



Designing seamless Microsoft Exchange deployments across data centers

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In conjunction with key Microsoft® Exchange Server 2010 features, F5® BIG-IP® application delivery controllers can help organizations create high-performance, highly available messaging infrastructures spanning multiple data centers.

Messaging applications have become a critical part of enterprise operations. Microsoft Exchange Server 2010 incorporates multiple features designed to increase availability and enhance management in these environments—helping to maximize uptime while simplifying deployment, administration, and capacity sizing for IT administrators.

Two key changes in Exchange Server 2010 now enable organizations to incorporate F5 BIG-IP application delivery controllers into their Exchange infrastructures to help optimize messaging traffic across multiple data centers. The first change is that end users no longer connect directly to the Exchange Mailbox servers, even when using the Microsoft Office Outlook® e-mail client in native Messaging Application Programming Interface (MAPI) mode rather than through Remote Procedure Call (RPC) over HTTP. Instead, this access is provided by the Client Access servers—an approach that allows organizations to use F5 BIG-IP systems to optimize and load balance end-user traffic.

The second change relates to the Exchange database availability group (DAG) capability, which provides mailbox availability and automated database recovery in the event of failure. Continuous replication and monitoring of group members enables quick detection and recovery of a mailbox database; if an active member fails,

DAG brings up the passive database copy on another server and resumes services, helping minimize impact on end users. In Exchange Server 2010, DAG members can now be located at geographically separated sites interconnected by a wide area network (WAN), enabling organizations to use F5 BIG-IP WAN Optimization Module™ (WOM) technology to accelerate and encrypt DAG replication traffic.

F5 BIG-IP systems support a range of Exchange server roles, and can provide a variety of benefits depending on the specific deployment and configuration (see the “Enhancing performance and availability” sidebar in this article). By designing an Exchange infrastructure based on Dell™ and F5 BIG-IP systems, IT administrators can provide reliable e-mail and calendar access for end users while enhancing performance, availability, and management across their data centers.

Availability and failover for Client Access and Edge Transport servers

F5 BIG-IP systems can help organizations simplify and automate the management of Exchange Server 2010 data recovery configurations across multiple sites. F5 BIG-IP Global Traffic Manager™ (GTM) systems provide load balancing and failover across data centers, automatically updating Domain Name System (DNS) information based on application health. Administrators can define policies that take



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into account the real-time availability and performance of Exchange Client Access and Edge Transport servers, plan and easily initiate local maintenance outages without disrupting service, and maintain high availability even in the event of a disaster.

Effectively implementing failover between data centers across a WAN may require accelerating and encrypting DAG replication traffic: poor WAN conditions can cause data transfer delays, and regulatory or compliance requirements often dictate the need for encryption. While GTM handles the data center availability and failover through DNS, F5 BIG-IP WAN optimization can accelerate and encrypt the DAG traffic, helping to secure the data and shorten replication times between sites. Because DAG replication can therefore complete in less time than it would otherwise, the passive Mailbox databases are more likely to be up-to-date when activated in the event of a failure of the primary database.

WAN optimization for DAG replication

WAN conditions and remote data transfer performance can vary widely depending on factors such as available network bandwidth, link type and quality, and distance between sites. WANs that have limited bandwidth, high latency, and packet loss can cause delays for DAG replication, and prolonged data transfer times between disaster recovery sites can put business continuity plans at risk.

Out of the box, Exchange Server 2010 provides compression and encryption for DAG partners located on different IP subnets. These features are built-in, cost-efficient, and effective at helping to reduce the amount of network traffic and ensure the privacy of the transfers, but both are resource intensive and take away server processing power from the primary application. In addition, compression alone does not address poor performance associated with problematic WAN conditions. Specialized technologies such as F5 BIG-IP WOM are required to effectively overcome poor WAN replication performance and offload the tasks of compression and encryption from the Mailbox servers.

WOM is designed to accelerate TCP traffic for data center applications and provide the scalability to meet high-bandwidth requirements. In addition to symmetric compression and hardware encryption processing, WOM provides symmetric deduplication, TCP optimizations, tunneling, and a single point of administration. Deduplication, a key acceleration feature, builds a cache on the device at each end of the WAN link, and when a duplicate pattern in the network traffic is found, a small reference to the cache is transmitted instead of the entire pattern—an important way to help reduce the amount of WAN traffic. F5 TCP Express™ technology applies advanced protocol optimizations to the LAN and WAN to help deal with latency and packet loss

Enhancing performance and availability

F5 BIG-IP systems can offer a variety of advantages in Microsoft Exchange Server 2010 environments—helping administrators create an efficient, high-performance, highly available infrastructure.

