EMC Plugins for VMware vSphere

Overview

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If you are not already aware, the EMC storage Plugin for VMware vSphere are free to download for all EMC customers off Powerlink. The plugins allow you to view all the characteristics of your virtual machine storage (NFS and VMFS) right from within your vSphere Client for vCenter. Optionally, based on how you configure your storage, you can also provision new datastores (again, NFS and VMFS) right from within vCenter.

If you have a Clariion, Celerra, or a VNX, and that's all, you can probably get away with just the ***Unified Storage Plugin***. This plugin allows the VMware administrator to view the characteristics of his Virtual Machine storage, and optionally provision both block and file storage to the VMware cluster(s). Furthermore, it can integrate with VMware View Manager to automatically populate the View implementation with array-based snapshot virtual machines for fast creation of desktop pools. This technology doesn't leverage the VMware View linked clone feature, however.

If you are integrating with more than one array, or you are using EMC PowerPath Virtual Edition (PPVE), or you are integrating with an EMC VMAX array, you should probably choose the ***Virtual Storage Integrator (VSI) plugins***. There are, in fact, several Virtual Storage Integrator Plugins:

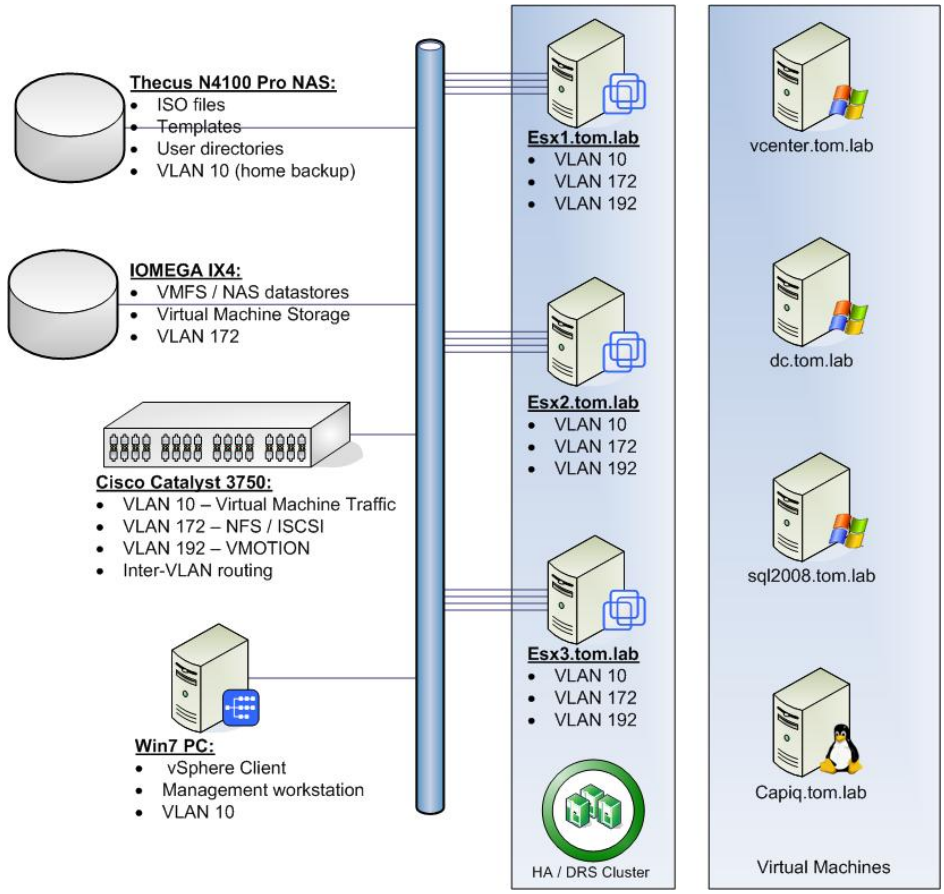
- Storage Viewer; allows for simply viewing the characteristics of the underlying storage for the VMware farm.
- Unified Storage Management; allows for viewing a provisioning of storage to a Celerra.
- Storage Pool Management; allows for viewing and provisioning from a storage pool on a VMAX.
- Symmetrix SRA Utilities; implements additional features for Symmetrix and VMware Site Recovery Manager, such as failback capabilities.
- Path Management; allows viewing and management of PPVE path claiming and ownership.

Why is this important? ***Reduced time to resolution***. Without unifying management tools, virtualization throws a monkey wrench into the process of provisioning across management domains and troubleshooting issues. The EMC storage plugins for vSphere are one way to help you gain transparency into your infrastructure.

Overview of Test Environment

This is a quick overview of the environment everything in this document was tested / installed on. The problem, of course, is that VMware really can't be felt or completely understood unless you are in a multi-host environment. The lab used for this document consists of (3) ESX 4.1 vSphere Hosts, (1) Cisco Catalyst 3750 switch, and 2 desktop-class 4-disk network storage devices.

Logical View of Lab and Equipment List



The lab runs set of three systems with 2 NAS boxes to use as an ESX cluster running vSphere 4.1. The complete gear list is below – each system is built as follows:

· Western Digital Caviar Black WD1001FALS 1TB 7200 RPM SATA 3.0Gb/s 3.5â€³ Internal Hard Drive

· Crucial 16GB (4 x 4GB) 240-Pin DDR3 SDRAM DDR3 1333 (PC3 10600) Desktop Memory

· AMD Phenom II X4 965 Black Edition Deneb 3.4GHz Socket AM3 125W Quad-Core Processor

· Diablotek PHD Series PHD750 750W ATX12V / EPS12V Power Supply

· SAPPHIRE 100293L Radeon HD 5570 1GB 128-bit DDR3 PCI Express 2.1 x16 HDCP Ready Video Card

· MSI 790FX-GD70 AM3 AMD 790FX ATX AMD Motherboard

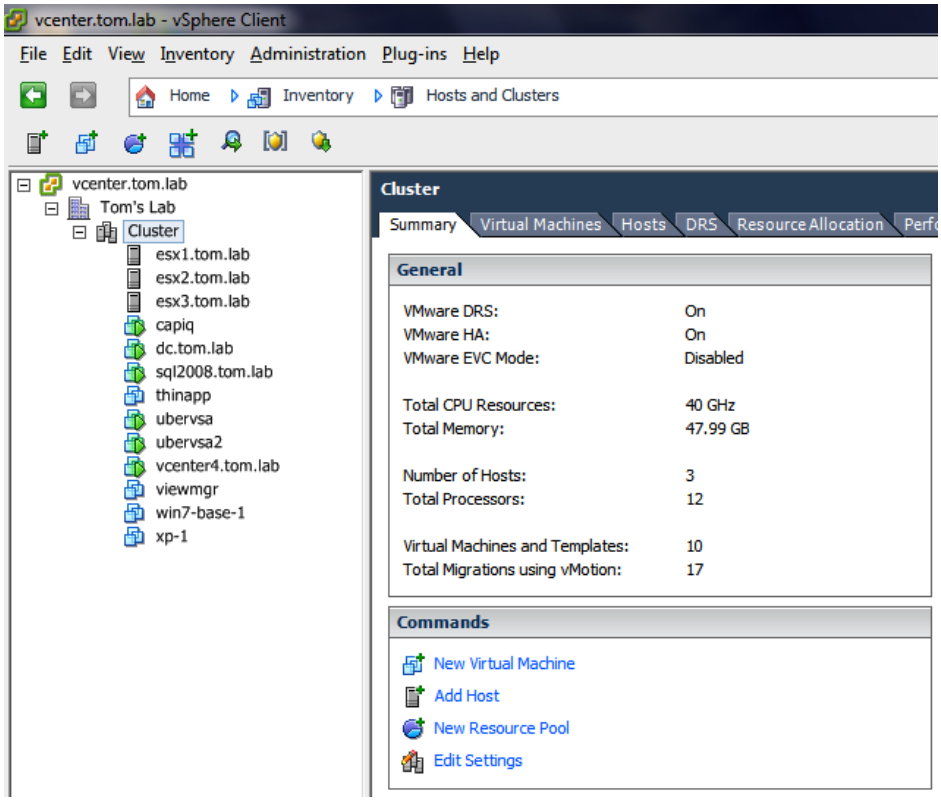
· Antec Nine Hundred Black Steel ATX Mid Tower Computer Case

· 2x IntelPro 1000 PT dual-port GbE NIC

In addition to the 3 ESX Servers, the following were used for storage and connectivity:

- Thecus N4100 Pro NAS (purchased a while ago)
- IOMEGA IX4 StorCenter
- Cisco Catalyst 3750 ethernet switch

vSphere Cluster Properties



Above, we see the three ESX servers have been configured in a VMware High Availability Cluster with DRS enabled to automatically apply Priority 1-4 recommendations. Other than the Windows PC used to manage the environment and the ESX servers themselves, all workloads were run as virtual machines. This includes VMware vCenter, as well as the Windows Active Directory Domain Controller, and the Microsoft SQL2008 server used for database connectivity.

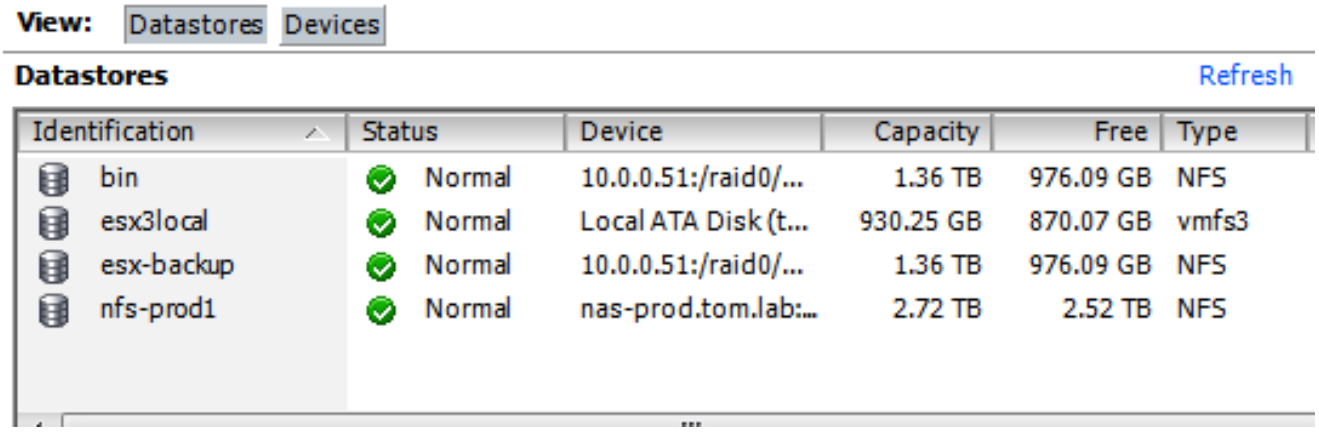
Example Virtual Switch Configuration

Each of the four (4) NIC ports on the ESX servers is dedicated to a separate VLAN:
vSwitch0 - VLAN 10 (native VLAN); virtual machine traffic and Service Console
vSwitch1 - VLAN 172 (storage_net); 'production' iSCSI and NFS datastore connectivity
vSwitch2 - VLAN 10 (native VLAN); NFS & CIFS traffic to ISO / templates / User directories and virtual storage appliances (UBERCelerra VSA)
vSwitch3 - VLAN 192 (vmotion); vmotion dedicated

