

# **System Performance: Sizing and Tuning**

## **ZENworks® Mobile Management 2.9.x**

**April 2014**

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## Table of Contents

<b>Sizing for Best Performance</b>	<b>4</b>
<b>Tuning ZENworks Mobile Management</b>	<b>6</b>
<b>Setting Up a Web Garden</b>	<b>8</b>
Setting up a Web Garden in IIS 6 .....	9
Setting Up a Web Garden in IIS 7 .....	11
<b>Hardware Requirements for Scaling ZENworks Mobile Management</b>	<b>13</b>
100K Devices .....	13
200K Devices .....	15

# 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 may 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. Machines where SQL is not installed will be able to support more devices than recommended below. These web servers can support approximately 2,000 users per 2.5 GB RAM.

**A note about firewalls or host providers:** Device traffic is routed through the *ZENworks Mobile Management* server. Because of this, the IP address of any server that sits between the *ZENworks Mobile Management* server and the ActiveSync Server (or LDAP server) will appear to have an increased amount of traffic. Some firewalls or hosts providers view increased traffic as an attempted attack and may limit or throttle connections. As a result, devices can experience sporadic connections with the ActiveSync, LDAP or *ZENworks Mobile Management* server.

## Minimum System Requirements

CPU	RAM	Hard Drive	Maximum Devices
Dual Core 1.60 GHz CPU	3 GB RAM (SQL restricted to 300 MB)	60 GB HD	1000 Devices

*This environment can be setup on SQL 2008 R2 Express with proper database maintenance.*

## Performance Requirements

	CPU	RAM	Hard Drive	Maximum Devices
<b>Low-End Servers*</b>	Quad Core 2.13 GHz	8 GB RAM (SQL restricted to 750 MB)	80 GB HD	4,000 Devices
<b>Mid-Range Servers</b>	Quad Core 2.13 GHz	12 GB RAM (SQL restricted to 750 MB)	120 GB HD	8,000 Devices
<b>High End Servers</b>	Dual Quad Core 2.40 GHz w/ Hyper Threading Enabled (16 Logical Cores)	30 GB RAM (SQL restricted to 1.5 GB)	160 GB HD	20,000 Devices
<b>Large Scale Servers</b>	Dual Hex Core 2.40 GHz w/ Hyper Threading Enabled (24 Logical Cores)	60 GB RAM (SQL restricted to 3 GB)	320 GB HD	40,000 Devices

*\* This environment can be setup on SQL 2008 R2 Express with proper database maintenance.*

## 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	

Test environments are configured with a 50/50 split between iOS & Android devices. All iOS devices have server side APNs enabled while all Android devices have server side GCM enabled.

*Disabling APNs and/or GCM will result in an overall performance reduction of the ZENworks Mobile Management system.*

# Tuning ZENworks Mobile Management

## PoolThreadLimit Registry Key

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.

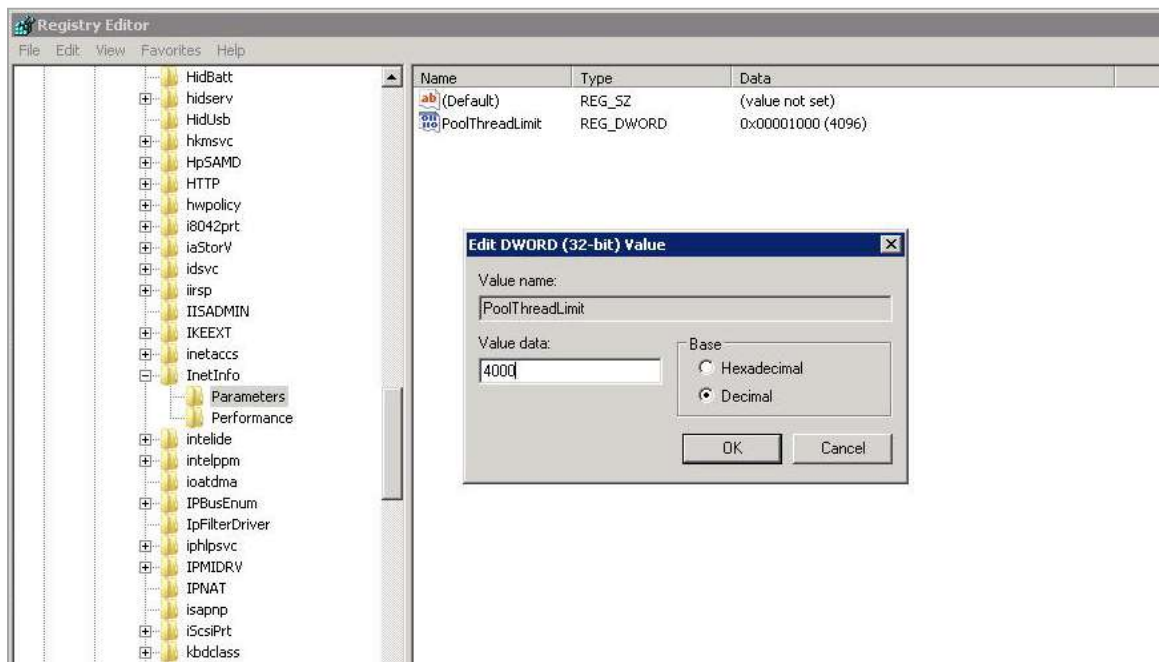
If the system is configured with multiple Web servers for a Network Load Balanced setup, you should adjust this setting on every server where a *ZENworks Mobile Management* component is installed. The value should be the same on every server.

