HP e3000 Internet Solutions

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Introduction and Roadmap

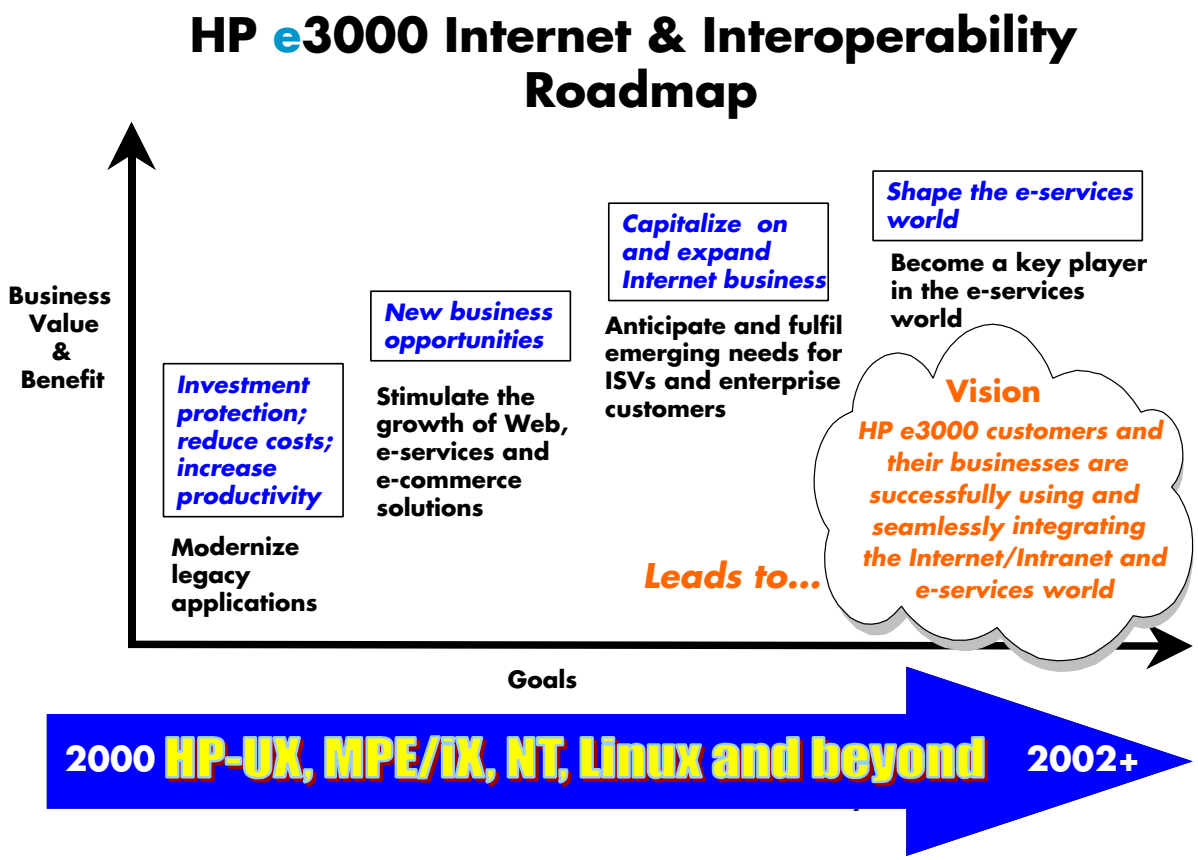
As companies and consumers transform and evolve their personal lives and businesses because of the Internet, comprehensive solutions become a respected, sought-after necessity. From servers and e-service/Internet solutions to peripherals and partners, from support and service to financing, HP brings added strength and stability to each customer's needs and requirements.

The HP e3000 is so successful in bringing real world applications to e-services and the Internet because it has been running mission-critical applications for many years and it has evolved along with the substantial and rapid changes in business and every day life brought about by the advent of the Internet. The HP e3000 works with web-enabling technologies developed by HP and key partners for use in heterogeneous environments to provide seamless integration of internet and e-services solutions. With its transaction-based models or Apps-on-Tap services, the HP e3000 has become a major catalyst for e-services in this area and is helping to build web-enabled businesses that will define success in this new millennium.