IP Addressing scheme

hostname	Service	IP Address	storage_ne	storage_net_lab	vmotion
netgear	Wifi Router	10.0.0.1			
switch	switch	10.0.0.2	172.16.1.254		192.168.1.2
dc	Directory Svc., DNS	10.0.0.200	172.16.1.20		
esx1	hypervisor	10.0.0.201, 204	172.16.1.101	10.0.0.101	192.168.1.101
esx2	hypervisor	10.0.0.202, 205	172.16.1.102	10.0.0.102	192.168.1.102
esx3	hypervisor	10.0.0.203, 206	172.16.1.103	10.0.0.103	192.168.1.103
vcenter.tom.lal	Virtual Center / Composer	10.0.0.210			
sql2008.tom.lal	microsoft sql	10.0.0.211			
view-mgr	View Manager	10.0.0.212			
celerra-vsa1	EMC Celerra Simulator	10.0.0.222		10.0.0.111, 114	
celerra-vsa2	EMC Celerra Simulator	10.0.0.223		10.0.0.112, 115	
celerra-vsa3	EMC Celerra Simulator	10.0.0.224		10.0.0.113, 116	
homenas	NFS / CIFS / FTP	10.0.0.51			
nas-prod	NFS / CIFS / FTP	10.0.0.52			

Storage Volume Layout



bin - NFS datastore mounted from a 4-disk Thecus NS4100Pro; used for ISO files and installation binaries

esx?local - local VMFS on each ESX server, served from internal 1 TB SATA

esx-backup - NFS datastore mounted from a 4-disk Thecus NS4100Pro; used for backups, templates, and disk images (flp, etc)

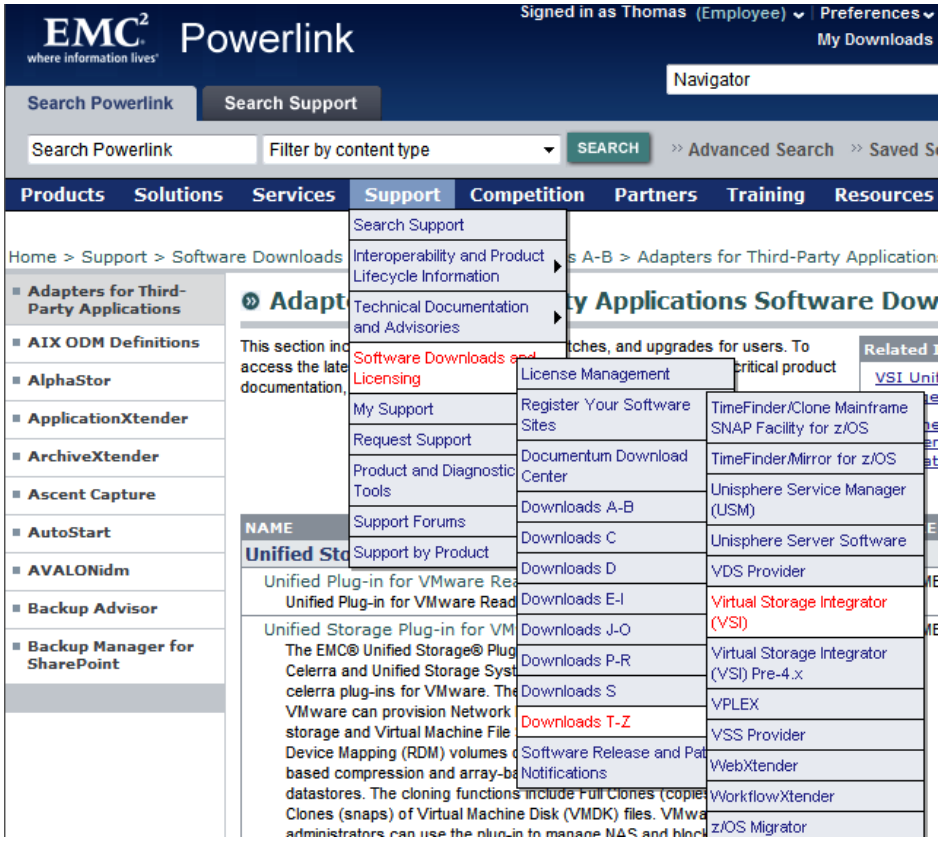
nfs-prod1 - NFS datastore mounted from a 4-disk IOMEGA IX4; used for production virtual machine disk files (VMDK)

Installation of the VSI Plugins

Downloading the Virtual Storage Integrator Plugins

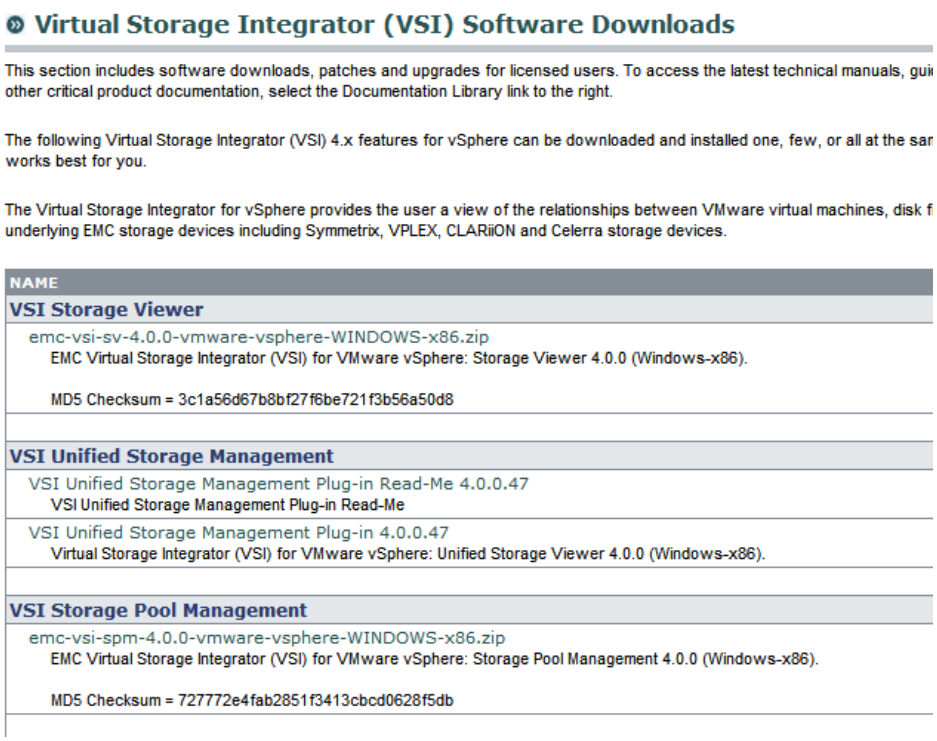
This section shows you where to find the pluins, as well as a description from the release notes for each, describing each pluin's functionality.

Log in to PowerLink



Go to Home > Support > Software Downloads and Licensing > Downloads T-Z > Virtual Storage Integrator (VSI)

Click the Link to Download the Desired VSI Plugin



Virtual Storage Integrator (VSI) Software Downloads

This section includes software downloads, patches and upgrades for licensed users. To access the latest technical manuals, gui
other critical product documentation, select the Documentation Library link to the right.

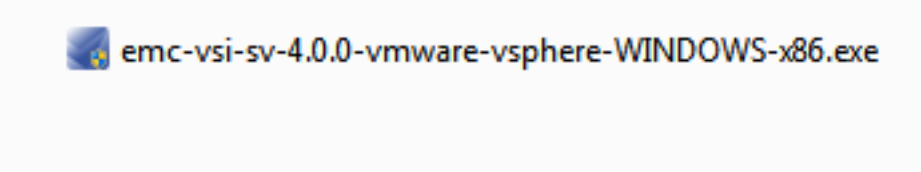
The following Virtual Storage Integrator (VSI) 4.x features for vSphere can be downloaded and installed one, few, or all at the sar
works best for you.

The Virtual Storage Integrator for vSphere provides the user a view of the relationships between VMware virtual machines, disk f
underlying EMC storage devices including Symmetrix, VPLEX, CLARiiON and Celerra storage devices.

NAME
VSI Storage Viewer
emc-vsi-sv-4.0.0-vmware-vsphere-WINDOWS-x86.zip EMC Virtual Storage Integrator (VSI) for VMware vSphere: Storage Viewer 4.0.0 (Windows-x86). MD5 Checksum = 3c1a56d67b8bf27f6be721f3b56a50d8
VSI Unified Storage Management
VSI Unified Storage Management Plug-in Read-Me 4.0.0.47 VSI Unified Storage Management Plug-in Read-Me
VSI Unified Storage Management Plug-in 4.0.0.47 Virtual Storage Integrator (VSI) for VMware vSphere: Unified Storage Viewer 4.0.0 (Windows-x86).
VSI Storage Pool Management
emc-vsi-spm-4.0.0-vmware-vsphere-WINDOWS-x86.zip EMC Virtual Storage Integrator (VSI) for VMware vSphere: Storage Pool Management 4.0.0 (Windows-x86). MD5 Checksum = 727772e4fab2851f3413cbcd0628f5db

Save and extract the files to a location of your choosing on your network / computer.

Description of the EMC VSI (Virtual Storage Integrator) for VMWare vSphere



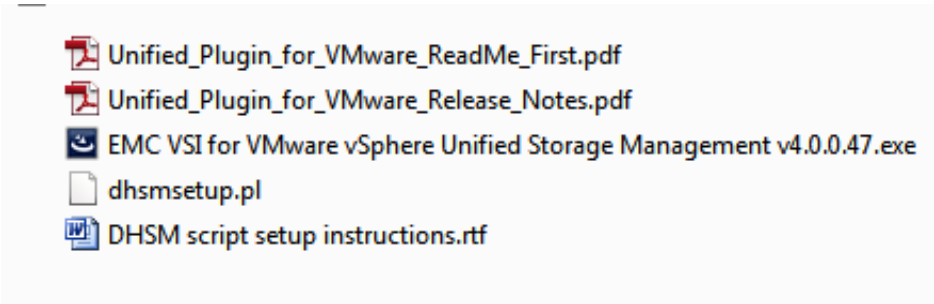
EMC Virtual Storage Integrator (VSI) for VMware vSphere version 4.0 is a plug-in to VMware vCenter that provides a single management interface used for managing EMC storage within the vSphere environment. Features can be added and removed from VSI independently, providing flexibility for customizing VSI user environments. Features are managed using the VSI Feature Manager. VSI provides a unified user experience, allowing each of the features to be updated independently, and new features to be introduced rapidly in response to changing customer requirements. Examples of features available for VSI are Storage Viewer (SV), Path Management, Storage Pool Management (SPM), Symmetrix SRA Utilities, and Unified Storage Management.

The Storage Viewer feature extends the vSphere Client to facilitate the discovery and identification of EMC Symmetrix, CLARiiON, Celerra, and VPLEX storage devices that are allocated to VMware ESX/ESXi hosts and virtual machines. SV presents the underlying storage details to the virtual datacenter administrator, merging the data of several different storage mapping tools into a few seamless vSphere Client views. SV enables you to resolve the underlying storage of Virtual Machine File System (VMFS) and Network File System (NFS) datastores and virtual disks, as well as raw device

mappings (RDM).

In addition, you are presented with lists of storage arrays and devices that are accessible to the ESX and ESXi hosts in the virtual datacenter. Once installed and configured, VSI provides storage mapping and connectivity details for Symmetrix, CLARiiON, Celerra, and VPLEX devices.