- Simplify site-to-site failover and shorten disaster recovery times
- Minimize downtime in the event of a failure
- Accelerate and encrypt database availability group (DAG) traffic over wide area networks (WANs)
- Scale out Client Access and Edge Transport servers
- Support consolidation to help simplify management and save on hardware use, rack space, and power consumption
- Enable server offload using BIG-IP systems to help reduce hardware requirements and increase virtual machine server density
- Combine BIG-IP feature sets on a single platform, helping maximize the value of hardware investments
- Support multiple applications and multi-tenancy on a single BIG-IP appliance
- Protect Outlook Web App (OWA) services and support regulatory and Payment Card Industry Data Security Standard (PCI DSS) compliance



and increase the efficiency and reliability of network communications. Exchange Server 2010 administrators needing to implement DAG replication over WANs can benefit significantly from F5 WAN optimization technologies.

Scaling and optimization for local Client Access and Edge Transport servers

Another critical aspect of a scalable, highly available infrastructure is application delivery and load balancing within a local data center. Working together, global and local application

delivery technologies can provide end-to-end high availability for applications.

Administrators can load balance Client Access servers using Microsoft Windows® Network Load Balancing (NLB) clustering, which provides a cost-effective choice for some configurations. However, administrators should consider using F5 BIG-IP Local Traffic Manager™ (LTM) application delivery controllers for environments that contain eight or more Client Access servers, with servers running more than one Exchange server role, or when Exchange servers are running

Microsoft Cluster Service (MSCS)—running NLB and MSCS on the same hardware is not recommended.

Scaling out an Exchange Server 2010 infrastructure requires the use of a hardware load balancer for Client Access and Edge Transport servers. The advanced features and benefits of BIG-IP application delivery controllers extend beyond those of software load balancers to include security, advanced persistence methods, application health check monitors, high availability, Secure Sockets Layer (SSL) acceleration and offload, TCP optimization and offload, and

