

# **Citrix Access Essentials and Microsoft Essential Business Server with Citrix XenServer Integration Benefits and Deployment Recommendations**

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## Executive Overview

Small and medium-sized businesses (SMB) are constantly faced with the ever changing complexity and security risks associated with providing a complete and robust IT solution to address their business needs. IT generalists employed at many of the SMB organizations are expected to be the security administrators, messaging experts, help desk support specialists, application owners, and fill numerous other IT specialist roles based on the business. Given the all encompassing role of the IT generalist, the need to consolidate efforts and maximize resources is constantly growing. The SMB environment must be able to secure the perimeter of the network from the Internet or other external sources, limit user and application access, monitor endpoint/device security, and most importantly ensure the security and integrity of proprietary or confidential information. The importance of ensuring secure, remote access can be costly for IT organizations with limited funding or technology support resources.

Citrix and Microsoft have been developing solutions designed to simplify the IT management needs of a SMB organization. The needs of the SMB organization are not that different from a large enterprise organization. They are focused on usability, collaboration, and security. The proven success of the Citrix and Microsoft alliance is representative of the collective SMB IT solution represented in this document. A solution built upon a well-established Microsoft-based software platform that allows small and medium-sized businesses enterprise level access to line-of-business applications and remote connectivity, but at a fraction of the cost. The components of this solution are comprised of the following software offerings:

- **Microsoft Windows Essential Business Server (EBS) 2008** Powered by Windows Server 2008 technology, Windows Essential Business Server is a suite of server products for mid-size businesses that integrates management, messaging, and security to dramatically reduce IT complexity and improve efficiency across the business.
- **Citrix Access Essentials** A remote access solution designed to securely extend the office network by providing secure application delivery from any device, from any location, over any type of network based on the proven technology of Citrix XenApp. The product features an intuitive management interface that simplifies setup and day-to-day maintenance.
- **Citrix XenServer** is a server virtualization system that makes data centers more agile and efficient through server virtualization, higher levels of availability, and improved utilization of IT resources resulting in savings in IT administration, equipment, space, power, and cooling.

Mid-size businesses need Microsoft Essential Business Server. They also need to provide employees with secure, remote access to critical business applications. The hardware for this consolidated yet robust environment requires multiple servers which can be costly from an infrastructure and on-going management perspective. By leveraging Citrix XenServer with Citrix Access Essentials and Microsoft Essential Business Server, the IT generalist can provide a complete SMB IT solution at a fraction of the cost. This document introduces Microsoft Essential Business Server with Citrix Access Essentials and provides critical step-by-step instructions for virtualizing these components on Citrix XenServer to showcase the simplified management and maximum cost savings for small and mid-size businesses. Citrix Consulting Solutions validated this solution and thoroughly examined the following benefits of integrating Citrix Access Essentials and Microsoft Essential Business Server in a virtualized Citrix XenServer environment. The following key benefits help solidify the momentum behind this integrated solution:

- **Hardware Consolidation:** Microsoft Essential Business Server requires a minimum of three servers for the Standard Edition and four servers for the Premium Edition. The overall cost of hardware, before purchasing any software or licensing, for implementing the Microsoft Essential Business Server solution starts to increase the project budget from the beginning. This document highlights the cost benefits of implementing both Microsoft Essential Business Server and Citrix Access Essentials on a Citrix XenServer virtual server platform. In the configurations detailed in this document, the four servers required for Microsoft Essential Business Server Standard Edition

and Citrix Access Essentials were virtualized on a single physical server in compliance with the recommended minimum hardware requirements.

- **Green Computing:** Through the ability to consolidate hardware, the combined solution becomes much better for the environment by reducing the amount of power consumption and cooling. The environmental gains also complement the financial benefit of reducing the overall number of servers.
- **Secure Remote Access:** While Microsoft Essential Business Server provides the collaboration, messaging, and security for a mid-sized IT infrastructure, Citrix Access Essentials enables remote users to securely access line-of-business applications from anywhere.
- **Business Continuity:** IT generalists can perform an entire server backup at designated intervals using the import/export capabilities of Citrix XenServer. These images can be stored off-site and used in the event of a disaster or operational interruption. With the simplicity of installing Citrix XenServer, businesses can quickly and efficiently restore IT operations. If Business Continuity is a major area of concern, Citrix XenServer Enterprise edition includes XenMotion. XenMotion provides IT administrators the ability to move a running virtual machine from one physical XenServer to another physical XenServer with the integration of an attached storage device.
- **Centralized Application Management:** Citrix Access Essentials has been designed to integrate very closely with Microsoft Essential Business Server by allowing administrators to manage the day-to-day operations associated with Citrix Access Essentials from the Essential Business Server management console. This document provides the deployment steps for centralizing the management interfaces of both applications into the Microsoft Essential Business Server Administration Console in [Appendix B](#). Additional information for configuring Access Essentials is available in the *Citrix Access Essentials Reviewer's Guide*.

