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SYCHRON ONDEMAND DESKTOP™

ONDEMAND DESKTOP 4.1

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OnDemand Desktop 4.1

1. OnDemand Desktop Overview

1.1. Overview

Sychron's OnDemand Desktop solution provides a complete virtual desktop management platform using Sychron's Habitat™ methodology that enables IT to cost-effectively provision, manage, and secure enterprise desktops from a centralized, server-based virtualization platform such as ESX, Hyper-V, or Terminal Services.

OnDemand Desktop offers:

- Improved service levels for higher productivity
- Faster, easier delivery of corporate applications and upgrades (minutes, not days)
- Reduced IT complexity and management challenges
- Savings on hardware and operational costs
- Better security and data protection for compliance
- Increased energy efficiency
- Dramatically reduced user logon/logoff times
- Access to multiple desktops at the same time
- Roaming from device to device

Sychron OnDemand Desktop™ centralizes desktop computing and storage resources into easily manageable, highly secure datacenters while providing end users with the convenience and familiarity of a traditional desktop environment. It provides a dynamic workplace solution that dramatically lowers desktop total cost of ownership (TCO) while raising levels of security, service quality, and ease of management. OnDemand Desktop is one example of how Sychron's core orchestration product delivers on the promise of on-demand computing today.

OnDemand Desktop provides a managed desktop architecture that delivers dedicated PC desktop functionality from a centralized, rack-mounted environment. By taking the PCs off the desktop and centralizing them on servers within the datacenter, OnDemand Desktop considerably increases manageability, agility, and security, while providing mission-critical reliability and improvements in uptime without adding to IT staff. OnDemand Desktop inventories servers, sets aside resources for unknown (private) VMs, and makes no attempt to manage these VMs.

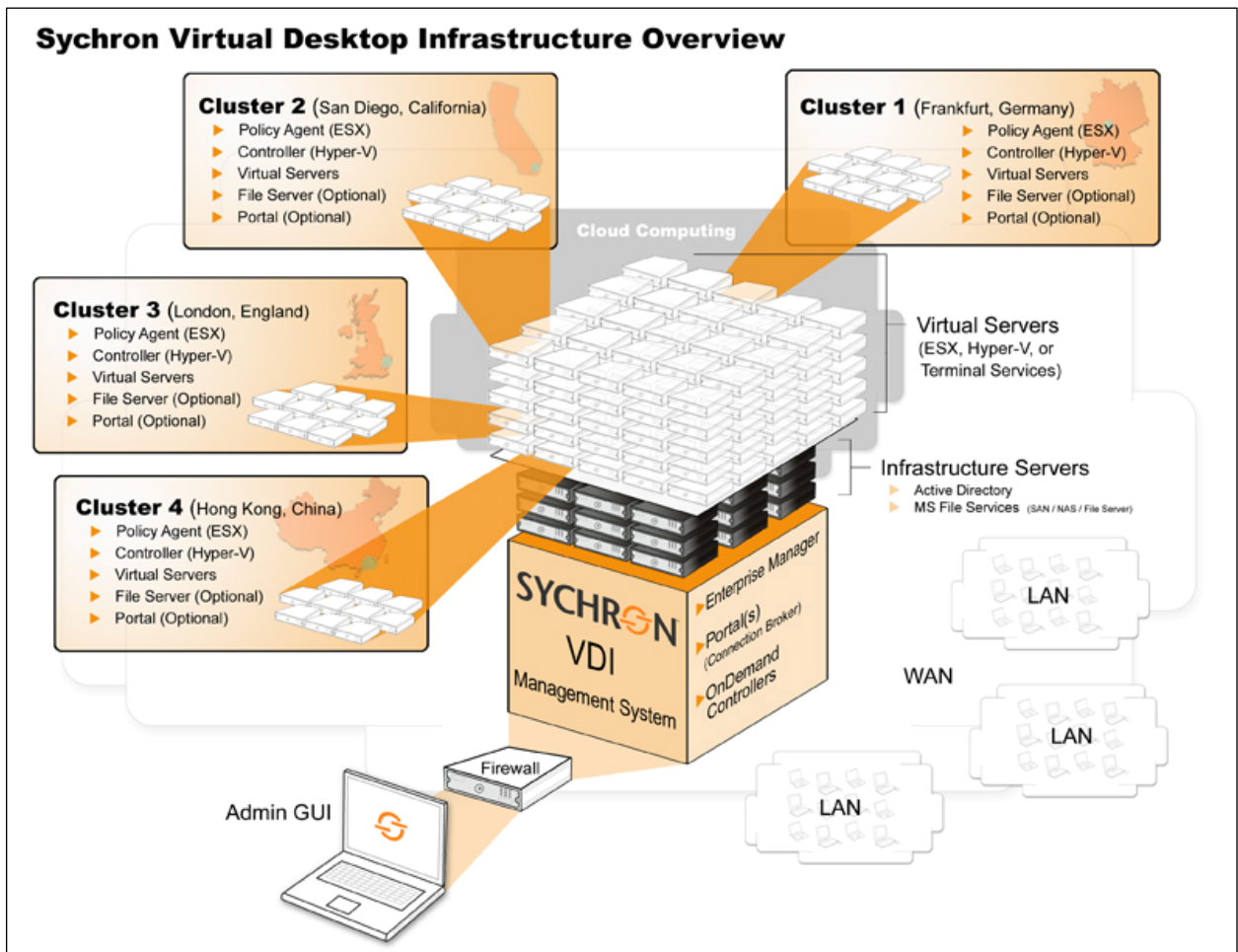
OnDemand Desktop delivers benefits to customers:

- significantly lower desktop TCO
- greater integrity and security for end user data
- improved resource allocation agility
- improved desktop utilization
- predictable user experience and resource service level for desktops

Sychron's core, policy-driven automation platform is the foundation for the OnDemand Desktop solution, which integrates with proven, industry standard products. With OnDemand Desktop, end users access their applications and data in a customized environment, just as they do today. The difference is that users establish a one-to-one connection with a dynamically allocated virtual PC that a general-purpose server in the datacenter hosts. Desktop images and user data are stored and controlled in an IT infrastructure within the datacenter, which increases security of desktops.

Sychron OnDemand Desktop is a three-tiered architecture that comprises:

1. an access tier using thin clients and/or PCs
2. a computing tier with racks of servers inside the datacenter, which hosts virtual machines running user desktops that network to users on demand
3. a resource tier containing a storage cluster, network printers, application servers, and other networked resources inside the datacenter



OnDemand Desktop product architecture

OnDemand Desktop provides the following functionality to deliver desktops on demand:

- **Create virtual desktops from a single “gold” virtual hard disk image.** An administrator creates and manages virtual hard disk images using either MS Hyper-V or VMware ESX hardware virtualization products. The administrator can create one or more Synchron user Habitats to provide customized desktop images for different types of users. Updating the desktops for all users of a Synchron Habitat requires the administrator to update only the gold image defined for that Habitat, and each OnDemand Desktop automatically boots from the centrally managed desktop image.
- **Automatically manage available virtual desktops.** The administrator can control the number of virtual desktops that should be available at all times.
- **Automatically configure virtual desktops with guaranteed levels of CPU and memory.** If a power user needs more CPU or RAM resources than a regular user, the administrator can configure how much of a host server’s resources each virtual desktop should receive.
- **Automatically assign a user to the correct virtual desktop.** If a power user needs a virtual desktop, the system will direct the user to an available desktop with the appropriate resources. If a user has a disconnected remote desktop session, the system will redirect the user to that session. If a user’s remote desktop is unavailable (for example, because of a server failure), the system will direct the user to an alternative available virtual desktop.
- **Centrally monitor virtual desktops and host servers from a single GUI.** The administrator can see which user connects to which virtual desktop and can manually stop remote virtual desktops. The administrator can see how much CPU, RAM, and bandwidth each host server is using over time.
- **Automatically restart service.** During the recovery interval between the time OnDemand Desktop starts and stops, the system will reject new requests for desktops but will maintain all running desktops.

1.2. Components

This section describes components of the OnDemand Desktop product. The management server(s) can be physical and/or virtual machine(s) running Windows Microsoft XP Professional (SP3), Windows Server 2003 (SP2), Windows Server 2003 R2 (SP2), Windows Server 2008 (SP2), or Windows Server 2008 R2. You may mix operating systems as well as physical and virtual machines.

1.2.1. Enterprise Manager

The Enterprise Manager is the software component that manages the overall environment in an OnDemand installation. It is responsible for the configurations of each cluster and Portal in the network.

1.2.2. Controller

The Controller creates and manages virtual desktops according to user-configured policies.

If a user logs out of a virtual machine, the Controller will make that virtual machine available for other users.

1.2.3. Portal

Install on the system providing web-hosting services that is running Microsoft IIS. The Portal provides users with an interface for requesting a virtual desktop session. The OnDemand Portal is the communication gateway between the user clients¹ which request virtual desktop sessions, and the OnDemand Controllers, which manage the virtual desktops or Terminal Server sessions. The OnDemand Portal runs on Microsoft Internet Information Server (IIS) with .NET2.0. The server must be part of the Windows domain or a trusted domain where users will be accessing this Portal.

The user sends his/her credentials to the OnDemand Portal, which verifies them against the Active Directory server. If the user is authentic, the OnDemand Portal uses Active Directory group membership to determine to which Synchron user Habitat the user belongs. If authentication fails, or if the user does not belong to any Synchron user Habitat, the system will return an error to the user. If a client who is not an administrator or a member of a "[whitelists](#)" attempts to connect directly to a VM or TS server rather than using the OnDemand Portal, the system will force the logoff of that client. Synchron refers to the user's action as "hijacking." Hijacked VMs are to return to a clean condition at least as aggressively as the "logoff type." The system will log off TS server hijackers, but there will be no further action on the TS server or its users.

The OnDemand Portal load balances inbound client requests for virtual desktops across one or more OnDemand Controllers. Each OnDemand Controller is responsible for one or more host servers supporting virtual desktops. Once an OnDemand Controller finds an available virtual desktop in the Synchron user Habitat, the OnDemand Controller returns the connection details of the selected virtual desktop to the OnDemand Portal, which, in turn, either embeds the connection details into the web page it returns to the browser or returns the connection details to the OnDemand Desktop™ or WTOS clients.

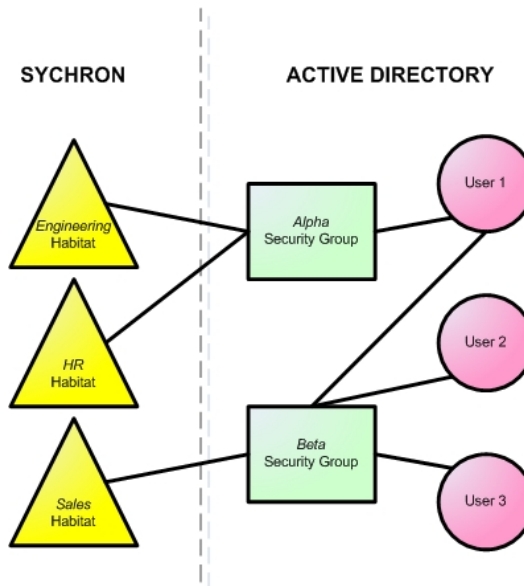
The IP addresses of management servers on which the OnDemand Controllers run are defined in the OnDemand Portal configuration file. The OnDemand Portal automatically chooses a subset of the servers with which it communicates. These servers must be reachable from the server that runs the OnDemand Portal. The OnDemand Portal is resilient to servers in the cluster being unavailable. In the event that a server running an OnDemand Controller becomes unavailable, the OnDemand Portal temporarily excludes the server from its load balancing set. The OnDemand Portal starts monitoring the unavailable server and includes that server once it becomes available again.

OnDemand authorizes user access to Habitats via Active Directory security groups. Authorized user access is possible only after the system administrator associates Habitats with security groups and then makes users members of those associated security groups. During Portal configuration, system administrators define the relationship between a Habitat and its associated security group(s).

¹ from Internet Explorer, the OnDemand Desktop client, or WTOS (Wyse Thin OS)

Make sure the date and time in your image are the same as in your server(s) and your Active Directory configurations. Your server(s) should synchronize their time with the same time source as your domain controller (e.g., NTP).

Virtual machines within a given Habitat share a common security group. Each Habitat can be associated with only one security group; however, a security group can be associated with multiple Habitats.



how Synchron Habitats relate to Active Directory

When a user requests a desktop, the Portal authenticates the user and then, based upon Active Directory membership, selects a list of available clusters that could satisfy this request. The Portal accomplishes this by assigning a score to each of the clusters and then choosing the cluster with the best score.

Cluster scoring is a tremendous asset in constructing a fault-resilient distributed environment with OnDemand Desktops. With this feature, configuring a Portal to organize the list of clusters into an order that suits the business's needs is easy. Custom scorers can easily be added to react to such conditions as client proximity to clusters, business factors, environmental changes, and calendar scheduling.

The scheduling mechanism orders this list of clusters according to some predefined policy. The Portal then polls this list and selects the first cluster that successfully satisfies the request. In the event that a cluster rejects the assignment requests, the Portal simply continues to the next cluster in the list. Policies are provided for four basic scheduling types. Others can easily be added in order to suit the needs of a specific customer. These extensions can be written in any ASP.NET-supported language such as VBscript, C#, C++, etc., in just a few lines of code.

The Portal provides four predefined policy types ([LRU](#), [Pack](#), [Stripe](#), and [Weighted](#)), which handle the common scheduling needs.

You can easily add custom scorers to a Portal by using tools such as Microsoft Visual Studio 2008. Synchron publishes a set of *Interfaces* to the cluster scoring code. Customers can use the programming/scripting language of their choice to implement their own custom scorers. Customer scorers have access to the various attributes described in the [Weighted](#) scorers section. Samples are provided in the Portal installation directory.

1.3. Supported Operating Systems

1.3.1. Operating Systems for the Sychron Role

You can install the Enterprise Manager, Controller, and Portal, on separate machines (physical and/or virtual) or together on one or more machines in any combination you wish. You may also mix supported operating systems (as specified below):

- Windows XP Professional (SP3)
- Windows Server 2003 (SP2)
- Windows Server 2003 R2 (SP2)
- Windows Server 2008 (SP2)
- Windows Server 2008 R2

1.3.2. Operating Systems for the Gold Image (Guest OS)

Ensure that your hypervisor supports the operating system you choose for your gold image.

- Windows XP Professional (SP3)
- Windows Vista Enterprise (SP2)
- Windows 7 Enterprise
- Windows Server 2003 Standard (SP2)

1.4. Required Infrastructure

1.4.1. Prepare for an OnDemand Environment

If you want to serve VMs to clients outside your network and do not want to use a VPN tunnel, you will need a server running Microsoft Server 2008 with the Terminal Services Gateway (TS Gateway) role added. You must add the Remote Desktop Gateway (RD Gateway) role if you are running Microsoft Server 2008 R2. You must also have a certificate issued by a public CA.

ESX	Hyper-V	TS/RD
<ul style="list-style-type: none"> • a server running VMware ESX 3.5 (Update 2 or higher) or 4.0 • functioning Active Directory (AD) • DHCP • network connectivity • communication to other Synchron components and all VMs • sync to same NTP as AD • virtual switch with enough ports to support the number of VMs you are planning to run • service console of 800 MB for 20 or more VMs • memory idle tax set to zero (0) • gold image running a supported operating system • a server (physical or virtual) running a supported operating system to host the Enterprise Manager, Controller, and Portal • CD or ISO of a supported guest OS with appropriate Microsoft license 	<ul style="list-style-type: none"> • a server running Windows Server 2008 with Hyper-V role • functioning Active Directory (AD) • DHCP • network connectivity • communication to other Synchron components and all VMs • virtual network with appropriate connectivity to support your implementation • gold image running a supported operating system • a server (physical or virtual) running a supported operating system to host the Enterprise Manager, Controller, and Portal • CD or ISO of a supported guest OS with appropriate Microsoft license • join to domain 	<ul style="list-style-type: none"> • a server running Windows Server 2003 or 2008 running TS/RD role • functioning Active Directory (AD) • TS or RD licensing server • network connectivity • communication to other Synchron components • a server (physical or virtual) running a supported operating system to host the Enterprise Manager, Controller, and Portal • and Portal • join to domain

1.4.2. Create a Gold Image (VMs only)

If you are running Terminal Services, go to the [pre-installation questionnaire](#), and continue from there.

The system configures each virtual desktop within a Synchron Habitat from a single virtual hard disk image.

The configuration for each virtual desktop within a Synchron Habitat comes from a single, master virtual hard disk image. The administrator makes the master virtual hard disk image available to each server in the cluster by either mounting it on globally accessible storage or by copying it to the local disk of each server.