1. Navigate through the *ZENworks Mobile Management* registry to adjust the setting:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\services\InetInfo\Parameters

2. If the PoolThreadLimit key already exists, double click on it and adjust the value to 2 times the total number of devices.

Add the PoolThreadLimit registry key if it does not exist by right clicking on **Parameters** and selecting **New > DWORD**. Rename the newly created key, then double click on it to adjust the value to 2 times the total number of devices.



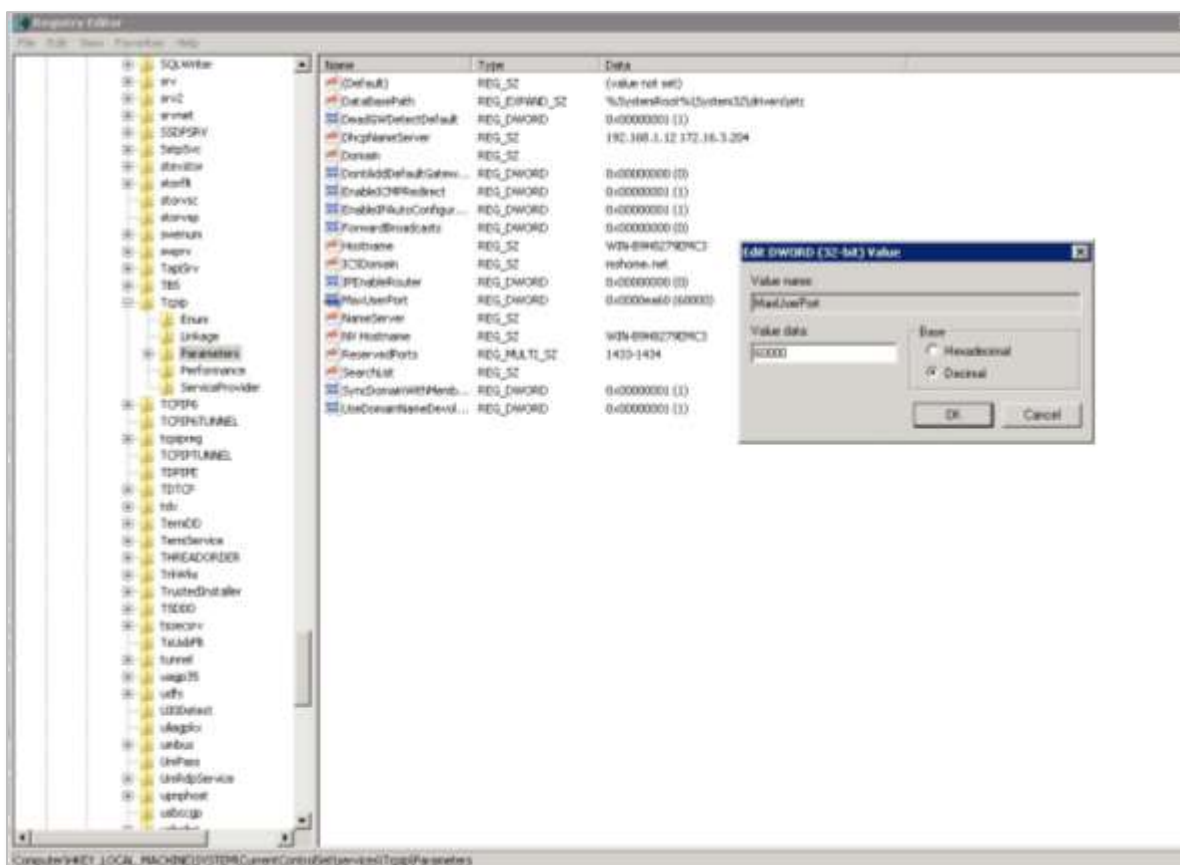
## MaxUserPort Registry Key

Due to a default Windows setting allowing a maximum of 5000 concurrent open ports, it is a good idea to adjust the MaxUserPort registry key on systems with more than 1000 devices. The value of this registry key should be set to 5 times the total number of devices on the system. For example, if there are 2,000 devices on the system, adjust this key to 10,000.