## Product Overview

### Windows Essential Business Server 2008

Windows Essential Business Server enables mid-sized organizations to benefit from the power and versatility of a multi-server, multi-computer network, while reducing installation time, system complexity, and IT administration overhead. Administrators can perform most of their daily operational tasks from a single, integrated console either from the server console or remotely from another device. Based on the Windows 2008 server technology, Windows EBS installs four major Microsoft products (with associated features, services, and roles) onto physical or virtual servers.

- **Security Server** – Microsoft Forefront Security for Exchange Server (Forefront) helps protect e-mail from viruses, worms, and spam. Forefront Security for Exchange incorporates multiple industry-leading antivirus engines offering layered protection against the latest e-mail—based threats. In addition to the security features enabled by the Microsoft Exchange Server 2007 Edge Role, Windows Essential Business Server 2008 incorporates the latest version of Microsoft Forefront Threat Management Gateway Medium Business Edition, an integrated edge security gateway that helps protect against Internet-based threats while providing users fast and secure remote access to applications and data.
- **Messaging & Collaboration** - Microsoft Exchange Server 2007 Standard Edition product technology introduces advanced e-mail and calendar functionality to Windows Essential Business Server 2008 environments. Exchange Server delivers a seamless end-user messaging experience and advanced security features.
- **Directory, File & Print Services (Management Server)** - Windows Server 2008 Standard product technologies provide the core foundation of Windows Essential Business Server 2008, including Active Directory, network file/print services, systems management services, and terminal services (the foundational component for application delivery with Citrix Access Essentials).
- **Database Services (Premium Edition Only)** - Microsoft SQL Server 2008 Standard Edition, a comprehensive data management and analysis software solution. SQL Server 2008 is a performance leader and the fastest growing database solution in the industry today.



Figure 1: Windows EBS 2008 Versions & Features

Additional information on the benefits and features of each Windows EBS 2008, component is available at <http://www.microsoft.com/ebs/en/us/compare-features.aspx>.

## Citrix Access Essentials 3.0 for Windows Server 2008

Citrix Access Essentials combines several innovative and patented techniques from Citrix and Microsoft to allow applications to run centrally on a server in the data center, while giving the user the appearance and performance of a locally installed application. Based on the tried-and-true Citrix XenApp architecture and its related components, Citrix Access Essentials turns a Microsoft Windows 2008 Server into the secure access point for access to application, files and internal websites.

Citrix Access Essentials enables small to medium-sized organizations with 5 to 75 remote users to securely access Windows-based line-of-business applications through their local network or remotely through Internet access with just a Web browser. Citrix Access Essentials addresses internal, remote and mobile user access requirements for small and medium-sized organizations with simple wizard driven administration and provides secure role-based web access based on the Microsoft Terminal Services architecture.

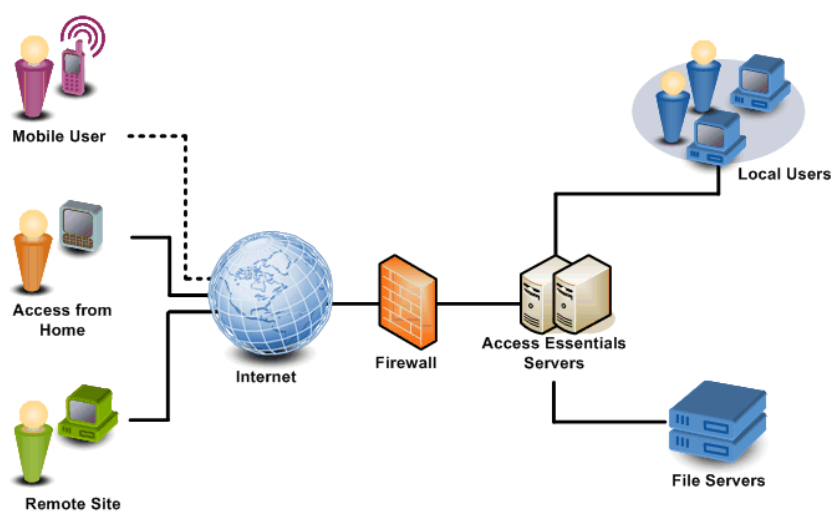


Figure 2: Typical Citrix Access Essentials Architecture

Citrix Access Essentials 3.0 application delivery capabilities offer a centrally managed environment for IT applications and services. This architecture provides the following benefits to Access Essentials users and system administrators:

### Administrator Benefits

- Centralized application deployment and management to minimize administrative effort
- Intuitive, wizard-driven administration, monitoring, and troubleshooting
- Role-based privileges to control who gets what
- Requires only one secure port to be open on the external firewall to gain remote access
- Automatic load-balancing across multiple Citrix Access Essentials servers bypasses any unavailable servers
- No need to rewrite applications, upgrade user workstations, or increase network bandwidth

### User Benefits

- Simple, secure, web access to Windows applications, intranet sites, and shared files from almost anywhere using a basic Internet connection and a supported web browser
- Responsive communications from remote offices, home, hotels, airports, customer sites, and mobile devices across firewalls even over low-bandwidth connections (as little as 20 Kbps)

- Remote digital image capture from cameras and scanners as well as audio inputs for recording voice and dictations remotely
- Printing to central and locally-attached printers

### Other Key Features of Citrix Access Essentials 3.0

- Platform support for Windows Server 2008
- Ability to have multiple Citrix Access Essential Servers with load balancing and fail-over
- Several features similar to Citrix XenApp, including Web Interface, printing, session reliability, and SharePoint integration
- Full SpeedScreen support, including multimedia and flash acceleration
- External access through Windows Essential Business Server 2008 Security Server
- Integration with Windows Essential Business Server 2008 management console:

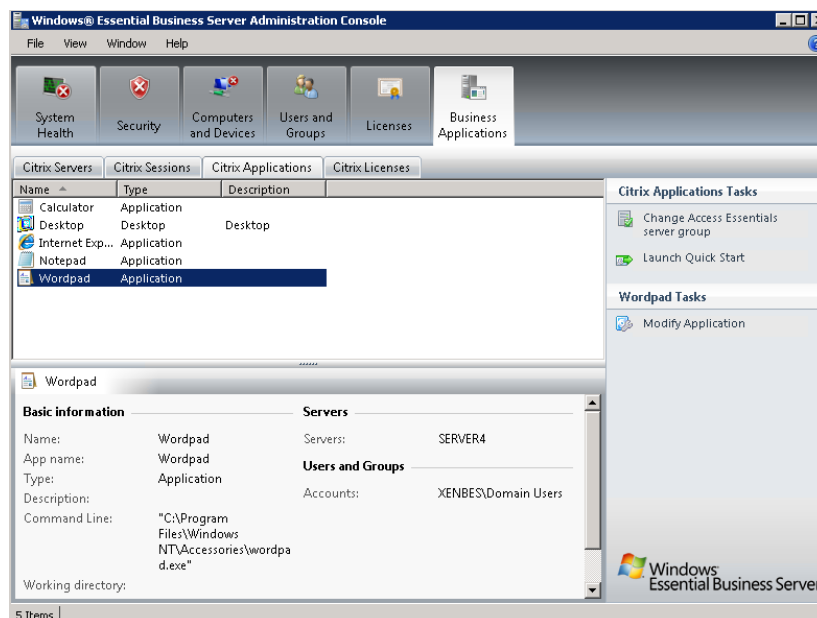


Figure 3: Citrix Access Essentials Integration with Windows EBS 2008 Console

### Citrix XenServer 5.0

Citrix XenServer is a cost-effective server virtualization solution that can rapidly deliver multiple virtual workloads across one or more physical servers. It enables businesses to deploy high-performance Windows and Linux virtual machines rapidly and easily, and to manage them and their related storage and networking resources from a single, easy-to-use management console.

XenServer is based on the open source Xen Hypervisor, an exceptionally lean technology that delivers low overhead and near-native performance. Leveraging both Intel VT platforms and AMD Virtualization (AMD-V™) platforms for hardware assisted virtualization, XenServer delivers faster, more efficient virtualization computing. XenMotion one of the additional features available with Citrix XenServer Enterprise Edition. XenMotion works in conjunction with Resource Pools. Administrators can migrate a virtual machine to any other XenServer host running in the same resource pool to support business continuity.

## Solution Architecture

This section contains an architectural overview of the implementation of Windows Essential Business Server 2008 Standard Edition and Citrix Access Essentials 3.0 on a Citrix XenServer 5.0 virtualization platform. This model shows customers how to quickly deploy the three (3) Windows EBS 2008 server-based workloads on a single physical server, reducing the overall costs (hardware, power, data center footprint, server maintenance and IT manpower) of a standard deployment of Windows Essential Business Server 2008. Citrix Access Essentials was also installed on a virtual server, so that all components were served by a single physical server.