The HP e3000 Internet and Interoperability strategy and roadmap (as illustrated by the accompanying graphics) leads to the realization of the following vision: HP e3000 customers and their businesses are successfully using and seamlessly integrating the Internet/Intranet and e-services world.

MISSION-CRITICAL FOUNDATION IN A HETEROGENEOUS ENVIRONMENT

Companies continue to evolve into heterogeneous computing environments with vast amounts of mission-critical data. The HP e3000 mission-critical computing environment has also evolved into a heterogenous one, often including both UNIX and NT platforms; a combination of LAN, WAN, intranet and Internet technology; and the use of commercial network management frameworks for centralized administration.



The HP e3000's strong foundation for e-services and the Internet is based on its high availability, system management, and storage capabilities along with the new MPE/iX Release 6.5 operating system, HP WebWise, the new Internet solution suite to Internet-enable the HP e3000, and a number of development tools and Internet applications. HP WebWise components include the new MPE/iX Secure Web Server based on Apache. Together, these form the basis on which to evolve into and enable growth in an Internet world; build Internet tools and applications and further capabilities; and access and use data securely so necessary for Internet and e-services solutions. In addition, The HP e3000 continues to provide investment protection to customers so that they can quickly and easily take advantage of web technologies and the Internet. In addition to its more traditional role as a transaction-based server, the HP e3000 now offers flexibility to customers in an Internet-oriented world as a reliable, scalable, web-enabled Internet application server.

NEW WEB/INTERNET-ENABLING TECHNOLOGIES FOR EVOLUTION AND INTEROPERABILITY

In today's e-business environment, interoperability is key. E-services depend on seamless computing in heterogeneous environments. The HP e3000 with MPE/iX 6.5 and the new web-enabling technologies deliver interoperability with UNIX, NT and other major Internet and intranet platforms. The HP e3000 has embraced such web-enabling technologies as the **Apache Web Server** and **the MPE/iX Secure Web Server based on Apache (first product in the HP WebWise Internet suite),** for establishing Internet presence with overall Internet security; **MPE/iX SDK for Java 2 Platform, version 1.2; Lightweight Directory Access Protocol (LDAP)** for directory access across platforms; **Open Database Connectivity (ODBC)** for a standard interface to access a variety of databases using SQL such as IMAGE/SQL and ALLBASE/SQL; **Java Database Connectivity (JDBC)** allows Java applications to access data stored in HP e3000 databases; **Secure Sockets Layer (SSL)**, the Internet security protocol for securing Internet data exchange; various front-end and graphical user interface (GUI) tools such as **HP Samba/iX** and **Javelin** from MiniSoft; designing and deploying web and client/server applications such as Minisoft's **Web Dimension**; and Message-Oriented Middleware, allowing applications on different computing platforms and networks to exchange data reliably and securely, such as **IBM MQSeries Client** from Willow Technology and **Geneva Message Queuing** from Level 8, connecting Microsoft and non-Microsoft applications. In addition, HP e3000 supports XML-enabled applications.

Key Focus Areas of HP e3000 Strategy

To meet the needs of existing and new customers and partners in the "e-world", the current key focus areas are:

Embracing partnerships and new technologies by delivering newly enhanced, affordable, interoperable, and easy-to-use solutions that incorporate fresh ideas like e-services and accelerate integration/interoperability with the Internet and other platforms; and partnering with best-in-class solutions providers by industry and category, as well as with tools and middleware vendors.

Enabling growth in an internet world by going beyond simple vertical and horizontal growth. With new peripherals, new back-up/storage offerings, and nearly transparent integration with UNIX, Windows NT, and other platforms, the HP e3000 helps customers grow without compromising their internal schedules at a competitive price/performance.

Expanding core strengths by improving in virtually every category in which it already excels such as improved uptime, reliability, and ease-of-use.

