

Microsoft Clustered SharePoint Server 2010 (Blueprint) - SolutionExchange Version (version 2)

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The blueprint for Microsoft Clustered SharePoint Server 2010 is applicable on Application Director 5.0 and later. This article contains an overview of a Microsoft SharePoint Server 2010 farm deployment.

This document assumes that the reader knows well how to use vFabric Application Director.

A Glance of SharePoint Server 2010

Concepts

The logical result of SharePoint Server's flexibility and richness can be a high degree of complexity around installing and configuring SharePoint Server correctly. A fundamental understanding of the following key structural elements in a SharePoint Server environment is necessary in order to correctly deploy and support SharePoint Server 2010 products:

- Server farm: The top-level element of a logical architecture design for SharePoint Server.
- Web application: An IIS Web site that is created and used by SharePoint Server 2010.
- Content database: Provides storage Web application content. You can separate content into multiple content databases at the site collection level.
- Site collection: A set of Web sites that have the same owner and share administration settings.
- Site: One or more related Web pages and other items (such as lists, libraries, and documents) that are hosted inside a site collection.

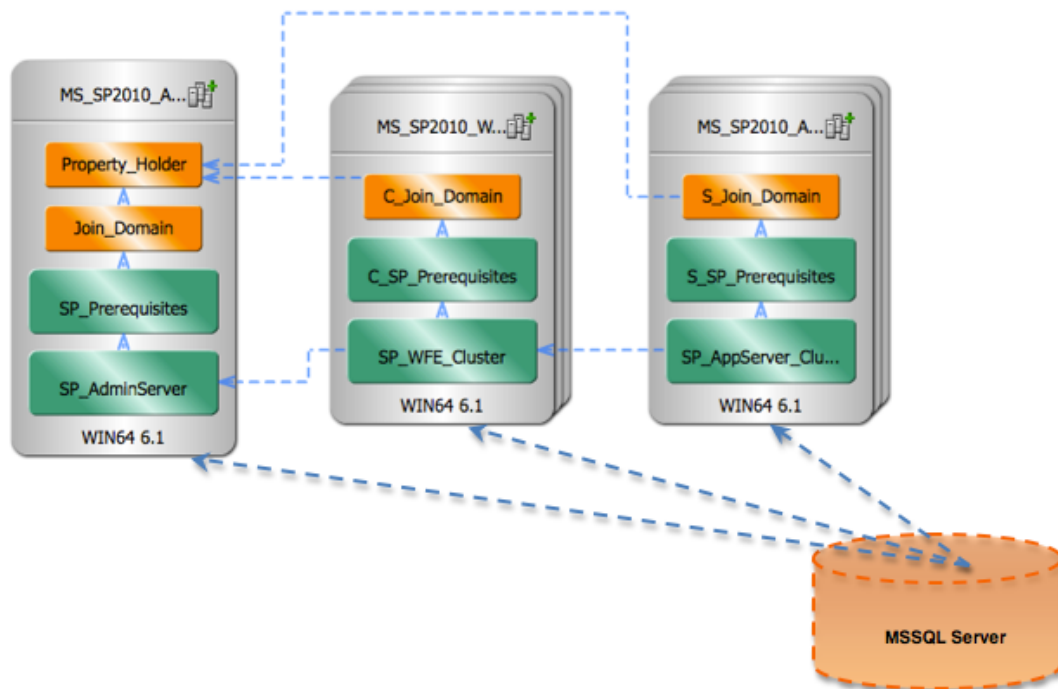
Physical architecture

The physical architecture, which consists of one or more servers and the network infrastructure, enables you to implement the logical architecture for a SharePoint Server solution. The physical architecture is typically described in two ways: by its size and by its topology. Size, which can be measured in several ways, such as the number of users or the number of documents, is used to categorize a farm as small, medium, or large. Topology uses the idea of tiers or server groups to define a logical arrangement of farm servers.

Blueprint

Description

The blueprint in this solution (See the snapshot below) can be used to deployed medium to large size, three-tier SharePoint server farms, which depends on the configuration of the blueprint cluster and configuration files. It take advantages of the AutoSPInstaller code for Sharepoint Server 2010 installation (<http://autospinstaller.codeplex.com>) to finish the installation by calling its configuration files and scripts. The following is the snapshot of the design of the blueprint of SharePoint Server 2010 cluster.



