the Solaris package, to seamless post-sales technical support as needed.

This paper further describes in detail how Compaq offers the best platform solutions for the X86 UNIX market.

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THE UNIX MARKETPLACE

During 1995, the UNIX market, including servers and workstations, experienced revenue growth of more than 20.8% worldwide with 1.3 million systems sold at an overall market worth of \$34.2 billion¹. Within that, the X86 UNIX server market place represented over 266,000 systems with 11.4% growth². More specifically, from 1994 to 1995, Compaq's Worldwide UNIX midrange system shipments showed a 206.1% increase in growth¹. With movements toward a more common X86 UNIX applications standard (UNIX 95), better PC connectivity, and potential for aggressive pricing, recent IDC opinion indicates that UNIX solutions will continue to be a growth area for the foreseeable future¹.

The UNIX marketplace is comprised of several segments, including:

- Small- and Medium-sized Businesses
- Replicated Sites, including point-of-sale, remote operations, specialized needs and branch offices of larger corporations
- Midrange/Enterprise Class Organizations

Small scale-systems (\$10,000 - \$100,000) account for more than one-third of the UNIX market and medium-scale systems comprise of nearly one-quarter (\$100,000-\$1M)³. Small and medium sized businesses depend on these systems to run their core business applications including accounting systems, inventory control databases, human resources systems, manufacturing, document management and others. This segment, which grew at a rate of nearly 16% worldwide during 1995, is dominated by small and medium scale systems including industry standard X86-based platforms running UNIX products from SCO.

In the enterprise market, X86-based UNIX systems support mission critical production environments, especially running databases, and offer a more cost effective solution than proprietary midrange systems from Hewlett-Packard, Digital Equipment Corporation, IBM and others. This market segment experienced a worldwide market growth of 28% during 1995 and IDC indicates this growth occurred at the expense of proprietary and large-scale systems (greater than \$1M)³.

Compaq offers excellent platform solutions for these markets with both the market leading SCO product line, as well as for SunSoft Solaris.

COMPAQ IN THE UNIX MARKETPLACE

X86 UNIX servers have traditionally been the stronghold in the small and medium business and replicated site market segments. As the leading server platform in this market segment, Compaq client/server UNIX solutions bring traditionally midrange class capabilities and application sophistication to the smaller businesses. Compaq servers running SCO OpenServer and SCO UnixWare provide unmatched price/performance, reliability, cost of ownership and choice of applications to small, medium, and replicated site customers.

As an industry standard platform, Compaq servers support a broad range of enterprise-class server operating systems, including SCO UnixWare and SunSoft Solaris. These open solutions provide greater flexibility, a more extensive portfolio of available applications and a lower total cost of ownership than any proprietary RISC-based midrange vendor.

¹ IDC, The UNIX Systems Market Review and Forecast, 1995-2000, August 1996.

² IDC, UNIX and Server Operating System Environments Review and Forecast, 1995-2000, July 1996.

³ IDC, UNIX Systems Market: 1995 Year in Review, January 1996.

Compaq penetration in the midrange/enterprise market segment is accelerating⁴. During 1995, Compaq showed a 50% rate of growth in this market—this is more than double the rate of growth of any other midrange systems vendor.

Compaq is the Leading Provider of X86-based UNIX Systems

Compaq is the leading vendor in worldwide server shipments with over 31% of the server market. Compaq is also the largest supplier of systems running SCO UnixWare and SCO OpenServer (based on SCO ORD data). Compaq servers are also widely used by SCO for product development and are the platform of choice for X86-based UNIX performance benchmarks.

Compaq and SCO have partnered to leverage their combined strengths and deliver best-of-breed solutions in the highly competitive UNIX market. SCO is the world's leading supplier of UNIX systems with SCO OpenServer and UnixWare license shipments in 1994 and 1995 outpacing those of HP-UX, Solaris, and AIX combined (Figure 1).

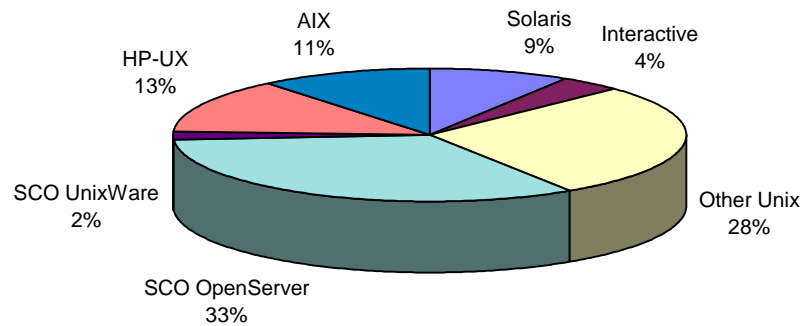


Figure 1 - Worldwide Server/Host UNIX Shipments for 1994 & 1995 (Source: IDC, July 1996)

When only X86-based UNIX systems are considered, SCO is far and away the market leader with roughly 70% of the total market⁵. As the leading provider of platforms for SCO and the other X86-based UNIX system vendors, Compaq servers meet the needs of nearly 76% of the market—far more than any other vendor.

