Microsoft Exchange 2000 Server

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Preview

The Exchange 2000 Server is Microsoft's current offering in the e-mail server market. It competes primarily with IBM Lotus Notes in the enterprise messaging and collaboration space, and offers assorted options such as scheduling, calendaring, and forms development. Exchange 2000 is on the verge of an upgrade from Microsoft, which plans to release Exchange 2003 in mid-2003 with a number of features to aid in administrative tasks and e-mail system deployment. This report discusses the features found in the Exchange 2000 Server, the key components of the forthcoming Exchange 2003 release, and Microsoft's place in the e-mail server systems market.

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Overview

Microsoft Exchange 2000, a top e-mail server market performer, is a business messaging system that bundles together e-mail, group scheduling, electronic forms, and groupware.

The product features a universal groupware in-box that is capable of receiving e-mail, Internet mail, facsimiles, and mail to other providers, such as X.400. Additionally, Exchange 2000 features centralized administration and management components to help a single, independent server function as a multi-site, multi-server messaging system.
Exchange 2000 is on the verge of being upgraded to Microsoft Exchange 2003, set for release in mid-2003. Exchange 2003 will offer exchange's collection of messaging and collaboration tools, as well as options for secure and private mobile, remote, and desktop e-access. These additions are aimed at helping companies increase efficiency in server and site consolidation.

**Operating Platform**

Table 1 lists the operating requirements for the previous two editions of the Microsoft Exchange Server, v5.5 and 2000, as well as the soon-to-be-released Exchange 2003 Server.

**Table 1. Microsoft Exchange Server Operating Requirements**

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Exchange 5.5</th>
<th>Exchange 2000</th>
<th>Exchange 2003 (Not Yet Released)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>Intel system with an Intel Pentium 60 Processor (Pentium 133 recommended); RISC-based System Alpha AXPTM processor.</td>
<td>Intel system with an Intel Pentium 133 or faster microprocessor.</td>
<td>Intel 133 MHz or higher processor.</td>
</tr>
<tr>
<td>Memory</td>
<td>24 MB server memory (32 MB recommended); 8 MB client memory (12 MB recommended).</td>
<td>128 MB RAM (256 MB recommended).</td>
<td>256 MB of RAM.</td>
</tr>
<tr>
<td>Available Hard Disk Space</td>
<td>250 MB hard disk space (500 MB recommended) for server; 12 to 22 MB hard disk space for client.</td>
<td>500 MB free disk space on Exchange 2000 installation disk drive; 200 MB free disk space on system drive.</td>
<td>500 MB on hard disk. 200 MB on system drive.</td>
</tr>
<tr>
<td>Display</td>
<td>VGA Monitor.</td>
<td>VGA Monitor.</td>
<td>VGA Monitor.</td>
</tr>
</tbody>
</table>
The Microsoft Exchange 2000 client/server messaging system was developed for PC-based networks that run on Windows 2000 or NT server. The system offers a universal groupware in-box that can send and receive various types of messages. This in-box can also be extended to understand any non-supported messaging protocols by writing a service provider. The server software provides critical services, while acting as the central point of administration and information storage.

The components of Exchange can be broken-down into five parts: Exchange Client, Microsoft Schedule+, Forms Designer, Exchange Server 2000, and Microsoft Outlook. The Exchange 2000 Server, the nucleus of the Exchange package, is available in three different versions:

- **Exchange 2000 Server**—Was designed to meet the messaging and collaboration needs of enterprise corporations of varying sizes
- **Exchange 2000 Server Enterprise Edition (EE)**—Enables large enterprises to create multiple storage groups and multiple data bases. EE offers a virtually unlimited message store without constraints on the amount of data that a single server can manage.
- **Exchange 2000 Conferencing Server**—Extends Exchange 2000 to enable data conferencing with application sharing and multicast video conferencing for organizations of all sizes.

Additionally, Microsoft plans to release an upgrade of the Exchange 2000 Server in mid-2003 when it releases the Exchange 2003 Server. Formerly dubbed Titanium while in beta testing, Exchange 2003 will deliver Exchange's breadth of messaging and collaboration tools, as well as options for secure and private mobile, remote, and desktop e-access. These additions are aimed at helping companies increase efficiency in server and site consolidation.