- **MS_SP2010_Admin_Server** (The first node on the left)
Together with WFE cluster, this is the front tier of the SharePoint Server farm. All the web applications will be installed here, and also the administration console will be installed here.
- **MS_SP2010_WFE_Cluster** (The middle cluster nodes)
Together with Admin Server, this is the front tier of the SharePoint Server farm. All the website collections will be installed here.
- **MS_SP2010_AppServer_Cluster** (The cluster nodes on the right)
This is the middle tier of the SharePoint Server farm. All the service apps, as well as query and crawl services, are installed here.
- **MSSQL Server**
This is not part of the blueprint. The Deployed SharePoint Server farm will use it as the back-end tier to store all the data.

Supporting Operating Systems

The blueprint can be installed on W2K8 R2 Enterprise SP1.

Prerequisites

The deployment needs the following device and environment to be setup within the Cloud Provider.

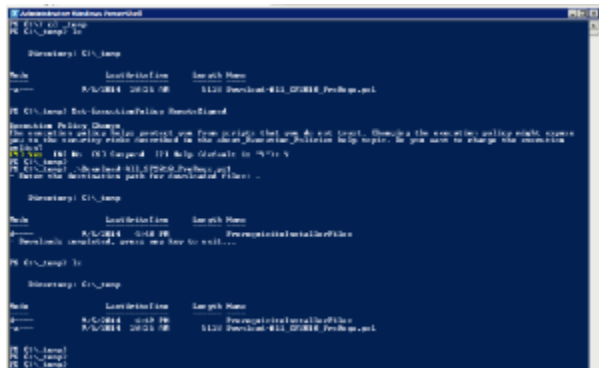
1. VM template

The VM template needs to be set up (generated) with the following.

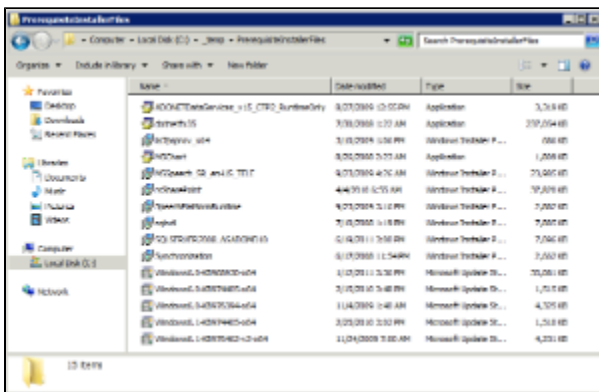
- **OS: Windows 2008 Server R2 (Enterprise Edition) SP1**
To make the VM template of Windows 2008 Server R2 (Enterprise Edition) SP1, please follow the User Guide of vFabric Application Director 5.0 or later.
- Proxy settings is set if it is needed for the servers to communicate with outside.

- Turn off warning on .exe files for unattended SharePoint installation.
To turn off warning on file open by typing "Run..." "gpedit.msc", "User Configuration", "Administrative Templates", "Windows Components", "Attachment Manager", "Including list for low file types" and add ".exe;" to the list.
- Install unzip command tool 7za920. This tool can be get from <http://sourceforge.net/projects/sevenzzip/files/7-Zip/9.20/>. Download 7za920.zip from that website, and unzip it to your desired the location. And then put the directory <path>7za920 to the PATH system environment variable (and [here](#) is how).
- Pre-download prerequisite files for SharePoint installation.
The SharePoint installer will download pre-prerequisite files from the external internet prior to installation. Not only does this take a long time but most servers I install are behind a firewall and do not allow direct access to the internet. In this solution, we pre-download those prerequisites in the VM template to speed up and simplify the installation.

To pre-download those prerequisites, download powershell script "Download-All SP2010 Prereqs.ps1" from <http://autospinstaller.codeplex.com/releases/view/44442> to a location on the template, for example to C:_temp. And then open a PowerShell console, cd to that location (e.g. C:_temp), run "Download-All SP2010 Prereqs.ps1". See the image below as an example.