### Architecture Overview

The diagram below illustrates the implementation of a single physical server hosting all the required servers to support this solution:

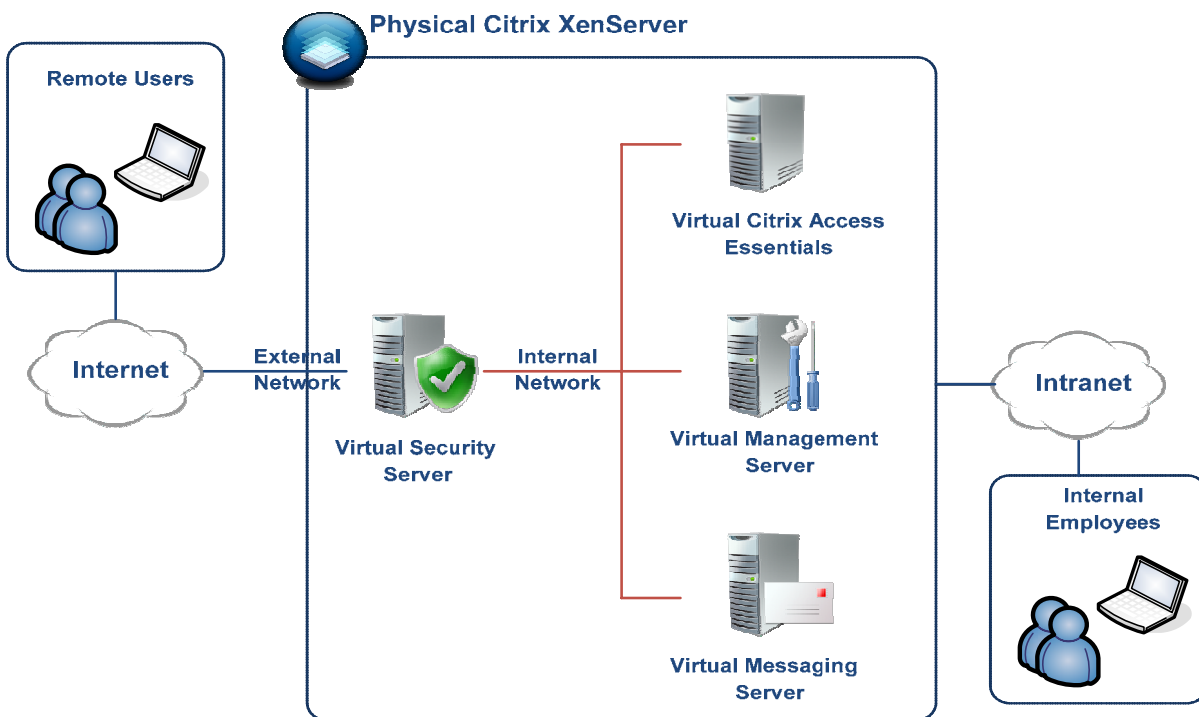


Figure 4: Windows EBS and Citrix Access Essentials running on Citrix XenServer

### Networking

For the purpose of this environment, two virtual networks must be configured on the physical server through the support of XenCenter. The first virtual network connects the Security Server to the Internet drop and protects the solution through Microsoft Forefront Threat Management Gateway. The second virtual network connects the Security Server to the Intranet. The remaining three virtual servers only connect to this network. The Citrix Access Essentials server helps proxying the requests routed through the Security Server to ensure secure access to the internal corporate applications.

Windows EBS 2008 supports the network topologies that are most likely to be implemented in a business with up to 300 users or computers. For the purpose of this document, the environment was created in a simple network. EBS 2008 supports the following topologies:

- Networks that contain one subnet at a single location (simple networks)
- Networks that contain more than one subnet at one or more locations (routed networks)
- Networks that span more than one location, with site-to-site virtual private networks (VPN) connecting them, and one or more subnets (VPN networks)

## Hardware Recommendations

Before building the virtual images for each component of the environment, the recommended hardware requirements for each image must be reviewed to ensure that each virtual server has appropriate resources. The physical server must be equipped to handle the needs of all four servers. Microsoft recommends the following minimum hardware requirements for Windows Essential Business Server 2008:

Hardware	Minimum Requirement
Processors	<ul style="list-style-type: none"> <li>• Systems with a Single Core CPU – 64-bit (x64) with a 2.5 GHz minimum clock speed</li> <li>• Systems with a Multi Core CPU – 64-bit (x64) with a 1.5 GHz minimum clock speed</li> <li>• Systems with Multiple Physical CPUs – 64-bit (x64) with a 1.5 GHz minimum clock speed</li> </ul>
System Memory	<ul style="list-style-type: none"> <li>• 4 GigaBytes (GB) (Management Server and Messaging Server)</li> <li>• 2 GB (Security Server)</li> </ul>
Network Adapters	<ul style="list-style-type: none"> <li>• One for the Management Server</li> <li>• One for the Messaging Server</li> <li>• Two for the Security Server</li> </ul>
DVD drive	One per server