HP e3000 Internet and e-services Solutions Strategy

What to accomplish	How to achieve
Modernizing legacy applications for easy connection to and use of the Internet means investment protection, reduction in costs, customer satisfaction and increased productivity	Provide Internet infrastructure, web and Internet directory enablement and quick easy software development environments to "webify" existing applications and create an Internet presence: • Apache Web Server • MPE/iX Release 6.5 • Front-end tools and graphical user interface tools to webify "existing" applications such as: – HP Samba/iX – GUI3000 from OmniSolutions – Javelin and Web Dimension from MiniSoft – StarMan from Bradmark – PERCobol from Synkronix --- Qedit from Robelle • Common Gateway Interface Protocol • Java Database Connectivity (JDBC) • Open Database Connectivity (ODBC)
Stimulating the growth of Web, e-services and e-commerce solutions promotes and develops new business opportunities and expands current business	Enable rapid development environments, explore and recommend partner technologies and tools, and provide Internet security for scalability, increased performance, and new capabilities: • HP WebWise Internet Suite (MPE/iX Secure Web Server based on Apache with Encryption, Authentication, and SSL) • BSAFE SSL-C Development Toolkit • Lightweight Directory Access Protocol (LDAP) • MPE/iX SDK for Java 2 Platform, version 1.2 • Strong partnerships with ISVs
Anticipating and fulfilling the emerging needs for customers and partners leads to capitalizing on and expanding Internet and e-services business	Embrace key middleware and Internet standards to ensure seamless integration and interoperability and continued evolution in heterogeneous computing environments: • IBM MQSeries Client from Willow Technology • Geneva Message Queuing (Microsoft) from Level 8 • Active Web Information Broker from Premier Software • XML-enabled applications • DCE-RPC
Becoming a key player in the e-services world allows for shaping and defining an e-services world as it evolves, bringing new revenue streams, expanded portfolios, increased efficiencies, and new market and strategic opportunities	Utilize transaction-based e-services or Apps-on-Tap and avoid building complex, costly systems and environments: • One-stop destination to which customers can switch all of their telecommunications systems and products, including wireline and wireless technologies (HP/Telenomics Alliance) • One-stop destination to ticketless travel, providing convenience to passengers and a ticketless operation for the airline industry, bringing lower costs and increased efficiency (Open Skies).

Solution Foundation

HIGH AVAILABILITY

The Internet stretches the limits of today's systems and solutions with the exponential increase in the amount of information and access to it, 24 hour, worldwide accessibility, free-flowing direction, distance flexibility and just-plain-speed for everything. This emphasizes the urgent need for Internet/e-services solutions that provide high availability of critical business applications to meet the challenge of stretching and surpassing limits for today's systems. Capitalizing on the opportunities provided by the Internet means having a strong, solid, reliable infrastructure foundation. Downtime in a 24-hour uptime e-world means loss of revenue, productivity and deals, and extra costs.

The HP e3000 with its three levels of availability eminently qualifies it for Internet and e-services solutions: basic system availability with built-in fault avoidance; high availability for rapid recover; and disaster tolerance. In addition, the HP e3000 keeps pace with the growing memory needs of Internet and e-services solutions with increased memory sizes to at least 16 GB.

The basic system availability with built-in fault avoidance refers to the inherent robustness of the HP e3000 and the MPE/iX high availability operating system. Features, such as online device configuration, error correcting memory, Patch/iX, Stage/iX and electronic patch delivery, minimize downtime for routine maintenance.

SYSTEM MANAGEMENT

In the networked world of e-services, the monitoring and managing of heterogeneous environments is more important than ever. HP OpenView IT/Operations addresses one primary task: keeping distributed, mission-critical, multi-vendor environments up and running. It provides powerful management functionality for the server, and covers key events related to database conditions, networking and job and process management. Powerful scripts in IT/O monitor key HP e3000 system resources and processes, and cover system areas such as networking, backups and security.

HP Secure Web Console simplifies HP e3000 system management by allowing users to access multiple HP e3000 server consoles from a single location via the Internet. Through remote access, senior system managers can be available instantly to troubleshoot problems, even from home or on the road. This HP Internet appliance offers an extremely efficient and cost-effective way to manage networked HP e3000 servers remotely and securely.

