

# **System Performance: Sizing and Tuning**

## **ZENworks® Mobile Management 2.6.x**

November 2012

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# Sizing for Best Performance

## Architecture

The *ZENworks Mobile Management* system is comprised of an SQL Database component and a Web/HTTP component. Both components can be installed on a single server. The system can also be configured with multiple Web servers for a Network Load Balanced setup. With this configuration, you can install the SQL component and first instance of the Web component on a single machine and install the second instance of the Web component on a second machine.

## System Requirements

Minimum Requirement Servers	Single core 1.60 GHz CPU	1 GB RAM	40 GB HD	300 devices per box
Mid-range Servers	Quad core 2.13 GHz CPU	4 GB RAM	80 GB HD	2000 devices per box
High-end Servers	Dual quad core 2.80 GHz CPU	8 GB RAM	160 GB HD	4000 devices per box

Increasing RAM on these configurations allows for additional devices. For example, you can increase the RAM on a single core machine to 2 GB and be able to accommodate several hundred more devices than what is recommended above for a minimum requirement server. As the number of devices continues to grow, however, you might experience processing limitations and you will eventually require increased processing power (number of cores). Each system's configuration is unique and should be monitored carefully to maintain an acceptable level of performance.

**Usage Parameters.** These system requirements are based on the usage parameters used in the test setting, which are listed below:

All devices are in Direct Push mode, set with a Direct Push Interval of 30 minutes.  
Location data is reported based on the 30 minute interval, as well.

Email usage is as follows:

15% of the devices receive 12 emails/hour	25% of the emails are 500K
50% of the devices receive 8 emails/hour	50% of the emails are 75K
30% of the devices receive 4 emails/hour	25% of the emails are 10K
5% of the devices receive no email	

70% of the devices log text messages and phone calls.

- Devices log 1 phone call every 17.5 minutes
- Devices log 1 text message every 20

30% of the devices (iOS) do not support text/phone logging, but simulate iOS APNs requests based on the 30 minute push interval.

Text/phone logging and iOS APNs requests have consistently shown no impact on the performance of the *ZENworks Mobile Management* server in the test setting.

## **SQL Database Recommendations**

The *ZENworks Mobile Management* system is not SQL intensive; however, it is always good practice to monitor SQL usage. Improvements to SQL performance, if required, can usually be accomplished by adding RAM.

The recommendation for the machine on which the SQL component resides is 1 GB RAM per 2000 devices.