Description of the EMC VSI (Virtual Storage Integrator) for VMWare vSphere: Unified Storage Management



The EMC® VSI for VMware vSphere: Unified Storage Management feature can provision Network File System (NFS) datastores on NAS storage and Virtual Machine File System (VMFS) datastores and Raw Device Mapping (RDM) volumes on block storage, and perform array-based compression and array-based cloning of virtual machines in NFS datastores. The cloning functions include Full Clones (copies) and Fast Clones (snaps) of Virtual Machine Disk (VMDK) files. VMware administrators can use the feature to manage NAS and block storage in VMware environments by using the existing vSphere Client user interface. VMware administrators can use the tool to:

- Provision new NFS, VMFS, and RDM storage
- Extend existing NFS storage
- Compress virtual machines in NFS datastores
- Clone virtual machines in NFS datastores:
- Fast Clones support Limited to the same file system
- Full Clones support Limited to file systems on the same Data Mover
- Integrate with VMware View

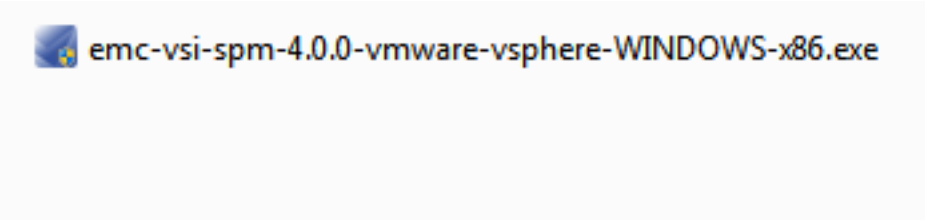
To provision new NAS storage, the feature:

- Creates a file system with automatic file system extension and EMC Virtual Provisioning™
- Exports the file system using NFS
- Provides one or more ESX servers root access to the export
- Creates an NFS datastore on the newly created Celerra file system

To provision new block storage, the feature:

- Binds a Fibre Channel (FC) or iSCSI LUN in a user-specified RAID group or storage pool.
- Adds the newly bound LUN to the storage group associated with the selected ESX hosts.
- Creates a VMFS datastore on the newly created block LUN

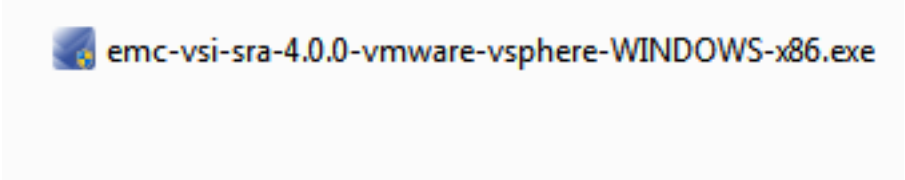
Description of the EMC VSI (Virtual Storage Integrator) for VMWare vSphere: Storage Pool Management



The EMC Storage Pool Management (SPM) feature simplifies the task of provisioning storage in VMware environments. In Virtual Computing Environments, IT is offered as a service, user requirements change dynamically, and the underlying infrastructure is transparent to the end user. For example, in a VMware environment, Virtual Machines (VM) can be provisioned in minutes to meet the demands of the users. As such, any underlying infrastructure, for example, storage that supports the new VM needs to be provisioned quickly to meet the IT Service Level Agreement of the user. EMC Virtual Storage Integrator (VSI) and Symmetrix Management Console (SMC), together manage storage as a shared resource pool that accelerates storage provisioning, so the IT service is available to the end-user faster.

Using SMC's Storage Pool Management feature, an administrator creates a Virtualization Domain that corresponds to a vCenter instance with physical pooled storage defined by drive type and RAID protection type. A Virtualization Domain is a set of boundaries defined by a storage administrator to limit the physical Symmetrix array storage (thin pools) in which a VMware user can create LUNs. Each thin pool contains storage of a particular type, defined by the Storage Type with which they are labeled. A Storage Type is simply a label for a particular type of storage. It is defined by a storage administrator during SPM configuration and is utilized by a VMware user when provisioning storage.

Description of the EMC VSI (Virtual Storage Integrator) for VMWare vSphere: Symmetrix SRA Utilities

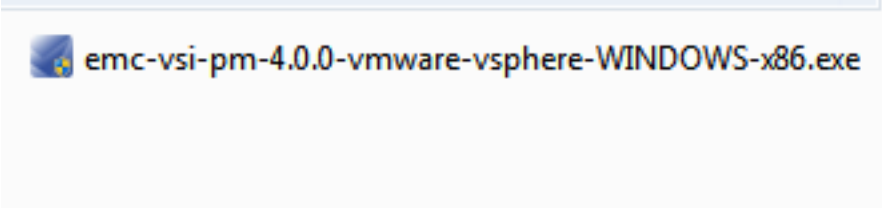


The Symmetrix SRA Utilities feature helps users to more efficiently manage vCenter Site Recovery Manager (SRM) configurations in Symmetrix Remote Data Facility (RDF) environments. It provides SRM diagnostic tools that help users to easily identify configuration errors. SRA Utilities allows users to view and create consistency groups and perform storage failback operations to restore a workload site back to the protection site after being failed over to a recovery site.

These SRA utilities includes four separate functions within the Virtual Storage Integrator version 4.0.

These functions are:
- Automated consistency groups creation In order to enable failback and assist with failover configuration and preparation, VSI introduces the ability to easily and automatically create and configure Symmetrix device Consistency Groups.
- Automated failback This feature offers a built-in mechanism that interfaces with vCenter and the involved Symmetrix arrays to failback without needing to rebuild protection groups and recovery plans or using separate tools to configure SRDF relationships.
- Test failover configuration This offers the ability to help users with the task of defining device pairs to be used by EMC SRDF Adapter when testing recovery plans with TimeFinder technology.
- Gold copy configuration This offers the ability to help users with the task of defining device pairs to be used by EMC SRDF Adapter when creating gold copies for failover to a recovery site.

Description of the EMC VSI (Virtual Storage Integrator) for VMWare vSphere: Path Management



The Path Management feature for EMC Virtual Storage Integrator (VSI) for VMware vSphere includes support for both VMware Native Multipathing Plugin (NMP) and PowerPath/VE. With the emergence of VMware's vSphere as a true computing platform (referred to as the Virtual Datacenter OS), users are spending increasingly more time within VMware's vSphere Client.

More of their business activities are now completed without leaving the vSphere Client. As such, users no longer want out-of-band management applications or tools. They prefer to remain inside of vSphere Client to complete all of their tasks whether it be systems related or storage related. Currently, the Storage Viewer feature displays multipath properties for both NMP and PowerPath/VE. Those properties include the number of paths, the state of those paths, the policy used to manage those paths. The Path Management feature allows you to change the multipath policy and is a first step in allowing the VSI user to manage multiple paths from within the vSphere Client.

The Path Management feature allows a VSI user to change the multipath policy on a multitude of devices, based on both storage class and virtualization object. For example, all Symmetrix devices for a given ESX host can be managed, or all CLARiiON devices for a given virtual machine. This ability will exist for both NMP owned and PowerPath/VE owned devices. This feature will be a valuable asset to administrators who need to maintain consistent multipath policies across a large virtual datacenter containing a large number or wide variety of storage devices.

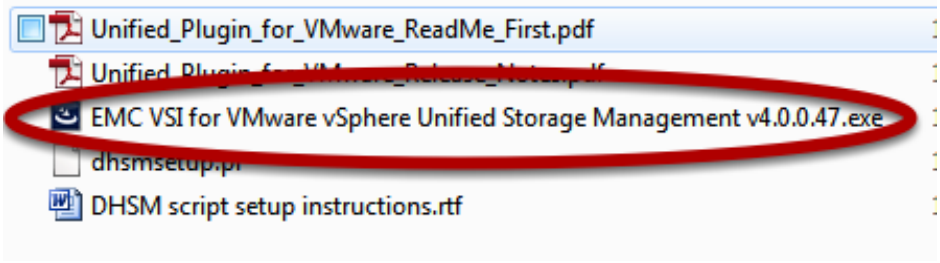
Installing the VSI Unified Storage Plugin

The Celerra requires a DHSM (which I believe stands for Distributed Hierarchical Storage Management) user to be configured on the Celerra. This user is granted rights and priveleges to access some file systems and not others, provision storage or not, etc., thereby providing the storage administrator with a user assigned to a role of his/her choosing. When a VMware administrator makes a request to perform some storage action(s) from the vSphere client, the plugin uses the credentials for the DHSM user to carry out those actions. The DHSM user must be set up and configured on the Celerra prior to attempting to use the Unified Storage plugin. Accompanying the Unified Storage plugin are instructions for how to copy the DHSM user script up to your Celerra and how to configure your users to access the datamovers.

However, one of my colleagues, Nick Weaver (http://www.nickapedia.com), has already created a GUI tool to do this for you, and he has provided this for you at no cost, along with instructions for how to use it.

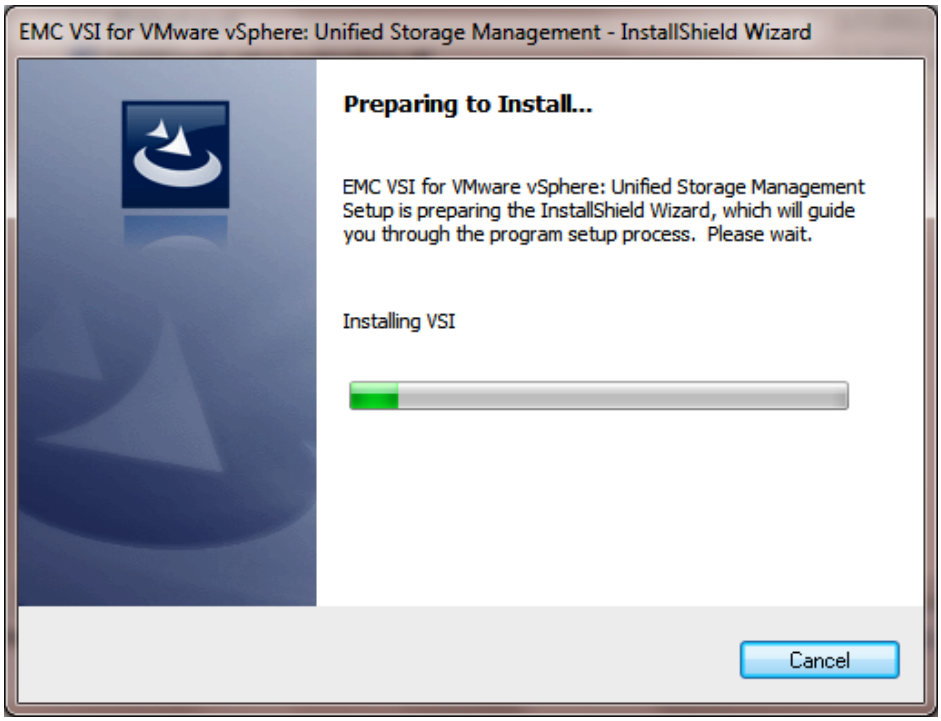
Find those here (http://nickapedia.com/2010/10/21/slap-a-gui-on-it-new-emc-uber-dhsm-tool/).

Locate the Unified Storage Plugin



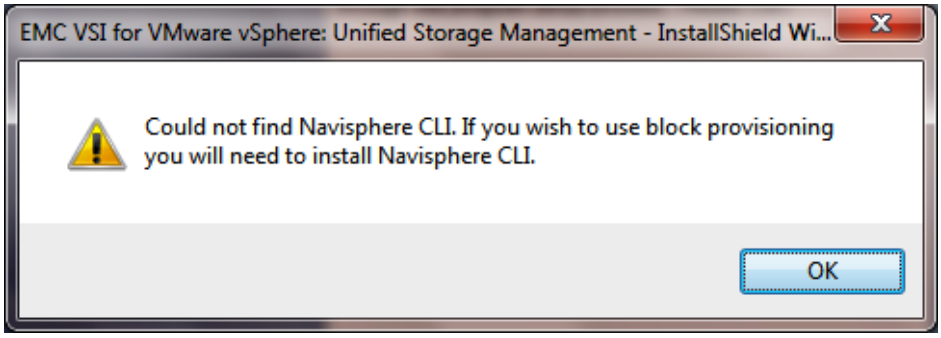
Double click the fle to launch.

Launch the Installer



The Installer will decompress its files.