**Exchange Server**

Microsoft’s Exchange Server acts as the point of centralized administration, and provides connectivity between disparate systems, data storage, monitoring and troubleshooting tools, security features, and legacy migration tools.

The Exchange Server contains a number of features, most of which focus on administrative management and maintaining the connectivity of the company server's overall functions. The tool offers a centralized administration tool that enables company personnel to customize the server's overall features and functionality. Additionally, the Exchange Server makes use of a number of service providers, such as CompuServe and Lotus, offering an integration component to expand potential usefulness for companies by expanding the number of messaging-exchange platforms that can work hand-in-hand with the utility. A complete list of the product's features includes:

**Centralized Administration.** The Exchange Server comes with a graphically-based administration tool that simplifies the administration of a multi-server, enterprise-wide messaging system. Using the graphical browser in a tree fashion, the administrator can navigate and modify all of the messaging system's objects, from shared folders to user's accounts, and create user accounts and mailboxes, as well as distribution lists. Administration can also be accomplished over a dial-up connection or from another seat on the LAN. Administration is not restricted to the server console.

**Connectivity.** Using additional service providers (called "connectors" by Microsoft), Exchange supports additional messaging protocols, such as legacy Microsoft Mail installations, X.400 messaging, CompuServe mail, or Internet Mail. Microsoft has also made available a developer's kit that enables programmers to create additional connectors by using common development tools such as Visual C++. Microsoft also supports Lotus cc:Mail for release 5.0.
Exchange also utilizes the Internet as part of a corporation's network, thereby creating a WAN. Using the Exchange Client, a mobile user can use NT Server's Remote Access Services and the Point-to-Point Tunneling protocol (PPTP), to access e-mail over the Internet. Using a dial-up connection to a local Internet service provider eliminates the need for separate dial-up connections to the network for remote access.

Exchange uses the Internet to replicate data to remotely-located servers, and provides USENET newsgroups to the installed user base. In addition, Exchange transparently handles MIME and UUENCODED e-mail attachments.

**Monitoring and Troubleshooting.** The Exchange Server comes with three server monitoring tools: Link-, Server-, and Performance-Monitor, that provide the administrator with a window into the operation of the mail server. Administrators can use these tools as necessary to view event logs or diagnostic information. The Link Monitor watches the links between various Exchange mail servers and gateways, and warns the administrator of any interruptions. Link Monitor uses e-mail messages to estimate the amount of time it takes test messages to reach their destinations. Round-trip message timing that exceeds a predetermined limit triggers an e-mail message to the administrator. Since the Link Monitor utilizes e-mail, foreign e-mail systems can be included in the link timings. The Server Monitor reports on the condition of a given Exchange Server and the status of its running processes. If the Server Monitor detects that a particular system service stopped running, it will notify the administrator by e-mail or pager to shut down and restart the server. The Performance Monitor displays performance statistics on the server, such as memory usage, processor utilization, and server throughput. This assists the system administrator in diagnosing and correcting system-wide performance bottlenecks.

**Security Features.** Exchange Server leverages the inherent security features of the Windows NT Server to provide access and process security for the messaging system. Exchange Server security features include security policy management, digital key management, and transaction logging.

Exchange's security policy management features govern various aspects of password properties, including minimum/maximum password age and length, history of a specific password, password uniqueness, account lockout after failed login attempts, and time-of-day and workstation restrictions (i.e., restricting a user to a specific workstation). These features reduce the e-mail system's exposure from a compromised password.

For digital key management, Exchange Server offers tools for managing public and private encryption keys, which are used for both digital signatures and file encryption. Exchange also enables the administrator to revoke a user's keys from a central location. The key revocation feature is particularly useful when a person leaves the company, or when the key is compromised. Furthermore, Exchange provides recovery for a user's keys in the event that the user forgets his or her password. This feature is important because competing e-mail systems require the issuance of new login information to the forgetful user, permanently abandoning previously signed or encrypted files. Exchange enables users to send digitally signed and encrypted e-mail over the Internet.