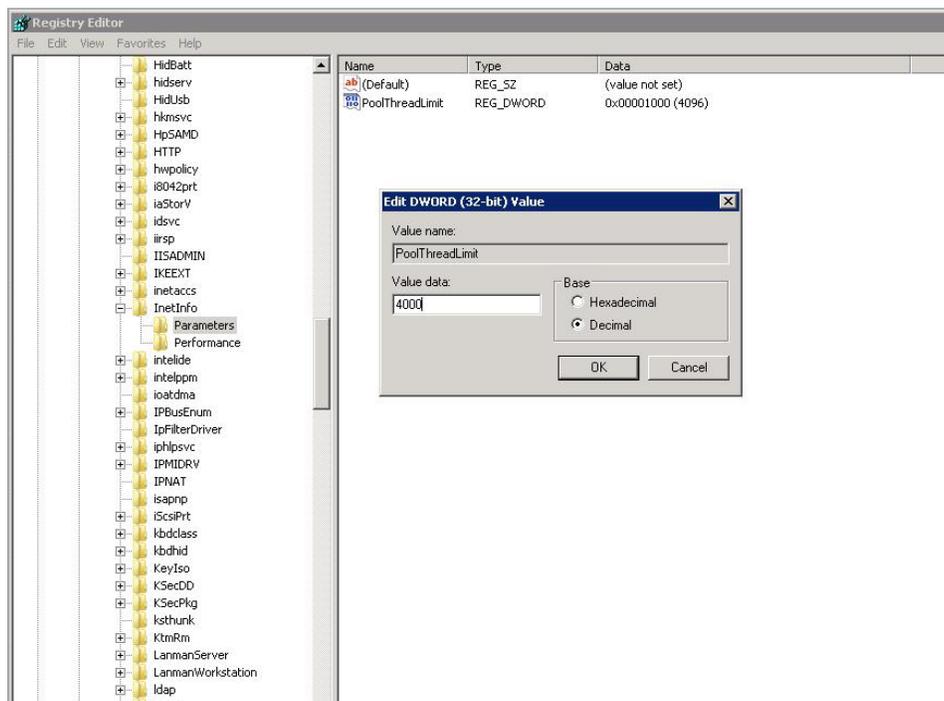
# Tuning ZENworks Mobile Management

Adjust the PoolThreadLimit registry key on systems with more than 125 devices.

The value of this registry key should be configured to 2 times the total number of devices. For example, if there are 2000 devices on the system, you should adjust this setting to 4000.

If the system is configured with multiple Web servers for a Network Load Balanced setup, you should adjust this setting on every server where a *ZENworks Mobile Management* component is installed. The value should be the same on every server.

1. Navigate through the *ZENworks Mobile Management* registry to adjust the following setting:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\services\inetInfo\Parameters
2. Select the PoolThreadLimit registry key and adjust the value.



# Setting Up a Web Garden

## Configuring a Web Garden for the ZENworks Mobile Management Web Server

A Web Garden is a server configuration where multiple processes run on a single Web server. This is accomplished by activating the Web Garden feature in Microsoft Internet Information Services (IIS), version 6 or 7. By default, an application pool in IIS runs in a single process on the server; however, there is an option to increase the *Maximum Worker Processes* to a value greater than 1. The result is that the server runs multiple processes, thus improving system performance.

If you have configured your system with multiple Web servers for a Network Load Balanced setup, the Web Garden feature (**Maximum Worker Processes**) should be adjusted on all servers running the *ZENworks Mobile Management* Web/Http component.

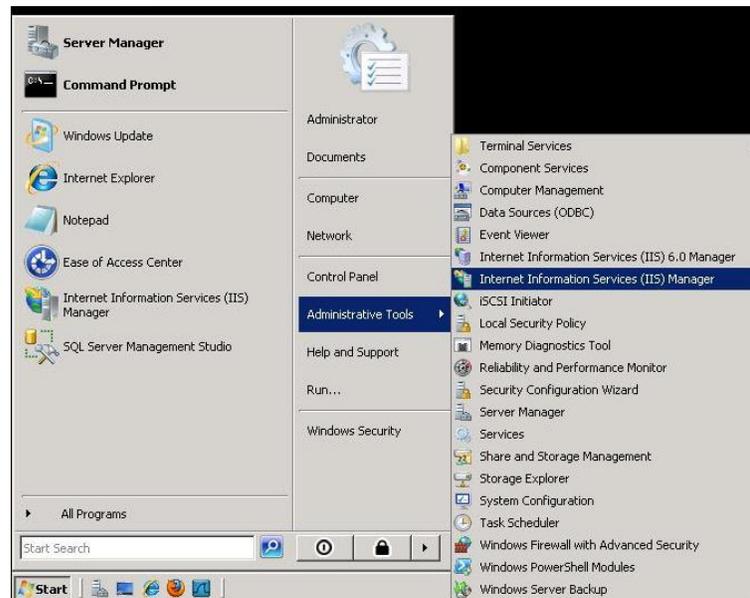
## Recommendations

- One Worker Process per core.
  - Single core – Leave *Worker Processes* setting at 1
  - Quad core – Increase *Worker Processes* to 4
  - Dual quad core – Increase *Worker Processes* to 8
- Increasing the number of *Worker Processes* beyond 2 per core results in a reduction in performance.