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 to the following location in the registry:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\services\Tcpip\Parameters
2. If the MaxUserPort key already exists, double click on it and adjust the value to 5 times the total number of devices.

Add the MaxUserPort registry key if it does not exist by right clicking on **Parameters** and selecting **New > DWORD**. Rename the newly created key, then double click on it to adjust the value to 5 times the total number of devices.



# 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

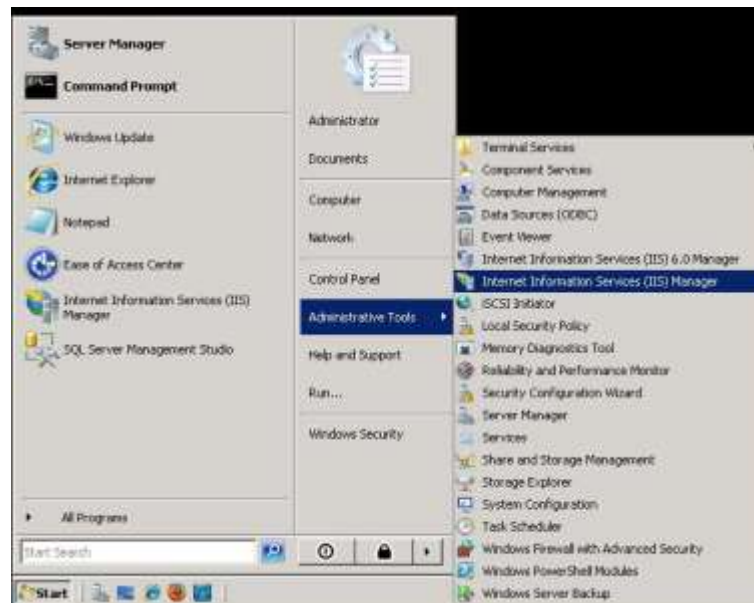
- One Worker Process per 1000 devices.
  - 1000 devices – Leave *Worker Processes* setting at 1
  - 2000 devices – Increase *Worker Processes* to 2
  - 4000 devices – Increase *Worker Processes* to 4
- Increasing the number of *Worker Processes* beyond 2 per 1000 devices could result in a reduction in performance.

