IBM OS/400 Operating System

Summary
The IBM eServer iSeries line is driven by the 64-bit OS/400 operating system. The platform maintains a worldwide installed base, but market forces are challenging its growth potential.

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IBM OS/400 Operating System

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Overview

The IBM eServer iSeries line is designed primarily for small and midsize companies, and it features a tightly self-contained architecture consisting of database and development software, hardware, middleware, security and integrated business applications. The iSeries line is driven by the 64-bit OS/400 operating system, which offers many transaction and data management features from IBM's zSeries mainframe line.

IBM eServer iSeries systems are used for business intelligence, core banking and financial, customer relationship management (CRM), e-mail and collaboration, enterprise resource planning (ERP), enterprise applications solutions/supply chain management (EAS/SCM) and gaming applications. The high-end iSeries 890 is geared for industries where large databases and high volumes of transactions are processed. The eServer iSeries platform is currently used by over 200,000 customers worldwide.

IBM introduced the iSeries in 2000, along with a re-branding and transformation of its entire server line. The iSeries is part of IBM's eServer family, which includes Intel-, Unix- and mainframe-based server lines. On the market for over 20 years and formerly known as the AS/400, the iSeries is IBM's non-Unix, midrange server line.

Since the 2000 release of the IBM eServers, IBM has concentrated on sharing best-of-breed IBM technology between its product lines. For example, OS/400 implements logical partitions (LPAR) technology used in the IBM S/390 (zSeries). Technology cooperation with IBM's Intel-based product line (xSeries) provides direct attachment of four-way, Windows-based systems. With the newest release, OS/400 version 5 release 2 (v.5 r.2), Linux and OS/400 applications can be run on a single IBM eServer. Furthermore, with OS/400's partition management capabilities, up to 31 Linux partitions can be run on the high-end i825, i870 and i890 models. (Linux suppliers SuSE, Red Hat and Turbolinux offer Linux distributions for iSeries.)

OS/400 Description

OS/400 is a 64-bit, multitasking operating system that is designed to handle such Internet-oriented applications as CRM and SCM. It provides Java integration, Linux/Windows integration, IBM DB2, the IBM HTTP Server (based on Apache) and Lotus Notes/Domino support. It provides the ability to consolidate multiple servers onto the system through logical partitioning features. It allows multiple instances of the operating system to run simultaneously and independently.

OS/400 v.5 r.2 supports models in the low-end and high-end iSeries line, including the IBM i890 model. The i890 runs IBM's most powerful microprocessor, the POWER4, and is available in two symmetrical processing (SMP) configurations: 16 to 24 processors or 24 to 32 processors. POWER4 consists of two...
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microprocessors, communications functions and RAM on a single piece of silicon. The tight integration of all these functions contributes to fast performance levels. The Model i890 is the first iSeries server to surpass 1GHz processor speed.

Released in August 2002, OS/400 v.5 r.2 offers workload management tools for logical partitioning and self-optimizing database images, support for WebSphere Java 2 Enterprise Edition (J2EE) applications with adaptive e-transaction capabilities, and switched-disk clustering features. OS/400 offers Web-caching technologies (Fast Response Cache Accelerator) and secure socket accelerators that are designed to increase the capacity for distributing secure Web pages. It also provides new capacity on demand (COD) capabilities, permitting processors to be activated only as needed.

eSeries iServer Products

In January 2003, IBM announced a makeover of its OS/400-baed eSeries iServer line involving new models on both of the high and low ends, prepackaged software, On/Off Capacity Upgrade Demand capabilities and price cuts. With the product line revamp and price reductions, IBM is attempting to reinvigorate the product line. The Table “IBM eServer iSeries Line: Basic Characteristics” briefly highlights the characteristics of the eServer iSeries models.