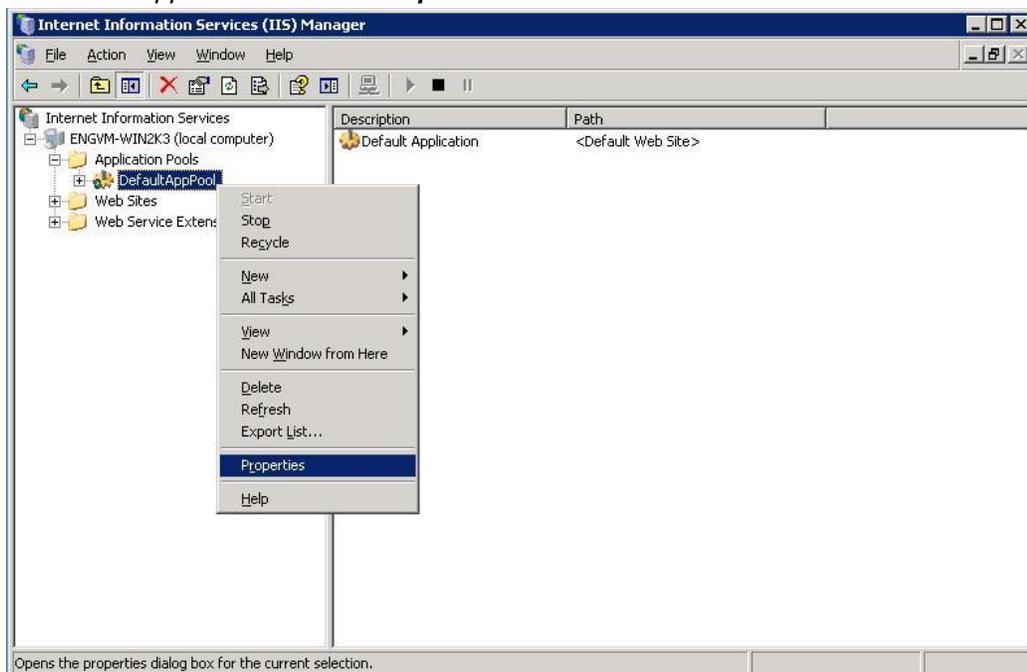
Instructions follow for setting up a Web Garden with IIS 6 or IIS 7.

# Setting up a Web Garden in IIS 6

1. Open **Internet Information Services Manager**, located under **Administrative Tools**.

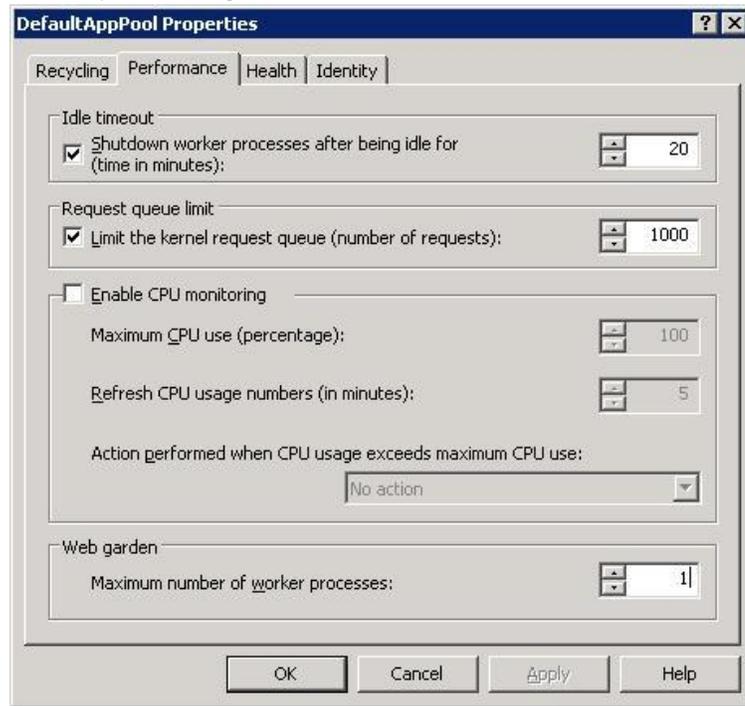


2. In the left menu, expand the server and select **Application Pools**.
3. Expand **Application Pools** and select **DefaultAppPool**.
4. Right-click **DefaultAppPool** and select **Properties** from the menu.