During its execution, When asked the destination path for downloaded files, provide a location, e.g. "C:_temp". After that, all the prerequisite files will be downloaded to that location. In the blueprint, there is a property from service "SP_Prerequisites" where this location will be asked to be filled in in order for the SharePoint installation to find the prerequisites (default value for it in the blueprint is "C:_temp".) If you want to know how to run PS file or get trouble when running this PS file, [here](#) is more detailed information.



NOTE: The SID of VM template that will be used by the blueprint cannot contain the same SID as the one for your Domain Controller. This is not uncommon if your Domain Controller is a VM too. To change the SID for the VM template, you can deploy the VM in the vCD and reset the SID and then save it back to the vCD catalog. And [here](#) is how to reset SID for Windows.

After all above is done on the VM template through vCD, save the VM template back to the catalog, and it is ready to be used by the SharePoint installation through AppD.

2. httpd Repository

The following software available on a reachable httpd server or repository

- Sharepoint Server 2010 (SharePointServer.exe)
You can download it from <http://www.microsoft.com/en-us/download/confirmation.aspx?id=16631>
- AutoSPInstaller (AutoSPInstaller.zip)
This package can be obtained from <http://autospinstaller.codeplex.com/>

- Adobe PDF iFilter (PDFiFilter64installer.zip) and the official Adobe PDF icon (AdobePDF.png)
 - Adobe PDF iFilter can be obtained from <http://download.adobe.com/pub/adobe/acrobat/win/9.x/PDFiFilter64installer.zip>
 - Adobe PDF icon can be obtained from http://helpx.adobe.com/content/dam/kb/en/837/cpsid_83709/attachments/AdobePDF.png
- PsExec package (PsExec.exe).
It can be downloaded from <http://live.sysinternals.com/PsExec.exe>

3. Domain Controller

A domain controller needs to be on site in order for the VMs of SharePoint Server cluster to join the domain.

4. Installation Accounts

There are lots of discussions about how many accounts to use for SharePoint Server cluster installation. As an overview, the installer account should have admin rights on SharePoint servers and the farm account, i.e. the main SharePoint system account, should not. This could lead to SharePoint having too much control of the servers and cause security risks. The configuration below uses many accounts but provide with the breakup of rights of each service/functionality.

For a minimal accounts configuration, you could for example use the SP_Service account for Cache Admin, Cache Reader, Excel, Visio and Performance Point. You could also use a generic SP_AppPool account for all application pools. Personally, I wouldn't use less accounts than that.

These accounts must be created in the Domain Controller and passwords must be made available before installation begins. Naming standards are examples and may be changed to reflect internal policies.

The following account are the minimal set of installation accounts. For more sophisticated accounts, see [here](#).

NOTE: The default password for all installation accounts in the blueprint is "vmware123#". If you use different password, please modify the property "install_account_allInOne_password" in service "Microsoft Clustered SharePoint Server 2010" from the Application Director catalog.

Account Type	Account Name	Rights/Notes
Install Account	SP_Install	Administrative rights on SharePoint servers. The administrative rights will be disabled after install is completed. SQL roles DBCREATOR and SECURITYADMIN is required for this account. "SP_Install" account needs to be able to login the MSSQL server with the roles of "DBCREATOR" and "SECURITYADMIN". See MSSQL server documentation for how to add a new login account.
SQL Service Account	SQL_Service	If not already installed, domain account with no local rights above Domain User. This is the account to run SQL Server Agent and SQL Server DB Engine on the MSSQL server 2008. If you use your own named domain account to run the server and agent, feel free to use your own.
Farm Administrator	SP_Farm	No local rights or SQL rights above Domain User.
Application Pool	SP_PortalAppPool	One account per application. For example one per intranet, extranet and public website. Naming standard could be SPS_APP_POOL1 or SPS_APP_POOL_INTRANET. No local rights or SQL rights above Domain User.
My Site	SP_ProfilesAppPool	No local rights or SQL rights above Domain User.

Services	SP_Services	No local rights or SQL rights above Domain User.
Search Agent	SP_SearchService	No local rights or SQL rights above Domain User.
Search Crawl Access	SP_SearchContent	No local rights or SQL rights above Domain User.
Profile Access	SP_ProfileSync	No local rights or SQL rights above Domain User. Important: Account needs "replicate changes" rights in Active Directory. For more info, see TechNet . For a script to test if the account was set up correctly, download the PS script from CodePlex site .