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

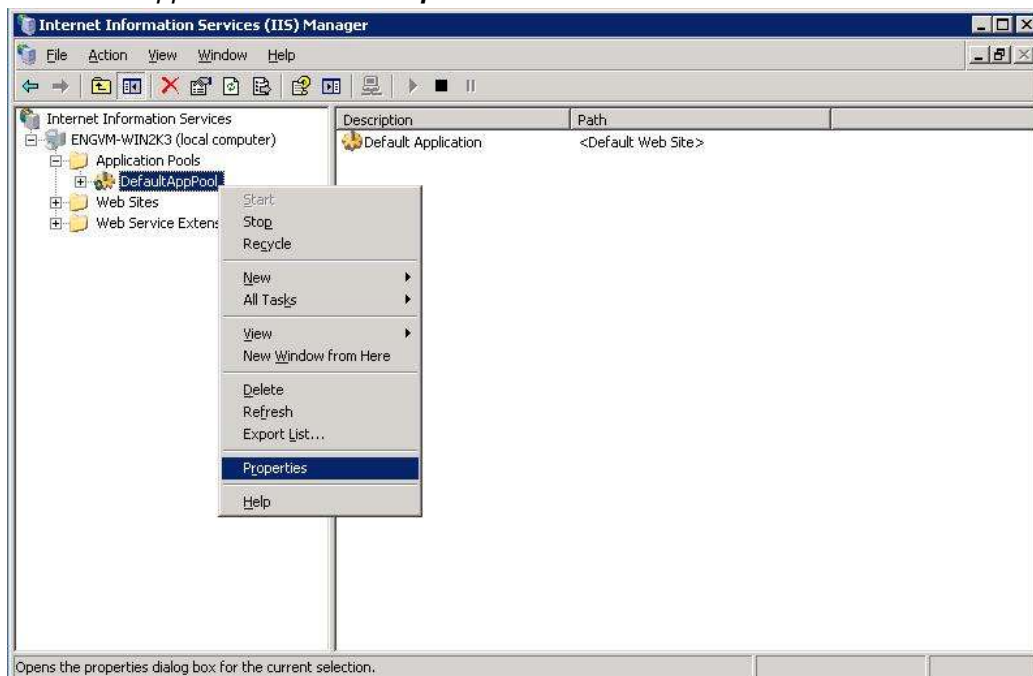


# Setting up a Web Garden in IIS 6

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

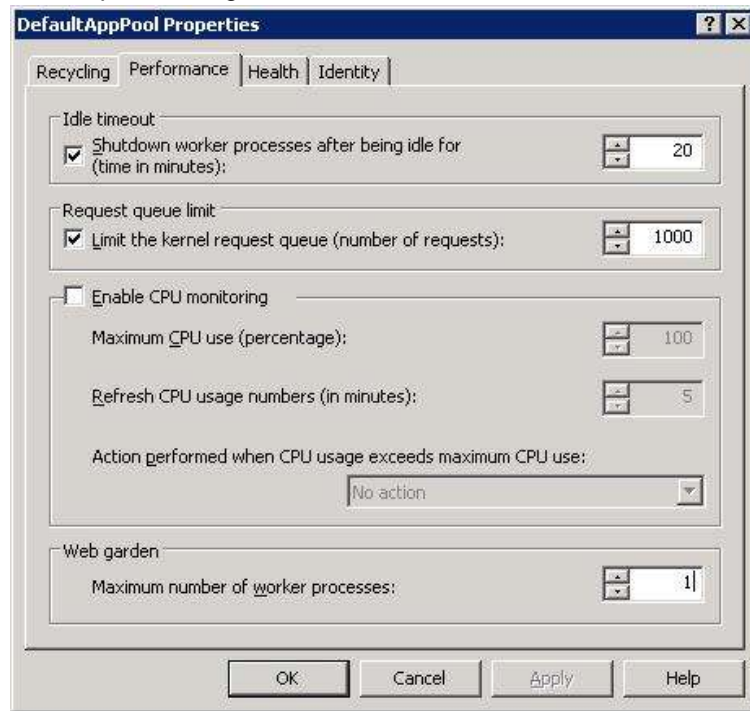


2. In the left menu, expand the server and select **Application Pools**.
3. Expand **Application Pools** and select **DefaultAppPool**.
4. Right-click **DefaultAppPool** and select **Properties** from the menu.



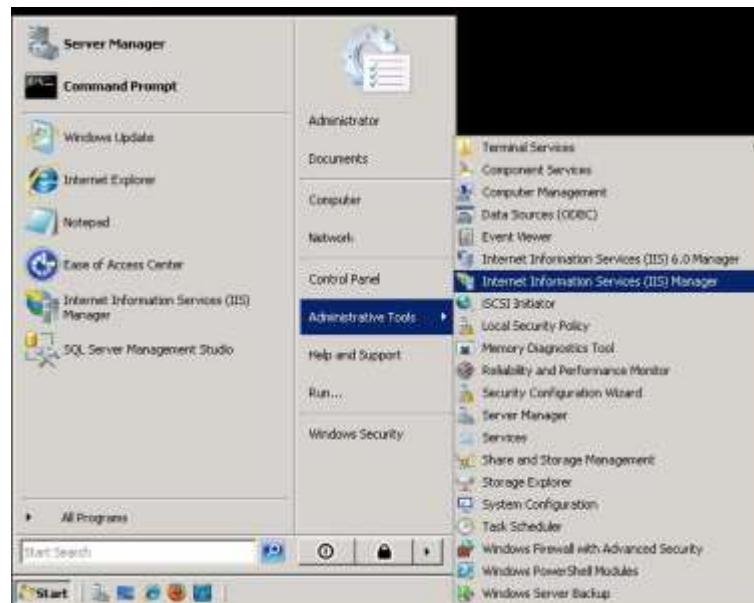
5. Select the **Performance** tab.