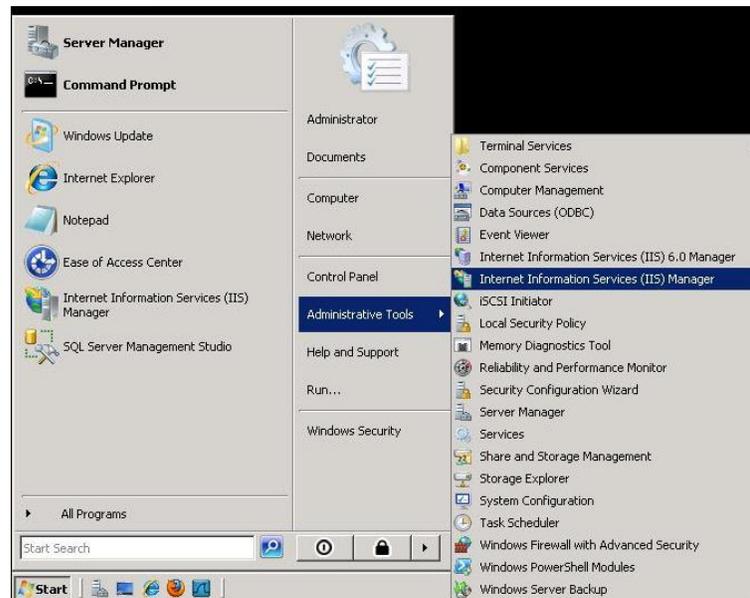
5. Select the **Performance** tab.

- Under the **Web garden** section, adjust the **Maximum number of worker processes** to a value greater than 1, (see the recommendations listed earlier in this section). The value should remain at 1 for a non-Web garden setup or on single core machines.