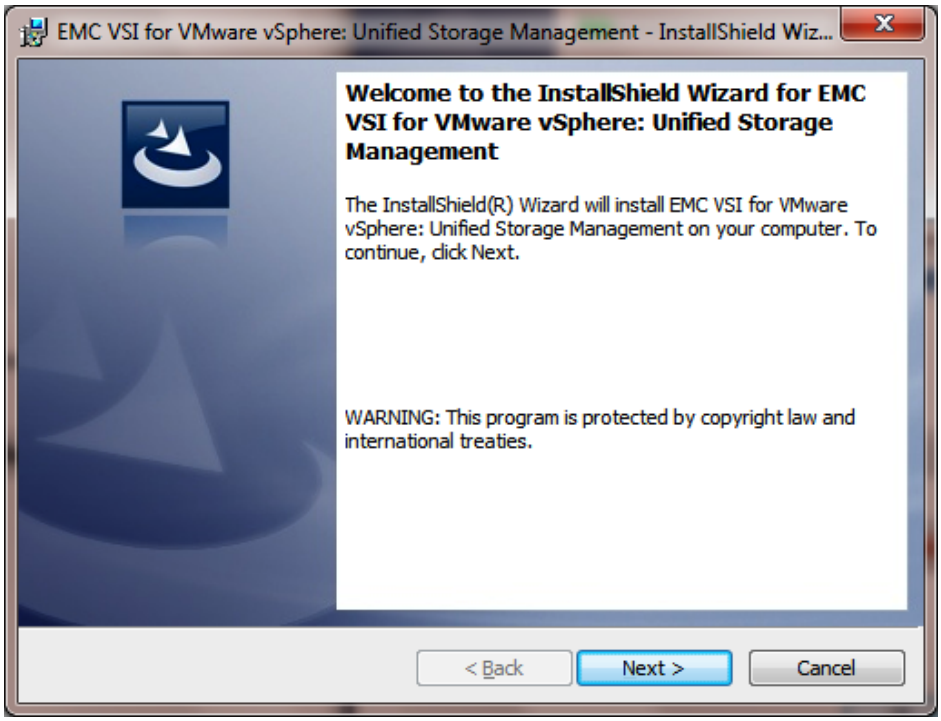
Note: Navisphere CLI May Be Required



If you don't already have NaviCLI installed, note that your ability to provision FC LUNS will be hampered without it.

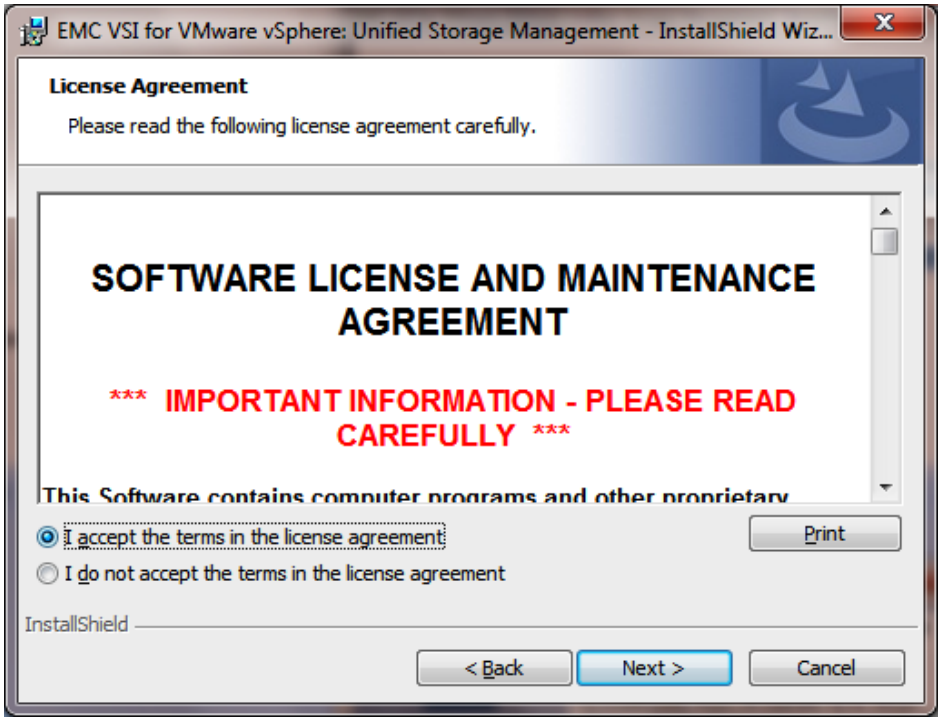
Click OK.

The Installer Launches



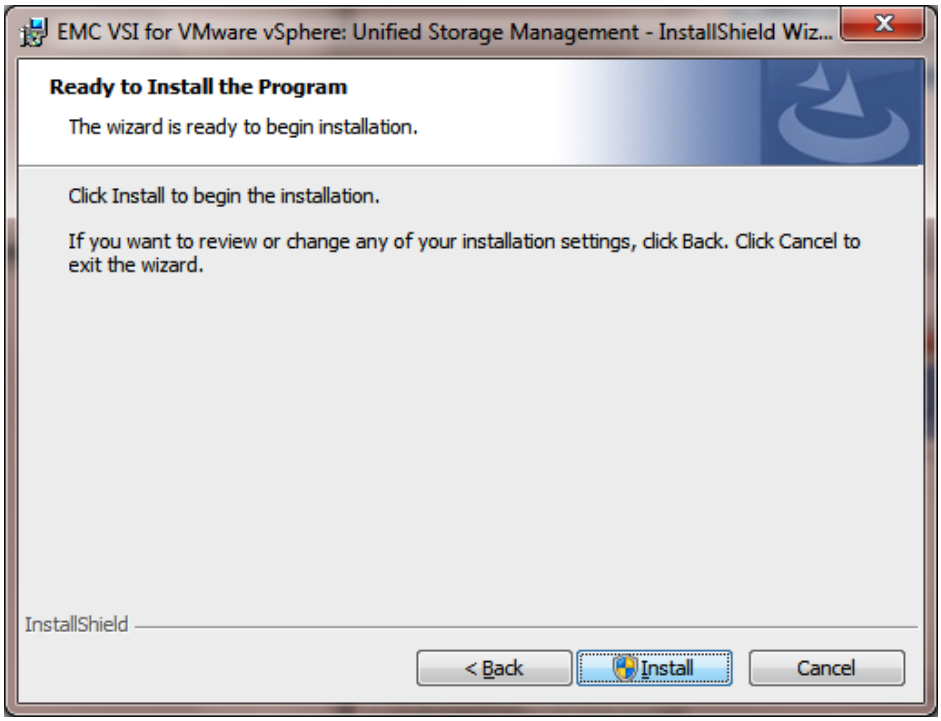
Click Next.

Accept the License Agreement

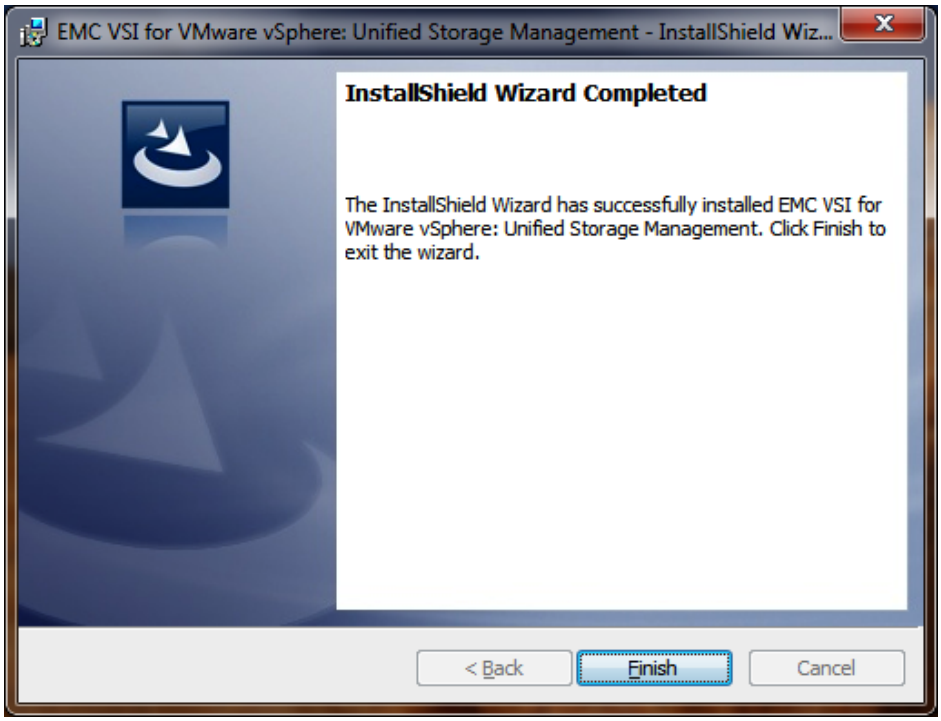


Click Next.

Click Install

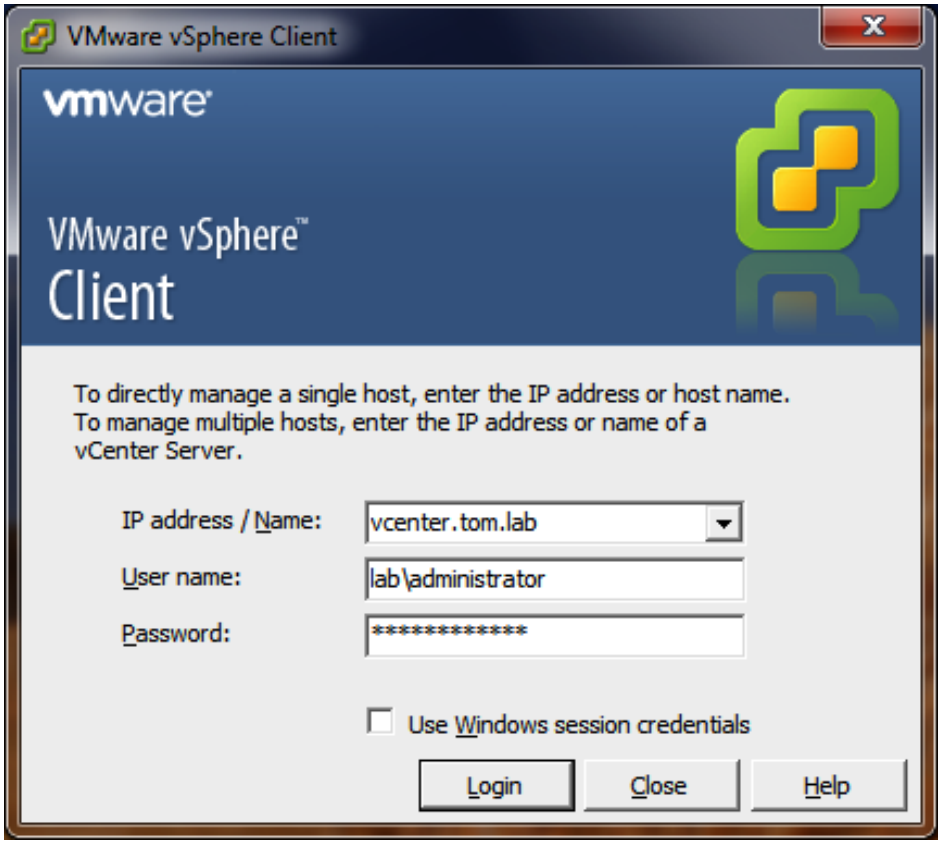


Installation Complete



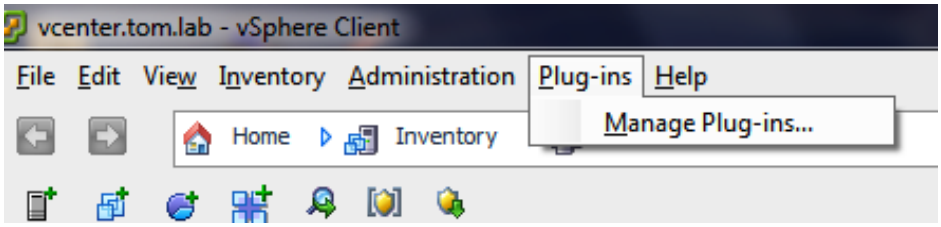
Click Finish

Open the vSphere Client

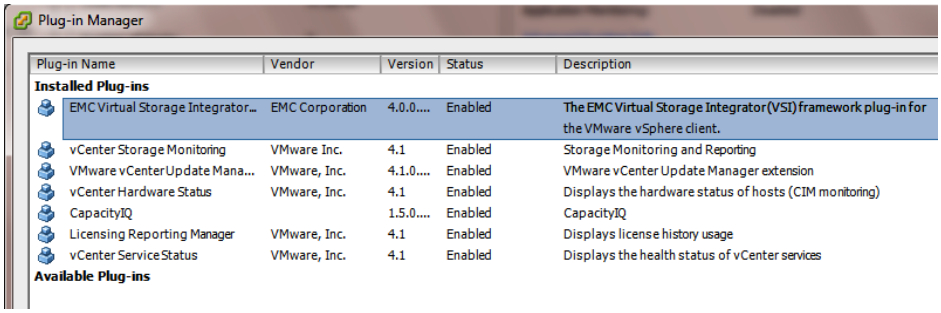


Log in to vCenter.