Following SCO, the SunSoft Solaris X86 operating system makes up the second largest market share for X86-based servers with 1995 shipments increasing by nearly 79%. For users preferring SunSoft Solaris X86, full driver support and operating system technical support for Compaq servers is available directly from SunSoft.

DRIVING FACTORS BEHIND COMPAQ'S INDUSTRY LEADERSHIP POSITION

Compaq understands the needs of its UNIX customers and is committed to the advancement of industry standard technology, continued investment protection for its customers, a secure growth path, the lowest total cost of ownership and the best price:performance numbers available.

Compaq also adds value through UNIX support for Compaq Insight Management, and integration of the operating system and applications through Compaq SmartStart. Put all of this together, and Compaq servers are clearly your best choice for UNIX-based solutions.

⁴ IDC, Midrange Systems: 1995 Review and Look Ahead, January 1996.

⁵ IDC, UNIX and Server Operating System Environments Review and Forecast, 1995-2000, July 1996

Industry Leading Technology

Since the introduction of the SystemPro server in 1989, Compaq has consistently delivered technologies that produce the most cost effective, high performance, highly available, industry standard servers on the market. In key areas, Compaq was the first to develop and bring advanced technologies and capabilities to the mainstream X86 server market.

- X86-based, 4-way SMP server architectures, including today's Pentium® Pro servers capable of supporting 1000+ user environments with the industry's highest TPC-C price:performance numbers;
- ECC and Advanced ECC memory systems which can detect and correct bit errors in server memory or, in the case of Advanced ECC memory, can protect Compaq servers from the failure of an entire DRAM device;
- Optimized I/O and memory management systems deployed in the ProLiant server architectures;
- Industry standard bus architectures such as EISA and PCI, optimized for maximum performance in Compaq servers;
- Drive array technologies including the SMART-2 Array controller which provides a 40MB/s I/O channel, support for hot-pluggable drives, a hardware-based RAID engine, and ECC read/write cache with battery backup;
- Automatic Server Recovery and Automatic Server Restart;
- High Performance Network Interface Controllers including 100BaseTX and 100VG-AnyLAN Netelligent interfaces.

Compaq also continues to advance UNIX technology and its compatibility with Compaq products through participation on the OEM Advisory Council in the newly formed SCO UNIX Computing Forum (UCF). The UCF maximizes the market potential for SCO UNIX based solutions and sets the future direction of SCO software products. The UCF was developed from the transition of the UnixWare Technology Group (UTG) into an internal SCO function.

LOWEST TOTAL COST OF OWNERSHIP

In terms of cost of ownership, Compaq industry standard X86-based servers begin with tremendous cost advantages over proprietary RISC-based solutions. While proprietary systems vendors charge a premium for their closed platforms, customers and industry standard vendors benefit from the economies of scale present in the X86-based server market.

As a volume platform, Compaq servers also have the focus of the largest number of independent hardware and software vendors (ISHVs). New developments in processor, bus, management, networking, and operating system technologies are immediately available to vendors of industry standard servers. This leveraged development model gives Compaq a strong advantage in time to market and permits Compaq to concentrate on innovation and technologies which provide timely added value to its customers.

Compaq servers achieve the lowest total cost of ownership available through continuous innovation and the development of new technologies which improve price:performance, system availability, system manageability; software tuning and software integration.

Price / Performance

Earlier this year, the Pentium® Pro-based Compaq ProLiant 5000 demonstrated unmatched price/performance along with enterprise-class TPC-C transaction processing capabilities. As well

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as beating out competitors' X86-based servers, Compaq exceeded the performance of proprietary RISC-based midrange competitors at a much lower total system cost (Figure 2).