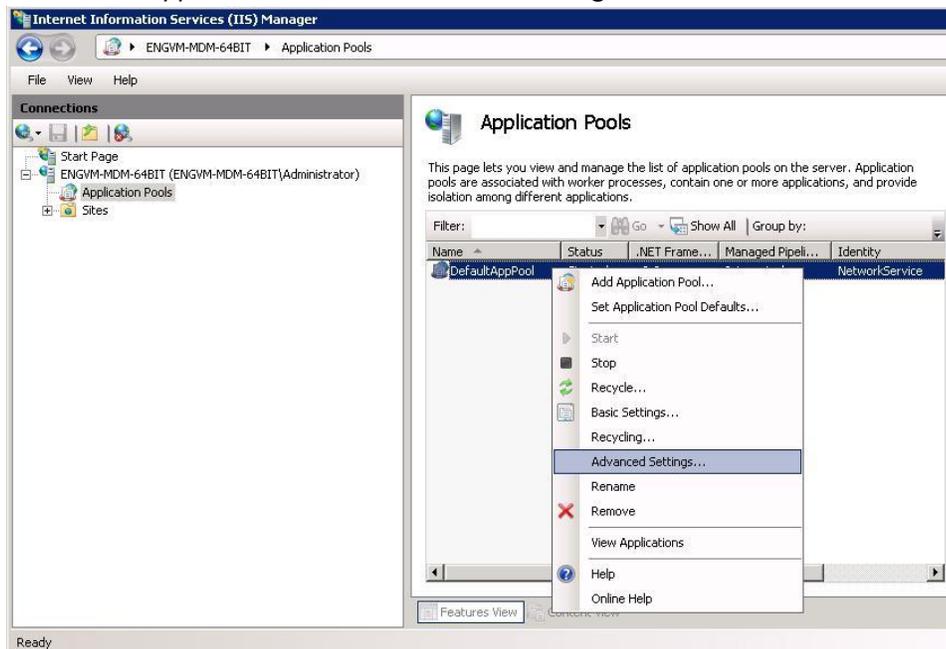


# Setting Up a Web Garden in IIS 7

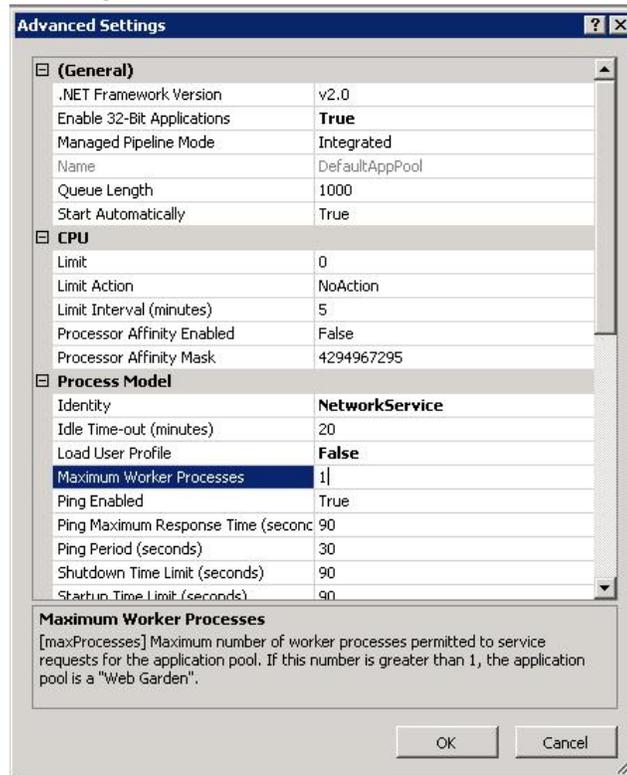
1. Open **Internet Information Services Manager**, located under **Administrative Tools**.



2. In the left menu, expand the server and select **Application Pools**.
3. In the **Application Pools** section, select **DefaultAppPool**.
4. Right-click **DefaultAppPool** and select **Advanced Settings** from the menu.



5. Under the **Process Model** section, adjust the **Maximum Worker Processes** to a value greater than 1, (see the recommendations listed earlier in this section). The value should remain at 1 for a non-Web garden setup or on single core machines.