5. MSSQL Server 2008

The SharePoint Server deployment will use a MSSQL Server 2008 as the back-end tier to store all the data. The deployment of MSSQL server 2008 is not included in the blueprint. Before deploying the SharePoint Server cluster, 1) the information of MSSQL server IP and credentials of DB instance need to be ready for use; 2) In this blueprint, the domain account "SQL_Service", which is added to the domain controller by session "4. Installation Accounts", is the one that is used to run SQL Server Agent and SQL DB Engine. Feel free to have your own named domain account to do this job.

NOTE: All the deployments of this blueprint, as well as MSSQL server 2008, need to be on the same network as the one that The domain controller is on, so that all the VMs will be able to join the same domain.

Blueprint Details (Properties and Action Scripts)

For the details of the blueprint, please take a look at an alive blueprint at one of AppDs in my dev lab.

<https://10.140.16.59:8443/darwin/index.html#ZmFsc2U6YXBwbGljYXRpb25PdmVydmlld1BhZ2U6MTE1OTE6b3ZlcnZpZXdNb2RlPXPpZXc=>

Application Name: Microsoft Clustered SharePoint Server 2010-Demo

Login: demo_user/Demo123!

NOTE: Please respect the owner's lab by performing READ ONLY action, i.e. No change should be made in the AppD instance. And also please share the AppD instance listed here within VMware ONLY. Let me know if you need the blueprint to be shared outside of VMware.

Importing Blueprint

You can import the blueprint by clicking "try" button at the solution page. The "try" button will lead to blueprint import page. At the import page, fill in the following field, and then click "import" button. Upon import success, you will find the Application "Microsoft Clustered SharePoint Server 2010" at Application page of user's Application Director.

- Application Director Host Base URL: It can be filled by "http://<Application Director's IP>:8080"
- Application Director User Name: User name to log in
- Application Director Password: User password to log in
- Advanced Option: There are three options, import as "Overwrite", "Skip", and "New". The details of each option is explained in the User Guide of vFabric Application Director 5.0, the session of import-package through CLI command. If possible, please choose "Skip" or "Overwrite". The option "New" may cause the default property values to be lost due to some limitation of Application Director.

Properties

After the blueprint is in place, in order to deploy the blueprint, you need to fill the properties of each service or SCRIPT component in the blueprint with the proper values.

Clustered SharePoint Server 2010 blueprint is designed for the user's convenience. It puts all the user-to-fill properties into the one service - "Property_Holder", i.e. all the properties that need the user to fill in the values are put in one service component ("Property_Holder"), and the rest of properties of all the services/SCRIPT components are already filled by default. If the user follows the instruction in this document and uses the default values, basically you don't need to change any value of the rest of properties.

Update: It is found with Microsoft Clustered SharePoint Server 2010 (Blueprint) 2.1.0 that the property "domain_password" of the service "Property_Holder", which is the password for the domain account to join the domain to access to the global resources during the SharePoint installation, cannot contain the special characters of "\$" and "@". Please don't use those characters for it.

The following snapshot shows all the properties of service "Property_Holder", which are the ones that you need to fill with your own values. The second snapshot shows an example of the property values for your reference.

Snapshot - Properties of Property_Holder

Service

Application Component

Property_Holder

Join_Domain

SP_Prerequisites

SP_AdminServer

MS_SP2010_W...

C_Join_Domain

C_SP_Prerequisites

SP_WFE_Cluster

WIN64 6.1

MS_SP2010_A...

S_Join_Domain

S_SP_Prerequisites

SP_AppServer_Cu...

