



NETMOTION MOBILITY XE SCALABILITY

Executive Summary

This product sheet serves as a general guide to how Mobility XE can scale to meet the needs of growing organizations. For more specific information on capacity planning and system performance under specific load conditions, please contact a Mobility XE representative at +1-206-691-5555 or sales@nmwco.com.

NetMotion Mobility XE® is designed to support both small and large mobile device deployments. The size of the deployment and the load on the network determine how many Mobility XE servers should be used. Deployments with fewer than 1,500 simultaneously connected clients can use one Mobility XE server under reasonable load conditions. Up to 15,000 simultaneous connections can be supported using multiple servers in a pool. In addition, multiple-server pools also provide redundancy and load balancing.

Many factors have an impact on the load, capacity, and performance of a Mobility server or server pool, including:

- The number of users and devices
- The nature and volume of network traffic between the clients and servers
- The processing power and configuration of each server
- The type and number of applications being used
- The number of discrete connections between the client and server (network connections or “sockets”)
- The operating system on the mobile device

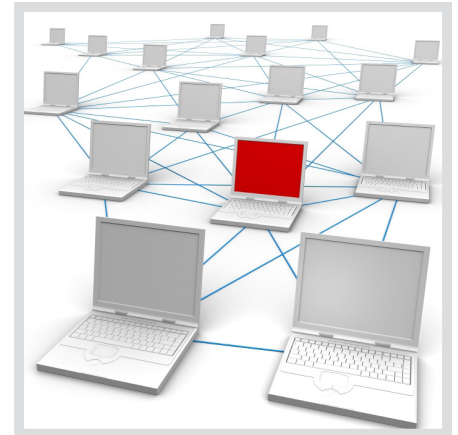
Whatever the size of the deployment, the server(s) and clients are centrally configured and managed from a unified, web-based console.

This product sheet discusses the options and reasons for increasing server capacity and adding new servers to scale the system.

Scaling Up: Increasing a Mobility Server’s Capacity

Scaling up involves increasing system resources such as memory, processor speed, or multiple processor cores. In addition to increasing the processing power of the server, increasing a server’s capacity often requires increasing the speed of the underlying network. An enterprise may be able to connect up to 1,500 clients simultaneously to a dedicated Mobility server, depending on the nature of the network traffic being secured between the mobile devices and the Mobility server. To protect against server hardware failures, we recommend adding at least one additional server to provide for system redundancy and failover.

The Mobility XE client-to-server ratio depends on how many devices are connected to the Mobility XE server, how many simultaneous network connections (sockets) the applications on those devices open up, how much data traffic is flowing during peak periods, and whether compression, encryption, or image compression (web acceleration) are used.



Deployment size and network load determine how many Mobility XE servers should be used to support mobile deployments.

In this paper we assume the following level of traffic between a client and server:

- The client is a domain member with no mapped drives
- Single line-of-business application, used actively 2 hours per day
- Light email use (approximately 10 messages/hour)
- Light web browsing (approximately 2 pages/hour)
- HTTP or FTP file transfers - 2 per day of 200MB files

Increasing Server Capacity and Performance

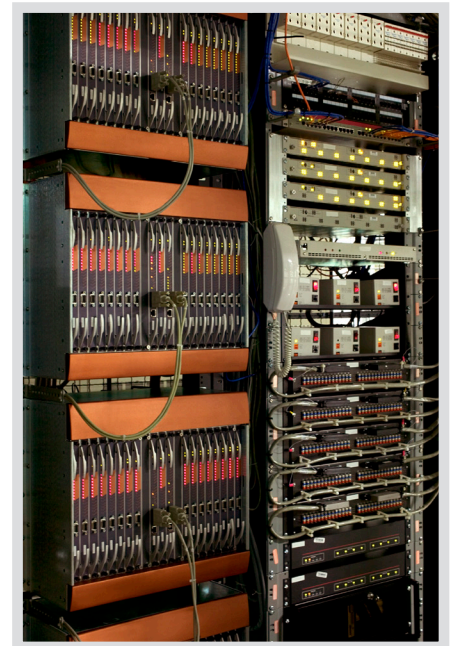
Memory/RAM. The number of Mobility client devices that can be connected simultaneously to a Mobility server depends directly on the amount of RAM on the server. For Mobility servers running Windows Server 2003 the minimum amount of RAM required is 3 GB. For Mobility servers running on Windows Server 2008 R2 the minimum is 4 GB.