Analyzing the data and getting answers to all the questions is another aspect of the Internet world. The HP e3000's e-Intelligence solution is Decision Vault. It enables a data warehouse or data mart to be implemented easily using an IMAGE/SQL database, with high-speed access to the data through graphical end-user tools. This solution is provided by HP, DISC, Taurus Software, Quest Software, Inc. and Brio Technology.

STORAGE

The Internet means collection and use of vast amounts of mission-critical data for companies in heterogeneous computing environments. Data protection and management are hallmarks of the new e-world. Solutions offering increased performance, capacity, protection/reliability, online backup, flexibility and fast, easy access to data are critical.

HP e3000 storage solutions are more reliable, cost-effective and flexible then ever. The new HP SureStore E Disk Array 12H combines hassle-free storage management with the best-in-class performance and capacity. The last thing an e-business needs is to worry about its storage needs. The 12H is a self-managing storage array. With its self-optimization, it automatically transfers data of one raid level to the other to maintain the highest performance and balance space availability based on the incoming data loads. E-businesses have an inherent need for high availability, and the 12H provides that with its internal mirroring of data which prevents the failure of a disk drive from impacting the daily business of today's new e-company.

The HP SureStore E Disk Array XP256 is the ultimate high availability solution for the e-business that needs large online storage capacities, high performance and high availability. The XP256 supports capacities from 60GBs to over 11 Terabytes. Like the 12H, its components are hot-swappable so downtime is so no longer an issue. Because its capacity can be increased on-line, the XP256 can grow as the requirement for capacity grows without imposing unnecessary downtime. Built for the e-services environment, the XP256 can support multiple copies of data or host copies of the data on a second XP256 for those disaster sensitive environments. To further its support of e-businesses, the XP256 has an automatic call home feature allowing support to respond to problems, before they can impact a business.

Both the 12H and the XP256 are disk arrays designed to be pillars of the e-business infrastructure. Without these kinds of storage devices in an e-services environment, it is doubtful that the business will survive or compete well against other e-businesses.

E-businesses by definition are 24x7 shops. Therefore, it is important to be able to perform storage backup online. Enhanced TurboSTORE/iX 24x7 TRUE ONLINE Backup, together with the Legato NetWorker Storage Node, provides a cost-effective, high capacity hot backup solution for HP e3000 enterprise environments. Since many e-businesses are multi-vendor shops, the Legato Storage Node works with Legato's NetWorker server components to create a backup solution that can manage scheduling backups, archiving of data and data cloning across the multiple operating systems of e-businesses. TurboSTORE/iX and Legato facilitate increased efficiency, ease of use and decrease resources needed to manage the data center.

The Internet also means connecting people and systems in more than one place or area. Fibre Channel Distancing for distance flexibility (10 meters to 10 kilometers) in a data center is available in a new HP e3000 distance solution that allows the HP e3000 to use a SCSI-to-Fibre Channel-to-SCSI bridge without native Fibre Channel support.

These HP e3000 storage solutions fold nicely into the HP Storage Area Network (SAN) strategy and will provide investment protection while evolving into and growing with the Internet and e-services world.

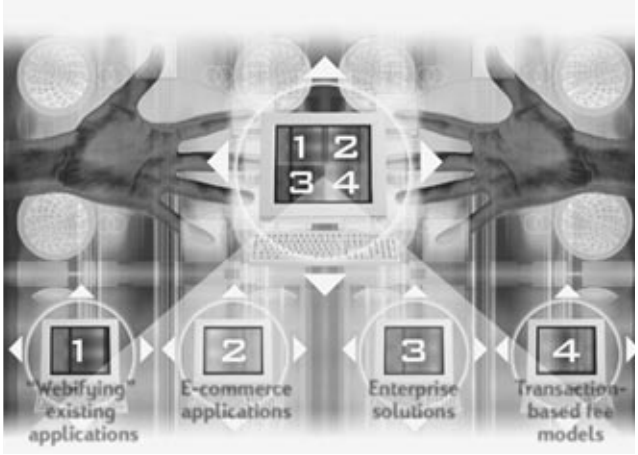
Integrated Web/Internet Enabling Technologies