The master virtual hard disk image will serve as the parent of each virtual machine's differencing hard disk. Access rights to the Windows domain are required to create a virtual machine's master virtual hard disk image and to be able to join a new computer to the Windows domain.

The administrator must manually create and configure a virtual hard disk that will serve as the parent hard disk for each virtual machine that a Synchron Habitat creates. You must

create/customize your Windows image and allow remote desktop group user access to the virtual desktop.

1.4.2.1 **Create a Virtual Machine**

Use your chosen hypervisor to create a gold image. Refer to the documentation for your chosen hypervisor for instructions and details.

NOTE: If you are using ESX as your hypervisor, you must use BusLogic as the hard disk controller type, regardless of the operating system you are loading in your gold image.

1.4.2.2 **Load the Virtual Desktop with a Guest OS**

Load the virtual desktop with a guest operating system. Follow manufacturer's instructions for this task.

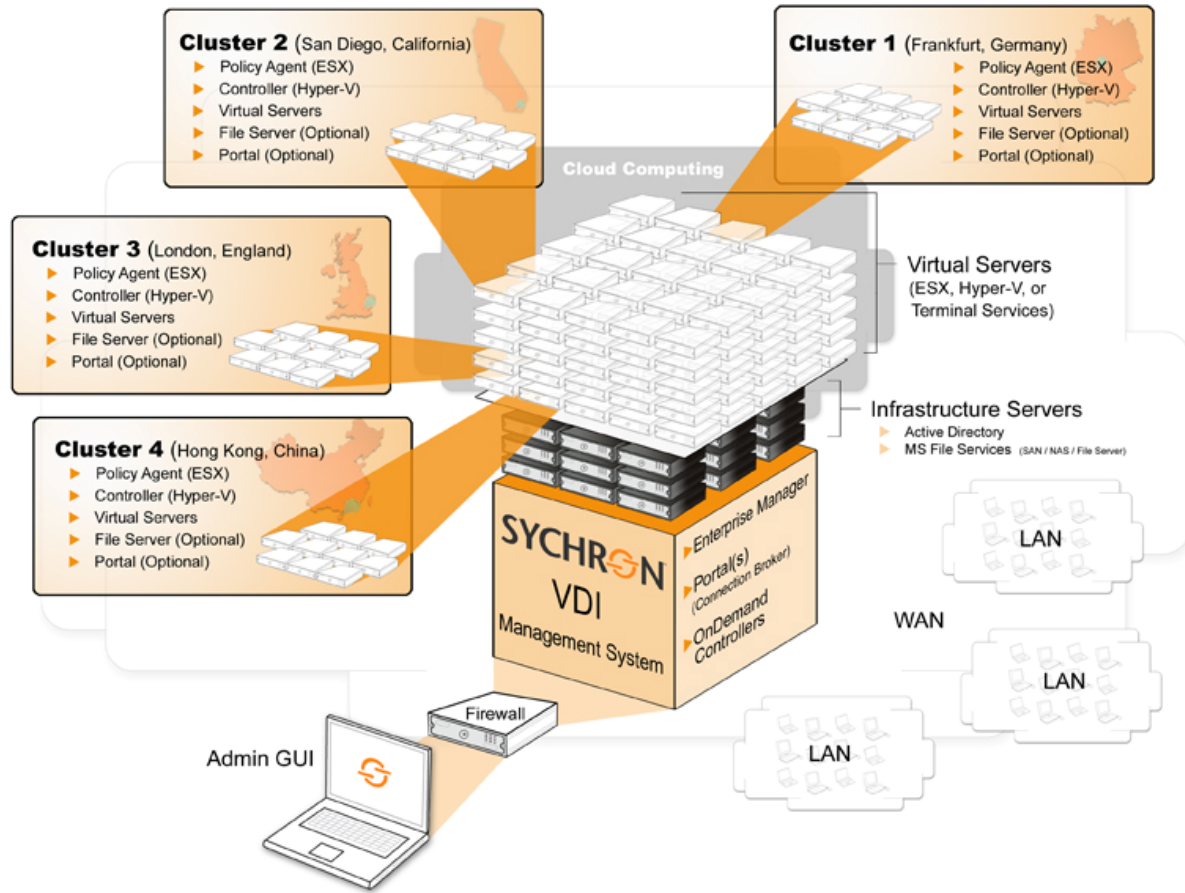
If you have chosen ESX as your hypervisor, you must load the VMware Tools Package into your gold image.

If you have chosen Microsoft Server 2008 as your hypervisor, you must load Hyper-V Integration Services into your gold image.

Your gold image will run in a single virtual machine after you complete OS installation. Customize this gold image to prepare it for deployment.

- Install any applications you intend to be resident on each virtual desktop that you plan to allocate.
- Add items such as browser plug-ins, printer settings, etc.
- If desired, set up a default user profile. Refer to <http://support.microsoft.com/kb/319974> for complete instructions.
- If you joined the gold image to the domain, remove it from the domain before proceeding.

Sychron Virtual Desktop Infrastructure Overview



1.4.2.3 Disable Automatic Boot-Time Disk Defrag

To ensure that your VMs do not run automatic boot-time disk defragmentation, disable this program as follows:

- Open REGEDIT.
- Navigate to
`HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Dfrg\BootOptimizeFunction.`
- Change the value of the key "Enable" from Y to N.

1.5. Questionnaire

This [form](#) is to help administrators gather important information before beginning an OnDemand Desktop installation to ease the process and to provide reference documentation for troubleshooting purposes.

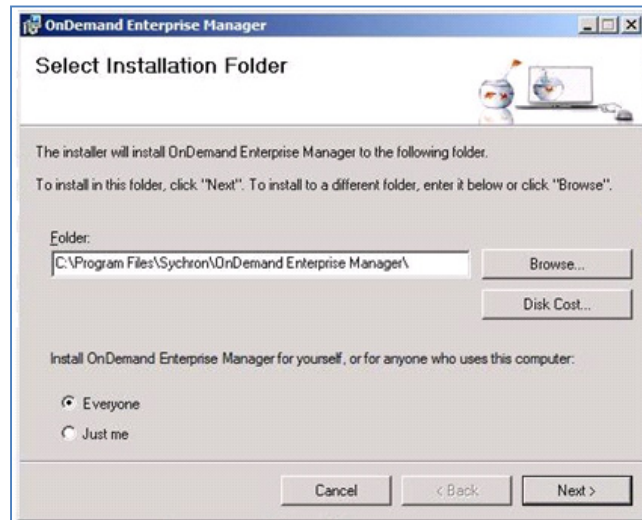
2. Installation

2.1. Install the OnDemand Enterprise Manager

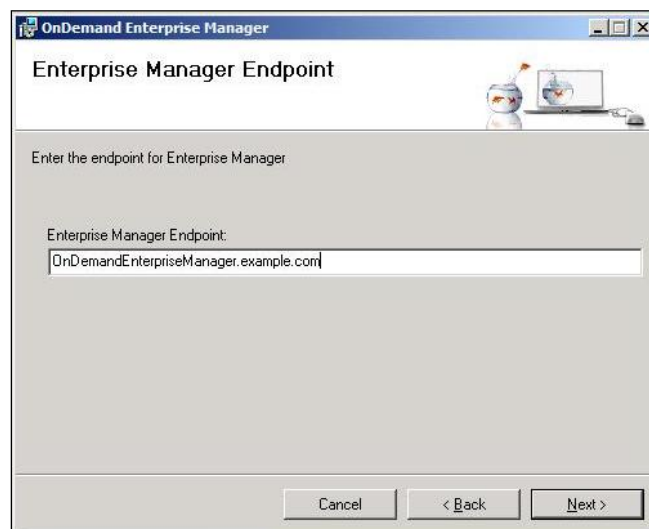
1. Locate the **OnDemand Enterprise Manager** ZIP file on your system.
2. Extract the folders to where you want to stage EM installation.
3. Open **setup.exe** to begin installation. This operation will also install .NET Framework 3.5 if it is not already installed.

Note: Installing .NET Framework may require a reboot before you can move to the next step. Installation will resume after reboot.

4. Click **Next**.



5. Verify the destination of the installation, and select **Everyone**. Click **Next**.



6. Enter the fully qualified domain name (FQDN) for the Enterprise Manager endpoint. Click **Next**. (The endpoint is the network name of the computer on which you are installing the Enterprise Manager. You may optionally enter a TCP/IP (`server-name:port`) number in this field, which will cause the EM to operate using this specified port instead of its default port, 3724.)
7. Click **Next** to begin installation.
8. Click **Close** to complete installation.

2.2. Install the OnDemand Controller

1. Log into your management server with administrative privileges.
2. Locate the **OnDemand Controller** ZIP file on your system.
3. Extract the folders where you want to stage Controller installation.
4. Open **setup.exe** to begin installation. This operation will also install .NET Framework 3.5 if it is not already installed.

Note: Installing .NET Framework may require a reboot before you can move to the next step. Installation will resume after reboot.

5. Click **Next**.
6. Verify the destination of the installation, and select **Everyone**. Click **Next**.
7. Enter the endpoints for the OnDemand Controller and the Enterprise Manager (EM). (The OnDemand endpoint will be the network name of the computer on which you are installing the OnDemand Controller. The Enterprise Manager endpoint is the network name of the computer on which you installed the Enterprise Manager. You must enter a port number (`server-name:3723`) in the OnDemand endpoint field, which will cause the Controller to operate using this specified port.) You must make the entries for the Enterprise Manager endpoint match the entries for the EM you have already installed. Click **Next**.
8. Click **Next** to confirm that you are ready to begin the installation.
9. Click **Close** to complete installation.

2.3. Install the OnDemand Portal



Install the OnDemand Portal in a Microsoft IIS application server environment. **Do not** attempt to install the OnDemand Portal without IIS. For Windows 2008, you must also

select the IIS 6 Management Compatibility and ASP.NET role services. Refer to the [Appendix](#) for more information. The Portal will also broker connections from a WTOS client. Refer to the [Appendix](#) for more information.

1. Locate the **OnDemand Portal** ZIP file on your system.
2. Extract the folders to where you want to stage Portal installation.
3. Open **setup.exe** to begin installation. This operation will also install .NET Framework 3.5 if it is not already installed.

Note: Installing .NET Framework may require a reboot before you can move to the next step. Installation will resume after reboot.

4. Click **Next**.
5. In the Select Installation Address window, click **Next**.
6. Click **Next** to begin the installation. Wait for the installation to finish.
7. Click **Close** to complete installation.
8. Execute `C:\WINDOWS\Microsoft.NET\Framework\v2.0.50727\aspnet_regiis.exe -i`.
(Note: This is for Windows 2003. This does not apply to Windows 2008 if you select IIS 6 Management Compatibility and ASP.NET role services when installing IIS.)
9. Go to the drive where you installed the Portal.
10. In the `Inetpub\wwwroot\svdwp` folder set **Security** in the `web.config` file and the **controls** folder.
11. In a Windows XP environment, select **Launch IIS Process Account**, and allow **Modify**.
12. In a Windows 2003 environment, select **IIS_WPG**, and allow **Modify**.
13. In a Windows 2008 environment, click the **EDIT** button, select **IIS_IUSRS**, and allow **Modify**.
14. If you are running Terminal Services only, go to this [Customize Provisioned VMs or TS Sessions for Remote Access](#).

2.4. Additions

2.4.1. VM Additions

From the VM running your gold image, perform the following steps:

1. Locate the **OnDemand VM Additions** ZIP file on your system.
2. Extract the folders to where you want to stage VM Additions installation.

3. Open **setup.exe** to begin installation. (VM Additions require Visual C++ Runtime Libraries, which is part of this installation process.)



4. Click **Install**.
5. Click **Next**.
6. Click **Next** to confirm installation.
7. Click **Close** to complete installation.

2.4.2. TS Additions

1. Locate the **OnDemand TS Additions** ZIP file on your system.
2. Extract the folders to where you want to stage TS Additions installation.
3. Open **setup.exe** to begin installation. (TS Additions require Visual C++ Runtime Libraries, which is part of this installation process.)



4. Click **Install**.
5. Click **Next**.
6. Click **Next** to confirm installation.
7. Click **Close** to complete installation.

2.4.3. Customize Provisioned VMs or TS Sessions for Remote Access

You can customize a Windows installation in a variety of ways to allow remote access. One method is to create and link a GPO to the organizational unit (OU) in which you will create your virtual machines.

Edit the GPO by setting the following parameters:

1. **Computer Configuration**→**Windows Settings**→**Security Settings**→**Local Policies**→**User Rights Assignment**→***Allow logon through Terminal Services***
 - Check the **Define these policy settings** box.
 - Add users or groups who need to access the Habitat.
 - Click **OK**.
2. Under **Security Settings**, click **Restricted Groups**. Add a group called `Remote Desktop Users`. Click **OK**. Open **Remote Desktop Users**, and add users and/or groups who need to access the Habitat. Click **OK**.
3. **Administrative Templates**→**Network**→**Network Connections**→**Windows Firewall**→**Domain Profile**→***Windows Firewall: Protect all Network Connections***
 - Set to **Disabled**.
 - Click **OK**.
4. **Administrative Templates**→**Network**→**Network Connections**→**Windows Firewall**→**Standard Profile**→***Windows Firewall: Protect all Network Connections***
 - Set to **Disabled**.
 - Click **OK**.
5. **Administrative Templates**→**Windows Components**→**Terminal Services**→***Allow users to connect remotely using Terminal Services***
 - Set to **Enabled**.
 - Click **OK**.
6. **Administrative Templates**→**System**→***Display Shutdown Event Tracker***
 - Set to **Disabled**.
 - Click **OK**.
7. **Administrative Tools**→**Windows Components**→**Terminal Services**→***Restrict Terminal Services users to a single remote session***
 - Set to **Enabled**.
 - Click **OK**.

8. **Administrative Templates**→**Windows Components**→**Terminal Services**→**Enforce Removal of Desktop Wallpaper**

- Set to **Enabled**.
- Click **OK**.

You may also edit the GPO by setting the following parameters:

1. **Administrative Templates**→**Windows Components**→**Terminal Services**→**Keep-Alive Connections**

- Set to **Enabled**.
- Click **OK**.

2. **Administrative Templates**→**Windows Components**→**Terminal Services**→**Automatic reconnection**

- Set to **Disabled**.
- Click **OK**.

Synchron strongly recommends that you save the virtual disk image at this stage, so that you can make additional configurations to the master image at a later date. This saves having to reload the image from the ISO each time you update a new master image (as well as having to apply all the updates).

2.4.4. Customize the Administrator Whitelist

This step is optional.

By default, only administrators are allowed to log directly into a VM or TS server, bypassing the OnDemand Portal. Administrators can change authorized users. SycVMService and SycTSService start with the option `/superuser:superuser.bat`. This `.bat` file contains `synchron_service_query --user "%SESSION_NAME%" superuser`, which will return 0 for a valid user and a non-zero for an invalid user. The check is based upon matching `%SESSION_NAME%` with "administrator." The administrator can replace this call to `synchron_service_query` with whatever he/she deems as valid, for example, matching the name to a list of known superusers or "exit 0" to disable hijack detection altogether.

2.4.5. Optional Components

Optional components exist to enable intelligent scripting, manage stale VMs, allow access to VMs from a variety of clients, as well as provide other enhancements.

OnDemand Desktop Client

Install these clients in a Windows or Linux environment to allow access to Synchron-controlled VMs.

GPO Additions

GPO additions enable administrators to tailor the user experience during logon, logoff, disconnect, and reconnect events. These additions enable software to be location aware by gaining client-specific information such as session ID, client IP address, and client name.

OnDemand Client Metrics

Metrics supports the analysis of usage patterns at the cluster, Habitat, server, and user levels, allowing an administrator to determine how resources are being used over time. This will then allow:

- optimizations for server consolidation, enabling greater or fewer resources to be allocated at the most appropriate time
- analysis of server use, to track scheduled and unscheduled downtime
- analysis of user access patterns over time, at the cluster, Habitat, and server levels

Active Directory Reporter

The OnDemand ADReporter tool is designed to provide the administrator with up-to-date information on the entries of the OUs associated with the Habitats in the clusters that a given Enterprise Manager (EM) manages.

Given an EM endpoint, the tool will interrogate the associated clusters to find the current list of Habitats and the desktops associated with these Habitats. The OU associated with a Habitat is also noted and is interrogated to determine the computer accounts currently listed. This data is cross-referenced to find valid OU entries and OU entries that might be stale.

3. Configuration

3.1. Create an OnDemand Environment

1. Navigate to <http://yourportal/svdwp/admin/index.html>.
2. Click **Enter**.
3. Enter the fully qualified domain name (FQDN) of your Enterprise Manager the first time you access the Portal. Click **Enter**. (Note: If you decided to run Enterprise Manager using a port other than the default (3724), enter that alternate port number here.)
4. Edit General Description. Click **Edit** in the General Description section of the EM Description screen. Describe the Enterprise Manager, and click **Apply**.