<table>
<thead>
<tr>
<th>Table 1: IBM eServer iSeries Line: Basic Characteristics</th>
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<tr>
<td><strong>System Expandable to:</strong></td>
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<tr>
<td>Model 800 (Small Enterprises)</td>
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<tr>
<td>One-way processor, 8GB memory, 4TB disk space, three integrated xSeries adapters and four xSeries servers, four OS/400 or nine Linux partitions. Includes dynamic LPAR capabilities and WebSphere.</td>
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<tr>
<td>Model 810 (Small to Medium Enterprises)</td>
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<tr>
<td>One- or two-way processors, 16GB memory, 14TB disk space, seven integrated xSeries adapters and 13 xSeries servers, eight OS/400 or 19 Linux partitions, 10 LPAR partitions per processor.</td>
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<tr>
<td>Model 825 (Medium Enterprises)</td>
</tr>
<tr>
<td>Three- to six-way POWER4 processors, 48GB memory, 58TB disk space, 18 integrated xSeries adapters and 36 xSeries servers, 32 OS/400 or 31 Linux partitions. Capacity on demand.</td>
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<tr>
<td>Model 870 (Large Enterprises)</td>
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<tr>
<td>Eight- to 16-way POWER4 processors, 128GB memory, 144TB disk space, 60 integrated xSeries adapters and 48 xSeries servers, 32 OS/400 or 31 Linux partitions. Capacity on demand. Processor activation for Linux. Also available in a five- to eight-way model.</td>
</tr>
<tr>
<td>Model 890 (Large Enterprises)</td>
</tr>
<tr>
<td>16- to 32-way POWER4 processors, 256GB memory, 144TB disk space, 60 integrated xSeries adapters and 48 xSeries servers, 32 OS/400 or 31 Linux partitions. Capacity on demand. Processor activation for Linux.</td>
</tr>
</tbody>
</table>

The iSeries systems are available in Standard and Enterprise Edition versions.

**Standard Edition**—Includes support for dynamic logical partitioning, licensing for OS/400 with its integrated DB2 relational database, integrated workload management and support for capacity on demand (both On/Off and permanent). It also includes WebSphere Development Studio software. It should be noted that this edition does not offer support for 5250 terminal-based, “interactive” applications, except for system management or console tasks.

**Enterprise Edition**—Includes all of the functionality of the Standard Edition, as well as full support for native 5250 workloads and an extensive IBM middleware stack for e-business applications. For the i825, i870 and i890 models, IBM includes licensing for the WebSphere Application Server—Express for iSeries, Lotus Instant Messaging (100 seats), Lotus Team Workplace (100 seats), IBM Backup Media Recovery
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Services, various Database 2 (DB2) and Extensible Markup Language (XML) tools (including DB2 Query Manager, DB2 SMP, Data Propagator and DB2 XML Extenders), and Tivoli Monitoring and Tivoli Storage Manager Extended Edition. The Enterprise Edition also comes with a variety of IBM educational and special services to assist in the deployment of IBM iSeries technologies and applications.