WIN64 6.1

Details

Properties

Actions

Name	Description	Type	Catalog Value	Blueprint Value	Required	Secured	Overridable at Deployment
sp_admin_port	Port of the admin console	String	2010		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
web_app_port	Port of the web application	String	8080		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
portal_app_port	Port for Web Site "Portal"	String	80		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
user_full_domain	Domain's full name, for example, "domain.com"	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
db_instance	SQL server instance that the SharePoint Server farm will use. It should be in the format of "SQLServer_HostName(SQL_Instance)".	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
db_port	Database port of SQL server that the SharePoint Server farm can use to contact SQL server.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
psexec_url	URL to download PsExec package. You can get the package to your local repository from "http://live.sysinternals.com/PsExec.exe". PsExec package will be used to remotely execute PS commands to a node. It is useful to execute PS command before PS environment is setup.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
db_prefix	(Read-Only) Prefix of database names of all the database(s) in the AutoSPInstallerInput file. It can be used to customize the database name(s) for the farms. The DBPrefix is prepended to all database names. e.g. If you set this to TEST, your config DB will be TEST_ConfigDB.	Computed			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
pidkey	Product key for SharePoint Server 2010	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
domain_acct	Domain account in the format of domain/domain_user. Each node in the cluster will use it to join the domain.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
domain_password	Password of the domain account	String			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
sp_install_acct	Admin domain account in the format "domain/domain_user". The AutoSPInstaller will use to run the installer. This account needs to be in administration group in the domain.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
sp_download_url	URL to download Sharepoint Server 2010 installer package	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
auto_spinstaller_url	URL to the AutoSPInstaller package	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
adobe_pdf_icon_url	URL to download adobe icon file for SharePoint web application installation.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
adobe_pdf_ifilter_url	URL to download adobe iFilter files for SharePoint web application installation.	String			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Snapshot - Example Property Values of Property_Holder

Name	Description	Type	Catalog Value	Blueprint Value	Required	Secured
sp_admin_port	Port of the admin console	String	2010		<input checked="" type="checkbox"/>	<input type="checkbox"/>
web_app_port	Port of the web application	String	8080		<input checked="" type="checkbox"/>	<input type="checkbox"/>
portal_app_port	Port for Web Site "Portal"	String	80		<input checked="" type="checkbox"/>	<input type="checkbox"/>
user_full_domain	Domain's full name, for example, "domain.com"	String		titan.com	<input checked="" type="checkbox"/>	<input type="checkbox"/>
db_instance	SQL server instance that the SharePoint Server farm will use. It should be in the format of "SQLServer_HostName\SQL_Instance".	String		SQLServer7\MSSQLSERVER	<input checked="" type="checkbox"/>	<input type="checkbox"/>
db_port	Database port of SQL server that the SharePoint Server farm can use to contact SQL server.	String		1433	<input checked="" type="checkbox"/>	<input type="checkbox"/>
psexec_url	URL to download PsExec package. You can get the package to your local repository from "http://live.sysinternals.com/PsExec.exe". PsExec package will be used to remotely execute PS commands to a node. It is useful to execute PS command before PS environment is setup.	String		http://10.140.16.75/artifacts2/sharepoint-server-2010-cluster/psexec.exe	<input checked="" type="checkbox"/>	<input type="checkbox"/>
db_prefix	(Read-Only) Prefix of database names of all the database(s) in the AutoSPInstallerInput file. It can be used to customize the database name(s) for the farms. The DBPrefix is prepended to all database names. e.g. If you set this to TEST, your config DB will be TEST_ConfigDB.	Computed			<input type="checkbox"/>	<input type="checkbox"/>
pidkey	Product key for SharePoint Server 2010	String		SHAREPOINT-PRODUCT-KEY	<input checked="" type="checkbox"/>	<input type="checkbox"/>
domain_acct	Domain account in the format of domain\domain_user. Each node in the cluster will use it to join the domain.	String		titan\administrator	<input checked="" type="checkbox"/>	<input type="checkbox"/>
domain_password	Password of the domain account	String		*****	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
sp_install_acct	Admin domain account in the format "domain\domain_user". The AutoSPInstaller will use to run the installer. This account needs to be in administration group in the domain.	String		titan\SP_Install	<input checked="" type="checkbox"/>	<input type="checkbox"/>
sp_download_url	URL to download SharePoint Server 2010 installer package	String		http://10.140.16.75/artifacts2/sharepoint-server-2010/SharePointServer.exe	<input checked="" type="checkbox"/>	<input type="checkbox"/>
auto_spinstaller_url	URL to the AutoSPInstaller package	String		http://10.140.16.75/artifacts2/sharepoint-server-2010-cluster/AutoSPInstaller.zip	<input checked="" type="checkbox"/>	<input type="checkbox"/>
adobe_pdf_icon_url	URL to download adobe icon file for SharePoint web application installation.	String		http://10.140.16.75/artifacts2/sharepoint-server-2010-cluster/AdobePDF.png	<input checked="" type="checkbox"/>	<input type="checkbox"/>
adobe_pdf_ifilter_url	URL to download adobe iFilter files for SharePoint web application installation.	String		http://10.140.16.75/artifacts2/sharepoint-server-2010-cluster/PDFiFilter64installer.zip	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If you do have your own customized properties during the deployment setup, please refer to the details described in the document to customize the properties.