3.1.1. Create Clusters

1. Click **Create** in the Clusters section of the Cluster Manager screen.

- a. Complete the form, and click **Apply**. Note: The Controllers field must contain the hostname of the server where you installed the OnDemand Controller. See the following restrictions for the form:
- Name: The cluster name may only contain letters, numbers, underscores, and hyphens and may not contain spaces.
 - Description: This is any text you wish to enter to describe your cluster.
 - Controllers: Enter the FQDN of the server running your OnDemand Controller software. Include the port number (FQDN:3723).
 - [Ethernet MAC base](#): This is the beginning of range of addresses OnDemand will allocate to VMs.
 - [Ending MAC address](#): This is the end of range of addresses OnDemand will allocate to VMs.
- b. Check the **This is an OnDemand 4.0+ controller** box if the controller for this cluster is going to run OnDemand 4.0 or higher.

The screenshot shows a 'Cluster Information' form with the following fields and options:

- Name: [Text input field]
- Description: [Text input field]
- Controllers: [Text input field]
- Ethernet MAC Base: [Text input field]
- Ending MAC address: [Text input field]
- This is an OnDemand 4.0+ controller.
- Available Habitat(s): [Text input field]
- Available servers(s): [Text input field]

At the bottom of the form are two buttons: 'Apply' and 'Cancel'.

2. Click **Apply**.

3.1.2. Create Servers

1. Click **Add** in the Servers section of the Enterprise Manager Configuration screen.

- Name: FQDN of the hypervisor or terminal server
- Description: This is any text you wish to enter to describe your cluster.
- Max. change states: This is the maximum number of desktops that can start on a server at one time
- Max. updates: This is the maximum number of simultaneous desktop updates per server.
- Authentication Username: the user who has credentials to administer the server
- Enter password: Windows domain password for authentication username
- Confirm password: confirmation of Windows domain password

2. Fill in the form, and click **Apply**.

3.1.3. Create Habitats

1. Click **Create** in the Habitat Manager screen.

Field Names	Descriptions	TS/RD	VM
Habitat Type			
Provide sessions via virtual machines (VM)	create a virtual desktop		✓
Provide sessions via Terminal Services (TS)	create a Terminal Services session	✓	
General Information			
Name:	the name of the user Habitat	✓	✓
Description	a description of the user Habitat	✓	✓
Resources			
CPU (MHz):	the CPU resources (in MHz) of a host server that each virtual desktop in the user Habitat should get	✓	✓
Memory:	the RAM (in MB) resources of a host server that each virtual desktop in the user Habitat should get	✓	✓
Gold Image:	the full path on the target server to the gold image for the virtual desktops in the		✓

Field Names	Descriptions	TS/RD	VM
	<p>user Habitat; the image must be accessible to all target servers at this path</p> <p>(e.g., for Microsoft Server 2008: d:\guess\windows7\windows7.vhd</p> <p>for ESX [Gold3] guestsGold/windows7/windows7.vmdk)</p>		
Datastore:	<p>This is where you will build VMs.</p> <p>(e.g., for Microsoft Server 2008: f:\</p> <p>for ESX [VM3])</p>		✓
Network:	the name of the virtual network from the Hyper-V Virtual Network Manager or ESX Virtual Switch		✓
MAC Address:	OnDemand Desktop 4.1 supports MAC addressing at the cluster level instead of at the Habitat level. See Create Clusters for more information.		
Scheduling Parameters			
Min.:	the minimum number of virtual desktops that the system will keep running within the user Habitat (If the server cluster does not have enough resources, the system will start as many virtual desktops as possible.)	✓	✓
Max.:	the maximum number of virtual desktops that the system will both provision and run for the user Habitat at any time	✓	✓
Low:	the minimum number of available (not in use) virtual desktops that the system will try to maintain at all times (If the number of available virtual desktops is fewer than this value, the system will automatically try to start more virtual machines until the system reaches this value.)	✓	✓
High:	the maximum number of available (not in use) virtual desktops that the system will maintain at all times (If the number of available desktops is more than this value, the system will automatically stop available virtual machines until the system reaches this value.)	✓	✓

Field Names	Descriptions	TS/RD	VM
Priority:	If multiple user Habitats exist, Habitats with higher priority get host servers first. Permissible values range from 1 to 1000. Higher values indicate higher priority.	✓	✓
Windows Domain Information			
Name:	the name of the Windows domain that the virtual desktops should join when they first boot		✓
Realm:	the NetBIOS name of the Windows domain		✓
LDAP name:	the organizational unit to which the virtual desktops will belong, the LDAP distinguished name of the OU in which you want to create computer accounts (e.g., ou=OnDemandVMs, ou=Synchron, dc=Synchron, dc=com)		✓
Authentication Username:	the user who has the credentials to check group membership for the user requesting a logon; user must be have authority to "Read all user information" in Active Directory		✓
Enter password:	Windows domain password for authentication username		✓
Confirm password:	confirmation of Windows domain password		✓
User Session Parameters			
Type of Logout:	the action taken when a user finishes with a VM <ul style="list-style-type: none"> • <i>reuse</i> – makes the VM immediately available • <i>restart</i> – starts the guest operating system (Windows XP) again (i.e., shuts down and starts back up the VM) • <i>reboot</i> – boots the VM to a previously saved, freshly booted state • <i>recreate</i> – puts the VM back into the state at which it was at the beginning of the 		✓

Field Names	Descriptions	TS/RD	VM
	provisioning cycle <ul style="list-style-type: none"> • <i>reprovision</i> – reallocates the VM by rebuilding the VM from scratch When a session ends, the system attempts to put the VM back into the state defined in the Habitat specification (one of the above states). If a problem exists, the system may assert a “more aggressive” state (one that consumes more time and/or overhead).		
Inactivity Timeout (mins.):	the number of minutes that a virtual desktop will continue to be reserved for a user after the user has disconnected from or is inactive on a virtual desktop (If the user logs into his or her virtual desktop during this time, the system will direct that user to the previously assigned virtual desktop.)	✓	✓

2. Click **Apply**.

3.1.4. Edit a Cluster

1. Click **Edit** next to the cluster you want to edit in the Clusters section of the Enterprise Manager Configuration screen.
2. Join Habitat(s) and server(s) to the Cluster by checking the boxes next to the Habitat(s) and server(s) you want to include.

3. Click **Apply**.

Notice that the Enterprise Manager configuration has changed.

3.1.5. Create End User Portals

1. Click **Portal Configuration**.

2. Click **create** to create a Global Portal configuration.

The name in this form must be the FQDN of the server running the OnDemand Portal.

3. Click the box of the cluster you wish to manage.
4. Click **Apply**.

3.1.6. Create End User Dropdowns

1. Click **edit** next to the name of the Portal configuration you just created.
2. Click **create** next to Dropdown Menu Items.
3. Fill in the form:

The screenshot shows a configuration form with the following sections and fields:

- Portal Dropdown Information:** Name, Display Name, Description.
- Windows Domain Information:** Name, Realm, LDAP name, Authentication Username, Enter password, Confirm password.
- Handy/Vill Parameters:** Number of Handy's needed, Number to acquire at any one time, Handy/Vill lease duration, Must have a Handy/Vill for login (checkbox).
- Habitat - Security Binding Information:** Security Group, Habitat name (dropdown), Priority.

Buttons: Apply, Cancel

Field Names	Descriptions
Portal Dropdown Information	
Name:	the name of the Portal dropdown
Display Name:	the Habitat name that the end user will see in the logon screen of the Portal or the Sychron desktop client; can be different from the actual Habitat name
Description	a description of the Portal dropdown
Windows Domain Information	
Name:	the fully qualified domain name (FQDN) for the Active Directory domain (e.g., example.com)
Realm:	the NetBIOS name for the Active Directory domain (e.g., example)
LDAP name:	the lightweight directory access protocol (LDAP), Distinguished Name for the Active Directory domain name (e.g.,

Field Names	Descriptions
	dc=example, dc=com)
Authentication Username:	the user who has the credentials to check group membership for the user requesting a logon; user must be have authority to “Read all user information” in Active Directory
Enter password:	Windows domain password for authentication username
Confirm password:	confirmation of Windows domain password
Handy VM Parameters	<i>This feature is active in OnDemand Desktop 3.x only.</i>
Number of Handy VMs Needed:	the number of HandyVMs (cached VMs that are available for instant assignment to a requesting user) you are requesting for this Habitat; based upon the arrival rate (how many VMs you will need at any one time)
Number to Acquire at Any One Time:	the number of HandyVMs that the system permits the Portal to acquire at any one time; large values will increase the load on the backend system; small values will result in a longer time before all requested HandyVMs are ready for use.
HandyVM lease duration:	the number of seconds the HandyVM “lives” before it expires, and a new HandyVM takes its place; HandyVMs are virtual desktop sessions that the system “leases” from the backend clusters. Too short a lease period increases the load on the system, while too long a duration will limit the system’s ability to reuse a HandyVM, should the Portal fail or be removed.
Must have a HandyVM for login:	tells the Portal if a HandyVM is required to log a user into a Habitat
Habitat-Security Binding Information	
Security Group:	the security group to which a user must belong if requesting to log into a Habitat; may be blank if checking for group membership is not necessary
Habitat name:	the name of the Habitat defined in Enterprise Manager
Priority:	drives the dropdown list in the Portal and directs the Portal to search for the security group with the highest priority of which the user is a member and then assign the corresponding Habitat

4. Click **Apply** and then **Apply & Restart**.

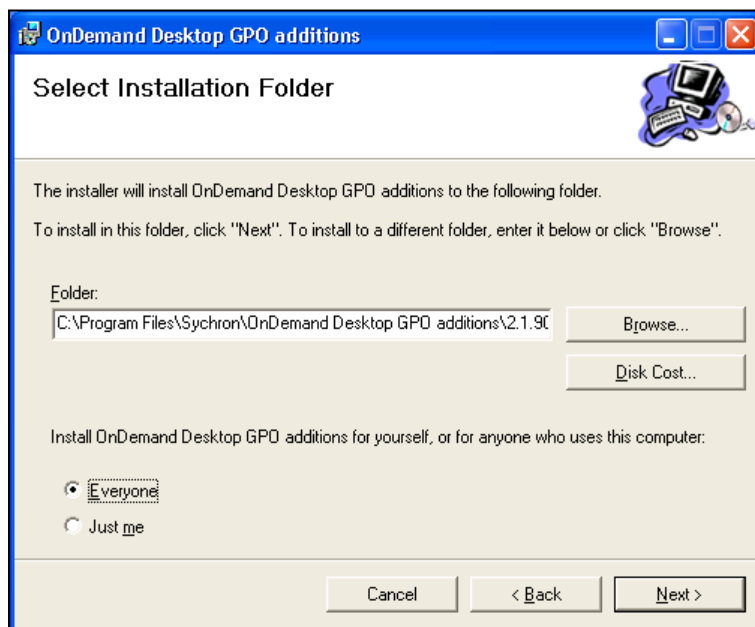
4. Appendix

4.1. Optional Components

4.1.1. GPO Additions

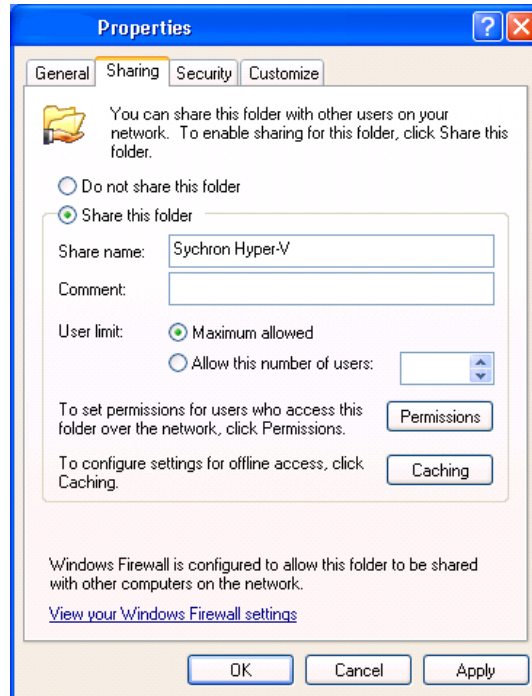
This is only necessary if you run the optional scripts for client connects, disconnects, logoffs, and client metrics. Note that your use of scripts, group policy objects, etc., may influence this section.

1. Locate the **OnDemand GPO Additions** ZIP file on your system.
2. Extract the folders to where you want to stage GPO Additions installation.
3. Open **setup.exe** to begin installation.
4. Click **Next**.
5. Verify the destination of the installation, and select **Everyone**, and click **Next**.

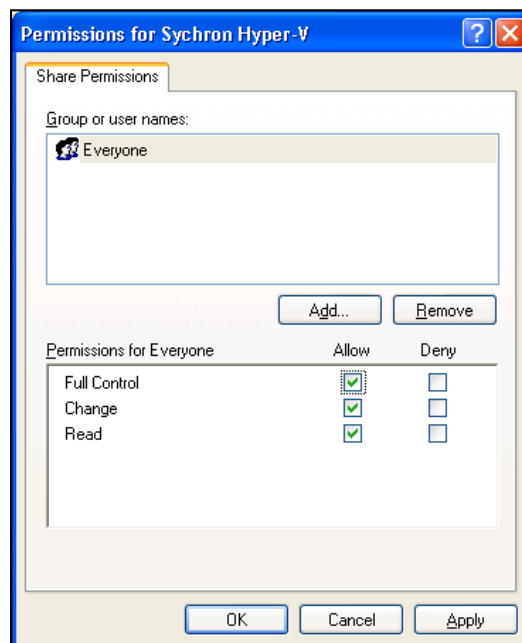


6. Click **Next** to confirm installation
7. Click **Close** to complete installation.
8. Navigate to `C:\Program Files\Sychron\OnDemand GPO Additions`.
9. Open **OnDemand Desktop GPO additions**.
10. Right-click the version number (e.g., **1.1.9181**).
11. Select **Sharing and Security**.

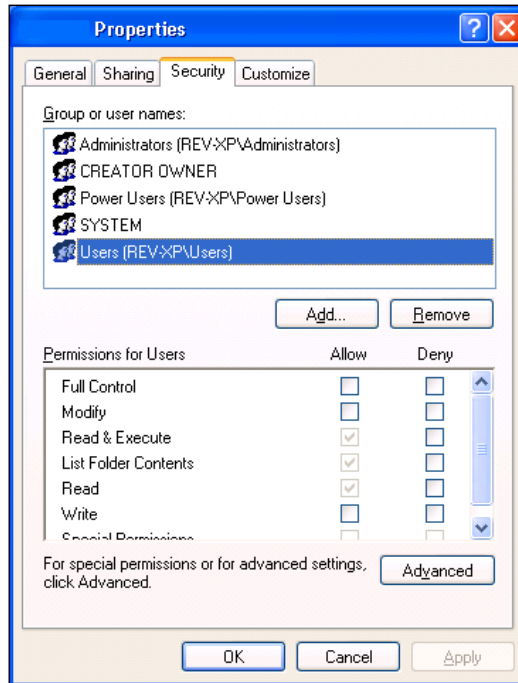
12. Select the **Sharing** tab.
13. Select **Share this folder**.
14. Enter the **Share name** as Sychron-Hyper-V. The **User limit** is Maximum allowed.



15. Click **Permissions**.
16. Allow all permissions as shown.



17. Click **Apply** and **OK**.
18. Select the **Security** tab.
19. Select **Users**.
20. Allow *Read & Execute*, *List Folder Contents*, and *Read* (as shown).