<table>
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<th>Table 2: Features and Functions: IBM OS/400 Version 5 Release 2 (v.5 r.2)</th>
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<tr>
<td><strong>Overview</strong></td>
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<tr>
<td>OS/400 is IBM’s proprietary non-Unix operating system for its midrange systems. eServer iSeries systems comprise a tightly integrated architecture with hardware, OS/400, middleware, database, Java Virtual Machine (JVM), workload manager, security and a range of business applications.</td>
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<tr>
<td><strong>Hardware</strong></td>
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<tr>
<td>OS/400 runs on the following iSeries servers: i800, i810 (low end); i825, i870, i890 (high end). OS/400 v.5 r.2 also runs on all previous iSeries models and most 64-bit reduced instruction set computer (RISC) AS/400 models.</td>
</tr>
<tr>
<td>The iSeries high-end server line uses the POWER4 64-bit chip. The i890 model exceeds 1.3GHz processor speeds and supports 32-way symmetric multiprocessing.</td>
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<tr>
<td><strong>Operating Requirements</strong></td>
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<tr>
<td>For each server or logical partition, OS/400 v.5 r.2 requires the following:</td>
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<tr>
<td>— Hard disk space of 2.5GB or larger.</td>
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<td>— Load source disk units require 4GB.</td>
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<tr>
<td>— A minimum main memory size of 128MB.</td>
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<td><strong>Standards</strong></td>
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<tr>
<td>Provides most of the commonly used X/Open Single Unix Specification interfaces for application portability. Supports Distributed Computing Environment (DCE), POSIX 1003.1 Application Program Interfaces (APIs), Federal Information Processing Standard (FIPS) 151-1, Berkeley Software Distribution (BSD) Sockets, Java, Structured Query Language (SQL), Extensible Markup Language (XML), X/Open Portability Guide release 4 (XPG4), and others. Also supports most major client/server, Internet, TCP/IP and networking standards. Also OS/400 Portable Application Solutions Environment (PASE) for AIX Unix portability.</td>
</tr>
<tr>
<td><strong>Systems Management</strong></td>
</tr>
<tr>
<td>— iSeries Navigator provides integrated systems management. It provides a graphical representation of file relationships. It includes Database Navigator, which provides a pictorial view of relationships between objects.</td>
</tr>
<tr>
<td>— Operations Console provides local and remote control panel capabilities to handle management tasks, including drag-and-drop of system files.</td>
</tr>
<tr>
<td>— Management Central-Pervasive (MC-Pervasive) provides the ability to remotely manage multiple iSeries or AS/400 servers using Internet-capable cellular phone, personal digital assistant (PDA) with wireless modem or Web browser.</td>
</tr>
<tr>
<td>— Provides Tivoli Management Agent, allowing systems to be managed within a Tivoli management environment.</td>
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### Workload Management

OS/400 v.5 r.2 includes the following workload management features:

- Workload Manager (integrated in OS/400), with subsystem support to balance system resources and runtime priorities between multiple applications and batch job streams.
- Dynamic logical partitions, with support for OS/400 and Linux partitions; supports up to 10 partitions per processor.
- On/Off Capacity on Demand, allowing customers to activate processors as they are needed. (Available on iSeries i825, i870 and i890 models.)
- Switched-disk clustering.
- With Enterprise Edition, 5250 Online Transaction Processing (OLTP) workloads can access the entire processing power of the server. This eliminates previous 5250 OLTP interactive limits and levels.

### Storage Management

DB2 Universal Database (UDB) for iSeries supports multiple, independently named database images within a single OS/400 partition:

- Adaptive e-transaction services that analyze and adapt to an application’s architecture.
- Unix (ported), Linux, Windows and OS/400 applications can be run in a single server.
- Provides Linux virtualization with the ability to run up to nine Linux partitions on a single processor on low-end i800 systems and up to 31 Linux partitions on i825, i870 and i890 models.
- Windows applications can be centrally managed through IBM’s Integrated xSeries technology.

### Availability

iSeries servers provide 99.9+ percent single-system availability:

- Availability features include battery backup; image journaling to enable forward recovery; checksum protection; disk mirroring; and Save-While-Active, which allows libraries to be saved while operations and changes continue against the library; and system-managed access path protection.
- Supports clustering to expand availability of resources beyond single-server environment. Five cluster types can be configured separately or together, including a Replication Cluster for switching between primary and backup servers, and a Switchable Disk Cluster for direct-access storage device (DASD) I/O towers containing IFS files in I-ASPs.
- Supports High-Speed Link OptiConnect in addition to asynchronous transfer mode (ATM) and 1GB Ethernet as a data connect between nodes.
- On/Off Capacity on Demand, permitting customers to activate processors as they are needed, and to turn them off when not needed. IBM offers On/Off or Permanent Capacity on Demand options to support changing needs.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Database Integration</strong></td>
<td>—Integrated DB2 UDB supports structured and unstructured data formats.</td>
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<tr>
<td></td>
<td>—Maximum size of large objects stored is 2GB and total size for all large objects for a table row is up to 3.5GB.</td>
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<tr>
<td></td>
<td>—Size of a single, nondistributed table is 1TB.</td>
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<tr>
<td></td>
<td>—DB2 XML Extender allows Extensible Markup Language (XML) data types to be stored.</td>
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<tr>
<td></td>
<td>—Business-to-business (B2B) applications include distributed transactions over TCP/IP and SQL trigger support for moving business logic into the database.</td>
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<tr>
<td></td>
<td>—Java Database Connectivity Micro Edition provides advanced support for database triggers and host-sided procedures.</td>
</tr>
<tr>
<td></td>
<td>—Support for multiple file systems, including a Unix-compatible file system that is used when porting. Used by non-database applications, like Lotus Domino, WebSphere Applications Server and Apache-based HTTP server.</td>
</tr>
</tbody>
</table>
### Table 2: Features and Functions: IBM OS/400 Version 5 Release 2 (v.5 r.2)