Source: TPC	Compaq ProLiant 5000 200 MHz	HP 9000 D370	Sun Ultra Enterprise 3000	DEC AlphaServer 4100
TPC-C Throughput	8311 tpmC	5822 tpmC	6662 tpmC	7598 tpmC
Price:Performance	\$96 / tpmC	\$1148 / tpmC	\$152 / tpmC	\$153 / tpmC
Total System Cost	\$792,738	\$857,852	\$1,013,031	\$1,155,226
Number of Processors	4	2	6	4

Leading Price/Performance

8311 tpmC @ \$96/tpmC

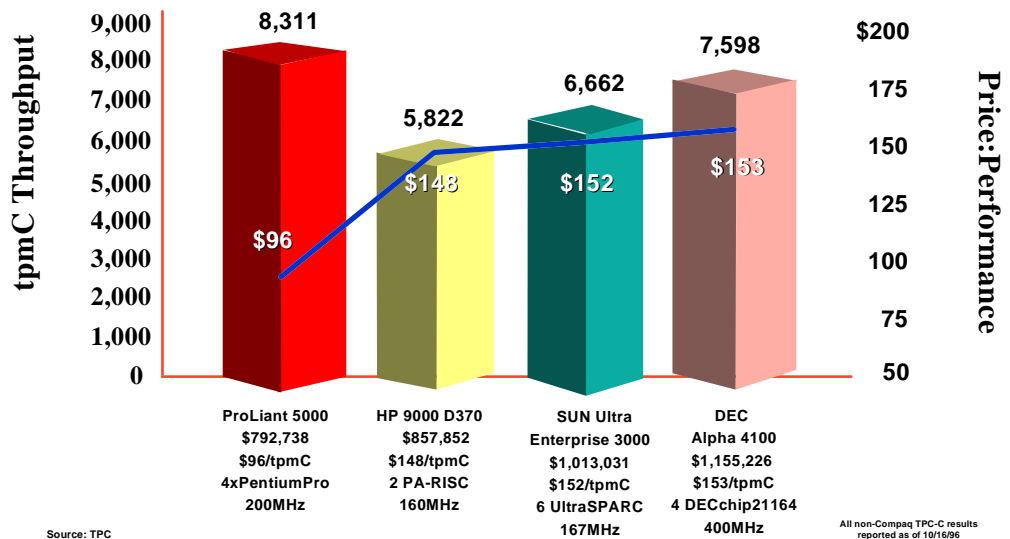


Figure 2 -Compaq ProLiant 5000 gains TPC-C record (Source: TPC, October 16, 1996)

In October 1996, Compaq won 13 out of the 20 UNIX Hot Iron Awards in the Best Performer and Best Price/Performance categories from Aim Technologies—the most ever won in the UNIX classification.

This event is significant as Compaq servers running SCO UnixWare 2.1 again exceeded the performance of both proprietary RISC/UNIX vendors and other X86-based vendors. Compaq servers again beat all other competitors in the Best Performer—File Server Mix (\$150,000 and Over) and Best Price/Performer—Throughput (Less than \$25,000) categories.

These independent third-party benchmarks and awards clearly demonstrate that Compaq servers provide UNIX customers with the best platforms at the best price:performance.

Manageability and Reliability

Compaq platforms are instrumented to manage over 1000 server parameters. Compaq Insight Manager captures and analyzes server parameters to provide network managers with more than just reporting and alerting—Insight Manager provides active server management tools including the ability to reach out and control distributed servers from a centrally managed environment. In a distributed enterprise, the ability to centrally control and manage hardware and application environments provides customers with significant savings in administrative, travel and personnel expenses.

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Compaq Insight Manager also provides a unique ability to combine hardware fault tolerance features with software-based predictive alerting. With advanced notification of impending failures and Compaq pre-failure warranties, customers benefit from maximum system uptime and scheduled server maintenance. Compaq Insight Manager also works hand-in-hand with SCO Doctor to provide a full hardware and software manageability solution. These factors contribute to high system availability and lower total cost of ownership.

High Levels of Software Integration via SmartStart

One of the most difficult challenges facing IS professionals is the integration of the server platforms, operating systems and applications that make up a complete solution. In fact, proprietary system vendors have turned the consulting and integration services typically required to install, configure and tune each element of a solution into a tremendous source of revenue. Compaq took the leading role in providing its customers with a more cost effective alternative.

Compaq introduced the industry's first automated server installation, configuration and management tool in SmartStart. In a single software tool, SmartStart combines thousands of hours of experience and expertise from Compaq systems engineers with the distribution of industry leading operating systems, relational database management systems, storage management solutions and Internet/Intranet applications.

Using SmartStart, customers gain measurable improvements in installation time and the resulting performance of SmartStart configured systems. Compaq SmartStart provides value-added installation, management and integration services that are unmatched by competing vendors. With SmartStart, customers are able to reliably build proven, tested and pre-tuned solutions on Compaq servers through a standardized and consistently repeatable process.