For transaction logging, the Exchange Information Store is Exchange's centralized message and document data base, and includes features typically found on high-performance relational data base systems. The primary common feature is a transaction log. As each data base transaction occurs, it is recorded in the log file and Information Store.

The transaction log feature becomes important in the event of a system problem. For example, if the server is improperly shut down, from a power failure, the system recovery module uses the transaction log to roll-back (delete) incomplete transactions, restoring the Information Store to a good state. This feature is only helpful, however, if the files on the server do not sustain physical damage.

Exchange Server can also recover from a catastrophic failure such as a hard drive crash. Using a combination of full and incremental back-ups and the transaction log (if recovered), Exchange can reconstruct, or "roll forward" the transactions from the last backup.
Exchange 2000 Server

The Microsoft Exchange 2000 Server is the core component of the Exchange suite, as well as the most widely deployed of Exchange's services. It is through this server that nearly all of the features it offers are enabled. The server contains several messaging data bases and allows services to be partitioned across multiple servers. Exchange 2000 features clustering options that include Active/active clustering, a single logical data base split across multiple physical data bases.

Exchange 2000 includes a server event model that contains support for synchronous events for processing objects as events occur. This service includes the T.120- based client/server capability that connects Microsoft NetMeeting and Exchange. Exchange 2000 users can use instant messaging and presence information to determine whether a person is busy or out of the office. In addition, the product's data base offers voice mail and other streaming data.

The Exchange 2000 Server offers several features to help companies organize communication exchange within the e- or network-setting. These features include support for a number of standards and protocols, as well as integration with other products and recently developed components. Such features include:

- **VPIM Support** -- Supports the VPIM standard for interoperability between separate voice mail systems.
- **Wireless Access** -- Offers built-in support for wireless access to Exchange data.
- **HTTP and XML Support** -- Utilizes HTTP for Web-based access and XML for native data representation.
- **Audio and Video Conferencing** -- Features multi-party video and audio conferencing via IP Multicast technology.
- **Windows Explorer 32 Support** -- Uses Windows Explorer 32-bit applications to access information stored in Exchange 2000, such as e-mail messages, documents, and Web content.
- **Instant Messaging** -- Enables real-time communication exchange between users.
- **Conference Technology Provider Architecture** -- Allows third-party providers to deliver conferencing products on the Exchange and Windows 2000 platforms.

Exchange 2000 Server Enterprise Edition

Microsoft also offers the Exchange 2000 Server Enterprise Edition (EE), which is designed for messaging and collaboration within large distributed enterprises. EE was developed to unify the management of messaging, collaboration, and network resources, on the Windows 2000 Server. EE includes most of the standard and native features of the Exchange 2000 Server.

**Single Seat Administration.** Single Seat Administration enables a company's network administrators to manage all of the company's Microsoft servers, whether native or remote-based, through a single, independent console. Additionally, server support for Single Seat Administration is extended to the Windows 2000 Server.

**Message Journaling.** A company's network administrator can use the message journaling feature within the Exchange 2000 Server to log all of the messages sent and received from business users.

**Public Key Encryption (PKI).** This feature enables e-mail exchanges, in either Exchange or Outlook, to be verified by becoming both digitally signed and encrypted. The certification employed by PKI is uses both Windows Certificate Server and Microsoft Key Management Server for management.

**E-mail and Directory Interoperability.** E-Mail exchanges can be configured by administrators or other IT personnel to interoperate with other e-mail packages such as Microsoft mail, Lotus cc:Mail/Notes/Domino, and Novell GroupWise. Exchange 2000 EE can be configured as well to interoperate with the above-mentioned systems for directory information as well as e-mail service offerings.
Outlook 2000 Integration. Complimentary group tasks, such as group scheduling, tasking, and contact-management, can be conducted using the e-mail server hand-in-hand with the Microsoft Outlook 2000 program.