Go to Manage Plugins

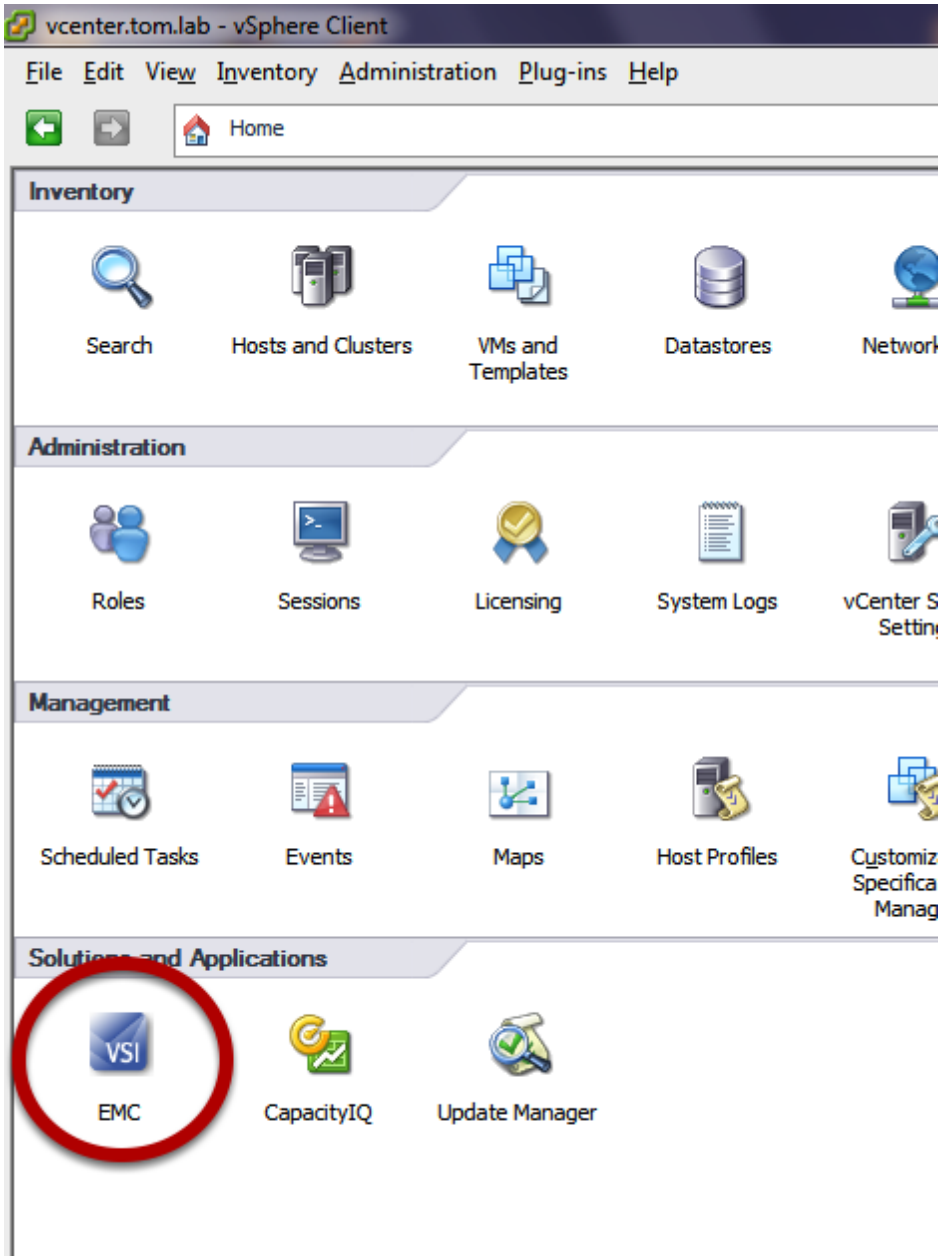


Verify the EMC VSI Plugin for Unified Storage is Installed and Enabled



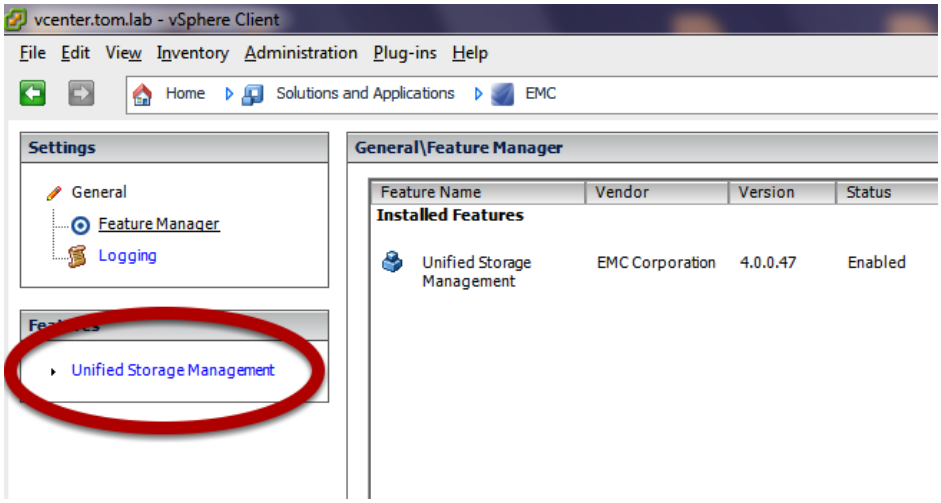
Click Close

Go to the Home Screen



Locate and select the EMC VSI icon. click to open.

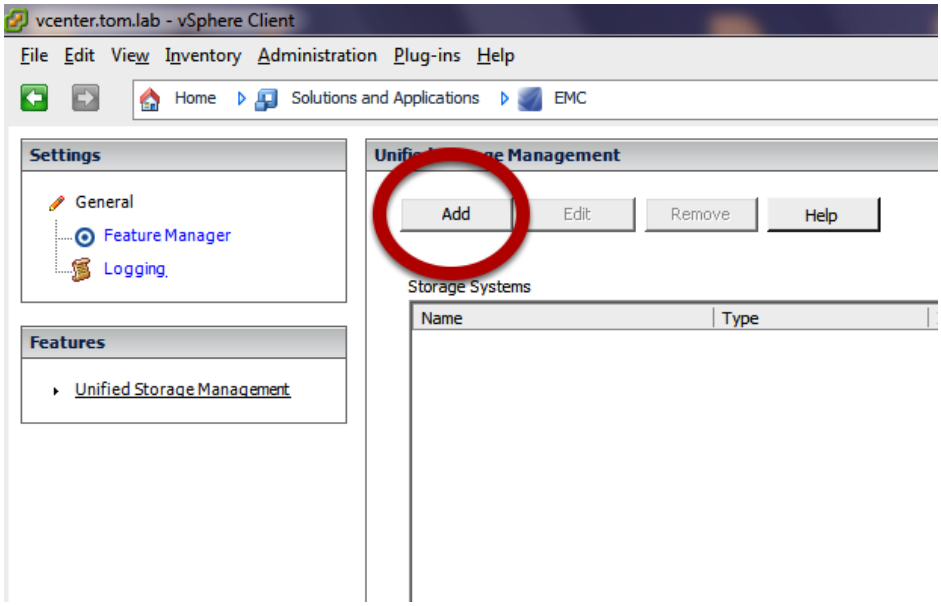
Go to the VSI Page



When the VSI page opens, you will be seeing the Feature Manager. this will inform you which plugins have been installed to the VSI framework.

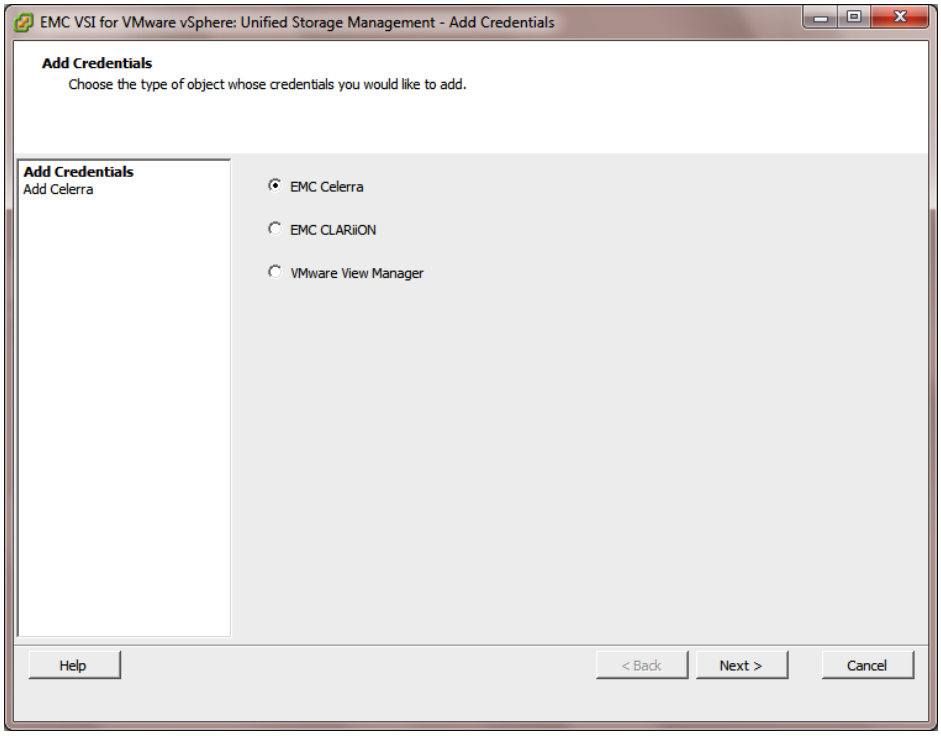
Click the link for 'Unified Storage Management.'

Add Your Unified Storage System



Click 'Add.'