21. Click **Apply** and **OK**.

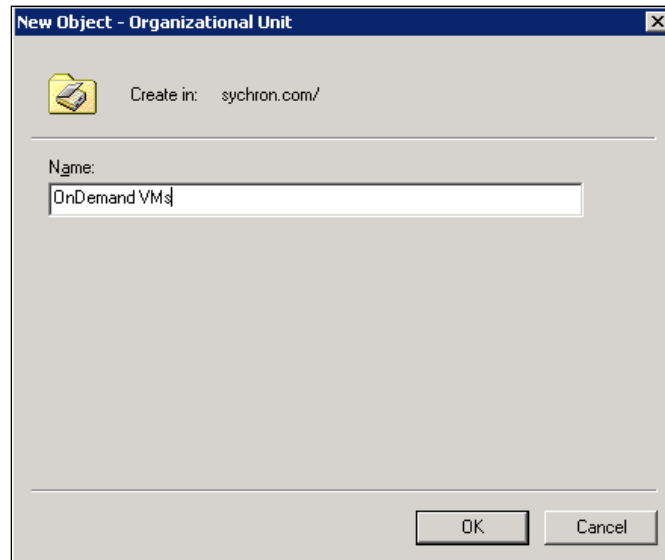
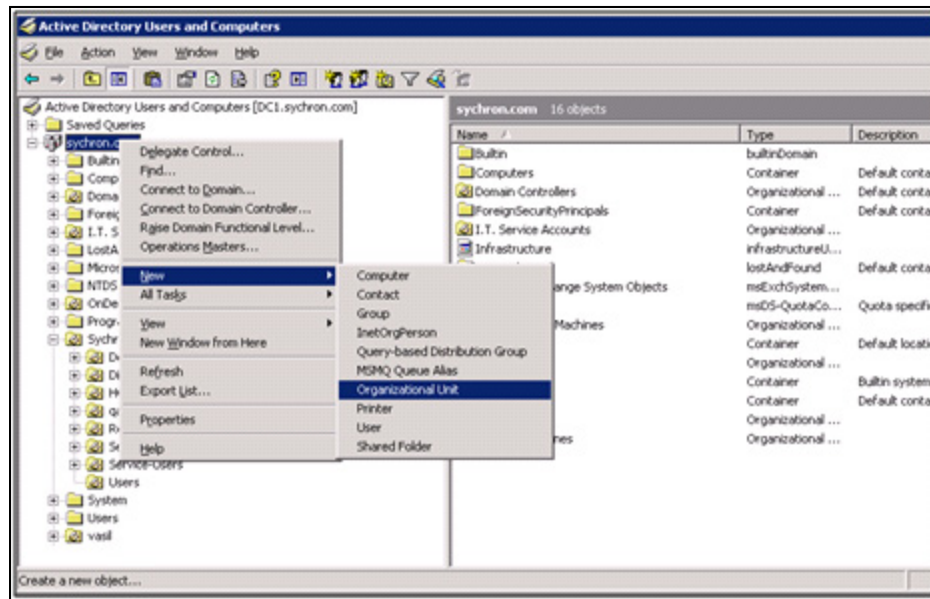
4.1.1.1 Customizing GPOs for Your Environment

1. Within the folder containing your GPOs, right-click and edit the files called `logon.bat`, `logout.bat`, `connect.bat`, and `disconnect.bat`.
2. Replace the string `\\dc1\Synchron Hyper-V` with the UNC of the <<name of folder containing GPOs>>. (Note that the examples may not conform to your local setup.)
3. Save the file, and exit the editor.

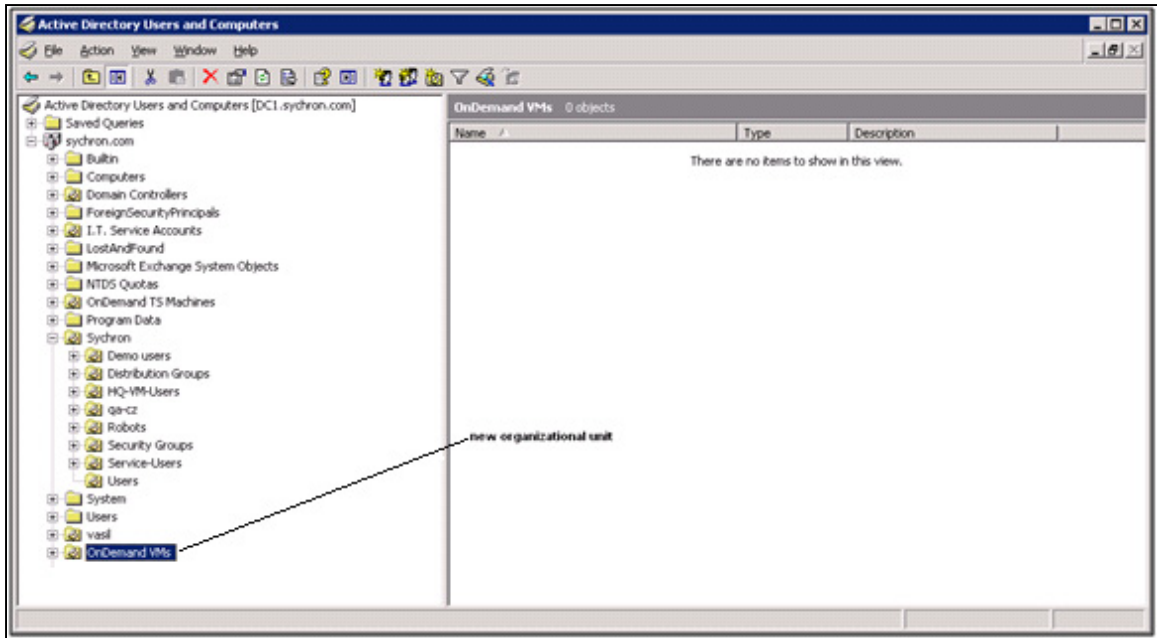
4.1.1.2 Linking a GPO to an OU

Configure a group policy object (GPO) on the domain controller. (Synchron strongly recommends the use of `gpmmc.msc`. Download and install `gpmmc.msi` if it is not already on your system.) Synchron uses this GPO to monitor traffic to the VMs. Link the GPO to the OU containing the VMs. Note that if you are also using login/logoff scripts linked to user GPOs, you must enable loopback processing and set **merge mode** in order to allow multiple login/logoff scripts to run.

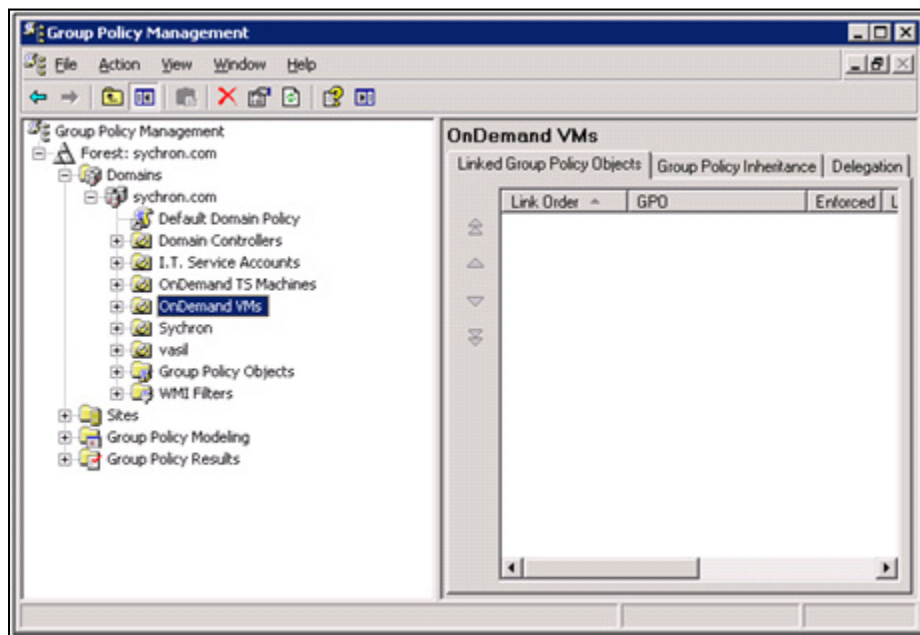
1. Log onto the domain controller.
2. Navigate to **Start→Programs→Administrative Tools→ Active Directory Users and Computers**.
3. Create a new OU called **OnDemand-VMs** where you will store VMs.



4. Click **OK**.

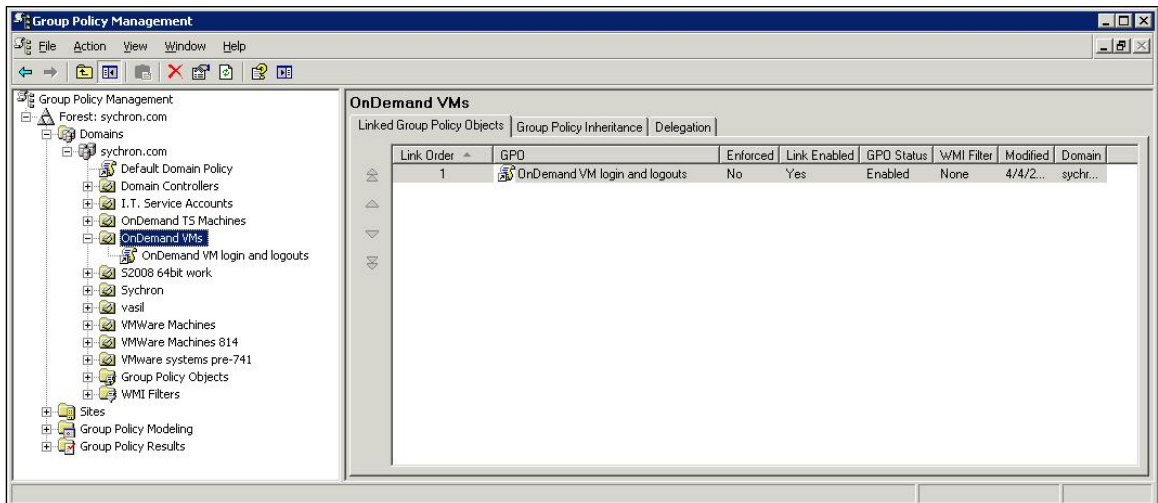


5. Exit.
6. Navigate to **Start→Run**.
7. Open `gpmc.msc`.
8. Expand **Domains** to see the OU you just created.

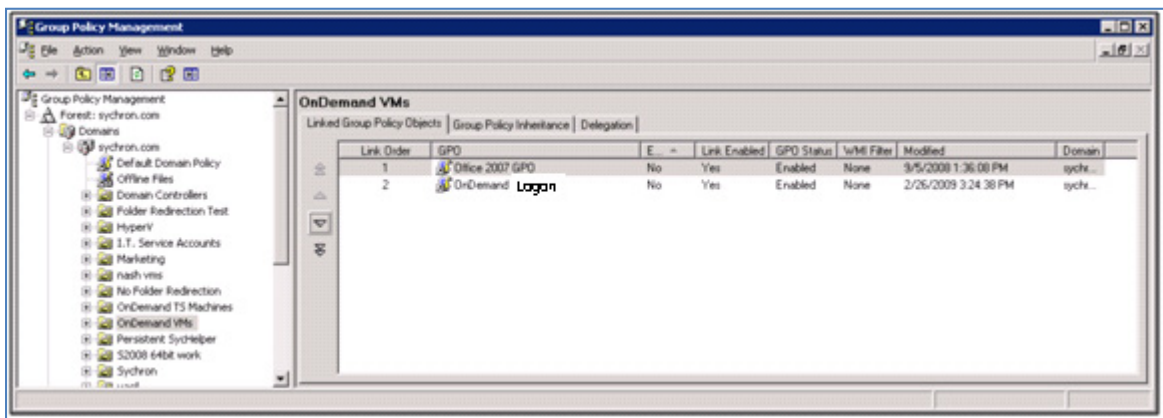


4.1.1.3 Configuring a Logon GPO

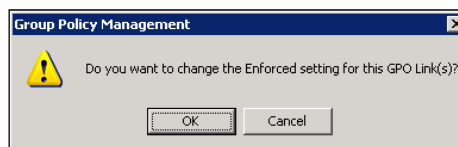
1. Right-click **OnDemand VMs** to create another GPO that OnDemand will use to manage VM logons.



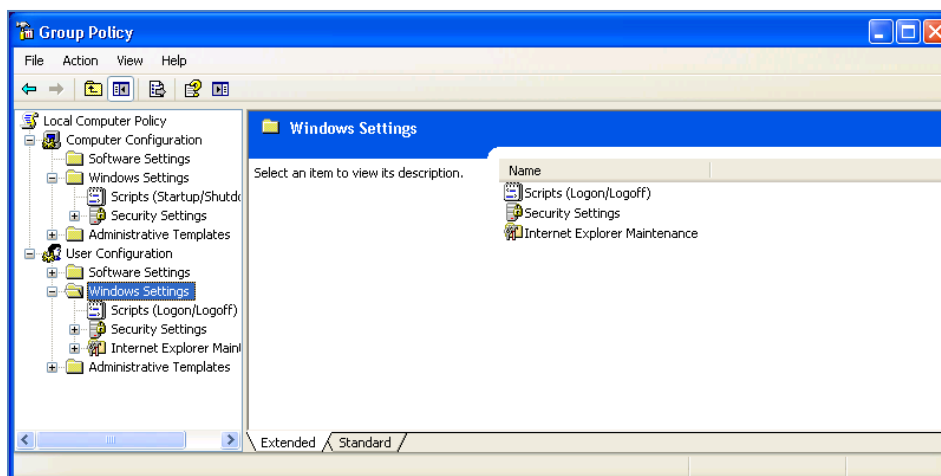
2. Select **Create and Link a GPO Here**.
3. Name the new GPO **OnDemand Logon**.



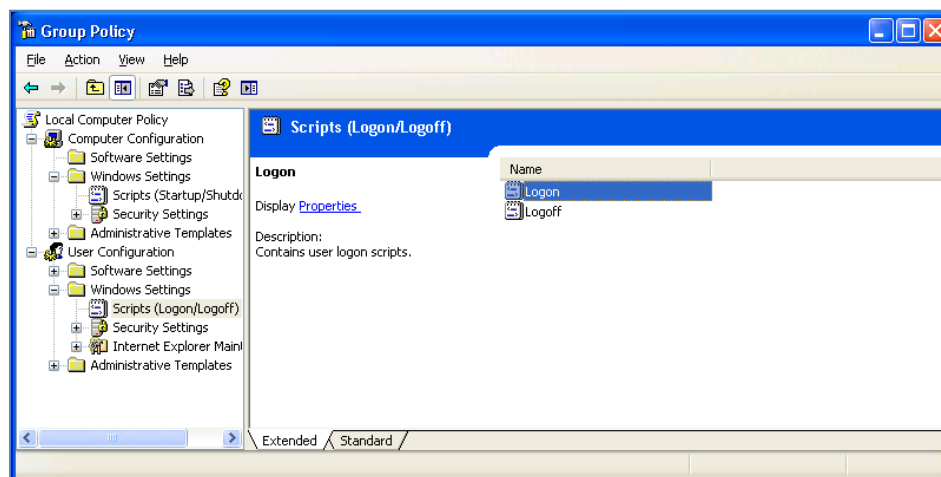
4. Click **OK**.
5. Expand **OnDemand VMs**.
6. Right-click the name of the new GPO.
7. Select **Enforced**.



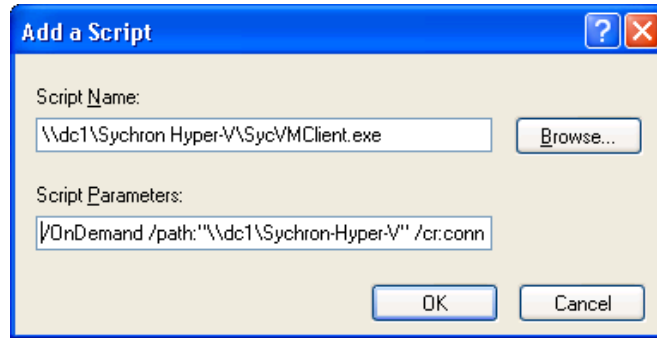
8. Click **OK**.
9. Right-click the name of the new GPO.
10. Select **Edit**.
11. Under **User Configuration**, expand **Windows Settings**.



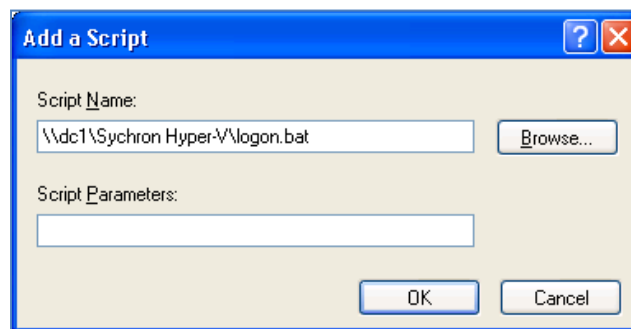
12. Open **Scripts (Logon/Logoff)**.