Deployment Procedure

After the deployment environment is setup and the blueprint is in place, including all the properties of the services and components are configured properly, it is ready to hit the deploy button.

During the deployment phase, it is OPTIONAL that the following properties need to be modified per deployment.

- Property "Property_Holder:db_prefix": it will be used as the base to compose the table name in the DB for the SharePoint Server cluster instance. It is the best-practice to have a name base to be easily recognized. The final DB table name for each clustered SharePoint Server will be unique per deployment.
- Property "hostname": During editing the deployment profile for the deployment, the hostname of each node will be uniquely generated by the Application Director by default. Uniqueness of the hostname is required when the VM joins the domain during the installation. It is the best-practice to assign the hostname to "base- $\{\text{random}\}$ ", where "base" can be any name at your choice to make the hostname is recognizable and the expression $\{\text{random}\}$ will be replaced by the Application Director a combination of English letters in the random order.

Deployment Time

The deployment time in my lab is about from 1 hour to 1 hour and 30 minutes.

Post-Deployment: Access to Web applications and Central Administration

After the successful deployment,

- To access to the Central administration website, browse to http://<admin_server IP>:2010/ from any machine, or http://<admin_server IP>:2010/

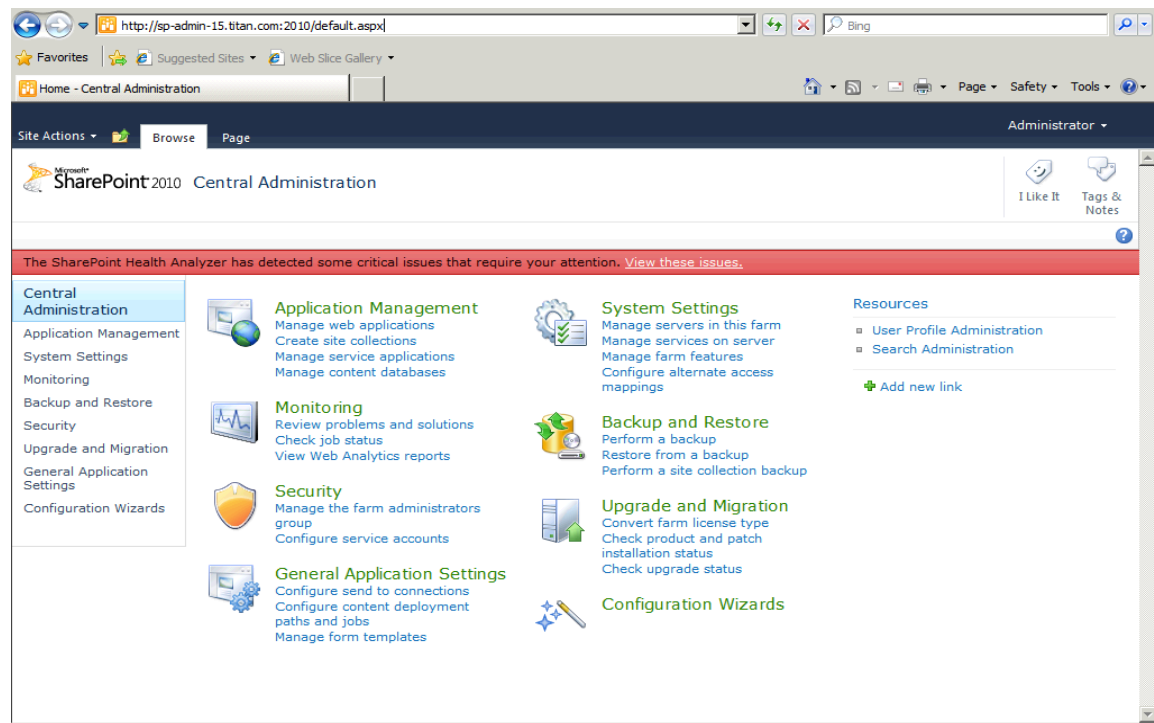
FQDN>:2010/ from a web browser within a VM that joined the same domain as the cluster does (see the snapshot below). "2010" is the port number of admin console that is configured at the property "Property-Holder:sp_admin_port". It may ask you to login the website from a popped-up login window in your browser. Please use the value of property "domain_acct" and "domain_password" from the service "Property_Holder" to login.