CPU Speed. Faster processors yield increases in overall performance and are a good investment. Encryption, compression and web acceleration increase apparent network throughput but are all processor intensive. Increasing processor speed improves server throughput and scalability when they are enabled. In this paper we assume enterprises will deploy a dual-core processors running at 2.1 GHz as a minimum.

CPU Cores. As with processor speed, adding additional processors or processor cores increases network throughput, especially in high-traffic environments with encryption or web acceleration enabled, because the Mobility server's services support multi-threading. Additional processor cores beyond four are of less benefit because much of the core work is processed on three threads.

Network Interfaces. You can increase a server's bandwidth capacity by having the fastest possible network adapter installed in the Mobility server and by removing any bottlenecks in the network backbone. In addition, a secondary network interface on a private, non-routable network can be used to handle load balancing traffic communicated between servers in the Mobility server pool. For best performance, we recommend that the Mobility XE server be placed on a gigabit network backbone. A network backbone slower than 100-megabits should not be used because it artificially limits server throughput.

Compression. By default, Mobility is configured to turn compression on automatically when the connection speed is 2500 kbps or less. This optimizes throughput for clients that roam between cellular data and faster Wi-Fi networks. If Mobility client devices will be running on cellular data networks, using the compression feature improves performance and reduces the amount of data transmitted. If your mobile devices will connect only over a wireless LAN, compression can be safely disabled. Each Mobility client device using compression consumes additional memory on the Mobility server for the compression dictionary — by default 75 KB of RAM. The compression dictionary can be configured to use from 9 KB to 300 KB per device (more memory yields better compression and better performance at the cost of overall connection capacity). Using additional memory reduces the overall capacity of the Mobility server.



Faster processors yield increases in overall performance and are a good investment.

Scaling Out: Using a Server Pool

Scaling out involves adding Mobility servers to a pool. A maximum of 12 servers are supported in a server pool, with two of the servers allotted for failover. A pool of this size can support up to 15,000 concurrent device connections (1,500 clients per server for ten servers, plus two servers for failover) with a reasonable client traffic profile. A Mobility warehouse that has been updated with all the appropriate service packs and configuration settings can support up to 65,000 registered devices and users. Primary factors affecting the overall capacity of a Mobility XE server pool include:

- Mobility server and warehouse configuration
- Network configuration
- The number of devices simultaneously accessing servers in the pool
- The type and amount of data being transferred
- The number of network connections or sockets opened between the client and server

As the volume of devices and data increases beyond the capabilities of your current Mobility server, we recommend that you add Mobility servers to the server pool. A pool consists of multiple servers that (by default) automatically balance the client load, fail over as needed, and share a Mobility warehouse that stores configuration settings and client policies. Adding servers also removes single points of failure, preventing costly service disruptions.

Mobility Warehouse

The Mobility warehouse is a distributed directory server based on LDAP (the Lightweight Directory Access Protocol). It stores system configuration settings and client policies so that all servers in a pool can be centrally configured and managed. The warehouse can be collocated with the Mobility server in small deployments, or it can reside on a dedicated machine for large deployments. One or more replicated, standby warehouses can also be deployed to avoid a single point of failure. The warehouse should be deployed on a dedicated server in deployments with more than 400 mobile devices.

New Mobility servers require no configuration from clients or established servers; new servers automatically start sharing bandwidth to help with balancing the client load.

Adding Mobility Servers

Expanding a Mobility server pool to increase capacity is as straightforward as installing another server and connecting it to the Mobility warehouse. No new configuration is required of clients or servers: the other servers in the pool immediately learn about the new server member and start sharing the client load with that server. The next time clients connect to any server in the pool, they automatically learn about any new servers.

Load Balancing

A Mobility server pool balances the client connection load among servers in the pool at the time they connect. By default, all servers in a pool participate in load balancing. Each server periodically communicates its load and status to every other load balancing server in the pool. Server load is based on available memory, CPU utilization, and available network bandwidth.