Internet Information Server (IIS) Integration. The integration of EE with the IIS enables administrators to access a Web-application management platform as well as company information on the Web.

Windows 2000 Security. EE also makes use of the security functions found in Windows 2000. These functions include options for installing messaging- and collaboration-necessary security, as well as administrative options for creating and managing all user groups.

FrontPage 2000 Integration. Application designers can take advantage of the server's integration options for use with FrontPage 2000. This enables a specific Web interface to be either designed or customized that fits specific company needs.

URL Addressing. The URL addressing feature provides a URL of all data that is stored in the Exchange 2000 EE Server's Web Storage System for future Web access and reference.

Exchange 2000 Conferencing Server

The third product of the Microsoft Exchange 2000 Server portfolio, the Exchange 2000 Conferencing Server is designed for three purposes: data conferencing, audio and video conferencing, and schedule management. Dubbed as the product for "meetings without walls," the Conferencing Server enables application sharing, text discussion, and file transfer data conferencing capabilities. For audio and video, it utilizes Telephony API (TAPI) 3.0 to access QoS and IP multicast features inherent in Windows 2000. This server is built around a Conference Management Service, which enables coordination of differing conferencing technologies and access to administration.

Key and Distinguishing Features

The Microsoft Exchange 2000 Server line includes several additional tools to help companies increase their Internet capacity and capabilities.

Outlook Web View. This Active Server application leverages the technology available in the Exchange Active Server component for building custom applications and user interfaces. Outlook's Web View enables users to read mail with web browsers that support frames and Java, and allow users read/write access.

Internet Mail Wizard. When connections are made to the Internet, this Wizard checks to ensure proper configuration.

Microsoft Office Integration. Exchange is integrated with Microsoft Office on the desktop, making it easy for end users to share mail, calendars, tasks, and contact information.

Internet Protocol (IP) Support. Exchange supports all important Internet protocols for messaging and collaboration.

Migration. Exchange includes a full suite of connectivity and migration tools that enable Lotus cc:Mail and Lotus Notes customers to move their mailboxes, directories, discussions, and collaborative applications to Exchange. It also provides connectivity to MS Mail, X.400 systems, and host-based systems.

Windows NT Server Integration. Exchange is integrated with the Windows NT server and the rest of the BackOffice family, easing client and server management capabilities for administrators.

Scalability. Exchange scales on commodity Windows NT hardware without server partitioning better than its competitors.
Exchange Connector for Lotus Notes. This feature provides messaging connection and directory synchronization between Microsoft Exchange, Lotus Notes, and Domino.

Exchange Connector for IBM OfficeVision/VM. This component enables a messaging connection between Microsoft's Exchange Server and IBM's OfficeVision/VM (PROFS).

Exchange Connector for SNADS. The SNADS-compliance component offers several independent messaging connections between Microsoft Exchange and SNADS-compliant messaging systems.

Microsoft Exchange 2003 Enterprise Edition (EE)

Microsoft Exchange 2003 Enterprise Edition (EE), which was formerly nicknamed Titanium while in its beta testing stage, is set for release in mid-2003 and will offer an upgrade from Exchange 2000's messaging and collaboration server line. Exchange 2003 EE will offer mobile, remote, and desktop e-mail access with state-of-the-art security and privacy. These changes are aimed at helping companies increase efficiency in server and site consolidation. Additionally, Exchange 2003 EE will be the first version of Exchange that runs on Windows Server 2003.

Common features found in Exchange 2003 EE will include: network compression, a management pack, integrated mobile device support, a volume shadow copy service, improved configurability, a recovery storage group, expanded support for clustering, and an X.400 Connector. These new features, which will be offered through Exchange 2003 upon its mid-2003 release, are each outlined below:

Security and Privacy. Microsoft based Exchange 2003 EE’s security features on the tenets of the Microsoft Trustworthy Computing Initiative, a set of standards the company established in 2003 to help companies ensure the security of their enterprise system. Exchange 2003 EE was developed to protect both a company’s messaging environment and privacy through the following capabilities:

- **Distribution Lists**—Enable administrators to restrict mailings to authenticated users only, and specify to which addresses or lists specific users can or cannot send mail.
- **Real-Time Safe and Block Lists**—Reduces a company’s unsolicited mail intake by employing connection filtering.
- **Inbound Recipient Filtering**—Filters out incoming, unsolicited, anonymous e-mail messages based on parameters set for each specific recipient. Messages addressed to users that are not found or to whom the sender does not have the permissions to send are rejected.
- **Kerberos Authentication**—Delegates between a front-end server, such as Microsoft Office Outlook Web Access or Outlook Mobile Access, and a back-end server, such as the mailbox store. This feature helps ensure that credentials remain secure from interception during information transfer.
- **Privacy Protection**—Blocks outside-the-network content by default, for both the Outlook 2003 and Outlook Web access packages. This feature was added to Exchange 2003 EE to prevent spammers from identifying valid e-mail addresses through links to external content. Additionally, an administrative option within this feature enables this feature to be overridden and external content to be viewed.
- **Virus Scanning API 2.5**—Enables third-party, antivirus products to run on servers running Exchange 2003 EE.
- **Antispam Integration**—Offers customizable Safe and Block-Senders Lists for filtering.
- **Clustering Security**—Supports Kerberos authentication against an Exchange virtual server. This enables the support of IP security between front-end servers and clustered back-end servers.
- **Administrative Permission**—Lets organizations segment the administration of a Windows-based or Exchange environment into two security-focused groups.
- **Restricted Relaying**—Limits relaying for security principles through the standard Windows 2000 discretionary access control list (DACL). The ability to grant relaying to an IP address is still
Restricted Submission—Cuts back on submissions to a limited number of security principles through the standard Windows 2000 DACL. This helps prevent blocked senders from sending to internal-only distribution lists by spoofing, the practice of tricking users into providing passwords and other information to allow unauthorized access into a system.

Public Folder Permission—Distinguishes access-control list names can be dropped into a folder so that Exchange 2003 EE’s security identifiers can drop the un-resolvable, distinguished names.

Public Folder Store Replication—Replicate with local servers for updates even if the local servers do not have necessary content. This feature enables users to employ a registry key to identify the first server that is used for backfilling.

Reliability. Several features included in the Microsoft Exchange 2003 Server EE were added to help businesses improve the reliability of message-exchange within a specific IT environment. One way the product accomplishes this goal is to offer deep integration between Exchange 2003 and Windows Server 2003. Additionally, the server offers support for up to eight cluster nodes, with at least one passive node in use, as well as integration with the Dr. Watson 2.0 error-reporting utility. Dr. Watson was developed to help administrators manage system attendant, directory, Exchange management and setup services. Other cutting-edge features common to the Exchange 2003 Server EE include:

Mailbox Recovery Center—Supports disaster recovery scenarios by enabling a bulk reconnection of mailboxes to an administratively determined user within the Active Directory service. This user can scan the mailbox data base to determine disconnected mailboxes and, matching user mailboxes to user accounts, recover lost mailboxes.

Cluster Failover Time—Offers the option to bring the Exchange store on- or offline using protocols. In this manner, Exchange protocol services are no longer dependent on the Exchange Information Store service.

Virtual Memory Usage and Monitoring—Can reduce fragmentation and speed up the availability of high-end servers using Windows Server 2003 in conjunction with the Exchange Information Store.

Performance. Exchange 2003, in addition to reliability features, offers a number of features aimed at helping companies improve performance gains. These features work by enabling administrators to consolidate or centralize a messaging server, configuring it with a company’s specific needs. Features included in this aspect include administrative mail delivery- and filtering tools, including:

Outlook Synchronization Performance—Reduces change notifications for clients working in the cached Exchange mode. Additionally, the server detects and sends only the native format of messages to the client. Clients using a cached Exchange mode also receive the number and size of messages to be downloaded.

Enhanced DNS-Based Internet Mail Delivery—Offers load balancing, improved performance characteristics, and better problem tolerance for problems such as network or host unavailability or a lack of external Domain Name System (DNS) server responsiveness.