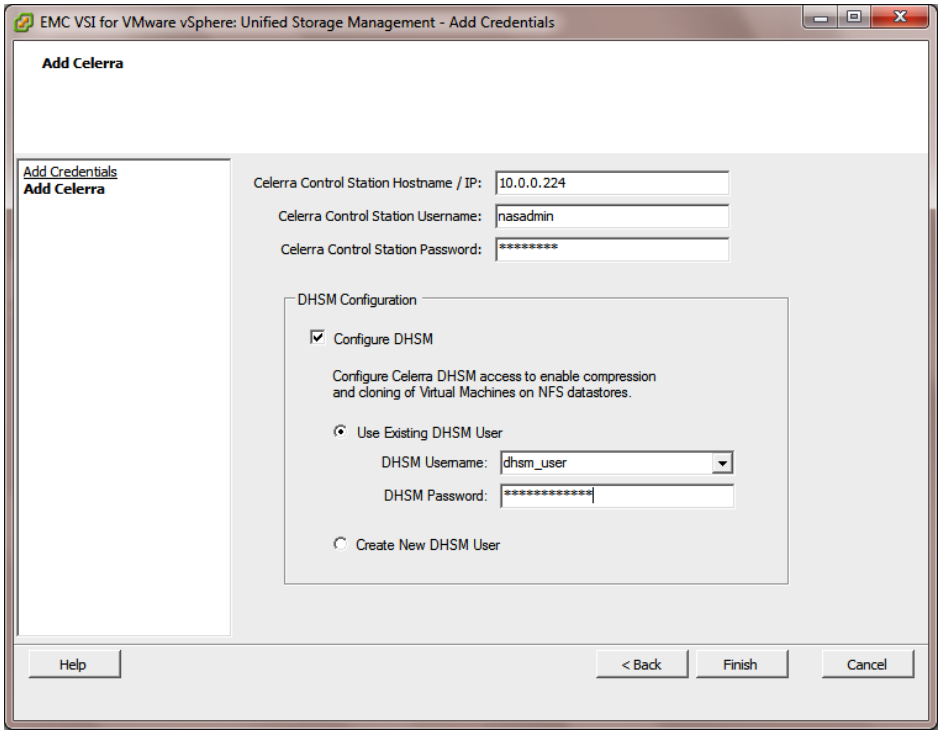
Select 'Celerra'



Note that you can also add a Clariion device, or a VMware View Management server.

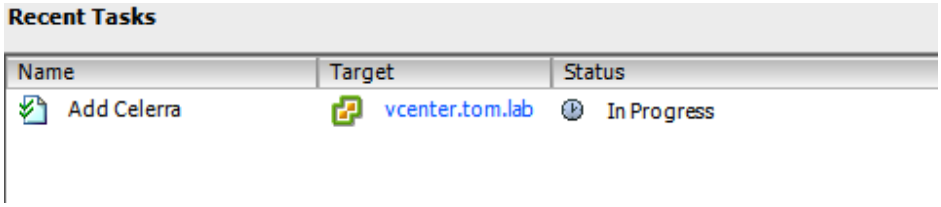
Click Next.

Configure the Details of Your Celerra

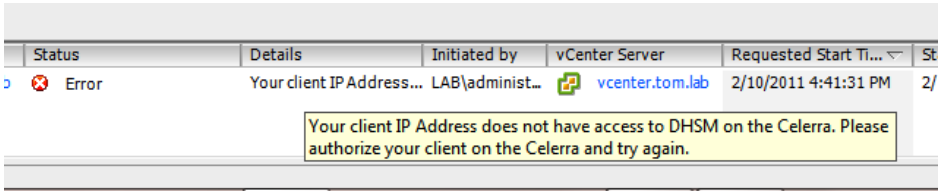


Fill in the configuration parameters for your Celerra network storage server. Click Finish.

vCenter Will Add the Celerra

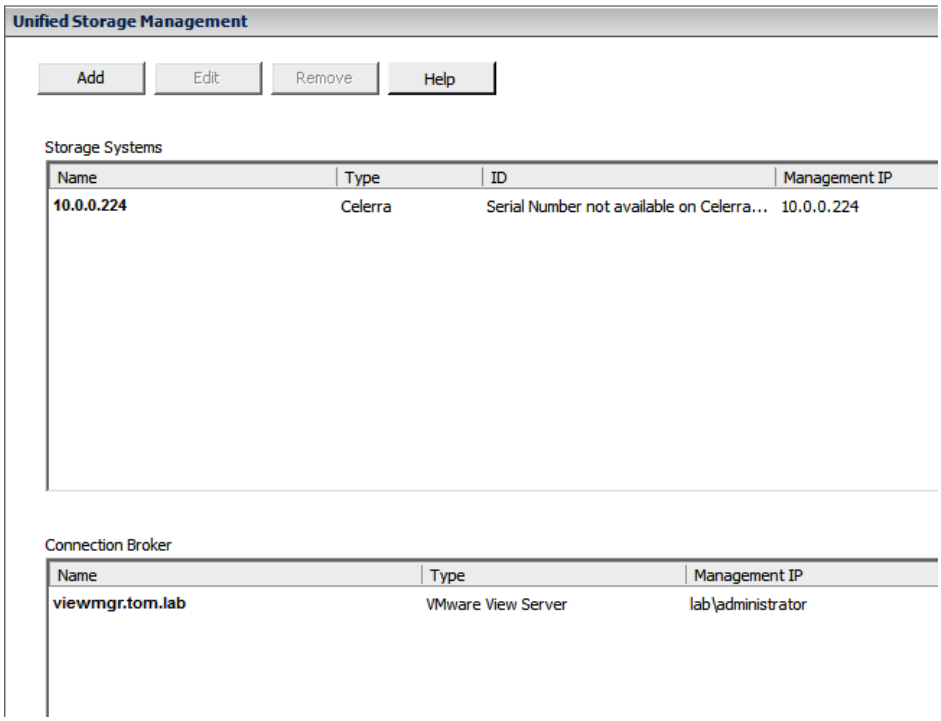


Watch for Errors



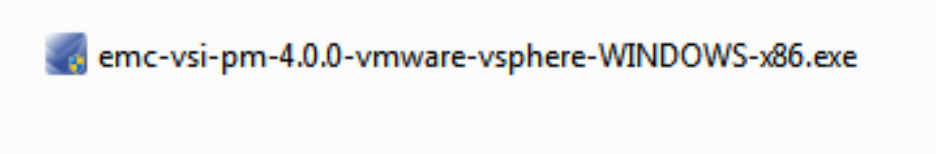
If you have configured the DHSM user incorrectly, you will receive an error. Correct the DHSM configuration and try again.

A Successful Configuration...



A successful configuration will show the newly added Celerra (and in this case, View Manager as well) on the 'Unified Storage Management' screen.

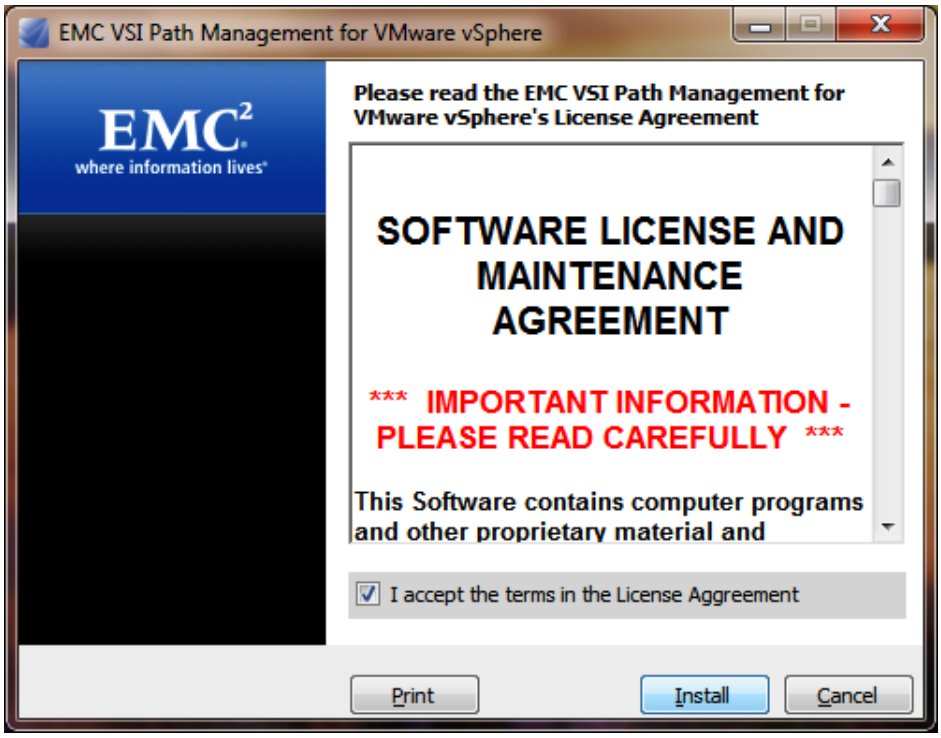
Locate and Launch the Plugin Installer



Double-click the file to launch the installer.

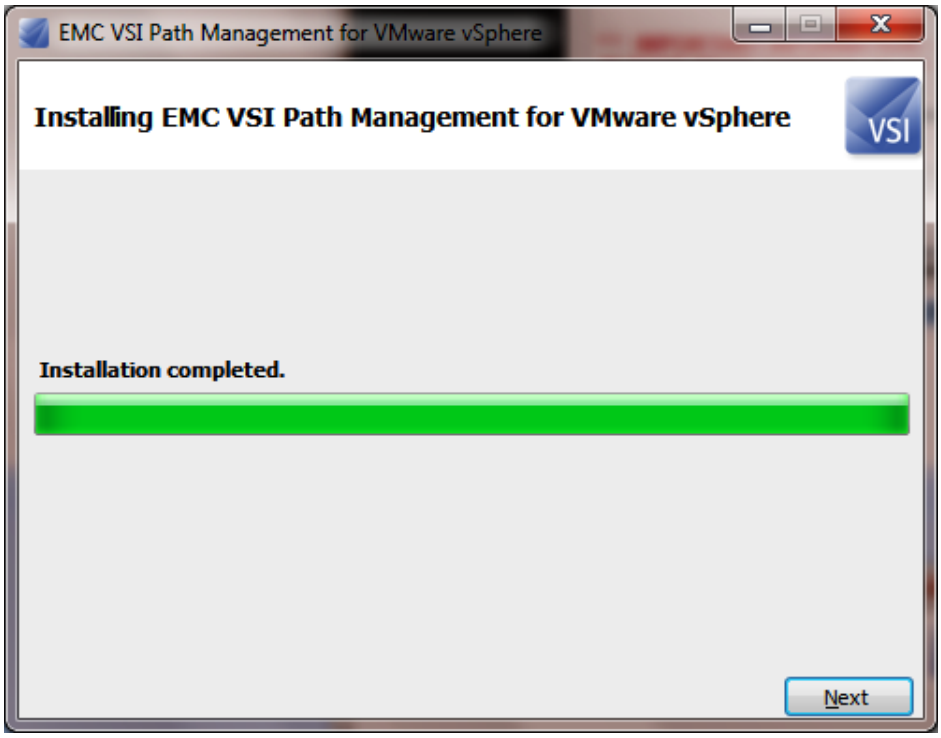
Note that the vSphere Client must be closed to install the plugin. If it is open, you will receive a warning message.