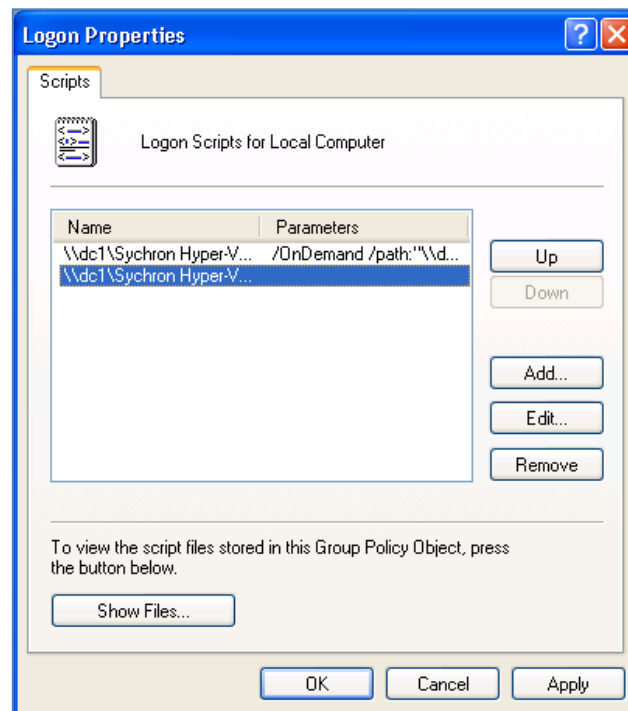
13. Open **Logon**.
14. Click **Add**.
15. Enter `\\dc1\Sychron Hyper-V\SycVMClient.exe` as the **Script Name**. Enter `/OnDemand /path:"\\dc1\Sychron Hyper-V" /cr:connect.bat /dr:disconnect.bat /logout:logout.bat` in the **Script Parameters** field. Click **OK**. (Note: `\\dc1\Sychron Hyper-V` is the path to a folder containing the logon script for this example. Your configuration may be different.)



16. Enter \\dc1\Sychron Hyper-V\logon.bat as the **Script Name**. Click **OK**. (Note: \\dc1\Sychron Hyper-V is the path to a folder containing the logon script for this example. Your configuration may be different.)

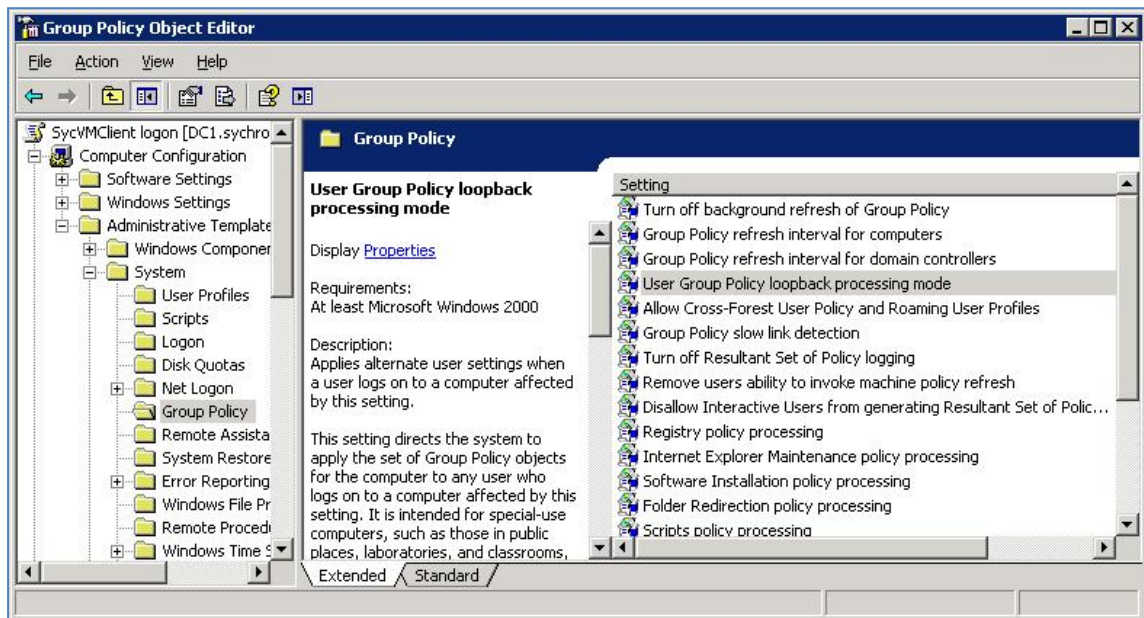


17. Click **Apply** and **OK**.

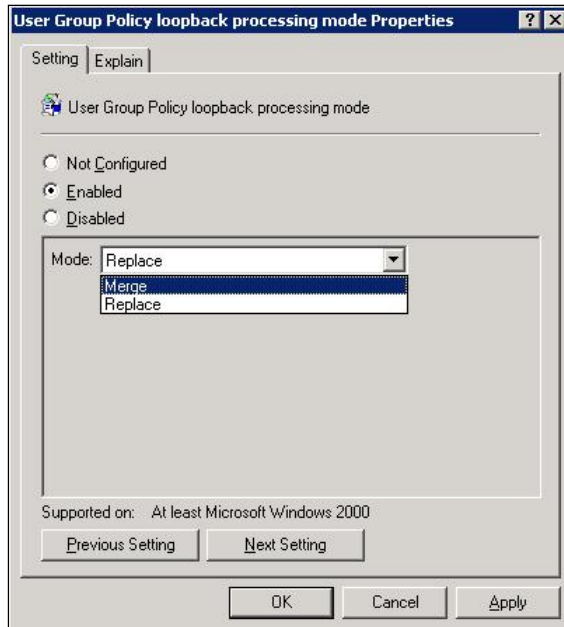


18. From **Group Policy Management**, expand **Group Policy Objects**.

19. Right-click **OnDemand Logon**.
20. Select **Edit**.
21. Expand **Computer Configuration**.
22. Expand **Administrative Templates**.
23. Expand **System**.
24. Highlight **Group Policy**.
25. Highlight **User Group Policy loopback processing mode**.



26. Click **Properties**.
27. Specify **Enabled**.
28. At the **Mode** dropdown, select **Merge**.

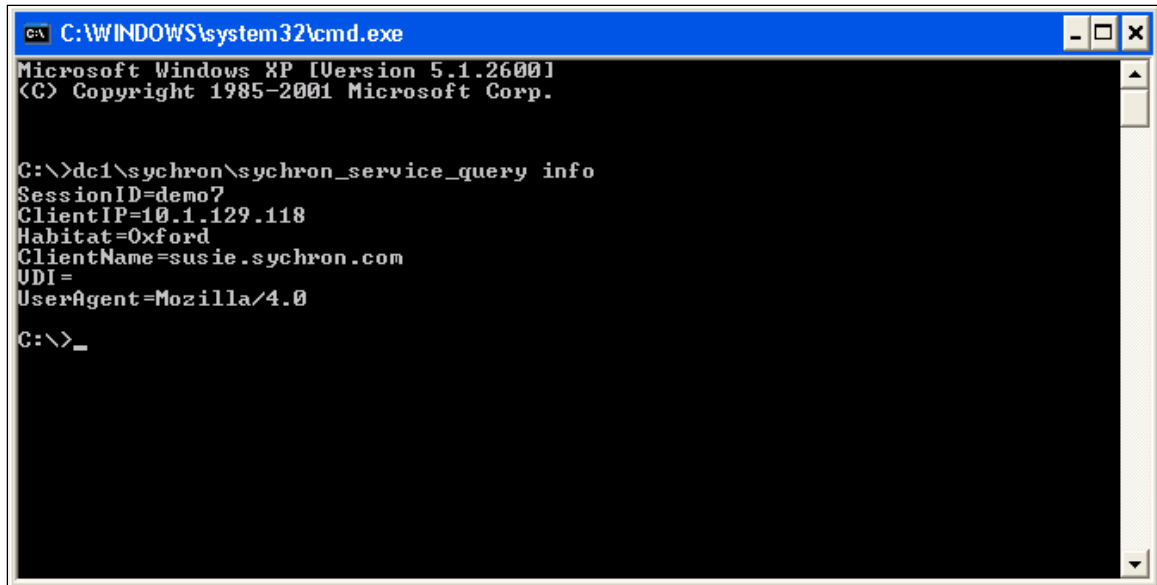


29. Click **Apply** and **OK**.
30. Exit the GPO Editor.
31. Exit Group Policy Management.

4.1.1.4 Accessing Client-Specific Information

Sychron provides a utility that can access client-specific information such as the session ID, the client IP address, the Habitat name, and the client name. You may wish to use this utility to enhance specific desktop environments, as these commands take place inside a VM.

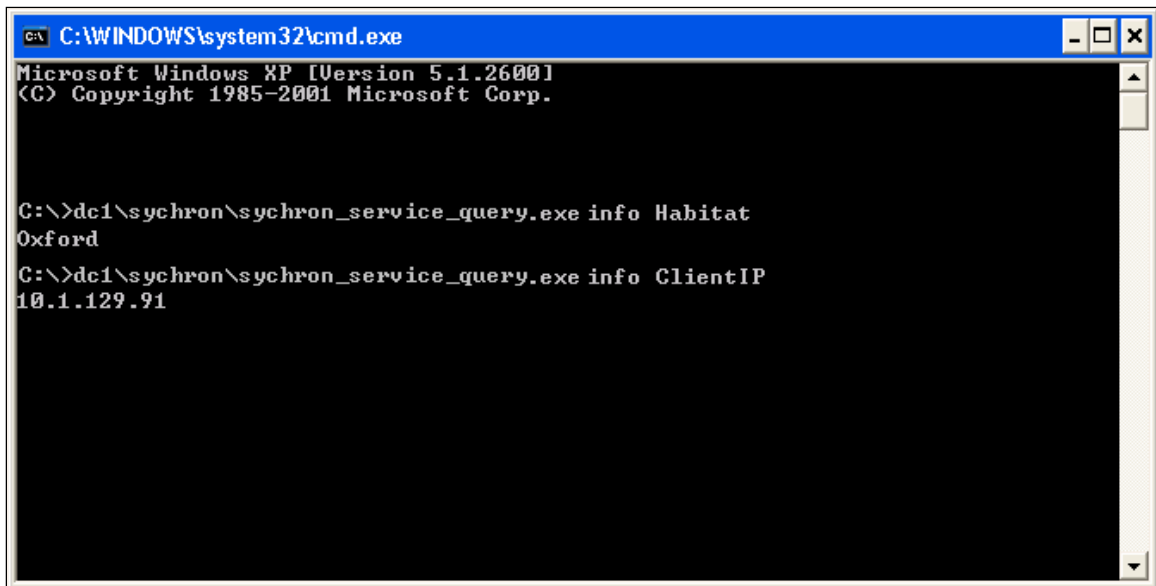
To access the entire list of this information, open a command prompt, and enter “\\dc1\Sychron Hyper-V\Sychron_service_query” info. (Note: The name of the domain controller for this example is dc1.)



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>dc1\synchron\synchron_service_query info
SessionID=demo7
ClientIP=10.1.129.118
Habitat=0xford
ClientName=susie.synchron.com
UDI=
UserAgent=Mozilla/4.0
C:\>_
```

Entering a specific parameter will return a value for that parameter alone. Note that parameter names are case-sensitive (SessionID, ClientIP, Habitat, ClientName).



```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>dc1\synchron\synchron_service_query.exe info Habitat
0xford
C:\>dc1\synchron\synchron_service_query.exe info ClientIP
10.1.129.91
```

4.1.2. OnDemand ADReporter

The OnDemand ADReporter tool is designed to provide the administrator with up-to-date information on the entries of the Organizational Units (OUs) associated with the Habitats in the clusters that a given Enterprise Manager (EM) manages.

Given an EM endpoint, the tool will interrogate the associated clusters to find the current list of Habitats and the desktops associated with these Habitats. The OU associated with a Habitat is also noted and is interrogated to determine the computer accounts currently listed. This data is cross-referenced to find valid OU entries and OU entries that might be stale.

4.1.2.1 Installation

Install the OnDemand ADReporter package onto a Windows XP or 2003/8 desktop. Typically, the package is installed on the same machine as the EM, but this does not have to be the case. The default installation folder is `c:\Program Files\Sychron\OnDemand ADReporter`.

4.1.2.2 Configuration

Running `ADReporter.exe` will access the configuration file `adrepoter.ini` by default. You can create this file in the same folder as the tool by copying or renaming the file `adreporter.ini.template`. You will need to edit this file to specify the EM endpoint:

```
Config.enterpriseManagerHostspec:std::string=my-em-server
```

By default, the tool will direct its output to the file `events.txt`. To change the name of this file, or to redirect to standard output if running on the command line, you will need to edit:

```
Config.eventTraceFilename:std::string=events.txt
```

Standard output is specified by replacing `events.txt` with `stdout`.

Alternatively, you may supply a number of command line options that take precedence over the configuration file:

```
/EM:<endpoint>
```

```
/output:filename
```

```
/config:filename
```

4.1.2.3 Interpreting the Results

The initial output contains a list of all the desktops across the clusters the EM manages. The information includes the name of the desktop, the server, and its current state.

```
SessionInfo{name: "recrea2089ea7c1", uuid: 4130739781605088409, server: hyperv03, state: available, sessionIP: RECREA2089EA7C1.qa.com, uptime: 98425558, username: , logonTime: 2009-07-10 09:00:56, lastActivityTime: 1969-12-31 18:00:00}
```

```
SessionInfo{name: "recrea200e37bcc", uuid: 4130747629955644776, server: hyperv03, state: available, sessionIP: RECREA200E37BCC.qa.com, uptime: 98418022, username: , logonTime: 2009-07-10 09:00:56, lastActivityTime: 1969-12-31 18:00:00}
```

A list of the “stale” entries in the OUs associated with the Habitat is then given. An OU entry is stale if the computer name corresponds to a currently defined Habitat, but that Habitat does not contain a desktop of that name.

Stale OU info:

```
--- Habitat:recreate

--- Domain:qa.com

--- LDAP:OU=Revolution,dc=qa,dc=com

name:recrea200f37bcc

    last logon:7/10/2009 8:44:10 AM

    last modified:7/10/2009 8:26:16 AM

name:recrea200f47bcc

    last logon:7/10/2009 8:48:02 AM

    last modified:7/10/2009 9:14:19 AM
```

Finally, a list is presented of “zombie” desktops. These are OU entries in which the computer name does not correspond to any currently defined Habitat.

```
Stale OU info (zombies):