- 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.

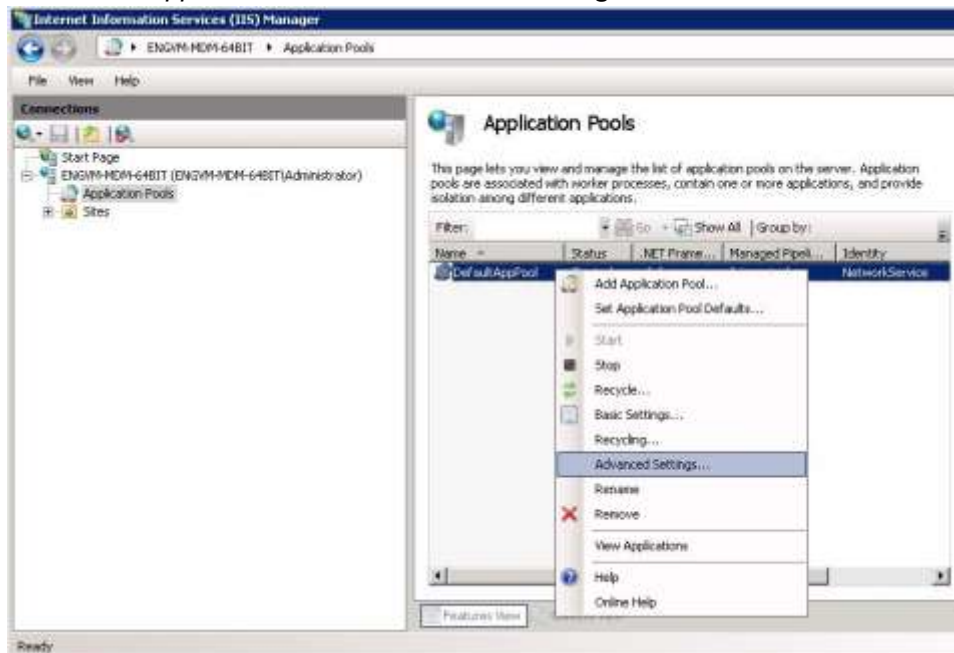


# Setting Up a Web Garden in IIS 7

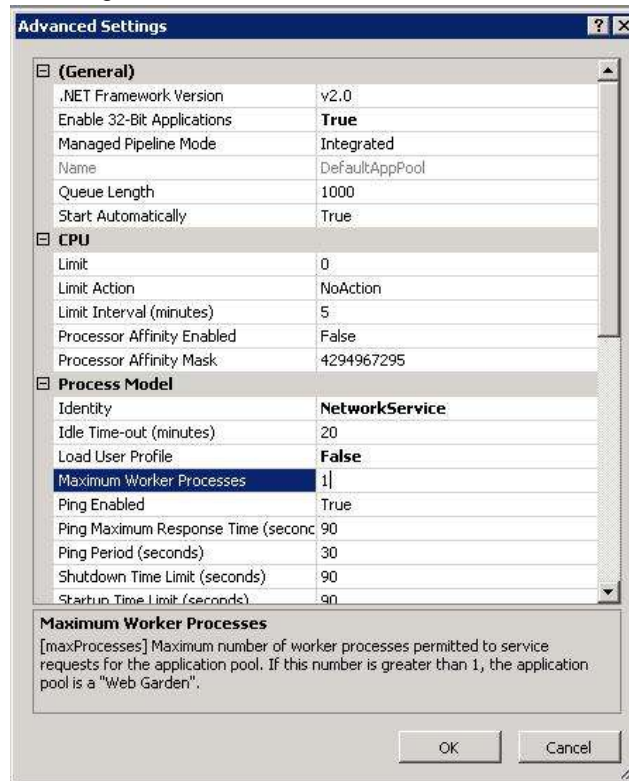
1. Open **Internet Information Services Manager**, located under **Administrative Tools**.