# Hardware Requirements for Scaling ZENworks Mobile Management

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## 10K Devices

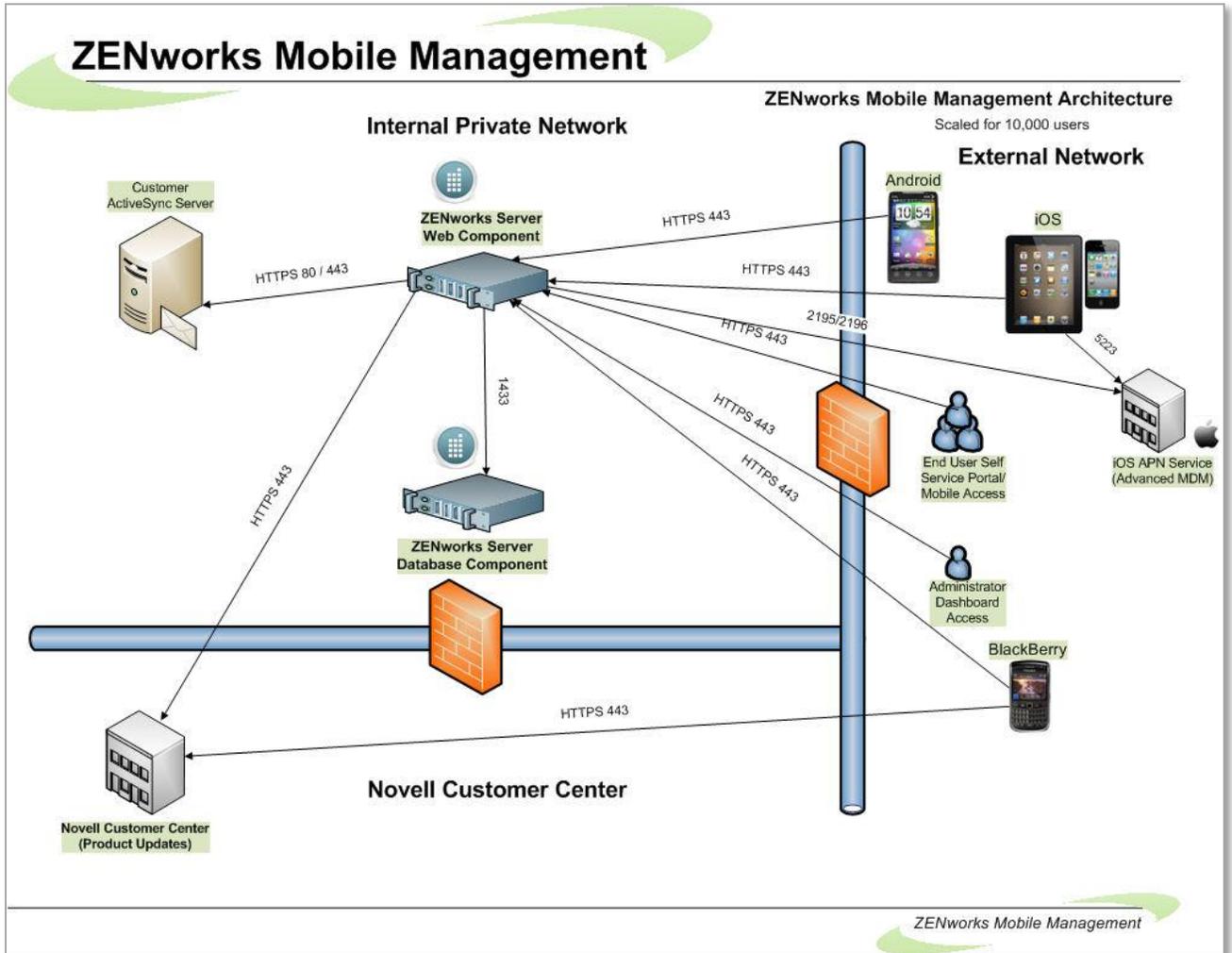
### Web Component

- 1 physical server consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - 24 GB RAM
  - 2 – quad-core CPUs with hyper-threading enabled
  - 150 GB HDD space (recommended mirrored configuration)
  - 32 worker processes

### Database Component

- 1 physical server consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64 bit version)
  - SQL Server 2008 R2 Advanced / Enterprise
  - 12 GB RAM (8 GB allocated to SQL Server)
  - 2 – quad-core CPUs with Hyper-threading enabled
  - 300 GB hard drive space (recommended RAID-5 configuration)