--- Domain:chqa.com

--- LDAP:OU=Revolution,dc=qa,dc=com

name:test200a47bcc

    last logon:7/10/2009 8:44:10 AM

    last modified:7/10/2009 8:26:16 AM

name:test200a48bc1

    last logon:7/10/2009 8:33:02 AM

    last modified:7/10/2009 7:01:19 AM
```

4.1.2.4 Processing the Results

The results for stale (and zombie) OU entries begin with information on the domain (in this example, `qa.com`) and the LDAP entry, which contains the OU (*Revolution* in our case) and the domain controller (DC), which is `qa.com` here. This is followed by a list of the OU entries themselves, such as `recrea2089ea7c1`.

To delete a stale OU entry,

1. Log onto the DC as administrator.
2. From **Administrative Tools**, open **Active Directory Users and Computers**.
3. Click the name of the domain in question (`qa.com` here).

4. Find the given OU entry, and right-click it.
5. Select **Delete**.

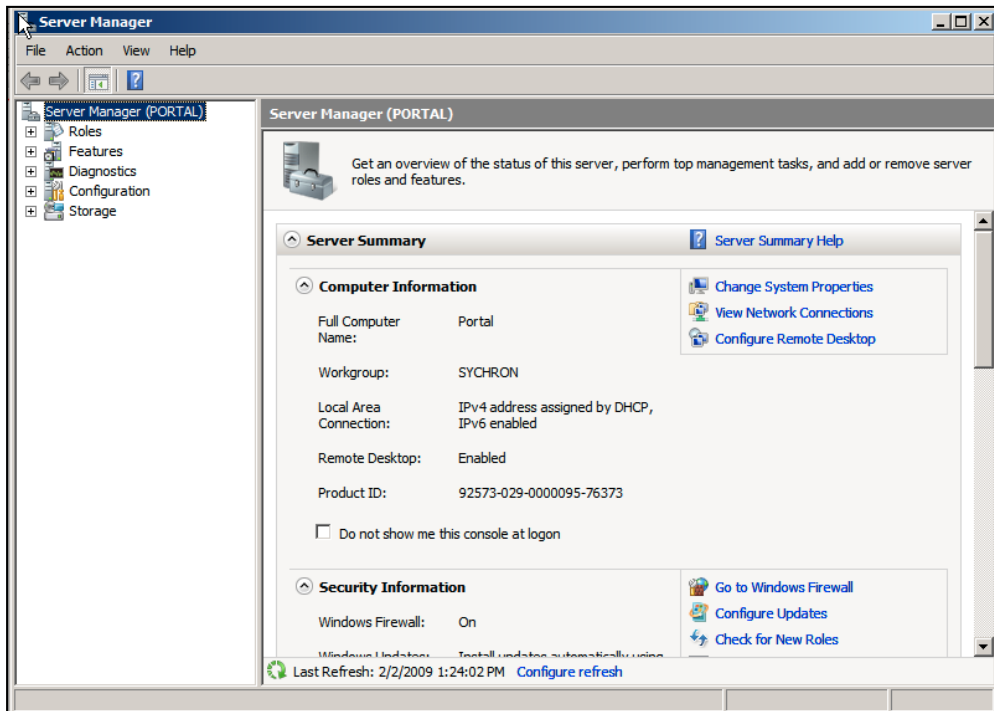
This will then remove the stale entry.

After removing a number of stale entries, you may re-run the ADReporter tool to check that the number of stale entries is reducing.

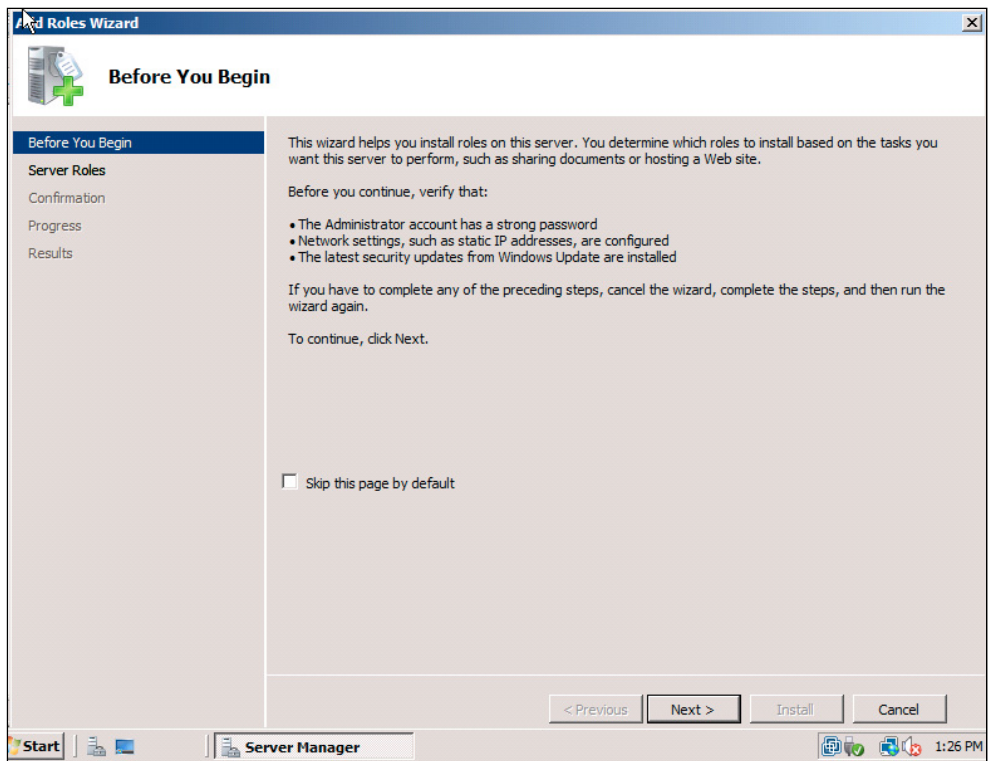
4.2. Tips on Managing Windows Components

4.2.1. Add the IIS Role to the OnDemand Portal – Windows 2008

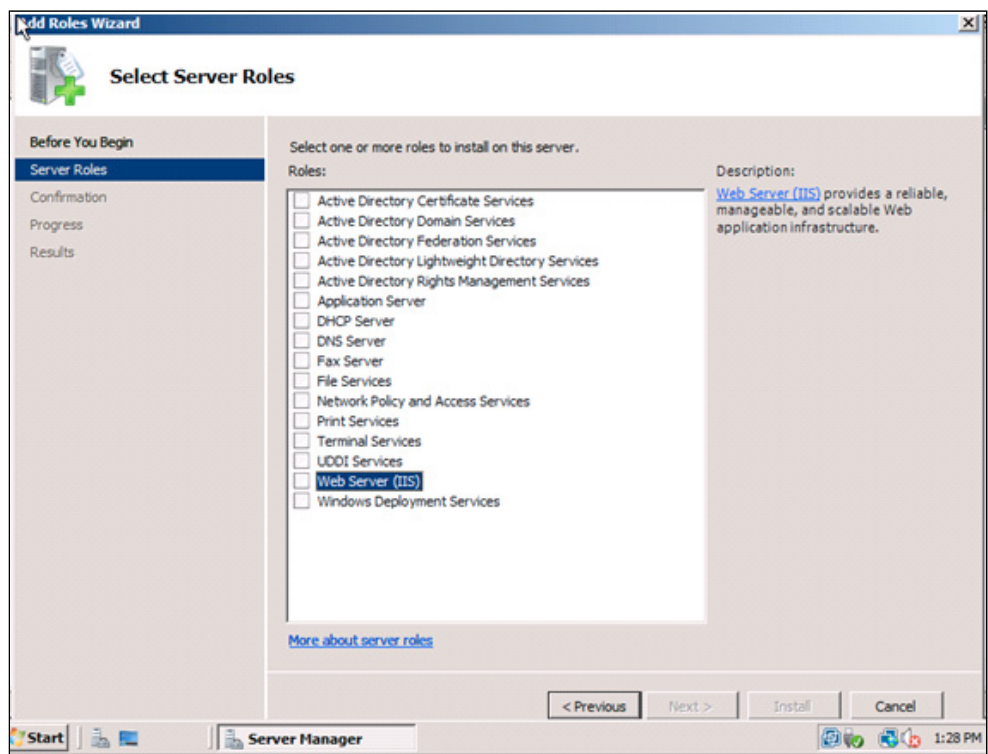
- Go to **Start→Run→Administrator Tools→Server Manager**.



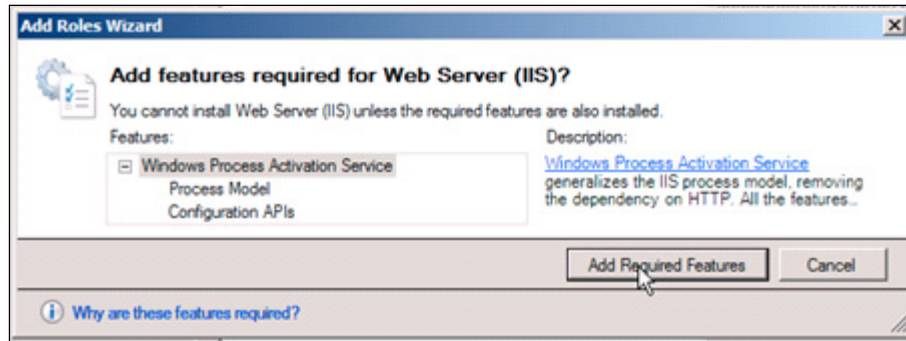
- Expand the **Roles** option, and select **Add Role**. This will launch the **Add Roles** wizard.



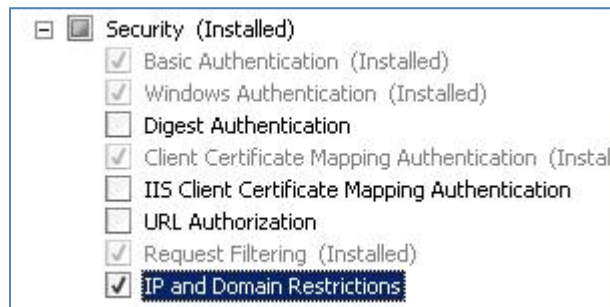
- Click **Next**, and Select the role **Web Server (IIS)**.



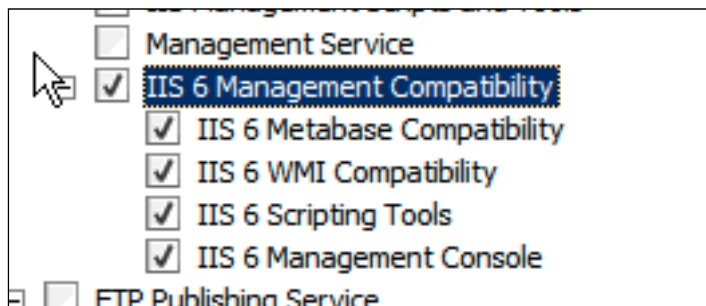
- Select **Add Required Features** and **Next**.



- On the sub-roles page, expand **Application Development**. Select **Application Development** and the roles under that heading.
- Expand **Security**, and check **IP and Domain Restrictions**.



- Scroll to **IIS 6 Management Compatibility**, and expand it. Select **IIS 6 Management Compatibility** and the roles under that heading.



- Click **Next** and **Install**. Your system may reboot.

4.2.2. Non-Admin Users Adding Machines to a Domain or Modifying Existing Machines

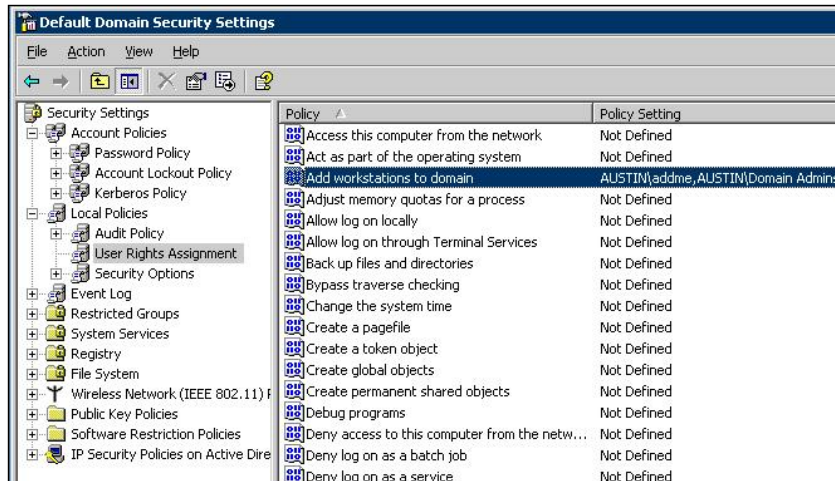
The system administrator must first create an account that has the right to add machines to the domain. After the account has this right, one can use this account to join machines to the Windows domain:

- The user account has to have privileges to join machines to the domain.

- The user account has to have full permissions to the AD container that stores machine accounts.

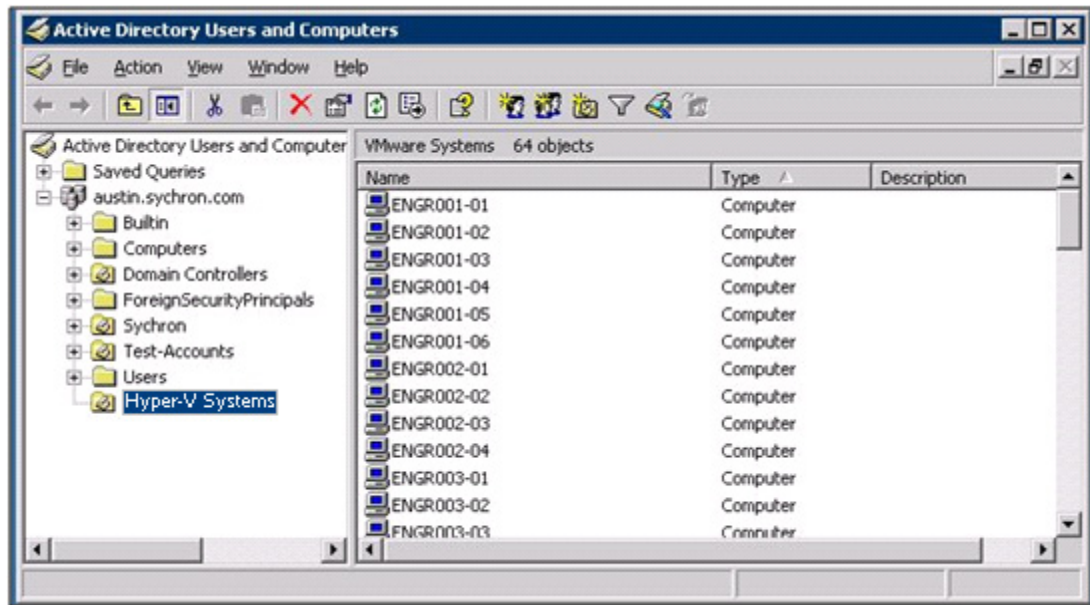
If the machine account does not exist, the user only needs the right to add machines to the domain.

In order for a user to add a new machine to the domain (“new” being that no machine account with the same name exists in the AD), that user must have the right to “Add workstations to domain.”



In the above example, the non-admin user called Add Me acquires the right to add a VM.

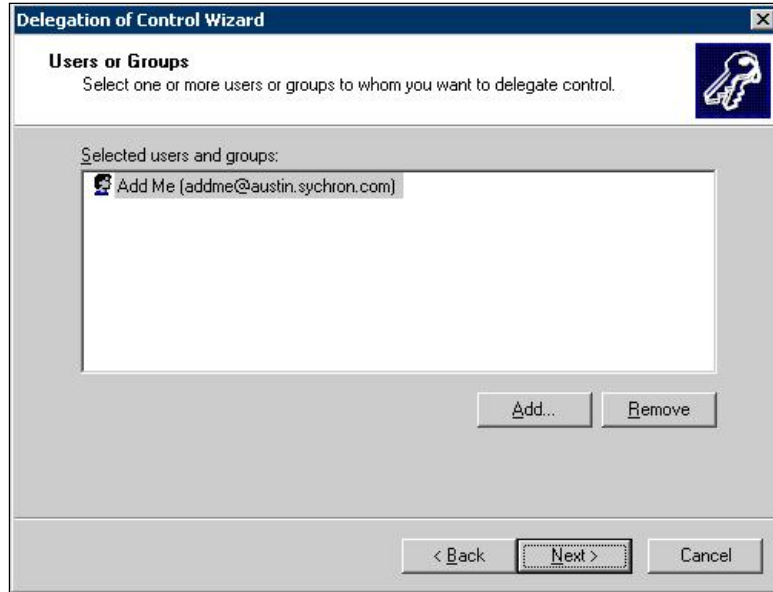
If the machine account already exists, the user needs rights to modify AD objects in the container that holds the machine account. The second time one invokes the Synchron software (creating a VM and joining it to the domain), the user must have proper AD container object rights. When a machine account already exists, a user has to have more rights in order to make modifications. The user (*Add Me*) must have control over the OU (name for the AD container) where the VM accounts exist. In this case, the name is **Hyper-V Systems**.