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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## 100K Devices

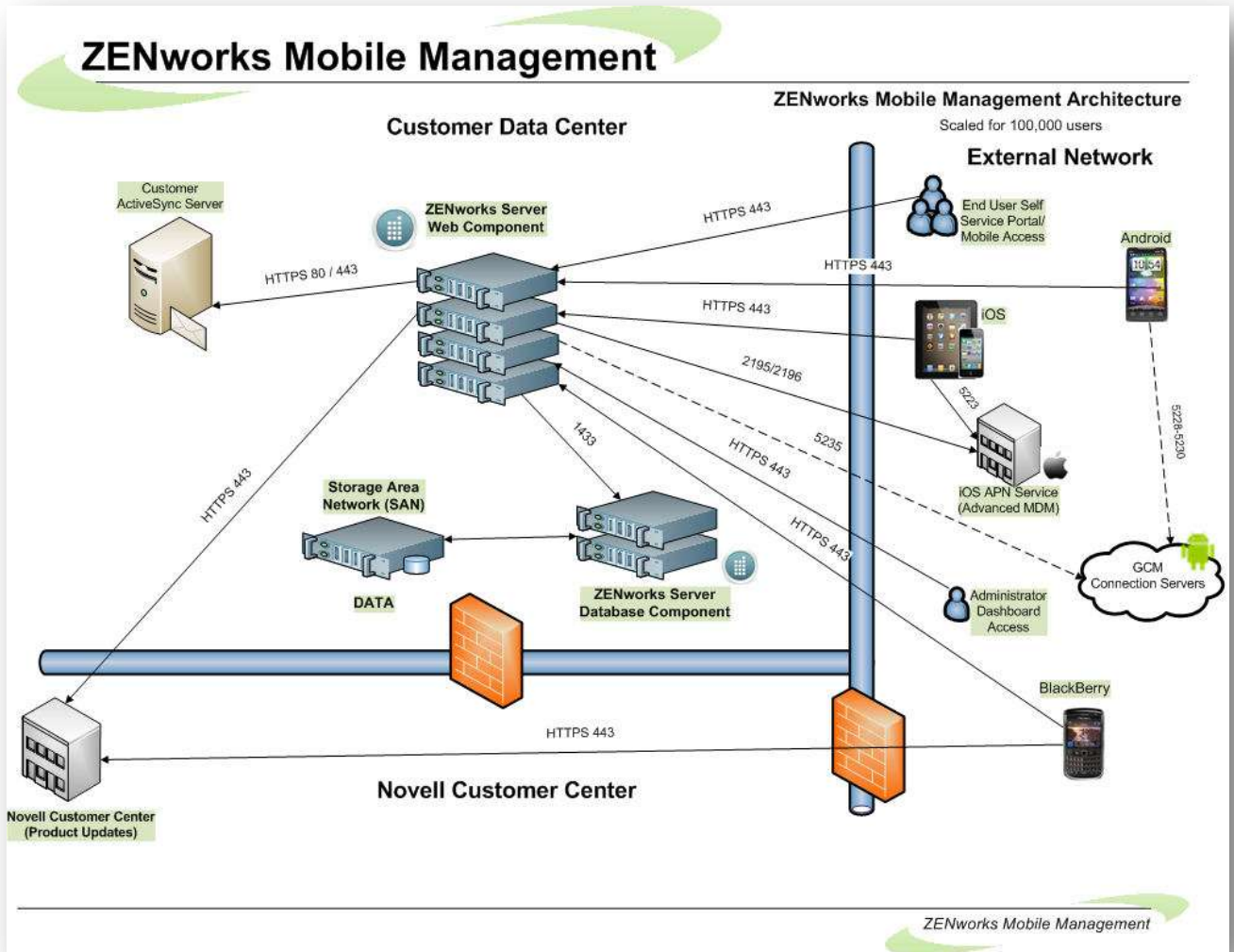
### Web Component

- 4 physical servers set up as a Web Cluster, each consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - 48 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)
  - 5 – 250 GB SAS Drives
  - 4 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 – Hex-core processors with hyper-threading enabled
  - 16 GB of RAM per server (10 GB allocated to SQL)
  - Windows 2008 Enterprise Server R2 SP1 (64 bit version)
  - SQL Server 2008 R2 Advanced / Enterprise
  - Using SAN as shared storage

# 100K Devices



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## 200K Devices

### Web Component

- 6 physical servers set up as a Web Cluster, each consisting of:
  - Windows 2008 Enterprise Server R2 SP1 (64-bit version)
  - 60 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)
  - 5 – 500 GB SAS Drives
  - 4 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 – Hex-core processors with hyper-threading enabled
  - 32 GB of RAM per server (20 GB allocated to SQL)
  - Windows 2008 Enterprise Server R2 SP1 (64 bit version)
  - SQL Server 2008 R2 Advanced / Enterprise
  - Using SAN as shared storage

# 200K Devices