| Internet/Intranet | —IBM WebSphere Application Server, for Java servlets and Enterprise JavaBeans (EJB), and providing links to database formats and object request brokers (ORBs). Supports WebSphere Commerce Suite for iSeries e-commerce infrastructure.  
—Supports WebSphere middleware and Java 2 Platform, Enterprise Edition (J2EE) for adaptive e-transaction services.  
—IBM Host Publisher and iSeries access for the Web.  
—Lightweight Directory Access Protocol (LDAP) support for managing information and applications across the Internet and intranets using LDAP directories on IBM and non-IBM platforms.  
—iSeries printers and NetServer print shares can be published in LDAP directories and for the Windows 2000 Add Printer function to configure iSeries printers on the Windows desktop.  
—Addresses print and communications requirements of e-business: Portable Document Format (PDF), dynamic e-mail of printed output, Internet Print Protocol, new printing architectures for Java, Unicode support, print transforms for printed data.  
—Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) servers. DNS services are based on the industry-standard Berkeley Internet Name Domain (BIND) v.8.2 reference and include Dynamic DNS (DDNS) update capabilities to automatically manage TCP/IP addresses and associated DNS host names on networks.  
—IBM Host Integration Suite for Web-enabling existing applications without reprogramming and extending them to new users using Java and HTML browser technology.  
—MQSeries, IBM’s messaging middleware to enable end-to-end e-business solutions. |
| Virtual Private Networks (VPNs) | Supports VPN for secure links within an intranet; links between intranet of different organizations to form an extranet; links between intranets of the same company connecting remote or branch offices; links for mobile workers. |
| Application Development | Supports Visual Age for C++, Java, C, COBOL and Report Program Generator (RPG) implementations for iSeries. Portable Application Solutions Environment (PASE) provides an Advanced Interactive Executive (AIX) runtime for rapid porting of Unix applications to iSeries. Java support includes Java Virtual Machine, Developer Kit for Java and Toolbox for Java. Also provides XML parsers for use with Java and C++, and XML parsing interfaces for RPG, COBOL and C.  
iSeries Toolbox for Java Micro Edition enables the creation of wireless Web applications and mobile device applications.  
WebSphere Development Studio provides a single toolset based on the open source Eclipse workbench. Converts traditional green screen applications for Web presentation without changing application source code.  
OS/400 v.5 r.2 offers adaptive e-transaction capabilities that dynamically evaluate and adapt to an application’s design. |
Table 2: Features and Functions: IBM OS/400 Version 5 Release 2 (v.5 r.2)