APACHE WEB SERVER

A variety of web-enabling technologies uniquely position the HP e3000 for the world of e-services and the Internet. The Apache Web Server, bundled with the latest Internet MPE/iX 6.5 OS and fully-supported by HP, provides customers with a powerful, easy and affordable means of establishing an Internet or intranet presence. The new HP WebWise MPE/iX Secure Web Server is now available as a separate product, offering authentication and encryption. (See Internet Security Section)

JAVA

The Internet is enhanced by Java-based technologies, and MPE/iX is a 100 percent pure Java compatible environment. Java's key features are portability and platform independence - so important in an e-services world. The Java Developer's Kit (JDK) 1.1.5 is included in MPE/iX 6.0, and the MPE/iX SDK for Java 2 Platform, version 1.2 is bundled with MPE/iX 6.5, enabling enterprise IT software developers to customize Java applications and applets. The MPE/iX Virtual Machine with JIT for Java, which is included in the MPE/iX Software Developers Kit for Java 2 Platform, allows Java applications and applets to execute BEST on HP e3000 platforms.



Evolving to the Internet/e-services World

Scenario	Who	Focus
"Webify"/ Internet-enable existing applications	independent, single shops	to leverage core HP e3000 applications to web-based computing; create development environment to deploy applications quickly with a common, easily-maintained browser interface
E-commerce applications	e-commerce vendors such as web retailers and web fulfillment vendors	build and deploy applications quickly, as well as provide high performance and secure access to critical information and business logic residing on the HP e3000; need to handle a large number of simultaneous users and incorporate multiple systems and resources
Enterprise solutions	large customers who want mission-critical HP e3000 applications to fit into an evolving Internet and web-centric enterprise environment	enterprise environments composed of information systems with distributed databases, automated business processes and business practices—all tightly integrated with web-based applications. Such applications use emerging industry standards, protocols and middleware technologies in networking, security and distributed OLTP areas.
Transaction-based models (i.e. Apps-on-Tap)	customers with needs to lower overall IT costs	build and deploy unique applications while renting the hardware, software and middleware as needed

MIDDLEWARE FOR INTEROPERABILITY IN A HETEROGENEOUS ENVIRONMENT

The HP e3000 offers industry-standard database connectivity with HP Driver for Java Database Connectivity (JDBC), a Java-based middleware tool that facilitates development of Java applications and applets. Legacy J PERCobol, running on the HP e3000, enables legacy applications to be extended to multi-platform multi-threaded client/server computing architectures. The HP e3000 also offers the Open Database Connectivity (ODBC) API interface that enables Microsoft Windows-based applications and tools access to databases using SQL such as IMAGE/SQL and ALLBASE/SQL. Applications that use the ODBC interface can connect to any database over the network that has an ODBC driver. The HP e3000 provides ODBC drivers such as ODBCLink/SE and DataExpress for Client/Server from M.B. Foster Associates; LinkWay from CSL Business Solutions; and ODBC/32 from MiniSoft.

In addition, for heterogeneous environments, Lightweight Directory Access Protocol (LDAP) for directory access across platforms provides easy interoperability and transparent access among X.500 directories on the HP e3000. DCE RPC, running on the HP e3000, provides a high-level programming model to the distributed applications and hides networking communication details from the users.

The ability to operate across platforms and applications is essential. Seamless integration of disparate computer systems with enterprise-wide and Internet-styled applications is a solid, core strength of the HP e3000. Data interoperability in a web-centric enterprise-computing environment is not only between the HP e3000 and other HP e3000's or NT and the HP e3000, but also with other platforms such as UNIX, IBM, Linux and Solaris. Message-Oriented Middleware (MOM) allows applications on different computing platforms and networks exchange data reliably and securely. For example, message-oriented middleware lets mainframe, UNIX or Windows NT applications communicate by sending data messages to message queues. MOM solutions on the HP e3000 from HP partners include: Level 8's Geneva Message Queuing connecting Microsoft and non-Microsoft applications; Willow Technologies IBM MQSeries Client; and Premier Software's Active Web.