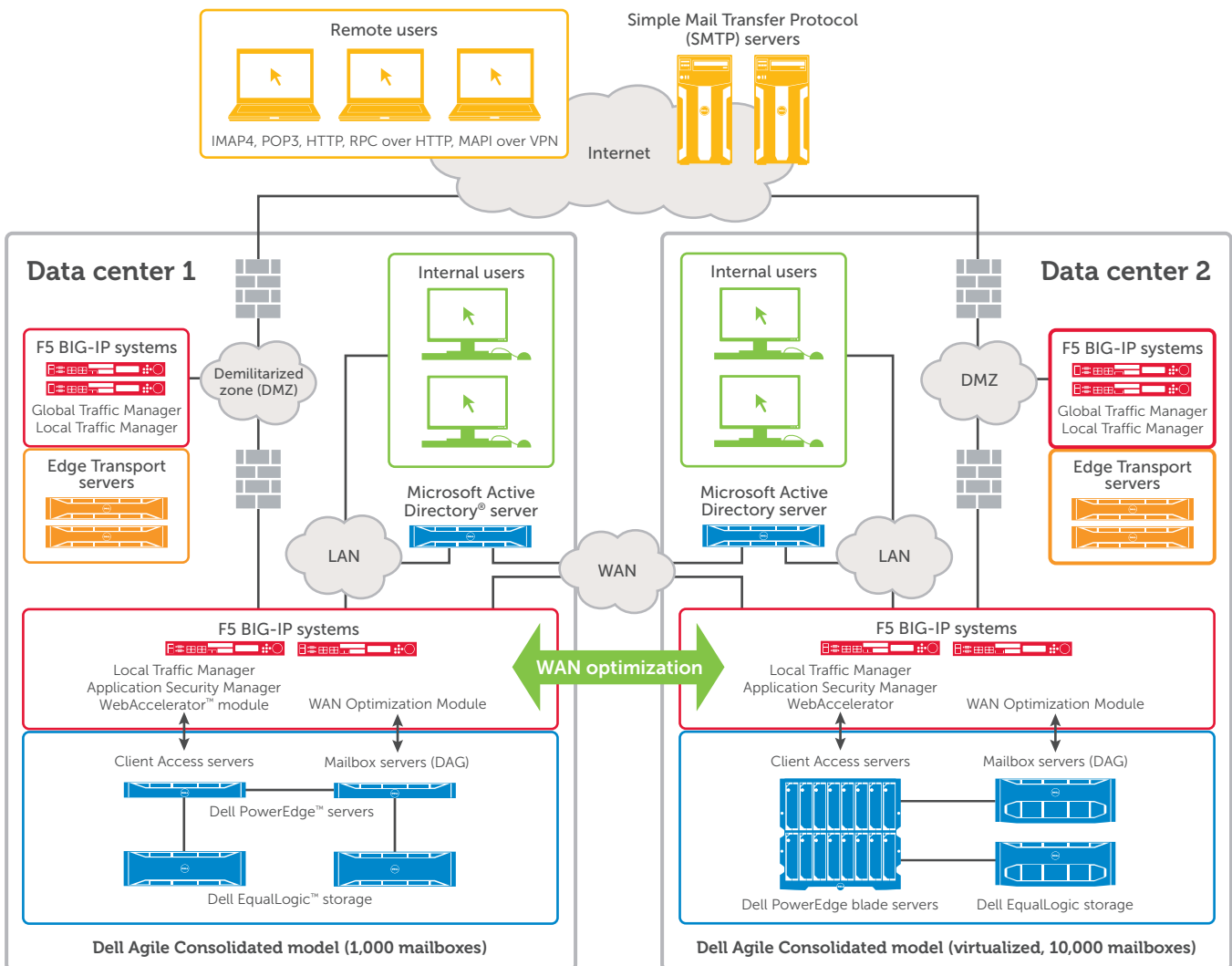


Figure 1. Example Microsoft Exchange Server 2010 architecture based on Dell servers and storage and F5 BIG-IP application delivery controllers

Web acceleration and offload with caching and compression—all of which enhance the end-user application experience and help reduce the Exchange server loads. F5 BIG-IP LTM and GTM systems are designed to complement each other to support high availability: LTM monitors the Client Access servers within a data center, while GTM monitors the health of the Client Access services and the LTM systems across multiple data centers. Together, they can make Exchange Server 2010 highly available both locally and globally.

The Exchange Outlook Web App (OWA) feature allows end-user access to Exchange messaging through a rich, full-featured interface on major Web browsers. Because OWA is a Web service, it can also provide an attack target, opening critical messaging systems to risk of data loss, compromise, theft, denial of service, and Web scraping, among other things. The F5 BIG-IP Application Security Manager™ (ASM) Web application firewall, which runs on BIG-IP systems alongside LTM and other modules, can help protect Exchange Web services from attack. Subscription-based updates are designed to keep ASM current to help ensure regulatory and Payment Card Industry Data Security Standard (PCI DSS) compliance. ASM also helps simplify audit efforts by producing an executive summary of requirements and recommendations for bringing application environments into compliance.

High-performance, highly available Exchange infrastructure

Combining Dell servers and storage, F5 BIG-IP application delivery controllers, and Microsoft Exchange Server 2010 can help organizations create high-performance, highly available enterprise messaging infrastructures. Figure 1, for example, shows one possible design based on Dell reference architectures for Exchange, illustrating how these components can link two data centers across a WAN while taking advantage of F5 BIG-IP modules to help maximize performance. Dell Services can also work directly with organizations to identify appropriate architectures that can meet the specific needs of their environment while helping simplify deployment and ongoing management (see the

Simplifying Exchange deployment

Dell Services can help organizations simplify and streamline Microsoft Exchange Server 2010 deployments and ongoing management while reducing risk, cost, and implementation time.

- Dell consulting services and Exchange reference architectures help ensure that e-mail and calendaring platforms based on Exchange Server 2010 are optimized, flexible, efficient, and secure.
- Dell can provide a single point of contact for a comprehensive e-mail and calendaring package based on Exchange Server 2010, including hardware, software, services, and support.
- The result is an integrated, end-to-end messaging system designed for maximum productivity, efficiency, security, and scalability.

"Simplifying Exchange deployment" sidebar in this article). Through this type of design, organizations can create integrated multi-data-center messaging environments while supporting site-to-site failover, simplified disaster recovery, high levels of security, and enhanced performance. 



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