| Security                        | —OS/400 v.5 r.2 provides a Secure Sockets Accelerator, which processes up to five times as many secure sessions than previous OS/400 releases. Multiple accelerators can be used together to handle high-volume sessions.  
|                                | — Provides Enterprise Identity Mapping, a cross-server and multitier application security tool. It tracks a user’s multiple security identities across a network.  
|                                | — Provides integrated authentication, identification, authorization and auditing, public-key infrastructure (PKI), Secure Sockets Layer/transport layer security (SSL/TLS) and virtual private network (VPN) support.  
|                                | — Cryptographic hardware.  
|                                | — Digital certificate manager (DCM).  
|                                | — Integrated firewall technology includes IP packet filtering and network-attached storage (NAS).  
|                                | — DCM provides a single database for certification for use by Web servers, SSL and other programs.  
|                                | — Digital signature support on several OS/400 object types to allow software providers or system administrators to add digital signatures to software. It is also used by the operating system as an added layer of protection. Password protection is enhanced with 128-character passwords.  
|                                | — SSL.  
| Windows Integration           | — Provides Windows integration from OS/400, such as Windows management, tape integration and disk and CD-ROM drive sharing.  
|                                | — iSeries Access, a suite of Windows client-based tools that link Windows users to iSeries applications. Includes data transfer, 5250 emulation, Open Database Connectivity (ODBC) and client/server programming interfaces.  
|                                | — Integrated xSeries Server plug-in cards for IBM Windows-based xSeries servers are supported by Integration for Windows Server software that installs automatically with OS/400. It supports functions such as save-and-restore of Windows files and systems management.  
|                                | — Supports up to four integrated xSeries servers per cluster. OS/400, Windows and Linux applications can be connected on up to 16 virtual Ethernet circuits.  
|                                | — Supports up to 32 Integrated xServer Servers (a motherboard) and 32 Integrated xSeries Adapters (that connect to xSeries servers) to run Windows 2000 applications.  

Analysis

Even though the OS/400 operating system and the iSeries servers have been overshadowed in terms of market awareness by Unix and Windows systems, the platform has been quietly chugging away and, in many ways, leads Unix and Windows servers in terms of functionality and manageability. The eServer iSeries’ self-contained architecture—consisting of hardware, software, database, middleware and applications—initially made it a favorite for terminal-based, interactive transaction applications within banking and distribution industries.

In 2000, the introduction of IBM's eServers featured a single road map for RISC processors between the OS/400-based iSeries and the AIX-based pSeries. A single road map is attractive for companies seeking long-term compatibility and portability between the product lines. IBM reports that in 2004, the iSeries itself will run AIX applications natively in a logical partition alongside OS/400 and Linux. Both platforms use IBM’s copper and silicon-on-insulator (SOI)-based processors, which are designed for both
transaction serving and compute-intensive performance. Both the iSeries OS/400 line and the pSeries Unix line share a single development team to leverage features between the platforms. Much of the hardware technology is now shared between the two servers. The same processors, memory and SMP design are used for the two product lines. Both are designed around the Performance Optimized With Enhanced RISC (POWER RISC) processor architecture.

The OS/400 iSeries customer base remains large and very devoted. These users appreciate the plug-and-play nature of the platform. It has established a reputation for high reliability and tight security, and through its long history has been one of IBM’s most successful product lines. In recent years, however, the product line has appeared to have lost a little of its luster. According to Gartner Dataquest, new business decreased from approximately 20 percent of the iSeries hardware revenue in 1997 (about US$900 million), to 9 percent of the iSeries hardware revenue in 2002 (less than $170 million). According to IBM, however, the iSeries is once again gaining steam, having recorded a 12 percent increase in the first half of 2003 from the year prior.

The iSeries is facing increasing market challenges, especially at the low end against Windows and Linux systems for small- to medium-sized businesses. Although IBM has invested a great deal of marketing resources in its eServer pSeries and xSeries lines, many customers feel that the vendor has virtually ignored the iSeries on this front. In the face of its competition, iSeries loyalists are expressing that it is getting harder to justify the platform to top management, many of whom are more familiar with the highly publicized Microsoft Windows and Unix brands.

Still, IBM insists, and demonstrates with continued investment, that it is very much committed to OS/400 and the iSeries, and if it is Windows that customers want, then they can look to its Windows-based xSeries server business. IBM says the two-year, US$500 million relaunch of the iSeries in January 2003 reaffirms its conviction to the platform. The company announced significant price reductions in iSeries hardware and has simplified its pricing structure. It is also providing developers with ways to modernize the iSeries environment.