Transforming MPE/iX applications into interoperable, high-powered server objects is also addressed on the HP e3000 with OSCAR (Open Services Catalog and Application Repository) by Premier Software. Because OSCAR supports connectivity across MPE/iX, HP-UX and Win32, MPE/iX applications can be engineered as a server or client. This OSCAR messaging technology and repository also have been integrated with popular ERP solutions such as SAP R/3.

GRAPHICAL INTERFACES

Graphical user-friendly interfaces (GUI) are demanded and essential in an Internet world. The traditional interface to the HP e3000 has been through a simple terminal. Today, the HP e3000 offers two design concepts: desktop-based and session-based. Once a style of access is selected, the HP e3000 offers numerous approaches to evolve the simple terminal user interface. Many HP and third-party products and tools provide enhanced user interfaces and GUIs to HP e3000 users such as:

HP Samba/iX allows MPE to act as a file and print server to PC client running on the Windows environment; GUI3000 from Omnisolutions manages files, groups and accounts; provides information about TURBO/IMAGE database, and establishes an interface to the HP e3000 for carrying out demands; Qedit from Robelle allows editing of MPE/iX or HP-UX server and local PC file from a single MS Windows application; and StarMan from Bradmark creates a point-and-click environment and a more user-friendly environment.

In addition to the technologies and tools that are mentioned above, many new emerging protocols, standards and middleware are also used to pull these heterogeneous data repositories together in a seamless fashion without burdening the user with knowledge of the access methods for each platform.

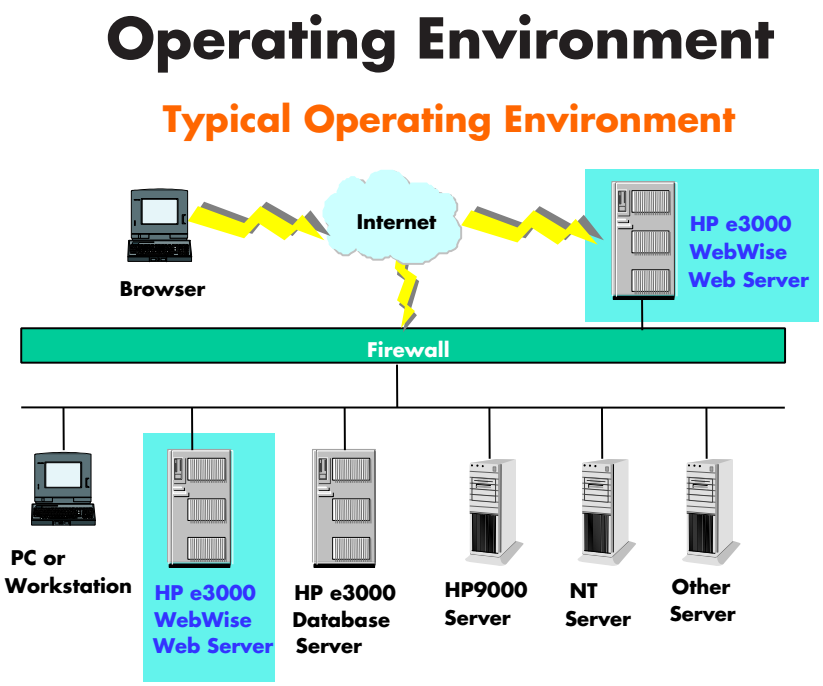
INTERNET SECURITY

With the advent of the Internet and the creation and rapid success of e-business, security has never been more important. As organizations move business processes onto the Internet and allow trading partners and customers and partners to enter their intranets, company boundaries blur. At the same time, as companies make more and more information about themselves available to outsiders, they need to protect other information from unwanted intruders. Building trust in the electronic marketplace and addressing security and privacy are essential to the success of capitalizing on the Internet.

The Internet Security vision for HP e3000 customers and their businesses is: successfully using and seamlessly integrating the Internet and e-services world - securely, privately, and with trust. The two key targeted areas to successfully realize this vision are: i) provide host security and ensure system integrity and robust system security while connected to the Internet; and ii) provide the ability to guarantee the privacy and integrity of data exchanged over the Internet.