Right-click the name of the OU, and select **delegate control** from the popup menu. You will see the following screen:



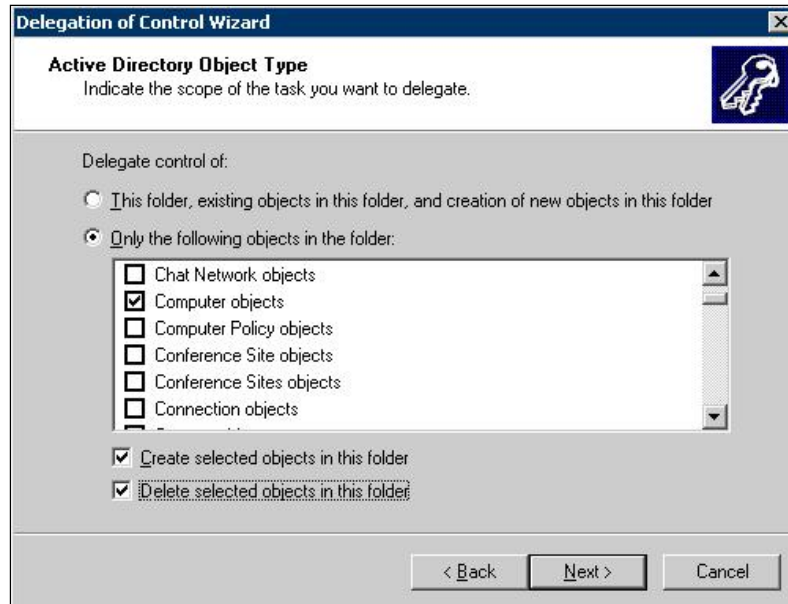
Click **Next**. Here is where you add the user to whom you wish to delegate control. *Add Me* is the user.



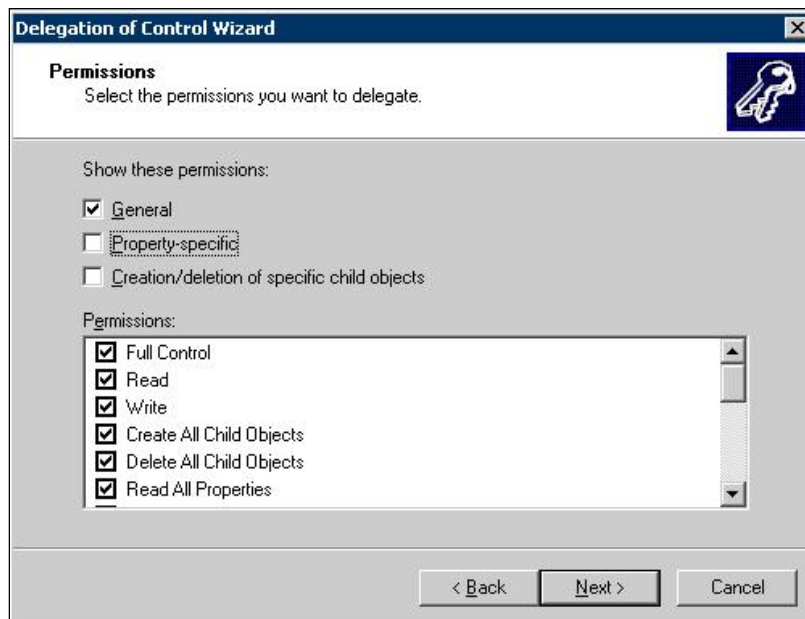
Click **Next**. On the next screen, select **Create a custom task to delegate**.



Click **Next**. On the next screen, click **Only the following objects in the folder**. Select **Computer objects**, and click **Create selected objects in this folder** and **Delete selected objects in this folder**.



Click **Next**. On the following screen, click **Full Control**.



Click **Next**. The confirmation screen shows that you have given the user *Add Me* full permissions to computer objects in the container.

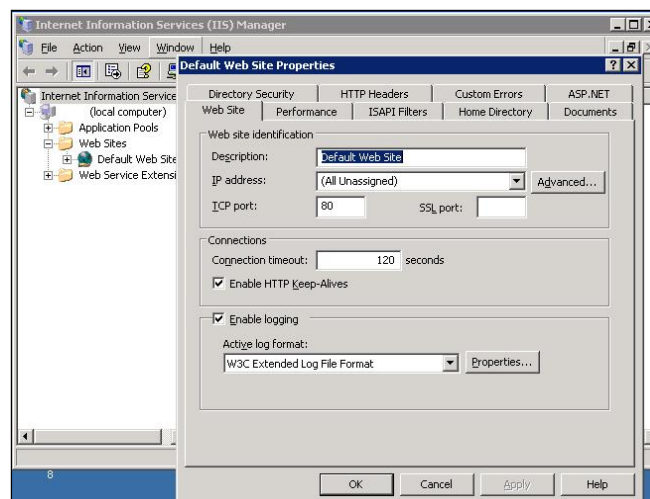


Click **Finish**.

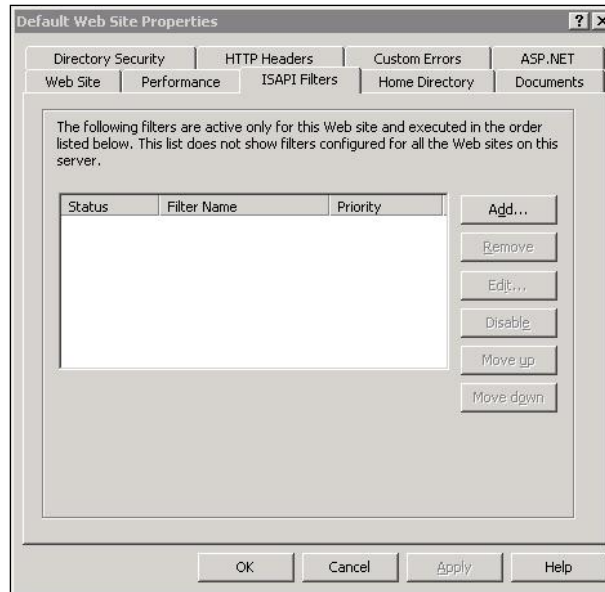
4.2.3. Configure the ISAPI Filter

4.2.3.1 Windows Server 2003 – Wyse thin clients only

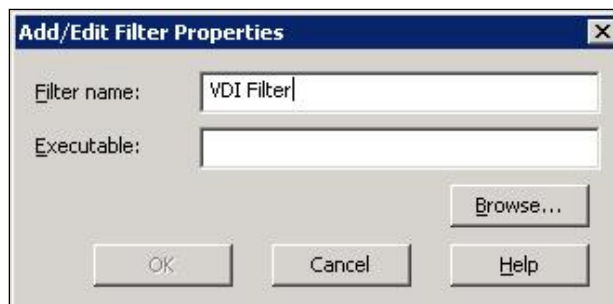
- From the IIS Manager, expand the node for the local computer.
- Expand the node for **Web Sites**.
- Right-click on **Default Web Site**, and choose **Properties**.



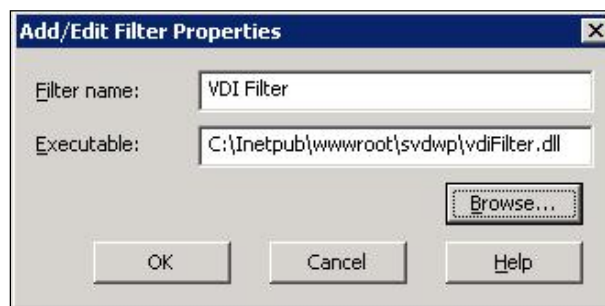
- Click on the **ISAPI Filters** tab, and choose **Add**.



- Enter **VDI Filter** in the **Filter Name** box.
- Click **Browse** to supply an executable.
- Browse to the location where you installed the Portal. (default = C:\inetpub\wwwroot\svdwp)

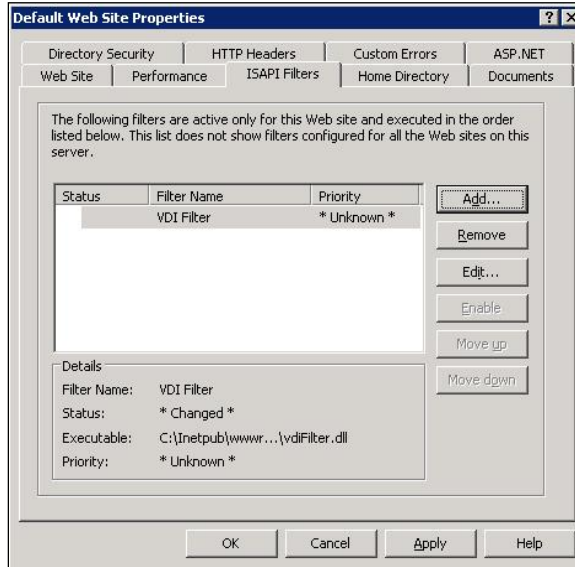


- Open **vdIFilter.dll**.

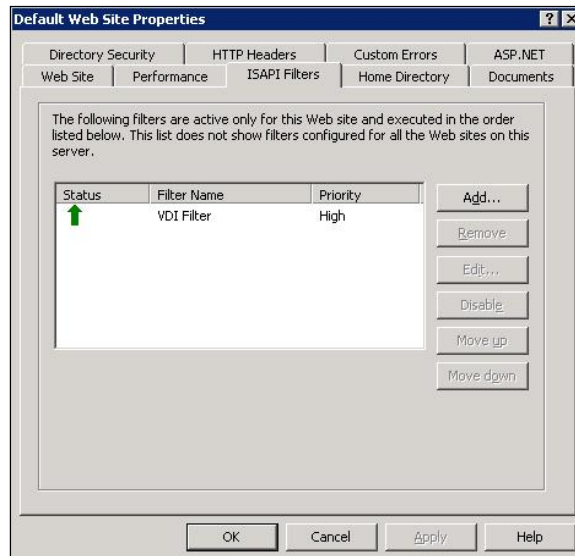


- Click **OK**.

- The priority will show as “*Unknown*.” Click **Apply** and then **OK**.



During operation, the status and priority will change.

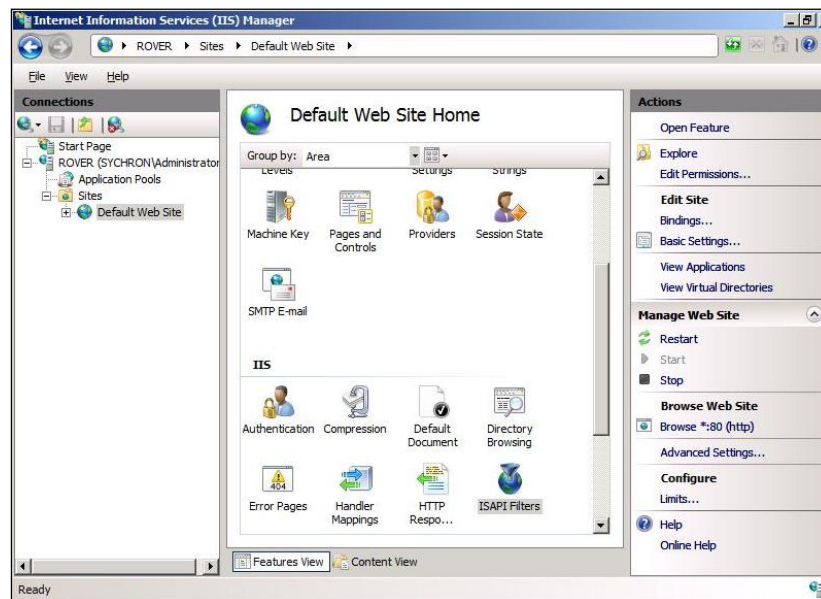


4.2.3.2 Windows Server 2008 – Wyse thin clients only

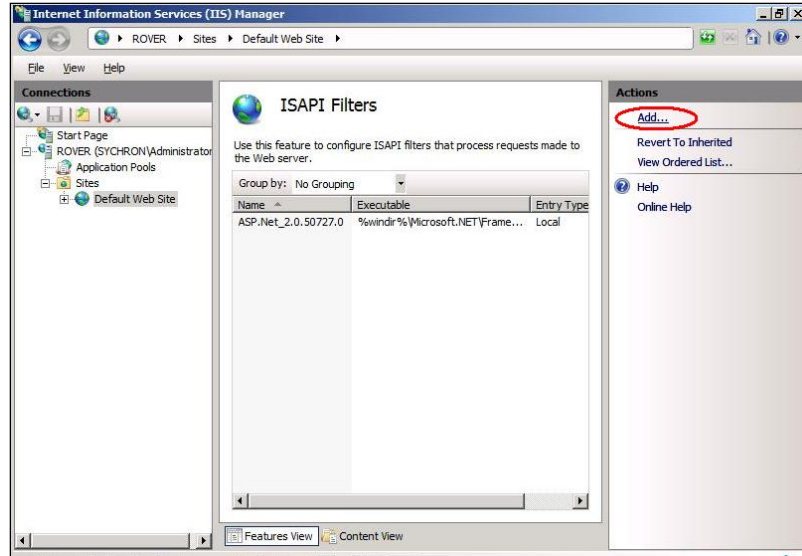
NOTE: If you are running a 64-bit, Windows 2008 operating system, you must reset the DefaultAppPool to allow 32-bit applications to run.

1. Open IIS Manager.
2. Expand the local server.
3. Click **Application Pools**.
4. Click **DefaultAppPool**, and choose **Set Application Pool Defaults** in the Actions area.
5. In the General section, set **Enable 32-Bit Applications to True**, and click **OK**.
6. Right-click **DefaultAppPool**, and select **Stop**.
7. Right-click **DefaultAppPool**, and select **Start**.

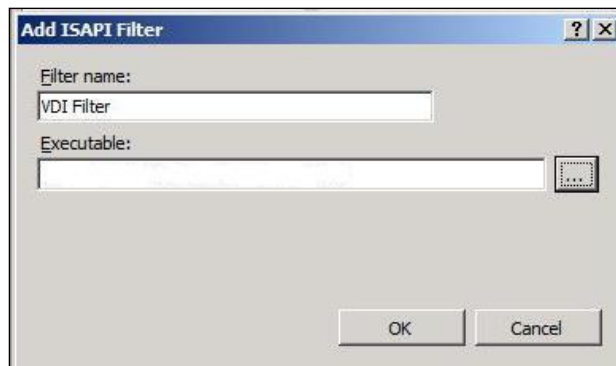
- From the IIS Manager, expand the node for the local computer.
- Expand the node for **Sites**.
- Select **Default Web Site**.
- Open **ISAPI Filters**.



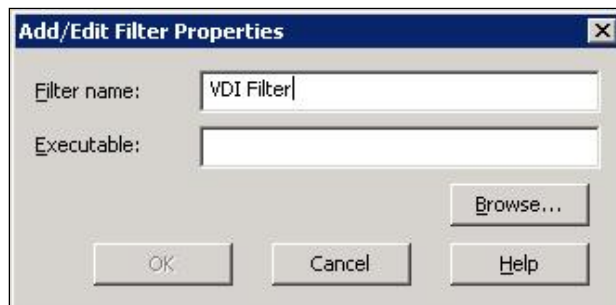
- Click **Add**.



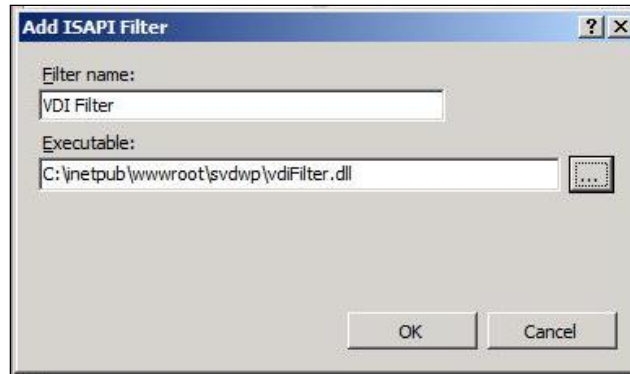
- Enter **VDI Filter** in the **Filter Name** box.



- Click **Browse** to supply an executable.
- Browse to the location where you installed the Portal. (default = C:\inetpub\wwwroot\svdwp)



- Open **vdifilter.dll**.



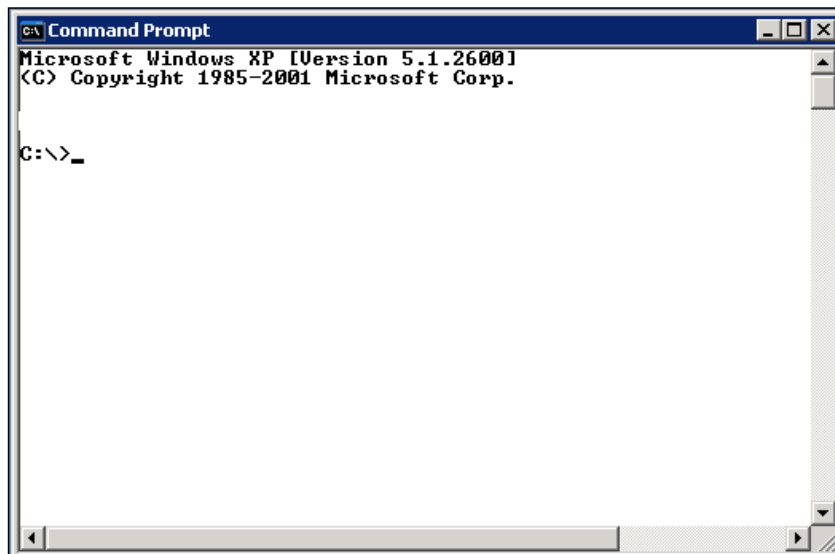
- Click **OK**.

4.2.4. Change How the ClientName Variable Presents Data

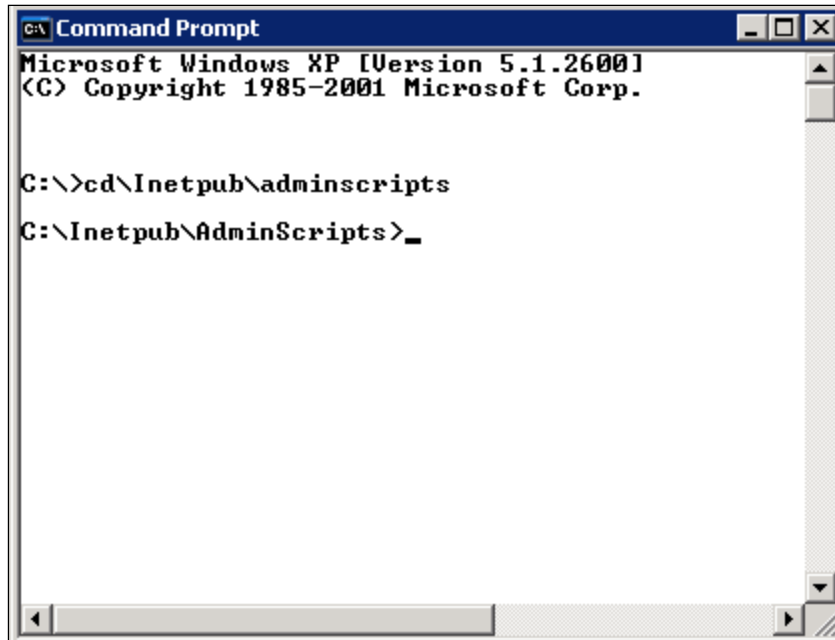
By default, the *ClientName* variable will show as a pure IP address. If you prefer to see real DNS names for *ClientName*, you will need to adjust a setting in IIS that runs your Portal(s).

In Windows Server 2003:

- Open a command prompt.



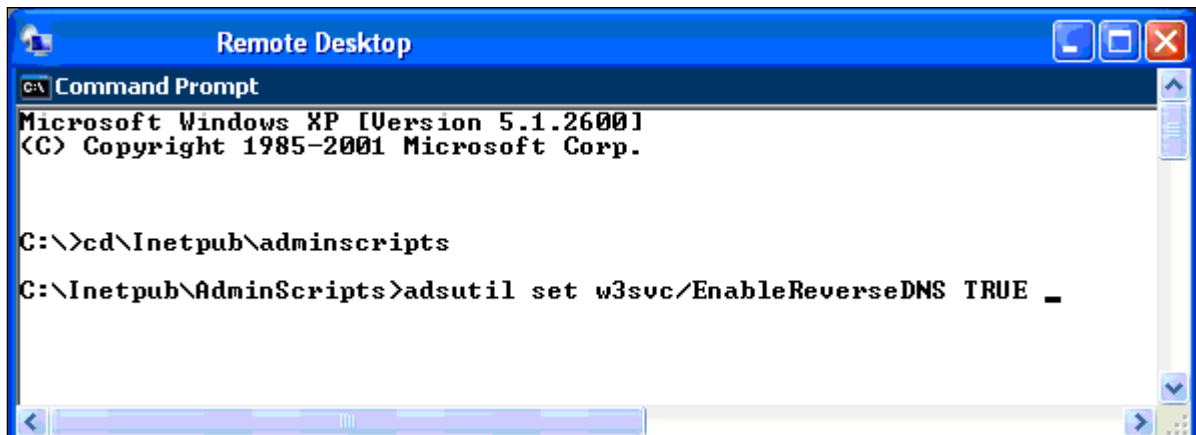
- Change the folder to `C:\>inetpub\AdminScripts`.