2. To access to the portal website, browse to `http://<admin_server FQDN>/` from a web browser within a VM that joined the same domain as the cluster does (see the snapshot below). the port number "80" (default port number) is configured at the property "Property_Holder:portal_app_port". It may ask you to login the website from a popped-up login window in your browser. Please use the value of property "domain_acct" and "domain_password" from the service "Property_Holder" to login.

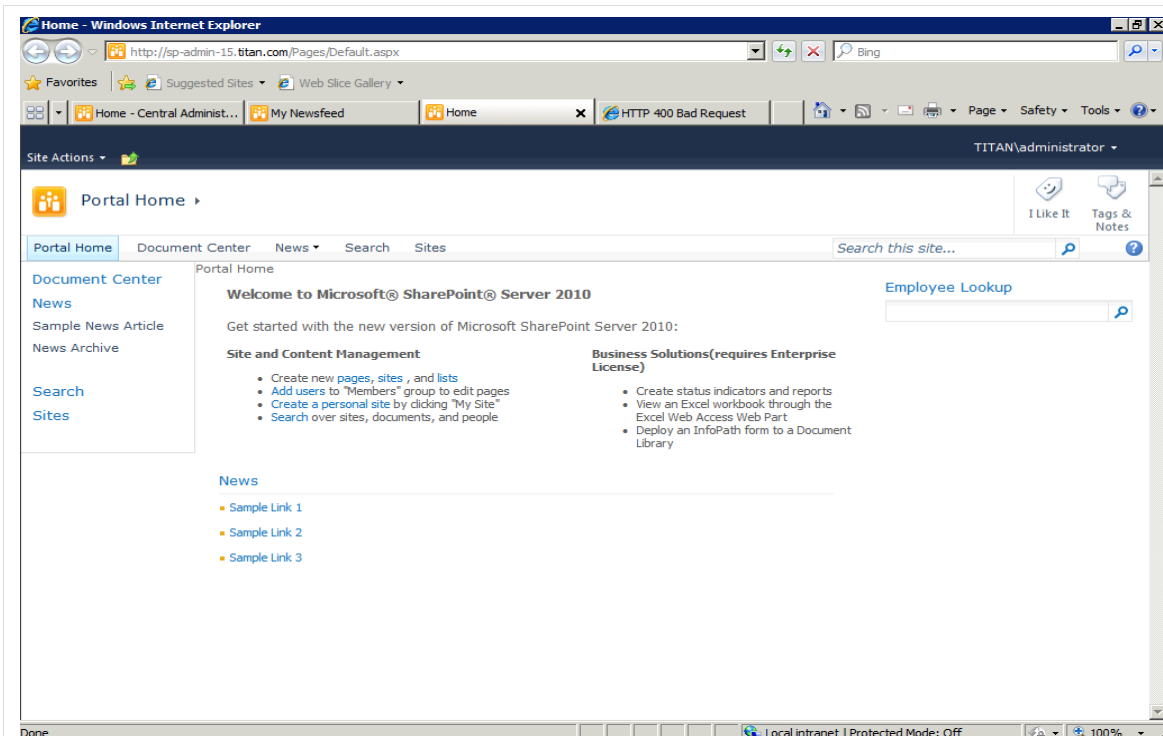
3. To access to the sample application browse to `http://<admin_server FQDN>:8080/` from a web browser within a VM that joined the same domain as the cluster does (see the snapshot below). "8080" is the port number of the sample web application. It is configured at the property "Property_Holder:web_app_port". It may ask you to login the website from a popped-up login window in your browser. Please use the value of property "domain_acct" and "domain_password" from the service "Property_Holder" to login.