To that end, HP embraces a key Internet security building block SSL (Secure Sockets Layer Protocol) and offers the HP WebWise MPE/iX Secure Web Server. This unique HP Internet software gives full-strength encryption, authentication, and overall Internet Security to the web sites of HP e3000 users. It is built on top of BSAFE Crypto-C library offered by RSA, a global provider of security products and services. SSL-C is a software development suite for building SSL security into e-commerce and Internet applications. SSL-C offers a comprehensive set of security software components for building SSL-enabled applications, combined with the full suite of RSA algorithms. In order to guarantee the privacy and integrity of the data that flows over untrusted networks, the HP e3000 applications can interoperate seamlessly with other SSL-enabled applications, while ensuring system security when connected to the Internet.

RSA and HP are working together to increase security capabilities for HP customers with RSA's support of its recently introduced BSAFE SSL-C toolkit on the HP e3000. BSAFE SSL-C provides independent software vendors (ISVs) and enterprise developers an integrated and tested package of components implementing both encryption and Secure Sockets Layer (SSL) protocol functions for building secure applications. When the HP e3000 system connects to the Internet, it is important to tighten the security. System security is built into the operating system to protect against unauthorized access and data corruption. The MPE/iX operating system for the HP e3000 is designed so the user capabilities, the account structure, the file system, and the system security are all integrated. The HP e3000 allows users to configure their system security to their business policy requirements.



PARTNER APPLICATIONS AND TOOLS

The HP e3000 has a rich offering of best-in-class Internet application solutions from world-class partners that span key industries such as e-commerce, order management, healthcare and manufacturing from such partners as Smith-Gardner and Fiorvanti-Redwood International. The HP e3000 also offers a wide range of enterprise management tools from vendors such as Adager and Bradmark; application development tools from vendors such as Cognos and Speedware; combine legacy applications, data, and objects from a wide variety of computers with Web Dimension (application server and Java components collection) from Minisoft; and middleware products from partners such M.B. Foster Associates, Willow Technology and Level 8 Software. These tools and middleware make it easy to deploy e-services and Internet applications on the HP e3000.

E-services Solutions: Apps-on-Tap Model

E-business and e-commerce are creatively transforming into e-services — the next E. An e-service is any asset that is made available via the Internet that will drive revenue streams or create new efficiencies. It can be applications, computing resources, services, processes or information. Unlike today's proprietary e-commerce systems, e-services will be highly modular and building blocks for other e-services.

In this chapter of e-services, companies will capitalize on this modular structure, utilizing IT e-services to better manage their IT infrastructure. As an increasing number of transactions move to the Internet, computing is certain to move from a predominantly client/server-based world to one in which services are brokered over the Internet. In fact, IT will shift from a traditional in-house hardware and software business model to a pay-per-use, transaction-based business model.

The HP e3000 is a major catalyst today in the e-services arena with its Apps-on-Tap e-service solution with innovative customers—Open Skies and Telenomics. These transaction-based models provide customers with lower overall IT costs. Customers can focus on building and deploying their unique applications while renting the hardware, software and middleware as needed. For an IT department, Apps-on-Tap can be both a revenue opportunity and a means to improve and increase efficiency while reducing ownership and management costs.

Future Directions

The future looks bright for Internet solutions for the HP e3000 customer with exploration of key security services such as Single Sign-on, Secure Telnet, Secure LDAP and Secure ftp and key security enabling technologies such as PKI, VPN and IPSec. In addition, an early prototype of e-speak runs on the HP e3000 and investigation of e-speak solutions on the HP e3000 continues. WAP interoperability is upon us with the Smith-Gardner application. Other areas of interest and investigation include J2EE, EJB, Linux API interoperability, XML , Secure email, and WebQoS.

Summary

The HP e3000 with its Internet and e-services solutions is a serious Internet player. The roadmap and strategies discussed earlier are intended to lead customers and their businesses to a full realization of the business values and benefits stated and the vision of successfully using and seamlessly integrating the Internet/Intranet and e-services world. Embracing partnerships and new technologies, enabling growth in an internet world, and expanding core strengths are the keys to success for the HP e3000 and its customers in this fast-paced, rapid- growth Internet world. The HP e3000 is being reinvented as an ideal platform with key underlying technologies and real-world solutions for the Internet and e-services.