```
C:\> Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>cd\Inetpub\adminscripts
C:\Inetpub\AdminScripts>_
```

- Type `cscrip adutil.vbs set w3svc/EnableReverseDNS TRUE` and press **ENTER**.



```
Remote Desktop
C:\> Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\>cd\Inetpub\adminscripts
C:\Inetpub\AdminScripts>adsutil set w3svc/EnableReverseDNS TRUE _
```

In Windows 2008:

- Open Internet **Information Services (IIS) Manager**.
- Navigate to the *Server Name* in the Connections pane. If you only want to enable reverse lookups on a particular website, navigate to that website.
- Double-click **IPv4 Address and Domain Restrictions** in the center pane, and click **Edit Feature Settings** in the Actions pane.
- Check the box for **Enable domain name restrictions**. Click **OK**.

4.3. Configure the Portal in IIS

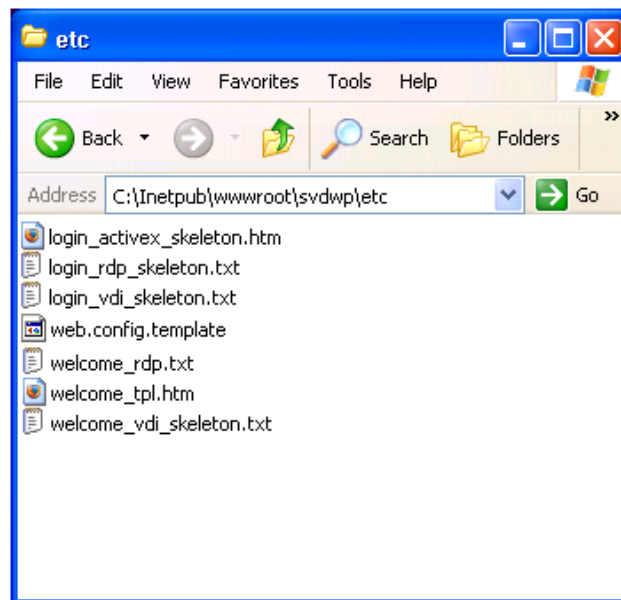
The OnDemand Portal uses a configuration file to store its configuration. The file `web.config` is located under the `svdwp` directory under the home directory of the Default Web Site. The file is in XML format and contains properties other than those of OnDemand Portal. The only properties that you should change are under the `<appSettings>` XML element. The properties are in XML format where each property is defined in an `<add>` element with `key` attribute having the value of the property's name and `value` attribute having the value of the property's value.

4.3.1. Configure IIS (Standard Web Browser Only)

****NOTE:** Whenever you perform a new installation of OnDemand Portal, you will have to customize your welcome page again. If you choose to customize any of the files in `etc`, create a folder called **Customer**, and save your work there. During a reinstall or upgrade, the **Customer** folder will remain intact.

If you are editing HTML for your welcome page at `C:\Inetpub\wwwroot\svdwp\etc` instead of an edit workspace, copy `welcome_tpl.htm` to a "safe" area to prevent permanent loss of code. Synchron recommends that you *not* edit directly at `C:\Inetpub\wwwroot\svdwp\etc`; editing in a safe area and copying the altered files into `C:\Inetpub\wwwroot\svdwp\customer` is the secure and recommended way to edit these files.

- To customize the default welcome page files, right-click `svdwp` from the IIS Manager, and choose **Explore**.
- Open the `etc` folder.



FILE	FUNCTION
login_activex_skeleton.htm	<p>builds the web page that returns after successful assignment of a VM from the Portal; includes ActiveX controls that define the RDP connection (where one defines TS Gateway settings); only applies when a user logs in from a Portal web page</p> <p>NOTE: The ONLY code you can edit is that between <code>//----- BEGIN</code> <code>[TYPICAL] CUSTOMER CUSTOMIZED CODE -----</code> <code>----- and //----- END</code> <code>OF [TYPICAL] CUSTOMER CUSTOMIZED CODE -----</code></p>
login_rdp_skeleton.txt	<p>the template that you will use to build a .rdp file when you use the OnDemand Desktop Client to connect to the Portal; in standard .rdp format; you can modify to change .rdp client behavior; uses standard RDP parameters</p>
login_vdi_skeleton.txt	<p>the template you will use to build an RDP session when using WTOS to connect to the Portal; in WTOS format; you can modify to change WTOS client behavior; see Wyse documentation for more information</p>
web.config.template	<p>the template on which active web.config is built</p>
welcome_rdp.txt	<p>defines dropdowns, text, and images for the logon screen for the OnDemand Desktop Client</p>
welcome_tpl.htm	<p>used with welcome_rdp.txt to provide a web page structure; customizable to your environment – gives your Portal the look and feel of your choice</p>
welcome_vdi_skeleton.txt	<p>defines dropdowns, text, and images for the logon screen for WTOS clients; see Wyse documentation for more information</p>

- Copy the file called `welcome_tpl.htm` into a workspace in which you can edit files.
- Edit `welcome_tpl.htm` to modify your welcome page.
- Be sure to leave in the HTML for the Synchron logo. Do not delete the strings `$$HABITATS$$` or `$$ERROR$$`, as these are necessary to populate the dropdowns on the welcome page with the actual data for these values.

- After you have edited the HTML code, copy `welcome_tpl.htm` and `welcome_tpl_files` back to `C:\Inetpub\wwwroot\svdwp\customer`.
- Restart the Portal.

4.4. Portal Properties

debugLogLevel

This property controls whether the system will capture debugging messages.

Example: `<add key="debugLogLevel" value="true" />`

debugMaxLogFile

This property sets the maximum number of debug messages the system should capture. When the list is full, old messages drop off the list to make room for the new messages.

Example: `<add key="debugMaxLogFile" value="5000" />`

metricsWallclockView

This property controls the duration of the time window for the graphs in the metrics page. In this example, the window will be two hours (7200 seconds).

Example: `<add key="metricsWallclockView" value="7200" />`

portal.callback-url

This property specifies a prefix of the URL that the Synchron Policy Agent uses to communicate with the Synchron Portal. If you install the Application Server on a host server that has multiple network cards, you should use the URL to distinguish an IP address or hostname that is visible from all the servers in the cluster. For this example, the URL of the Synchron Portal is `http://10.1.1.32/svdwp/Callback.aspx`. This property is optional unless the DNS name of the server running IIS is **not** the name that the Synchron service should contact.

Example: `<add key="portal.callback-url" value="http://10.1.1.32/svdwp/Callback.aspx" />`

portal.log-level

This property specifies the level of logging the Portal is performing. The value can be 0 for no logging or 1 for all logging. For this example, the Portal is logging activity at Level 1.

Example: `<add key="portal.log-level" value="1" />`

portal.request-timeout

This property specifies the number of seconds that the Sychron Portal should wait for a reply from the Controller. If the Sychron Portal does not receive a reply in this time interval, the request times out, and an error goes back to the user. For this example, the time the Portal will wait for a reply from the Controller before delivering an error to the user is sixty seconds.

Example: `<add key="portal.request-timeout" value="60" />`

StandardScorers:LRU

The LRU algorithm, perhaps the simplest policy, merely orders the list of clusters by the time that a login was last made to that cluster. In this way, logins are distributed to clusters that have been "least recently used."

Example: `<add key="portal.scheduler" value="StandardScorers:LRU" />`

StandardScorers:Pack

The Pack algorithm orders the list of clusters according to the current load. The algorithm is:

$$\text{score} = \text{tacticalSessions} \times 100 / \text{max SessionsAllowable}$$

tacticalSessions is the number of sessions in use on this cluster for the requested Habitat.
maxSessionsAllowable is the maximum number of sessions for this Habitat that are allowable on this cluster at this time.

The result of scoring each cluster is a list which is then sorted in descending order. This results in clusters with higher loads being used first. Thus, logins will be packed into clusters.

Example: `<add key="portal.scheduler" value="StandardScorers:Pack" />`

StandardScorers:Stripe

The Stripe algorithm orders the list of clusters according to the current load. The algorithm is:

$$\text{score} = \text{tacticalSessions} \times 100 / \text{max SessionsAllowable}$$

tacticalSessions is the number of sessions in use on this cluster for the requested Habitat.
maxSessionsAllowable is the maximum number of sessions for this Habitat that are allowable on this cluster at this time.

The result of scoring each cluster is a list which is then sorted in ascending order. This results in clusters with lower loads being used first. Thus, logins will be spread across clusters.

Example: `<add key="portal.scheduler" value="StandardScorers:Stripe" />`

StandardScorers:Weighted

The Weighted algorithm is the most sophisticated of the standard scorers. It dynamically applies a scoring algorithm to each of the clusters and orders the clusters according to their scores.

The scoring algorithm computes a weighted average for a set of attributes for each cluster. The attributes are:

1. **network:latency** – a score of 0-100 of the latency from this Portal to the cluster

Example: `<add key="scoring.weights.network:latency" value="x" />`

2. **network:speed** – a score of 0-100 of the useful bandwidth between this Portal and the cluster; higher speeds are scored lower

Example: `<add key="scoring.weights.network:speed" value="x" />`

3. **connection:cost** – a cost of 0-100 for using a connection to this cluster

Example: `<add key="scoring.weights.connection:cost" value="x" />`

4. **load:percentage** – the current load percentage of sessions for the requested Habitat on this cluster

Example: `<add key="scoring.weights.load:percentage" value="x" />`

5. **logins:last** – a score of 0-100 to indicate how long ago this cluster was used for a login

Example: `<add key="scoring.weights.logins:last" value="x" />`

6. **client:clusterProximity** – a score of 0-100 to indicate how “close” this client is to this cluster. Client to cluster proximity is computed based upon maps of subnets, MAC addresses or DNS names.

Example: `<add key="scoring.weights.client:clusterProximity" value="x" />`

Each cluster has a set of these attributes. Their values may be static or dynamically computed. Each Portal will likely have different values for each attribute of each cluster. This allows for an extremely flexible scoring system which is Portal-dependent. For instance, the cost of a connection from users of Portal-A to Cluster-X may be more than the cost of a connection for users of Portal-A to Cluster-Y.

Each Portal can also define a set of weights to apply to each attribute during the selection phase.

The pseudo-code for the weighted scorer is:

```

for each of the clusters

set finalScore = 0

for each of the scoring attributes

    compute the weighted score for this attribute = score x weight

    finalScore = finalScore + weighted score

set this cluster's final score = final score / number attributes scored

Sort the list of clusters in descending order of final score

```

Example: `<add key="portal.scheduler" value="StandardScorers:Weighted" />`

portal.templatePaths

This property directs the Portal to look for any template files that might have changed and use them instead of the default files that go with any standard installation. The administrator's ability to specify a search path for template files allows customers to maintain their own custom HTML, VDI, and RDP templates separately from the standard settings. This option goes into your `web.config` file. Specify paths to find template files, use colons to separate path names, and always leave `:etc` at the end of the string in order to use Synchron defaults.

Example: `<add key="portal.templatePaths" value="customer:etc" />`

4.5. Cluster Properties

cluster.cluster-name.server.index

This set of properties specifies the server names (or IP addresses) between which the Portal will load balance requests. Each server will be running a Synchron Policy Agent; if a Synchron Policy Agent is not available on the specified server, the Portal will forward the request to another of the specified servers. The attribute `<index>` is a unique number that distinguishes servers in the same cluster. Specify a separate property for each server that is running a Synchron Policy Agent. You can specify multiple clusters. The following example shows two clusters, **A** and **B**. The unique designations for the servers in Cluster A are **1**, **2**, and **3**. The names of the servers in Cluster A are **NodeX**, **NodeY**, and **sychron1.sychron.com**. Cluster B shows one server with a designation of **1** that is named **NodeZ**.

Example: `<add key="cluster.A.server.1" value="NodeX" />`
 `<add key="cluster.A.server.2" value="NodeY" />`
 `<add key="cluster.B.server.1" value="NodeZ" />`

```
<add key="cluster.A.server.3" value="sychron1.sychron.com" />
```

cluster.cluster-name.state

This setting allows administrators to let a cluster remain active but prevent users from logging into that cluster. This smoothly removes clusters from service as the user load eventually drops to zero. At `disabled`, this setting does not affect reconnects but does not allow new logins. `Enabled` restores the ability of the cluster to accept new logins.

Example: `<add key="cluster.A.state" value="enabled" />`

4.6. Information about Ethernet MAC Addresses

OnDemand allocates an address from the Ethernet MAC address range to each VM it creates and manages. The address range must be unique within the subnet, unique with respect to other cluster ranges similarly defined or network device addresses.

Tip:

Unless you have an IEEE-registered Organizationally Unique Identifier (OUI), Sychron recommends that you use a local address --- the second least significant bit (bit 1, starting from 0) in the first octet is 1, for example, `02:00:00:00:00:00 - 02:00:00:0F:FF:FF` is locally valid range. You still have to guarantee that no one else on your subnet uses the range, but no manufacturer assigned address (all hardware devices) will have that bit set, which guarantees no clashes with them. Note that the least significant bit (bit 0) in the first octet must be 0 (meaning unicast) for addresses in the range.

Limitations:

1. In ESX, OnDemand uses only the 22 least significant bits. ESX presets the 26 most significant bits. Sychron recommends for ESX-only clusters that you set the range to be a subrange of `00:50:56:00:00:00 - 00:50:56:3F:FF:FF` to avoid confusion. For clusters with both Hyper-V and ESX servers, Hyper-V VMs will use addresses from the original range, and ESX VMs will use addresses from `00:50:56:XX:XX:XX` range, where `XX:XX:XX` is taken from octets 4-6 from the specified range and the most significant bit reset to 0.
2. Sychron does not check that the specified range does not include multicast addresses. If you specify a range that includes multicast addresses, various errors may occur.

4.7. Pre-Installation Questionnaire

See the next page for the questionnaire.

Pre-Installation Questionnaire

EM

- Server Name _____
- IP _____
- Chosen Port (Default 3724) _____
- OS Version and SP _____

Controller

- Server Name _____
- IP _____
- Chosen Port (Default 3723) _____
- OS Version and SP _____

Portal

- Server Name _____
- IP _____
- OS Version and SP _____

Server (Hypervisor or TS/RD)

- Server Name _____
- IP _____
- OS Version and SP _____
- Hypervisor Network Name _____

Habitat

- Habitat Name _____
- Windows Domain Name _____
- OU for Computer Accounts (Full path in LDAP Distinguished Name format)

- Domain User Account with permissions to create computers in OU

- Gold Image path _____
- Datastore path _____

Cluster

- Cluster Name (only letters, numbers '_' and '-') _____
- Controller(s) that will manage cluster _____
- Habitat(s) _____
- Servers (Hypervisor or TS/RD of like type) _____

Portal Dropdown

- Dropdown Name _____
- Associated Habitat _____
- Domain User Account with permission to query user information to verify group membership