IBM recently introduced an iSeries Developer Roadmap, with prompts to move developers from traditional 5250 development tools like Programming Development Manager (PDM), Screen Design Aid (SDA) and Source Entry Utility (SEU), to more Web-oriented development methods with HTML; Java 2 Platform, Standard Edition (J2SE); JavaScript; and Enterprise JavaBeans (EJBs). With its new iSeries server packages, IBM includes WebSphere Application Server and the IBM Webfacing Tool. The Webfacing Tool provides a means to extend Cobol and RPG applications with a Web front end. In other words, it is designed to simplify the conversion of 5250 green screen interface to a browser-based interface.

The high end of the iSeries business is doing well and should maintain satisfactory sales levels, particularly with 2002’s release of the iSeries 890 model, which offers mainframe-type, logical partitioning capabilities. Large companies can use iSeries models for system consolidation projects. The i890 can be partitioned to keep each of its 32 processors into distinct application servers running either OS/400 or Linux applications. Native AIX support will be available in 2004, according to IBM. Until then, AIX applications can be run under OS/400 using the Portable Applications Solutions Environment (PASE) runtime environment.

**Pricing**

OS/400 is offered in two options: the Standard Edition and Enterprise Edition. The key difference is that Standard Edition, in general, does not support 5250 “green screen” workloads, while the Enterprise Edition does support 5250 workloads up to the maximum capacity of a given iSeries model and processor (plus it includes a range of WebSphere components bundled with the OS). The Standard Edition supports
IBM OS/400 Operating System

e-business applications, the ability to run multiple operating systems, Capacity Upgrade on Demand and dynamic logical partitioning. The Enterprise Edition supports everything included with the Standard Edition, plus traditional and e-business applications; it is bundled with IBM enterprise software (DB2, Tivoli, WebSphere), processor activation for Linux, Windows integration and extensive customer support. There are generally two prices: one as a Standard Edition and one as an Enterprise Edition. IBM says that 80 percent of iSeries servers are currently sold with Enterprise Edition.

Table 3: Price List: Sample IBM eServer iSeries Prices (1)

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<tr>
<td>IBM eServer iSeries 810</td>
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</tr>
<tr>
<td>Model 2465</td>
<td>750</td>
<td>105GB</td>
<td>1GB</td>
<td>58,802</td>
<td>83,122</td>
</tr>
<tr>
<td>Model 2469</td>
<td>2,700</td>
<td>875GB</td>
<td>4GB</td>
<td>178,515</td>
<td>349,575</td>
</tr>
<tr>
<td>IBM eServer iSeries 825</td>
<td></td>
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<tr>
<td>Model 2473</td>
<td>4,660</td>
<td>1050GB</td>
<td>4GB</td>
<td>360,103</td>
<td>574,224</td>
</tr>
<tr>
<td>IBM eServer iSeries 870</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Model 2486</td>
<td>11,500</td>
<td>2800GB</td>
<td>24GB</td>
<td>1,152,266</td>
<td>2,006,916</td>
</tr>
</tbody>
</table>

(1) These are sample pricing configurations; not all models are represented in this table.
(2) CPW—Commercial Processing Workload: IBM’s internal benchmark for performance measurement.

GSA Pricing
Yes.

Competitors

As the popularity of Linux, Windows, and Unix evolves in the 2000s, it seems hard to imagine that a proprietary operating system and its computer system with all-in-one, integrated designs like the iSeries would still be relevant. But OS/400 has transcended its “old-world” AS/400 roots to evolve with the times to the modern iSeries, and although it maintains its tightly integrated characteristics, it still has strong appeal for small-to-midsize organizations looking to conduct no-nonsense business functions. And the “proprietary” OS/400 now runs alongside Linux software. It also runs with Windows and AIX with the help of optional products.

The OS/400-based iSeries supports a very scalable range of platforms, ranging from entry-level uniprocessor servers designed to support a small number of users to large multiprocessor systems designed to support thousands of concurrent users. Primary challengers in the market are Windows and Intel-based servers. Midrange Unix operating systems and servers from HP and Sun are competitors where scalability and availability are required. As more independent software vendors (ISVs) port their applications to the Linux operating system, Linux-based systems can also be considered competitors.