The following are the snapshots of each website mentioned above.

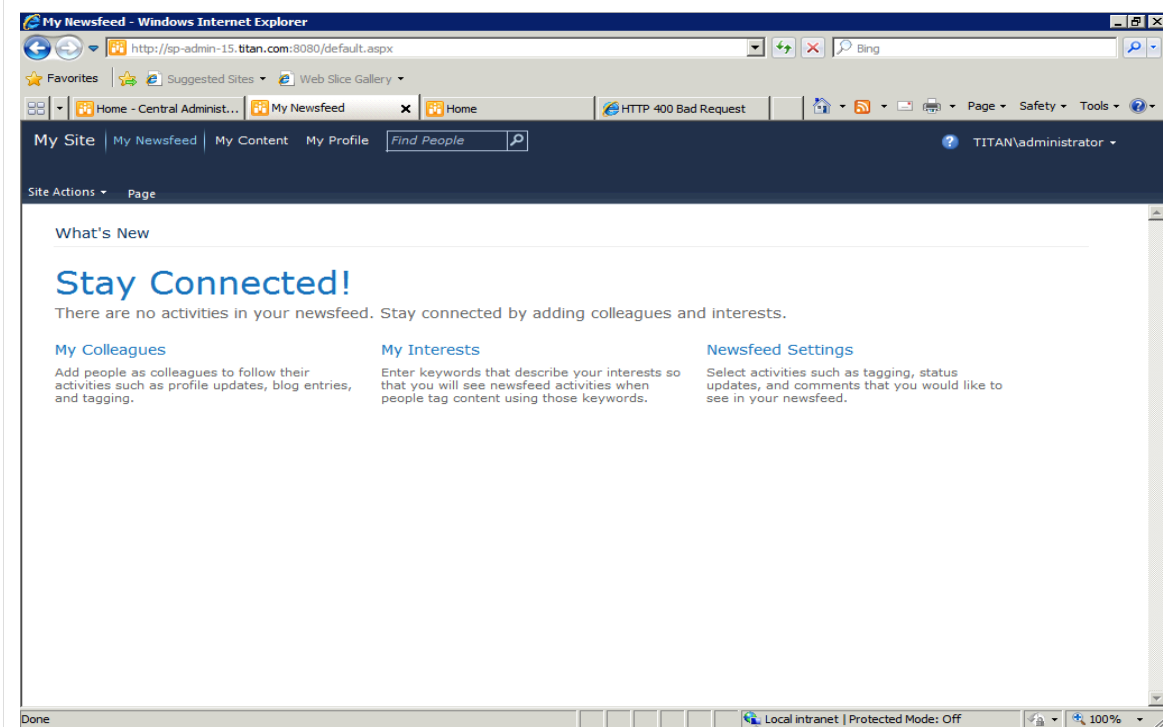
Snapshot - Central Administration WebSite



Snapshot - Portal WebSite



Snapshot - Sample Web Application



Limitation

1. As for the current version of the blueprint (v2.0.0), there can be multiple WFE servers, but the size of app server (i.e. MS_SP2010_AppServer_Cluster) can only be 1, due to the limitation of the current SharePoint Server installation configuration file. Supporting multiple app servers will be done in the next version of the blueprint.
2. The SharePoint installation deployment will create several tables in MSSQL server to maintain the SharePoint installation. When you need to

tear down the SharePoint installation, those tables will not be cleaned up by the deployment from AppDirector, and you may need to clean up those tables in the MSSQL server manually.

Reference

1. Documentation of SharePoint Server 2010 from Microsoft: <http://technet.microsoft.com/en-us/library/cc303422%28v=office.14%29.aspx>
2. CodePlex's AutoSPInstaller for SharePoint Server 2010: <http://autospinstaller.codeplex.com/>
3. Tobias Lekman's "Automated SharePoint Installations-Step-by-step": <http://blog.lekman.com/2010/11/automated-sharepoint-2010-installations.html>