Drive Partition	Minimum Free Disk Space
Operating System	45 GB
Application Data	50 GB

Citrix Access Essentials 3.0 must be installed on a server running Windows Server 2008 (Standard or Enterprise edition). Windows Server 2008 contains the required components for securely delivering applications to internal and external users. Only 32-bit versions of the Windows operating system are supported. If Active Directory is used, the Citrix Access Essentials 3.0 server should be added to the domain before starting the installation.

## XenServer Hardware Configuration

In order to achieve the goal of using only one physical XenServer for the entire solution, the hardware recommendations stated above were translated into the following physical hardware configurations on an HP ProLiant DL360 G5 Server hosting XenServer:

Hardware	Configurations
Processor	64-bit (x64) dual quad-core Intel Xeon 2.66Hz, hardware-virtualization-enabled
System memory	16 gigabytes (GB)
Storage capacity	3x 146GB Hot Plug 2.5 SAS 10,000 rpm
Network adapters	2 Embedded NC373i Multifunction Gigabit Network Adapters <ul style="list-style-type: none"> <li>• NIC 0: Internal Network</li> <li>• NIC 1: External Network</li> </ul>

The following table represents the network configurations for each of the virtual images:

VM	Virtual Interface		Default Gateway
	NIC 0	NIC 1	
Management Server	Internal Network	None	Internal interface's IP of the Security Server
Security Server	Internal Network	External Network	NIC0: None NIC1: External Gateway
Messaging Server	Internal Network	None	Internal interface's IP of the Security Server
Citrix Access Essential Server	Internal Network	None	Internal interface's IP of the Security Server

Virtual disk configurations for each VM are shown in the following table (minimum requirement):

VM	DISKS		Virtual Memory
	DISK 1	DISK 2	
Management Server	50 GB	30 GB	4096 GB
Security Server	50 GB	10 GB	2048 GB
Messaging Server	50 GB	20 GB	4096 GB
Citrix Access Essential Server	50 GB	None	2048 GB

Citrix Consulting Solutions built the virtualized solution based on the following high-level details:

- XenServer was installed on the single physical server listed in the XenServer [Hardware Configurations](#) section.
- Four virtual machines were created with XenServer. The details for each virtual machine are broken down as follows:
  - EBS Management Server:
    - The Prerequisite Planning Tools (Preparation Wizard and the Planning Wizard) from disk 1 was executed on this server.
    - Windows 2008 64-bit was installed with the EBS Management Server installation.
    - After Citrix Access Essentials was installed, the Citrix Access Essentials administration plug-in was installed on the Management Server.
  - EBS Security Server:
    - Windows 2008 64-bit was installed with the EBS Security Server installation.
    - Imported the CAE certificate that was exported from CAE.
    - Configured a firewall rule using the TMG console to allow access to CAE through the firewall ([Appendix A](#))
  - EBS Messaging Server:
    - Windows 2008 64-bit was installed with the EBS Messaging Server installation.
  - Citrix Access Essentials (CAE):
    - Windows 2008 Standard Edition was installed.
    - CAE was installed and configured to enable external access.
    - Enabled Advanced mode in CAE
    - Export the external CAE certificate created for the external access website.

## Deployment Considerations

Depending on the number of anticipated users and the resource requirements of the delivered applications, IT architects must consider additional items:

- **Single vs. Multiple Citrix Access Essentials Server** – In certain cases, there may be a need to add another virtual instance of a Citrix Access Essentials server to support an increase in user capacity or to achieve better performance. Citrix Access Essentials with Windows EBS 2008 will allow for multiple instances of Citrix Access Essentials to run in the environment. It is important to ensure that the Citrix Access Essentials configuration is in “Advanced” mode to allow for all features of a multi-server Citrix Access Essentials environment to operate properly and to support the integration with the Essential Business Server administration console.