Strengths

Integration and Simplicity

Through its long life span, the OS/400 operating system, along with its iSeries (and AS/400) platform, has outlasted nearly all of its proprietary system competitors. Longtime and new iSeries customers appreciate the system for its all-in-one, plug-and-play architecture. In one self-contained box comes all of the hardware, operating system, input/output devices, middleware and new Web-oriented development tools
that are needed to take a midsize business through Internet-oriented e-commerce, collaboration and e-mail applications.

Users have found that tight integration has led to high manageability, reliability and security levels. Although the upfront price for iSeries systems may initially seem high, users find that there are few hidden maintenance and management costs and that long-term cost of ownership is favorable.

Inherits IBM Mainframe Technology

Advanced technology underpins much of OS/400’s scope. It implements mainframe LPAR technology. With DB2 Universal Database (UDB) for iSeries, the OS/400 offers mainframe-like workload management features. It supports multiple database images within a single partition. The operating system now offers adaptive e-transaction features that dynamically assess and adapt to an application’s architecture. Such capabilities yield optimal transaction processing performance for both traditional applications and those based on Java and IBM WebSphere.

Another significant technology is its Capacity Upgrade on Demand (CUOD) capabilities. The iSeries offers true temporary capacity on demand (COD) that can be switched on and off by the customer when needed and without having to stop and restart the server or the partitions to which capacity can be added. IBM offers two types of COD options for the iSeries: permanent Capacity On Demand, or “Capacity Upgrade on Demand” (CUOD), and temporary Capacity On Demand, or “On/Off Capacity On Demand” (COD). For permanent activation, customers must purchase a “Processor-On-Demand” (POD) activation feature for each processor they expect to activate. Processors can then be activated, assigned to partitions and are ready for use without having to reboot the machine. With On/Off COD capabilities, processors can be activated to match peak capacity requirements, and then turned off again when not needed. On/Off COD is either charged per processor/per day or can be prepaid.

Limitations

Competition From Unix and Windows

The biggest inhibitor to the increased success of the OS/400 and the iSeries line is their capability to compete in a Wintel and Unix world. Sales have stagnated at the low end of the market due to both competition from Windows and the need for a high-volume business in a low-margin market. Although its installed base remains loyal, the iSeries is struggling to attract new customers because people hear a lot about Windows and Unix and too little about the iSeries. Even though IBM continues to invest in the iSeries, and its technology remains stronger than Unix and Windows, IBM’s marketing of the iSeries is less aggressive than for the pSeries and xSeries. New business has declined from approximately 20 percent of the iSeries hardware revenue in 1997 (roughly $900 million) to 9 percent of the iSeries hardware revenue in 2002 (less than $170 million).

Lack of Top-Tier Applications

IBM’s OS/400 has a huge applications portfolio; however, since the iSeries is targeted mainly to the small and medium business (SMB) market, it is not supported by all of the top-tier ISVs. Because it is not perceived as a growth platform, it is not attractive to some of the leading business software vendors like Oracle, PeopleSoft and Siebel. It should be noted, however, that J.D. Edwards, now part of PeopleSoft, is a big supplier of iSeries business software. It should also be mentioned that in 2004, iSeries systems will be capable of running AIX applications, which should bring rapid porting of applications to the series.

Recommended Gartner Research

“IBM eServer iSeries Midrange Servers,” DPRO-95458
IBM eServer iSeries maintains a large and loyal worldwide installed base that appreciates the system for its integrated design, reliability, tight security and low maintenance costs. Due to pressures from Windows and Unix, the low end of the market is especially challenged. The high-end business for the iSeries is doing better than the low end; it is driven by an interest in consolidating systems and logical partitions, as well as the system’s excellent mixed-workload capabilities. The iSeries is still profitable for IBM, its business partners and ISVs and, hence, they remain committed to the technology. IBM continues to invest in the platform; it is still strategic for the company because of the value of the installed base. While the long-term outlook does not hold a high possibility for growth, even in a slowly declining environment, the series is still a big moneymaker for IBM and continues to be a viable alternative especially as IBM tries to expand its software in the SMB market.