Deploying Server Blades in a Microsoft Exchange 2000 Front-End and Back-End Topology

By Mike J. Roberts and John W. Graham

The Dell™ PowerEdge™ 1655MC blade server can be deployed in a Microsoft® Exchange 2000 front-end and back-end topology to improve manageability, performance, availability, and security. This article describes the advantages of using a PowerEdge 1655MC blade server in this topology to integrate front-end Exchange servers and load-balancing software in a single chassis, increasing rack density and simplifying management.

Enterprises running multiple servers are increasingly challenged with providing Web-based e-mail and collaboration to client computers and employees’ mobile devices. Distributing server tasks between front-end and back-end servers enhances the availability and manageability of Web-based e-mail, and when leveraged with load-balancing products, improves performance and enhances security.

Microsoft® Exchange 2000 Server supports a front-end and back-end topology in which one or more front-end servers are configured to handle Hypertext Transfer Protocol (HTTP), Post Office Protocol 3 (POP3), Internet Message Access Protocol 4 (IMAP4), and Simple Mail Transfer Protocol (SMTP) requests from client computers and relay them to the appropriate back-end servers for processing. Back-end servers host databases, user mailboxes, public folders, and so forth.

Any server in this topology that is not specifically configured as a front-end server is considered a back-end server. In an environment running Microsoft Exchange 2000, a front-end server must run Exchange 2000 Enterprise Server, but either Exchange 2000 Enterprise Server or Exchange 2000 Server can be used for a back-end server.

This article demonstrates the advantages of using the Dell™ PowerEdge™ 1655MC blade server as a front-end server in an Exchange 2000 front-end and back-end topology. The new server blade architecture promises to alleviate many of the data center issues surrounding traditional rack servers. A server blade is essentially a server on a card—a single motherboard that contains a full computer system, including processor(s), memory, and integrated network connections. Server blades can increase server density, improve manageability, lower power consumption, and enhance deployment and serviceability. The PowerEdge 1655MC, for example, houses up to six dual-processor-capable server blades in a single chassis. These blades share redundant power supplies, networking, and cooling, all of which help to reduce heat production, costs, and space.

Benefits of a front-end and back-end topology
Organizations that want to use HTTP (available through Microsoft Outlook® Web Access [OWA], an Exchange 2000 component that provides users with e-mail access and collaboration capabilities through a Web browser), POP3, IMAP4, and SMTP to provide e-mail access to their employees over the Internet can do so by deploying an Exchange 2000 front-end and back-end topology.

In addition to the obvious benefit of Internet and Web-based e-mail access, an Exchange 2000 front-end and back-end topology provides certain other advantages.

Improved manageability. Administrators can define a single namespace, so they do not need to notify users or reconfigure client software when moving mailboxes from one Exchange server to another.

Performance and availability. Load-balancing software provides intelligent traffic management by dynamically distributing...
Administrators can define a single namespace (such as the URL http://companymail) through which OWA users access their e-mail. The use of Active Directory in this manner also saves administrators the need to reconfigure POP3 and IMAP4 clients if mailboxes move. Active Directory facilitates management for organizations and enhances user satisfaction by making the process of locating mailboxes invisible to users.

Load balancing for high performance and availability
In a front-end and back-end Exchange 2000 topology, larger organizations often require a group of front-end servers. A traditional Exchange 2000 deployment might use multiple stand-alone servers in combination with a load-balancing device or load-balancing software to intelligently manage traffic among the front-end servers.

In the same topology, a blade enclosure on the front end can house multiple Exchange 2000 front-end servers, which increases server density, improves manageability, and lowers power consumption. Each blade essentially stands alone and has no knowledge of the other blades in the chassis. To enable the server to intelligently manage traffic among each of its server blades, administrators can install load-balancing software on one or more blades.

Load-balancing software optimizes traffic management and prevents a bottleneck or a single point of failure at the front-end server by dynamically distributing OWA, POP3, IMAP4, and SMTP requests across multiple front-end servers. Both hardware and software load-balancing solutions exist. The sample topology discussed in this article uses the F5 Networks® BIG-IP® Blade Controller load-balancing software.

Administrators can install BIG-IP Blade Controller on one or more blades within the blade enclosure. BIG-IP Blade Controller accepts requests and routes them to available blades running Exchange 2000. If an Exchange 2000 server blade becomes overloaded or fails, BIG-IP Blade Controller no longer routes traffic to that blade. The use of load-balancing software enables administrators to take front-end Exchange 2000 servers in and out of service without affecting users. Figure 1 shows an active-active redundant pair running BIG-IP Blade Controller. An active-active redundant pair splits the workload and synchronizes connection information.

SSL and firewalls for enhanced security
Exchange 2000 Server can be configured to support Secure Sockets Layer (SSL), which encrypts and decrypts message traffic between clients and front-end servers. The drawback to this security measure is that it increases processor time. In a front-end and back-end deployment, front-end servers take on the task of encryption and decryption, freeing back-end servers to process requests.

Certain products that incorporate load-balancing software, such as the F5 Networks BIG-IP devices with SSL termination, support SSL acceleration, which allows organizations to off-load the overhead of SSL processing from front-end servers onto hardware optimized for SSL encryption and decryption functions.

An Exchange 2000 front-end and back-end topology can also include firewalls, which offer additional security but still permit HTTP, POP3, IMAP4, and SMTP access over the Internet. The PowerEdge 1655MC front-end server, with the BIG-IP Blade Controller software installed on one or more of its blades, can reside behind the Internet firewall or in the demilitarized zone (DMZ) between firewalls. Such a configuration reduces the number of ports that system and network administrators must open up for each service or protocol. Reducing the number of open ports helps to limit security vulnerabilities.

The example in Figure 2 contrasts a traditional front-end and back-end deployment that uses multiple Exchange 2000 front-end servers with a modular implementation that houses several front-end servers in one PowerEdge 1655MC blade enclosure. In the traditional implementation, Exchange 2000 front-end server traffic is managed with load-balancing, high-availability devices across four standard 1U servers. This configuration would...
theoretically use approximately 8U to 10U of rack space and require multiple power and networking cables.

In the modular implementation, the configuration incorporates four Exchange 2000 front-end servers and the BIG-IP Blade Controller software, which performs traffic management functions similar to those performed in the traditional implementation. The result is a compressed 3U footprint, yielding reduced cabling and power requirements. Both the traditional and modular implementations make use of firewalls, but firewall software can be integrated easily into the server blade configuration.

Server blades enhance topology
As illustrated in Figure 2, standard rack servers may be used as front-end servers in a front-end and back-end topology. However, a PowerEdge 1655MC offers distinct advantages. Use of server blades in this topology provides economies of scale as it improves hardware management, lowers power consumption, and enhances deployment and serviceability—all of which can result in a lower total cost of ownership.

Combining the hardware advantages of server blade technology with the benefits of load-balancing software in an Exchange 2000

front-end and back-end topology helps ensure that e-mail access is highly available and secure.

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