Accept the License Agreement



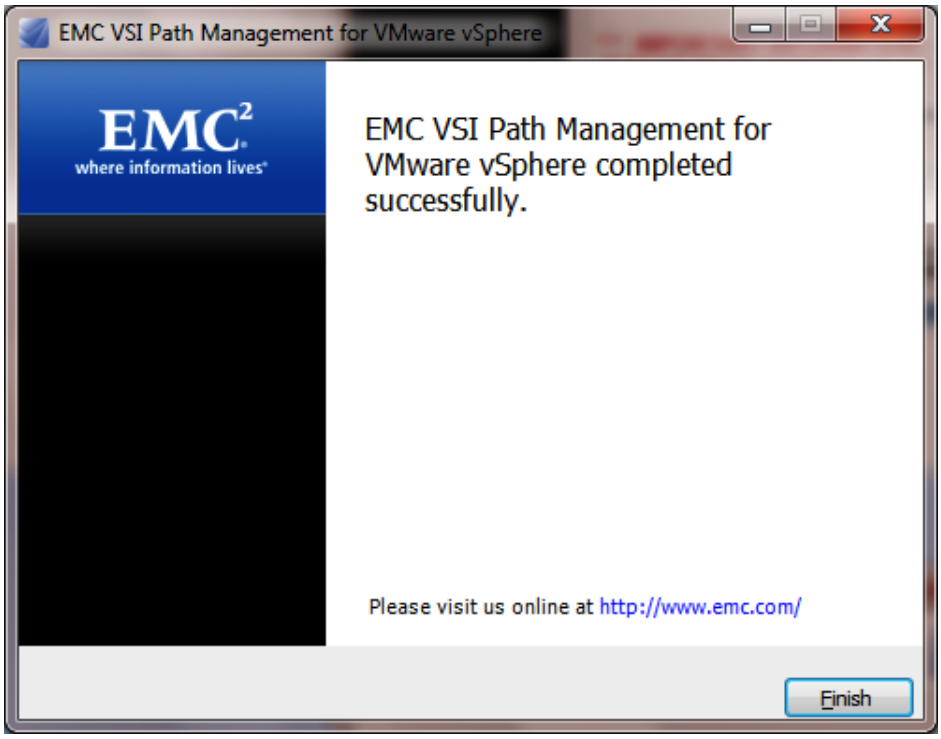
Click Install

Installation Proceeds

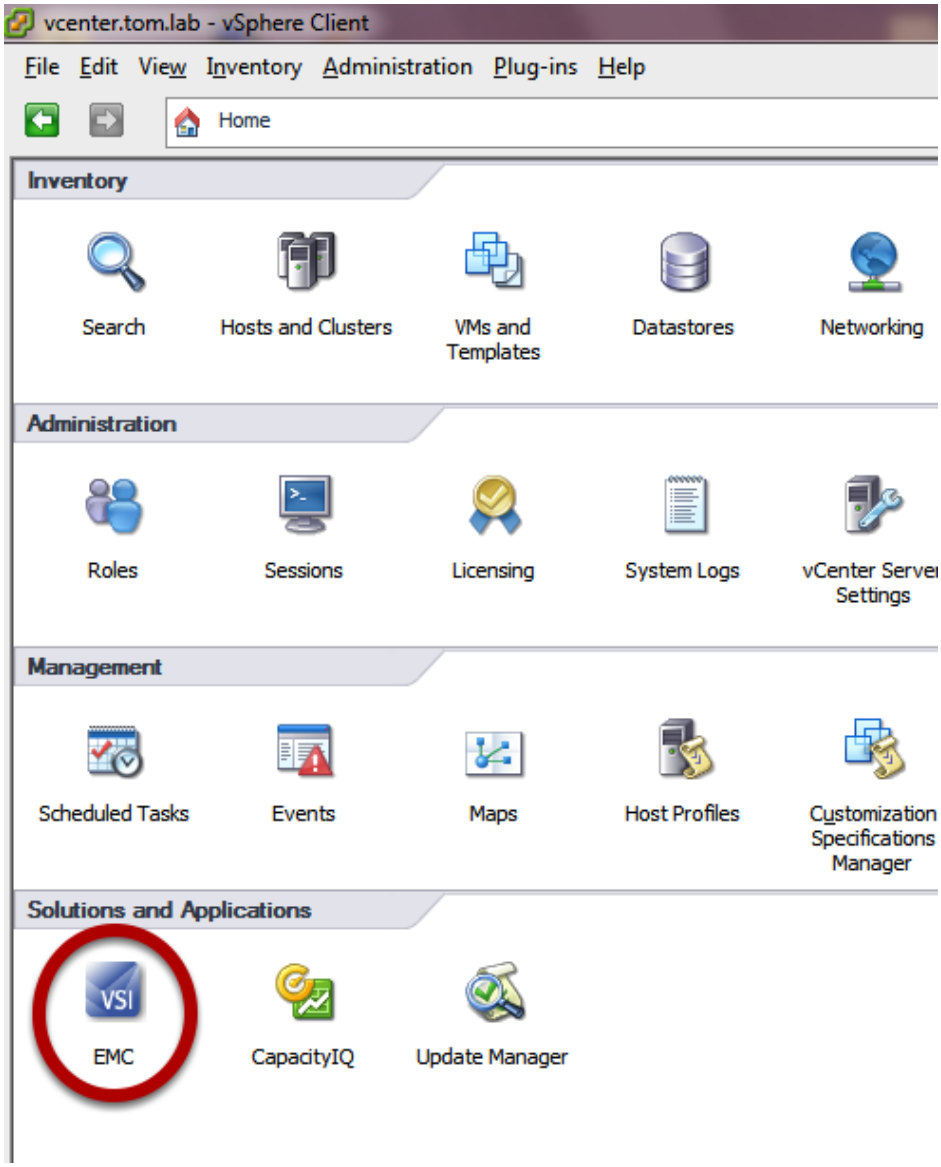


When complete, click Next.

Click Finish

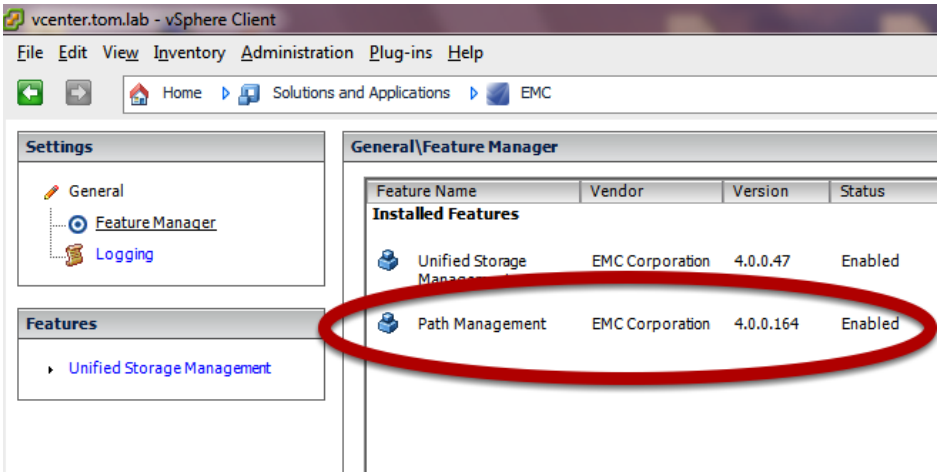


Open the vSphere Client



Connect to vCenter and go to the Home Screen; click the EMC VSI button.

Ensure the VSI Plugin for Path Management is Installed and Enabled

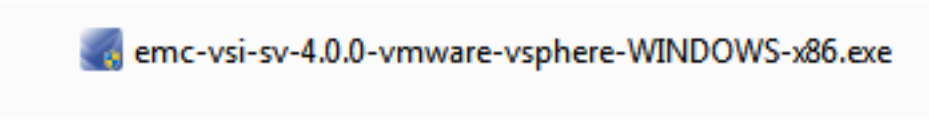


The EMC VSI plugin for Path Management enables the user to set NMP and PowerPath/VE multipath policies for hosts and clusters.

Installation is complete - there is nothing to configure to begin using the plugin!

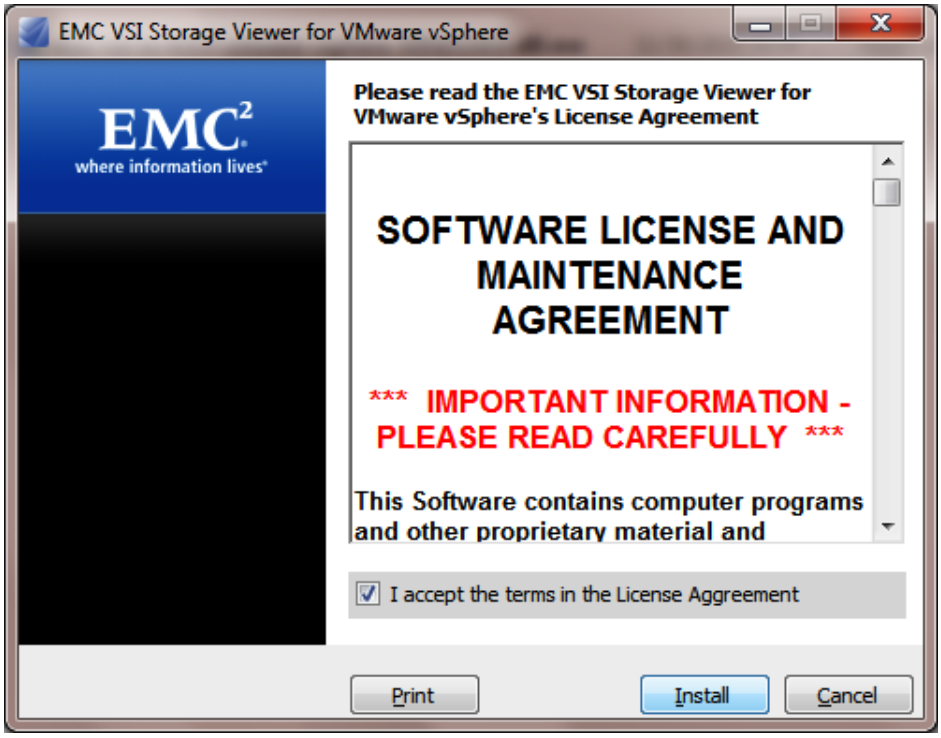
Installing and Configuring the VSI Storage Viewer Plugin

Locate and Launch the VSI Storage Viewer Plugin



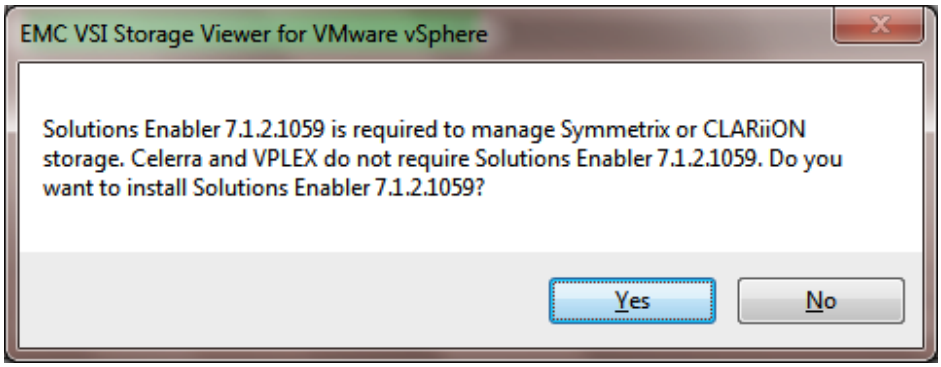
Double click the installer to launch.