Investment Protection

Since the early 1980s, Compaq has invested heavily in the development of solutions for UNIX and the X86 server market. This investment in the development and advancement of industry standard technologies continues today.

Compaq and SCO Cooperation

Compaq and SCO have a history of cooperation that spans more than a decade and includes the joint development of high availability fault tolerance, array technology, and SCO SMP (MPX) technology on Compaq servers. Over the years, Compaq and SCO have worked very closely together supporting joint investments in engineering and expertise, driver development, testing programs, and reseller training programs.

Some of the current ways SCO and Compaq provide added value for customers include the Compaq and SCO Technical Support Alliance, SCO TEAM Support, and the Compaq Global Service and Support Provider Program.

- The Technical Support Alliance establishes technical cross-training for support staff, exchange of partner products, and an escalation infrastructure for solving issues in complex environments.
- Mutual Compaq and SCO major account customers benefit from SCO's premier "TEAM Support" program whether products are purchased through Compaq SmartStart or directly from SCO.
- The Compaq Global Service and Support Provider Program was established to provide Compaq branded enterprise-level support services on Compaq servers anywhere in the world.

Compaq Endorses Standards for Enterprise UNIX

Last April, Compaq joined SCO, Intel, and six other OEMs to endorse SCO UnixWare as the industry standard UNIX operating system for Intel architecture servers. At this "Enterprise Summit," these vendors agreed to take a radical departure from the typical development model for the UNIX industry.

For the first time, X86-based UNIX systems will benefit from a common core operating system across diverse OEM hardware platforms. The net effect is to change development from a vertically oriented model to the shrink-wrapped model of other high volume operating systems in the server market. Instead of porting to a particular OS and platform, ISVs will port once to SCO UnixWare and a single application binary will run across different hardware platforms.

The benefits to customers are numerous. ISVs will now be able to concentrate on adding value rather than on porting to different platforms. Customers will enjoy more applications to choose from and a single application binary will scale from small business all the way through the enterprise. Industry standard platforms and applications also lead to favorable high-volume economics. Finally, common OS and application versions across platforms will reduce the management burden and cost of maintenance for IS.

Compaq Engages in Programs for Small and Medium Businesses

A similar collaborative program led by Compaq, Oracle, and SCO and involving leading independent software vendors simplifies customer purchasing decisions by bringing ready-made advanced solutions to small and medium businesses. These vendors have invested in training and support programs for resellers and SCO-certified Advanced Product Centers (APCs) that enable them to deliver application integration and service levels more typical of the midrange and vertical market vendors.

Small and medium businesses are the key benefactors of the program. Called Business/21, the program includes a strong portfolio of platforms and client/server applications with Windows-based front-ends:

- SCO OpenServer and SCO UnixWare
- SCO ARCServe/Open and SCO Doctor
- SCO Internet Server Products
- Oracle7 Workgroup Server
- Oracle InterOffice Suite
- Oracle PowerBrowser and Oracle WebServer
- Oracle Enterprise Manager
- Compaq Insight Manager
- BMC Patrol
- Orange Systems ALCIE V accounting and financials
- Cyberports Internet access services
- EZ Power PowerOffice document management and imaging
- Integral Systems HRServer for human resources and personnel
- Symix Manufacturing System
- Platinum Technologies AutoSys job management tools

These solutions are jointly tested, integrated, and tuned for combined Oracle, SCO and Compaq platforms. They are priced competitively for the small business market and include support for a number of advanced technologies typically not available to customers in the small and medium business markets.

Secure Growth Path

Next generation servers from Compaq and future operating systems from SCO provide a secure growth path to 64-bit UNIX technology. SCO has outlined a detailed road map for its UNIX products to reach a powerful 64-bit industry standard UNIX operating system over the next two years (Figure 3).