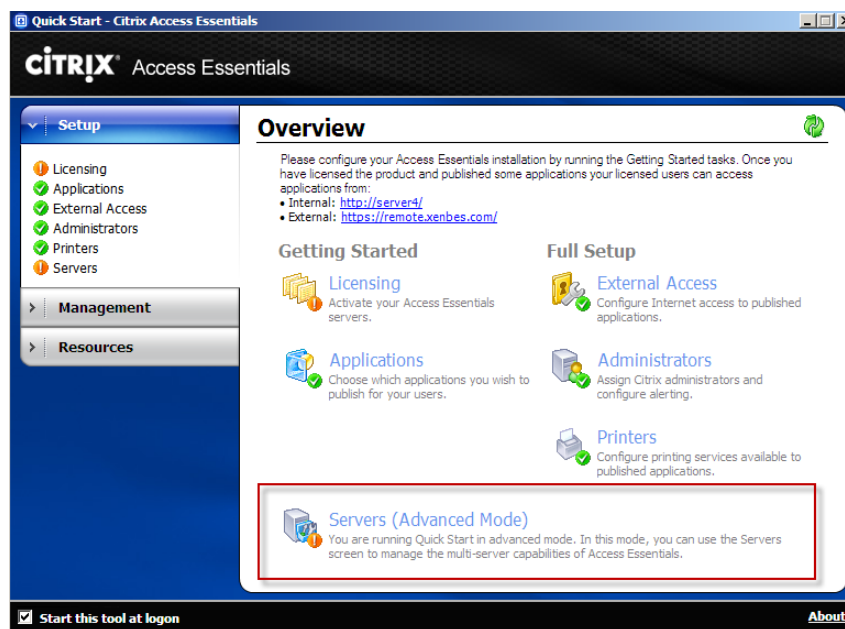


Figure 5: Citrix Access Essentials Quick Start – Server Mode Settings

- **Firewall Rules** – In order for users to access the Windows EBS 2008 and Citrix Access Essentials environment from outside the local area network, additional configurations to the ForeFront firewall need to be performed. [Appendix A](#) provides IT administrators with step-by-step instructions to properly configuring their environment for secure remote access.
- **XenServer Para-virtualization Drivers** – When using a virtualized environment, it is important to consider user performance. Some drivers may work and provide basic functionality, but will not perform optimally, especially with disk and network components. The same is true when using virtual workloads on a Citrix XenServer environment. These drivers are built to allow optimal performance and end user experience when accessing virtual workloads.
- **Licensing Considerations** – For a business to use Citrix Access Essentials in their environment, the software requires Microsoft Terminal Services Client Access Licenses (CALs). Citrix has partnered with Microsoft to bundle the Terminal Services client access licenses with the product purchase. Customers who already own Terminal Services client access licenses have the option of purchasing Citrix Access Essentials at a discounted rate.

- **SharePoint Integration** – Although Windows SharePoint Services 3.0 is not shipped with Microsoft Essential Business Server, Microsoft has provided download access to SharePoint at no additional cost. Based on the popularity of SharePoint, Citrix has also taken an initiative to integrate Citrix Access Essentials with SharePoint. Citrix developed a custom SharePoint web part titled Web Interface for SharePoint (WISP). Citrix Access Essentials integrates with the WISP web part to allow a user to automatically open a SharePoint file within a published application.

## Cost Analysis

The following section provides an estimate of the cost saving associated with delivering a Microsoft Essential Business Server Standard Edition environment for 200 internal employees and 20 remote employees at a theoretical company with no existing Terminal Services client access licenses. The examples show a potential 30% cost-savings based on 1 year of ownership.

### Non-Virtualized Environment

Description	Costs
Microsoft Essential Business Server Standard Edition (Up to 300 Users) Price also includes 5-pack of Windows EBS 2008 CAL Suite for Users ( <a href="http://www.microsoft.com/ebs/en/us/pricing.aspx">http://www.microsoft.com/ebs/en/us/pricing.aspx</a> )	\$5,472
Citrix Access Essentials with TS CALs (20 Users) Price also includes one year of Subscription Advantage (Cost based on \$249 * 20 Named Users)	\$4,980
EBS Management Server (4GB RAM, 146GB Hard Drive, Quad-Core Intel Xeon 2.0 GHz Processor)	\$2,250
EBS Messaging Server (4GB RAM, 146GB Hard Drive, Quad-Core Intel Xeon 2.0 GHz Processor)	\$2,250
EBS Security Server (2GB RAM, 146GB Hard Drive, Quad-Core Intel Xeon 2.0 GHz Processor)	\$2,000
Citrix Access Essentials Server (2GB RAM, 146GB Hard Drive, Quad-Core Intel Xeon 2.00 GHz Processor)	\$2,000
Data Center Costs (cooling, floor space, and power) (Cost based on \$1200 per server/year)	\$4,800
<b>Approximate Total Solution Cost</b>	<b>\$23,752</b>