Administration. Several Administrator-specific functions and features are included in Exchange 2003 offers several customizable administrative features to help companies customize the server to fit individual service needs. These Administration functions include the capability for creating and customizing distribution lists, real-time backup and mirroring via the Volume Shadow Copy Service, and the Exchange System Manager. This manager, specifically, features an updated user interface that can filter customized e-searches for administrators looking for a specific document or conversation.

Volume Shadow Copy Service (VSC)—Supports the VSC service to offer instantaneous backup and real-time restoration. VSC works by mirroring a copy of the data base that can be recalled and accessed instantly.

Dynamic Distribution Lists—Reduces the time spent managing distribution lists through a query-based distribution group. These groups work the same as standard distribution lists, but also...
enable the use of a Lightweight Directory Access Protocol (LDAP) query to specify the members of the distribution lists.

- **Exchange System Manager**--Helps administrators by making it unnecessary to personally log files with modification tools and update modification tools manually. In Exchange 2003, message tracking log files, as well as X.400 message transfer agent (MTA) queue data and Simple Mail Transfer Protocol (SMTP) queue data, are moved by using Exchange System Manager. Other Exchange System Manager improvements include:

  - **Queues On Per-Server Basis**--Centralizes queues based on the actual servers in place, as opposed to virtual servers. This enables all queues on a server to be viewable from a single location.
  - **Increased Queue Enumeration Performance**--Returns control of Exchange System Manager to an administrator before all queues are displayed.
  - **Increased Exposed Cluster Action**--Enables a cluster’s status to be viewed for use in virtual servers and failover.

**Deployment.** Microsoft offers several features to facilitate company upgrades, migration, and deployments for Exchange 2003. At the most basic level, Exchange 2003 EE offers deployment tools that offer step-by-step approaches, providing detailed information, analyzing the existing topology, checking for prerequisites, recommending a configuration setting, and validating each step. Other notable deployment features for Exchange 2003 include:

  - **Active Directory Connector tools**--Aids deployment by analyzing an existing Exchange 5.5 topology, automatically preparing the Exchange 5.5 directory, and creating the needed connection agreements to ensure successful deployment.
  - **Active Directory Schema**--Ensures that only Active Directory permissions are required by changing permissions when performing forest preparation. With single-schema update, the Active Directory Schema only needs to be updated once.

**Analysis**

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The Microsoft Exchange 2000 Server is due for an overhaul in mid-2003, when Exchange 2003 Server will be released. Exchange 2003 delivers upgraded, server-line messaging and collaboration features such as mobile, remote, and desktop e-mail access, with components to ensure security and privacy. Microsoft speculates that this release will help the company claim the official lead in the market for e-mail and groupware servers, over both IBM Lotus and Novell Networks, which have both already upgraded their e-server products without either dramatically pulling ahead in the market.

**Target Market**

Microsoft's Exchange Server is targeted toward small-, medium-, and large-sized businesses that require a comprehensive messaging platform, with the tools necessary to create rich collaboration applications. Other targets within the expansive server market include educational, governmental, and medical institutions with need for an e-mail or message-exchange, communication management platform.

**Market Share**

Microsoft, alongside IBM Lotus, is considered a top-tier player in the groupware server market. Although the company suffers in competing with the revenue generated by Lotus Notes 6, it figures to recoup many of those losses when it begins offering Exchange 2003. Microsoft actually has more user seats than Lotus; however, the seats held by Lotus generate slightly more revenue. The third major player in this
competitive groupware market is Novell, which offers the GroupWise 6.5 messaging system. GroupWise provides cross-platform support for a number of programs and is noted for its easy-to-use interface.

**Strengths**

The Exchange 2003 Server release is at the forefront for both spam prevention and security maintenance, as it offers several filtering and encryption options to maintain the integrity of incoming messages and security of outgoing messages by offering administrative distribution lists and restrictions, authentication via the Kerberos information-transfer tool, and virus and spam scanners.