Failover

By default, all servers in a pool function as failover servers. If a Mobility server fails, Mobility clients automatically try to connect to an alternate server in the server pool, allowing clients to easily re-establish network connectivity.

Events that cause a Mobility client to attempt to locate a failover server include:

- Failure to establish a connection to the configured Mobility server at startup
- Failure of the current server to respond (for a client with an active connection to a Mobility server)
- A system administrator forces failover (for example, so that system software or hardware can be updated)

Administration, Configuration, Logging and Analytics

All Mobility XE system administration and configuration is done centrally through the Mobility management console. Security, compression, and networking options can all be configured and managed from the server. NetMotion Mobility XE uses the following components to help manage your mobility deployment.

Mobility Console

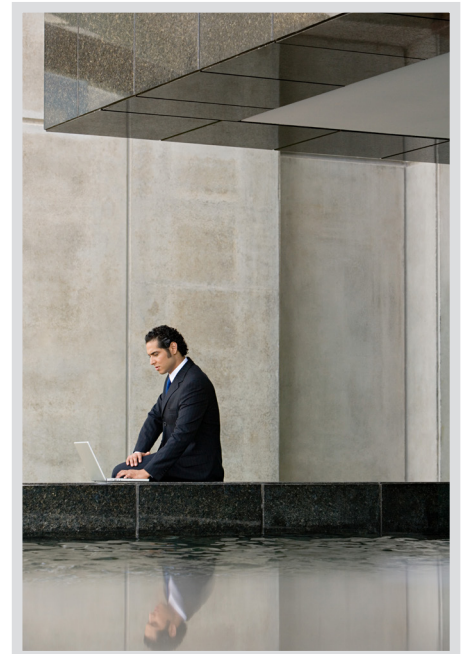
The Mobility console is a browser-based interface used for configuring and managing the Mobility XE system. It provides tools for monitoring server status and active connections, managing mobile users and mobile devices, tracking long-term activity, and troubleshooting server and connection problems. In addition to server information, it provides information about mobile device hardware and software, battery status, IP addresses, and other connection-related statistics. Since the Mobility console is web-based, users with appropriate permissions can configure and manage the Mobility system from a browser on a remote computer.

Activity Log

The Mobility activity logs displays historical information, such as connect and disconnect times, when a client roamed and to which network, and reachable status. The logs can be displayed in a spreadsheet or other application.

Event Logs

Each Mobility server keeps an event log with detailed information, warning, error and debug information (depending on how it is configured). You can use the Mobility console to control the information that is recorded in the server event log files and the information that is displayed in the console.



Since Mobility XE is web-based, users with appropriate permissions can configure and manage the system from anywhere.

Analytics Module

Beyond activity and event logging, the optional Analytics Module delivers intelligence about the performance of a Mobility XE deployment, guiding decisions about when and how to scale. In medium to large deployments (between 1,000 and 15,000 clients), the Analytics Module resides on a stand-alone server, separate from the Mobility servers and warehouse.

At a minimum, the Analytics Module should be hosted on a platform with a dual core processor running at 2 GHz with least 3 GB of system memory and at least 10 GB of free disk space.

Medium to large deployments (over 1,000 clients) should plan on hosting the Analytics Module on an enterprise grade database server.

To achieve the highest level of database scalability, the disk subsystem for the Analytics Module should use hardware RAID (level 10). Write-back caching must be disabled for the drives on which the database files are stored, and the following elements of the system should each be on a separate physical hard drive:

- Analytics Module Program Files and Windows Operating System
- Analytics Module database backups

Summary

NetMotion Mobility XE is designed to scale from the smallest test deployment to the largest enterprise. From server capacity and load balancing, to deployment and management, Mobility XE allows organizations to maximize resources and increase mobile-computing capacity in a straightforward, intelligent, and informed manner.





www.NetMotionWireless.com

FOR MORE INFORMATION, CONTACT US:

United States

Seattle, Washington

Telephone: (206) 691-5500

Toll Free: (866) 262-7626

sales@netmotionwireless.com

Europe

Germany and France

centraleasterneurope@netmotionwireless.com

United Kingdom

northerneurope@netmotionwireless.com