### XenServer Virtualized Environment

Description	Costs
Microsoft Essential Business Server Standard Edition (Up to 300 Users) Price also includes 5-pack of Windows EBS 2008 CAL Suite for Users ( <a href="http://www.microsoft.com/ebs/en/us/pricing.aspx">http://www.microsoft.com/ebs/en/us/pricing.aspx</a> )	\$5,472
Citrix Access Essentials with TS CALs (20 Users) Price also includes one year of Subscription Advantage (Cost based on \$249 * 20 Named Users)	\$4,980
Citrix XenServer License	\$900
Citrix XenServer Hardware (16GB RAM, 3x146GB Hard Drive, Dual-Core Intel Xeon 2.66 GHz Processor)	\$4,000
Data Center Costs (cooling, floor space, and power) (Cost based on \$1200 per server/year)	\$1,200
<b>Approximate Total Solution Cost</b>	<b>\$16,552</b>

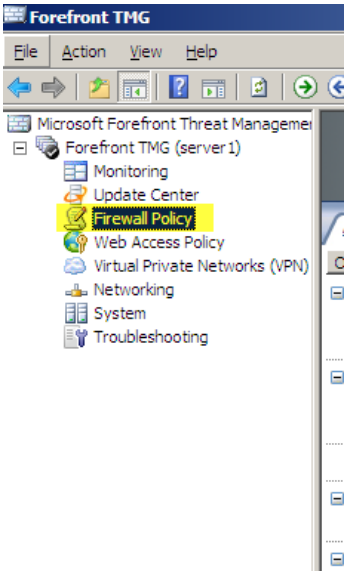

### Additional Cost Benefits

- If the business grows beyond the user limitations of Citrix Access Essentials, the IT administrator can upgrade to a larger Citrix XenApp deployment but continue to utilize the Terminal Services Client Access Licenses purchased with Citrix Access Essentials.

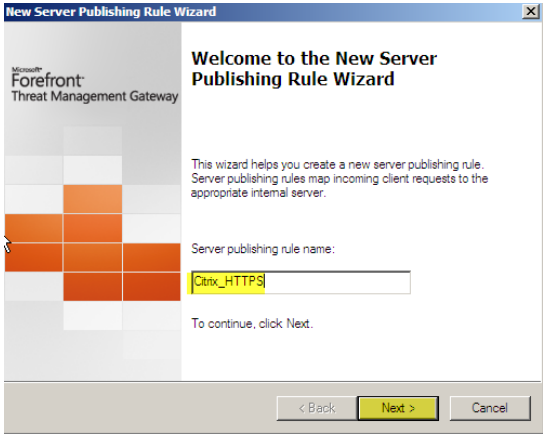
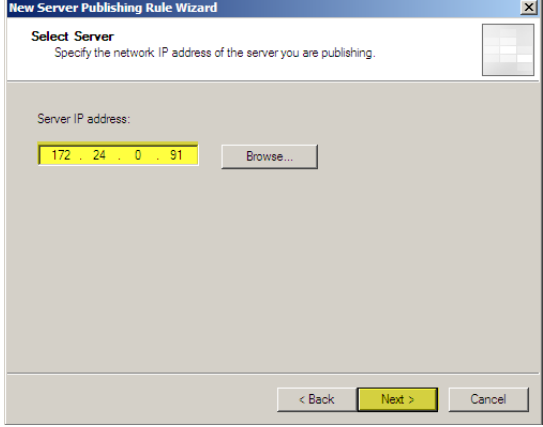
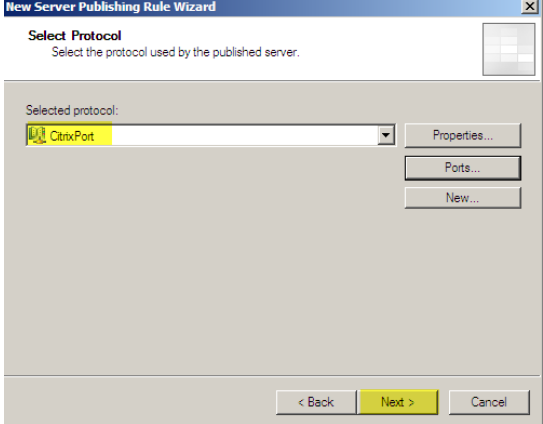
- If the business is already in possession of Terminal Services Client Access Licenses, Citrix Access Essentials can be purchased at a discounted rate that does not include the bundled TS CALs.