**Limitations**

Microsoft will see, shortly after the Exchange 2003 Server is released, its primary competitor IBM Lotus release version 6.5 of Lotus Notes. This collaboration tool, although it will not match Microsoft in terms of anti-spam or anti-virus features, offers enough other features to help the product keep pace and maintain its lead in the e-mail server market.

Another problem that Microsoft faces is that IBM Lotus offers a comprehensive Mobile & Wireless option for Notes for use on PDAs, cell-phones, and digital notebooks. Lotus is considered the unparalleled leader in this niche area of the e-mail systems market and, with Notes 6.5 set for release, does not look to be losing battles to Microsoft in this important, convergent area.

**Competing Products**

The Microsoft Exchange Server competes primarily with IBM Lotus Notes 6 and Novell GroupWise 6.5. Other competitors include SiteScape's WebWorkZone, Webex's Webex, and Relavis' eBusinessStreams.

Lotus Notes 6, Exchange's strongest competitor, is an enterprise-quality product with a strong industry-backing as a leading groupware product. It offers proven functionality and is a mature and scalable messaging and groupware system with impressive cross-platform client support and robust security. Notes provides high-end services such as replication, mobile collaboration, and clustering.

Novell's GroupWise 6.5, another robust messaging system, is easy to use, and provides an impressive cross-platform support. GroupWise's feature set boasts a strong workgroup orientation. This product is well integrated, and focuses on its Universal In-box and merging voice mail and calendars with e-mail. GroupWise's main strengths lie in its ease of use and low cost of ownership. It also offers native support for Internet standards such as POP3 and IMAP4, and Web access. Novell hopes to use its revamped design of GroupWise 6.0 to close in on its competitors in the wireless and unified communications sectors.

These three market leading messaging products have unique capabilities that distinguish them from their competitors. Notes is optimized for application development, GroupWise for its message handling, and Exchange for its use with Microsoft's other enterprise-wide applications.

**Sales Channels**

Microsoft sells its products directly through its worldwide sales office, online, through its Shop, and by mail order. Microsoft also has a wide range of business partners, VARs, and distributors that sell its products. Information on these partners and their locations is available at Microsoft's Web site.
Support Policies

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Users can access support for Exchange 2000 via the support section of Microsoft's Exchange 2000 Server Web page. The support menu provides users with helpful information that eases their Exchange difficulties. Within the support section is a Product Support Center that includes a Top Issues section with user access for downloading Exchange Outlook Web Access Patches, and linking users to Exchange FAQs. The Exchange Knowledge Base, another sub-section of the support page, is equipped with a searchable data base that provides answers to technical questions. Finally, a Support Contact section links users to Microsoft's local or worldwide Support Services Web site, where they can view a list of Microsoft Professional Support phone numbers, or link to OEM support.

Pricing

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Table 2 lists specific pricing for Microsoft’s Exchange 2000. The company has not released speculative prices for Exchange 2003, and should thus be contacted for more specific pricing information.

Table 2. Microsoft Exchange Pricing

<table>
<thead>
<tr>
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<th>Standard Price ($)</th>
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<tbody>
<tr>
<td>Exchange 2000 Server Full Package Product (5 clients)</td>
<td>1299</td>
</tr>
<tr>
<td>Exchange 2000 Server Full Package Product Upgrade (5 clients)</td>
<td>1029</td>
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<td>Exchange 2000 Server Upgrade (5 clients)</td>
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<tr>
<td>Microsoft Exchange 2000 License Pack</td>
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<td>Exchange 2000 Enterprise Server Full Package Product (25 clients)</td>
<td>6999</td>
</tr>
<tr>
<td>Exchange 2000 Conferencing Server Full Package Product</td>
<td>4999</td>
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</tbody>
</table>
About the Author

Brady Hicks is an editor in the Data Networking group at Faulkner Information Services. Brady's coverage of data networking technologies includes directory services, groupware and enterprise messaging, network backup, network and Web management, and storage.

Web Links

Lotus: http://www.lotus.com/
Microsoft: http://www.microsoft.com/
Novell: http://www.novell.com/
Relavis: http://www.relavis.com/
SiteScape: http://www.sitescape.com/
Webex: http://www.webex.com/