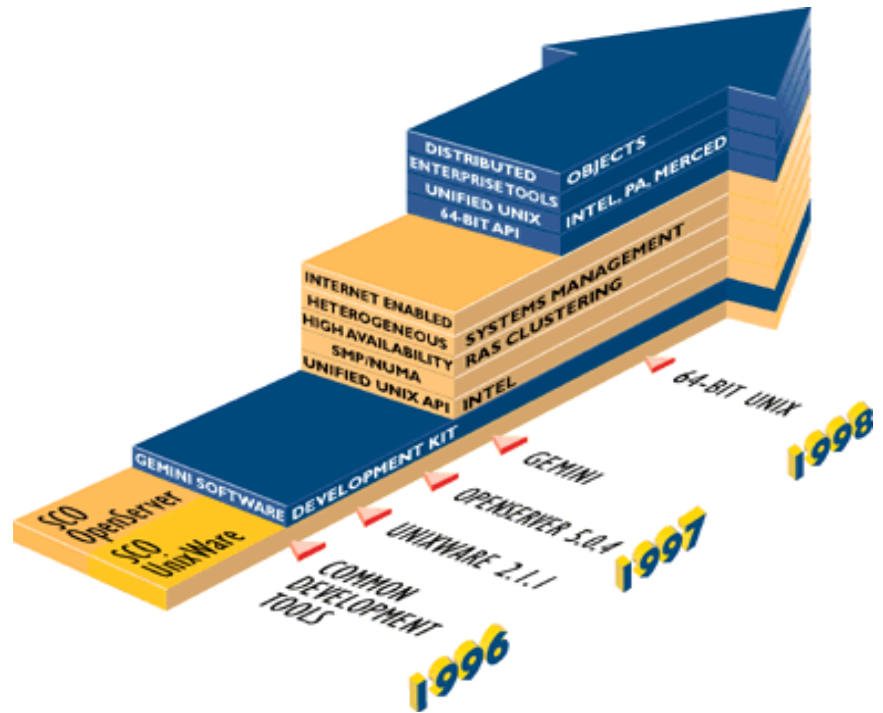


Figure 3 - SCO's Product Roadmap (Source: SCO)

During SCO Forum'96, SCO released the Gemini Software Development Kit (SDK) which is the first step in the eventual merge of SCO OpenServer and SCO UnixWare. The Gemini SDK will enable developers to write single binary versions of their applications for either SCO UNIX platform. Later in 1997, SCO will deliver a single merged UNIX operating system (Gemini) resulting from the consolidation of SCO OpenServer and SCO UnixWare technologies. Following Gemini in 1998, SCO will deliver a full 64-bit implementation of UNIX-based on the 3D Architecture (3DA) currently under development. Customers will continue to enjoy full support for future Compaq server technology within 3DA and future versions of SCO UNIX.

FUTURE UNIX MARKET TRENDS

- Future trends see UNIX systems accounting for \$58 billion in sales, including 2.1 million units in the year 2000 at a compound annual growth rate of 11.2%⁶.
- Customers will increasingly see UNIX used for database and application servers connected to Windows PC clients⁶.
- Value-added resellers that can provide systems integration and enterprise-level support to large corporations will increasingly broaden distribution to include smaller scale systems.

⁶ IDC, The UNIX Systems Market Review and Forecast, 1995-2000, August 1996

- As UNIX systems complete their transition to host Online Transaction Processing and data warehouse servers, vendors will provide more complete product sets to address system management, network management, and security⁶.
- UNIX system vendors will address users' concerns about the security of their data in new distributed computing and Internet/Intranet environments⁶.
- Customers will increasingly move their applications from UNIX mainframes to clusters of cost-effective UNIX servers.

FUTURE DIRECTIONS IN UNIX TECHNOLOGY

As future market trends unfold, both SCO and Compaq will continue to introduce new technologies and enterprise class capabilities in the UNIX market. In the near term, SCO will add third-party layered products to its current portfolio including NetScape Internet/Intranet products, Cheyenne ARCServe/Open, SCO Doctor (system management tools), and Advanced File and Print Services. Compaq SmartStart enabled integration of these products will provide additional tuning and installation assistance on Compaq platforms.

Compaq and SCO will leverage current developments in Compaq's Standby-Recovery Server and ServerNet clustering technologies for high-availability clustering add-ons and support for large databases in a distributed environment.

Compaq will also introduce support for SCO operating system products in new releases of the SmartStart Integration Management Server.

The Integration Management Server serves as a network-based repository for ROM, driver, system partition, and operating system images. Installing new servers becomes a simple matter of booting from a SmartStart CD and pulling a tested, pre-configured server image across the network. In complex environments or environments with large numbers of servers, Compaq Configuration Management results in tremendous lifecycle cost savings through reduced support costs and time spent managing driver and ROM updates. When used with Compaq Insight Manager's maintenance capabilities, Integration Management Server provides a means of deploying consistent server configurations.

COMPAQ UNIX SOLUTIONS SERVE A WIDE SPECTRUM

Whether your needs are related to small and medium business or enterprise in scale, Compaq UNIX platforms meet them with high performance, highly manageable, industry standard platforms. For small and medium businesses and replicated sites, the Compaq Prosignia and ProLiant server products are ideally matched with SCO OpenServer and integrated application suites from Compaq and Business/21 partners.

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