## Appendix A – Forefront Configuration for Citrix Access Essentials

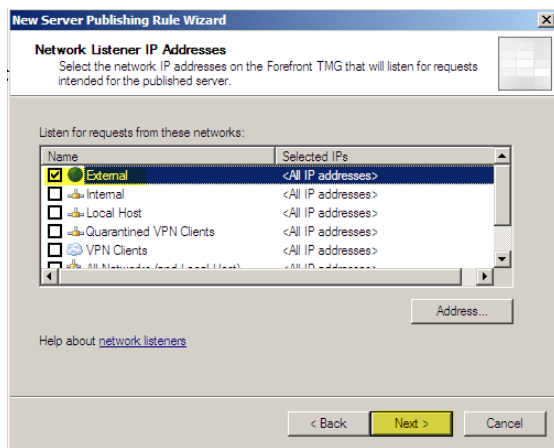
To enable external access to Citrix Access Essentials, the Microsoft Forefront Threat Management Gateway needs to be configured to route SSL connections directly to the server running Citrix Access Essentials. The following table provides step-by-step instructions for the firewall configurations:

Firewall Rule Configuration	
	<p>Logon to Forefront Threat Management Gateway (TMG) console:</p> <p>Click on “Firewall Policy”</p>
	<p>Create a new rule by clicking on “Publish Non-Web Server Protocols”</p>

## Firewall Rule Configuration

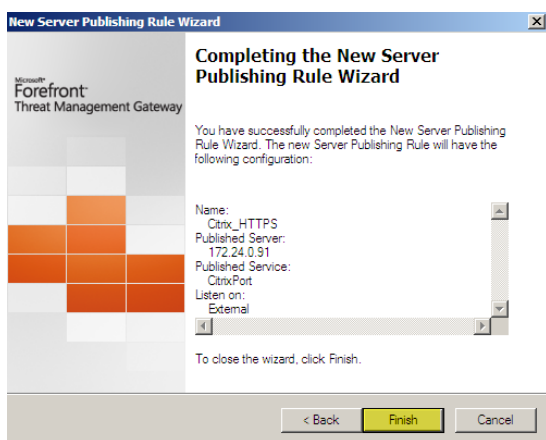
	<p>Enter a name for the rule</p> <p>Click "Next"</p>
	<p>Enter the IP address of the Citrix Access Essentials 3.0 Server</p> <p>Click "Next"</p>
	<p>Choose "HTTPS Server" if port 443 is used by Citrix Access Essentials 3.0 otherwise create a new one by clicking "New"</p> <p>Click "Next"</p> <p>Note: EBS uses port 443 for OWA. In this case, a new non-default HTTPS ports must be created for CAE or new IP need to be defined in the security server to forward port 443 to Citrix Access Essential</p>

## Firewall Rule Configuration

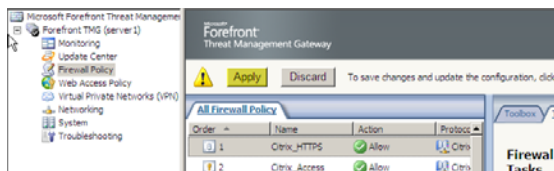


Choose "External" network

Click "Next"



Click "Finish"



Apply the new rules by clicking on "Apply"

## Appendix B – Integration with EBS Management Console

This section provides detailed instruction on how to install the Citrix Access Essentials plug-in for the Windows Essential Business Server Management Console. The following steps were executed on the Management Server:

- On the Access Essentials media, browse to the Essential Business Server folder
- Click the EBSSetup.msi file
- The welcome page in the installation wizard will appear
- Click Next
- The license agreement page will appear
- Select I accept the terms in the License Agreement
- Click Next
- Click Install
- Click Finish to complete the installation
- The Setup Wizard will exit

Before you launch the Essential Business Server Management Console, ensure that Citrix Access Essentials is running in Advanced Mode (as shown below), and that all of the Access Essential servers you want to manage are in the same domain.

The screenshot displays the Citrix Access Essentials Management Console interface. On the left is a navigation pane with three main sections: 'Setup', 'Management', and 'Resources'. The 'Setup' section is expanded, showing a list of tasks: 'Licensing' (with a warning icon), 'Applications' (with a checkmark), 'External Access' (with a warning icon), 'Administrators' (with a checkmark), and 'Printers' (with a checkmark). The main area is titled 'Overview' and contains the following information:

- Overview:** Please configure your Access Essentials installation by running the Getting Started tasks. Once you have licensed the product and published some applications your licensed users can access applications from:
  - Internal: <http://server4/>
- Getting Started:**
  - Licensing:** Activate your Access Essentials servers.
  - Applications:** Choose which applications you wish to publish for your users.
- Full Setup:**
  - External Access:** Configure Internet access to published applications.
  - Administrators:** Assign Citrix administrators and configure alerting.
  - Printers:** Configure printing services available to published applications.
- Advanced Mode:** Switch to advanced mode and benefit from various additional features including load balancing and server failover.

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Version History			
Author	Version	Change Log	Date
Solution Center	1.0	Final Document	10/16/08



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