# 10K Devices



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## 50K Devices

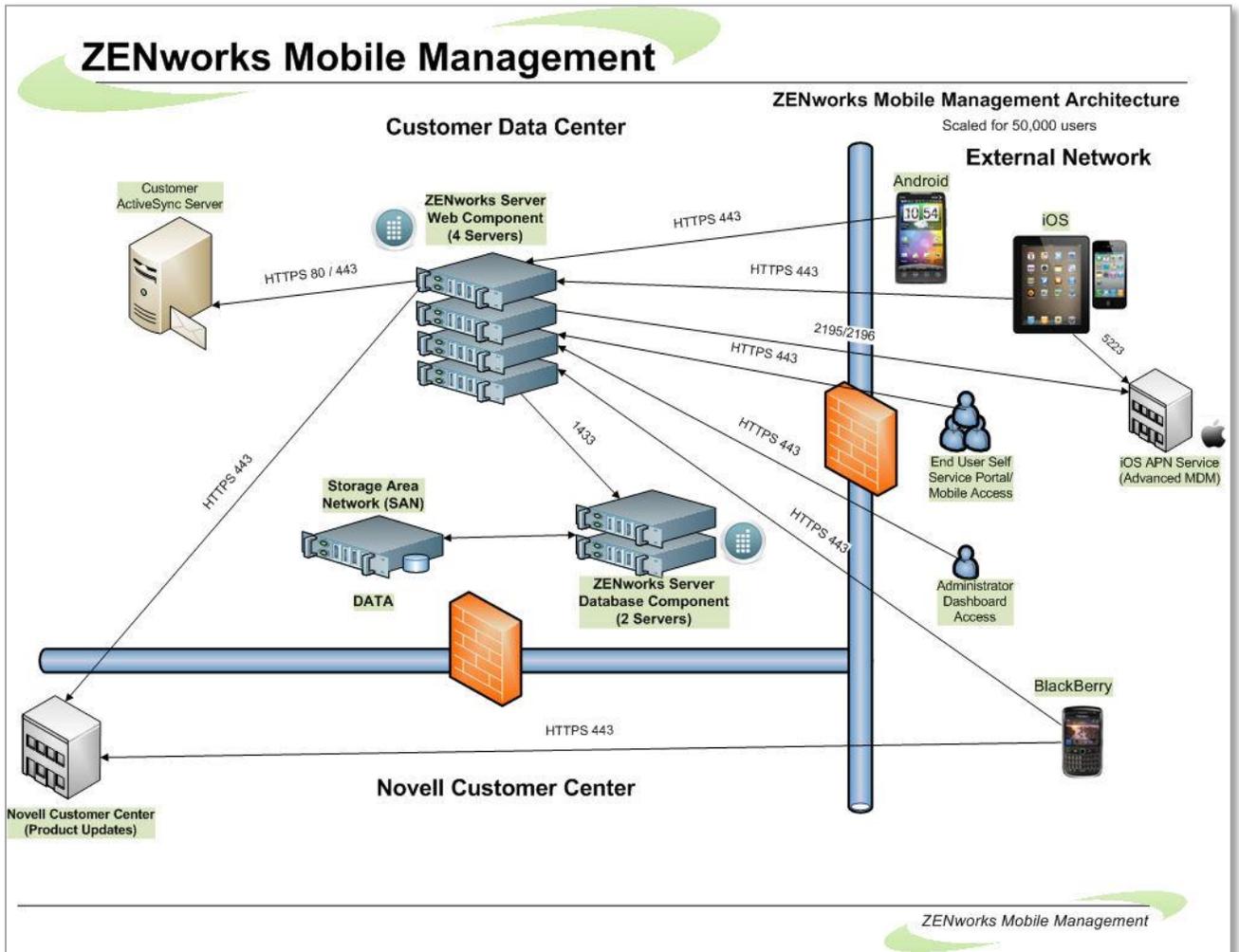
### Web Component

- 4 physical servers set up as a Web Cluster, each consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - 40 GB RAM
  - 2 –eight-core CPUs with hyper-threading enabled
  - 150 GB HDD space (recommended mirrored configuration)
  - 32 worker processes

### Database Component

- Use a dedicated SAN
  - Dual Head (High Availability)
  - 6 – 450 GB SAS Drives
  - 5 set up in a RAID 5 configuration
  - 1 set up as a hot spare
- 2 physical host servers connecting to the SAN, each consisting of:
  - 2 – quad-core processors with hyper-threading enabled
  - 36 GB of RAM per host
  - 2 – 73 GB HDD (recommended mirrored configuration)
- Each VM should be set up to run on separate hosts, set up as described below:
  - Windows 2008 Enterprise Server R2 SP1 (64 bit version)
  - SQL Server 2008 R2 Advanced / Enterprise
  - 30 GB RAM (24GB allocated to SQL Server)
  - 6 Processors
  - 1.5 TB hard drive space (recommended RAID-5 configuration)

# 50K Devices



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# 100K Devices

## Web Component

- 7 physical servers set up as a Web Cluster, each consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - 40 GB RAM
  - 2 –Eight-core CPUs with hyper-threading enabled
  - 150 GB HDD space (recommended mirrored configuration)
  - 32 worker processes

## Database Component

- Use a dedicated SAN
  - Dual Head (High Availability)
  - 12 – 450 GB SAS Drives
  - 11 set up in a RAID 5 configuration
  - 1 set up as a hot spare
- 2 physical host servers connecting to the SAN, each consisting of:
  - 2 – six-core processors with hyper-threading enabled
  - 48 GB of RAM per host
  - 2 – 73 GB HDD (recommended mirrored configuration)
- Each VM should be set up to run on separate hosts, set up as described below:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - SQL Server 2008 R2 Advanced / Enterprise
  - 40 GB RAM (36 GB allocated to SQL Server)
  - 8 processors
  - 3 TB hard drive space (recommended RAID-5 configuration)

# 100K Devices