Accept the License Agreement



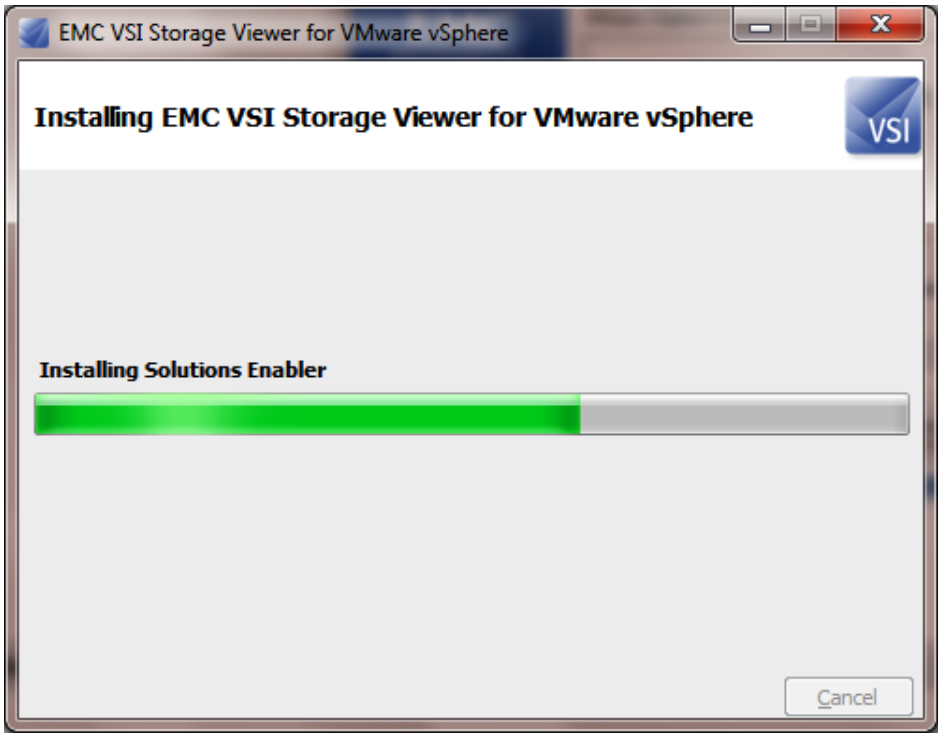
Click Install.

Click Yes to Install Solutions Enabler

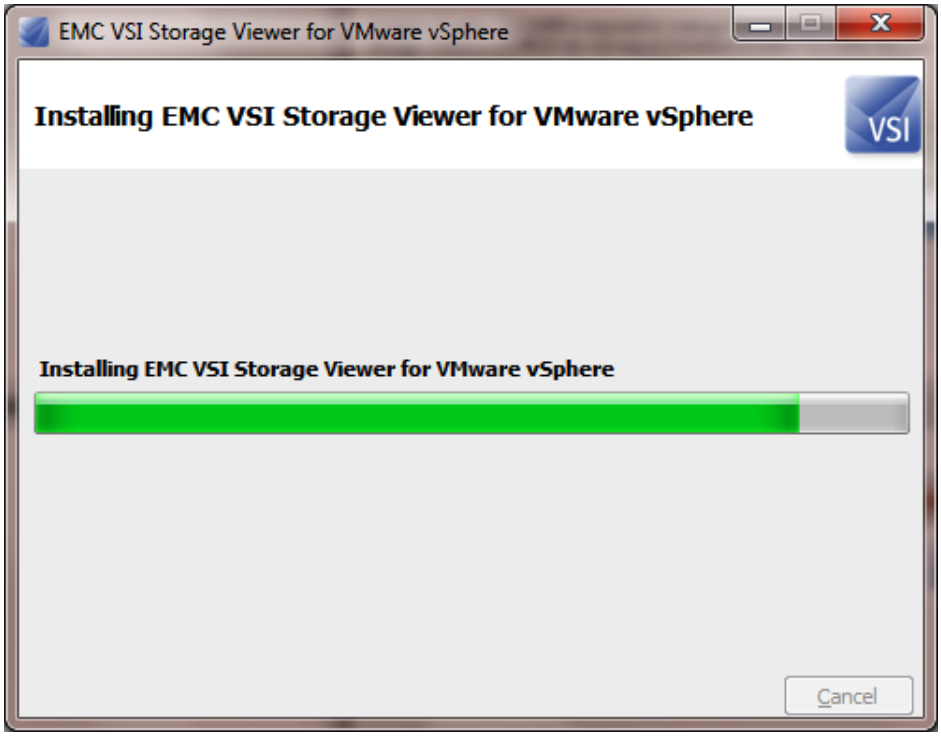


Click Yes.

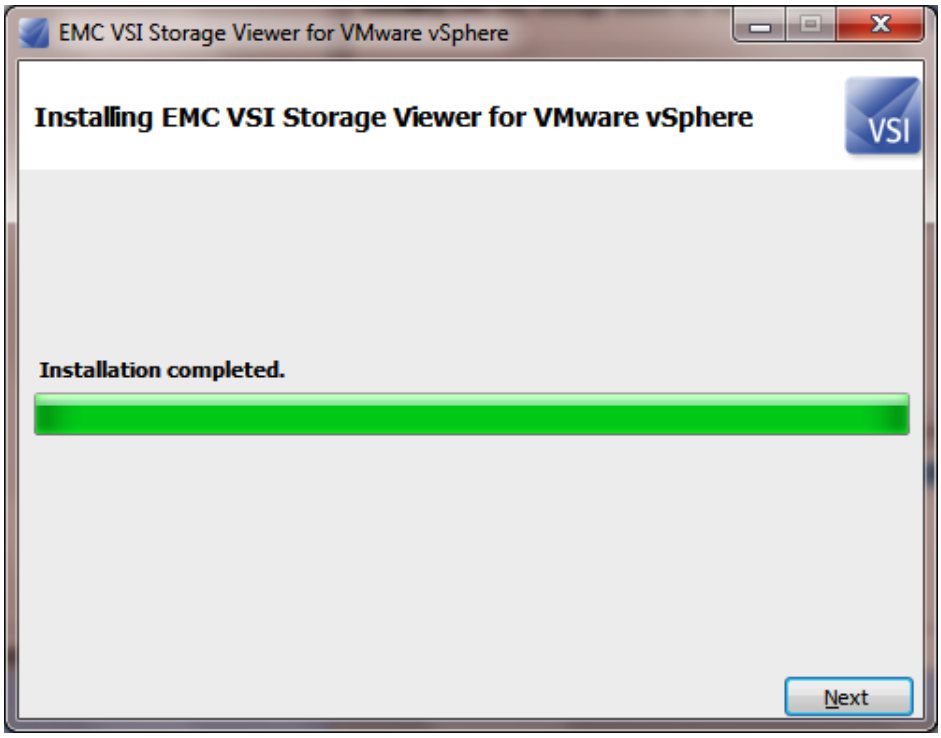
Solutions Enabler is Installed



The Storage Viewer Plugin is Installed

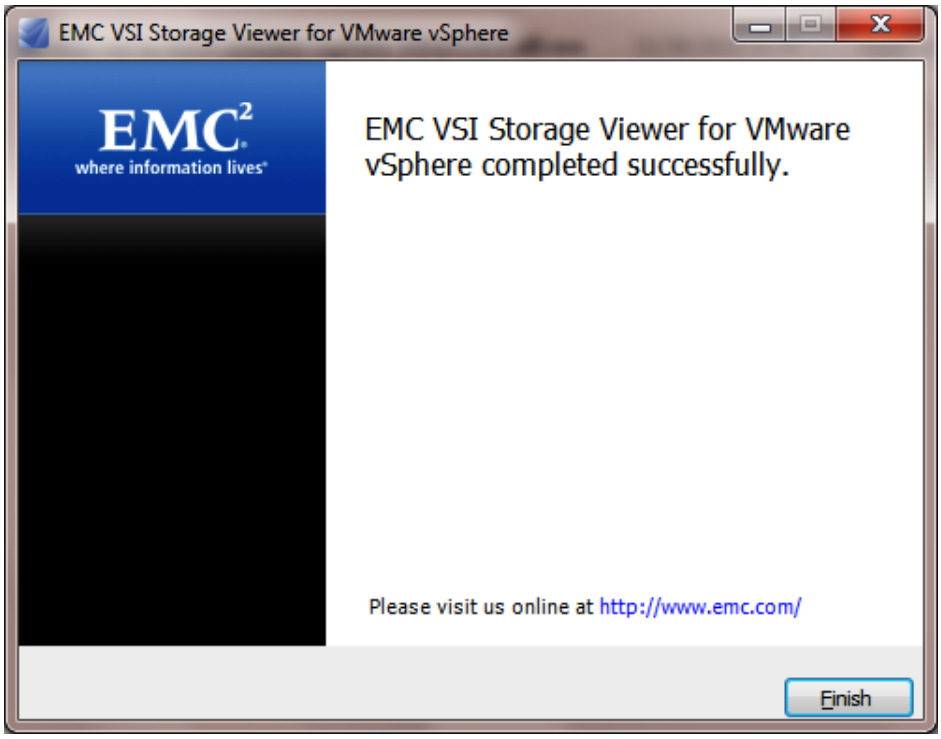


Installation Complete

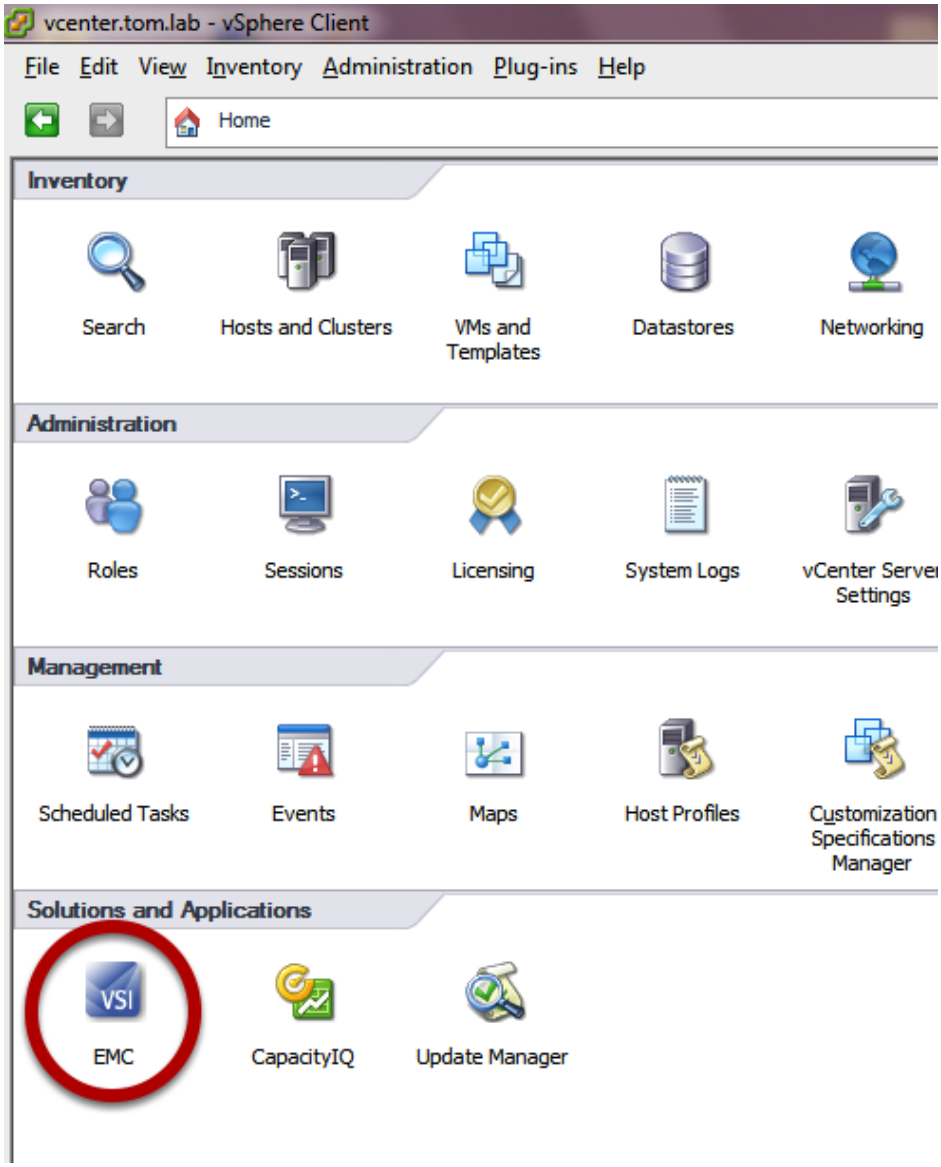


Click Next.

Click Finish

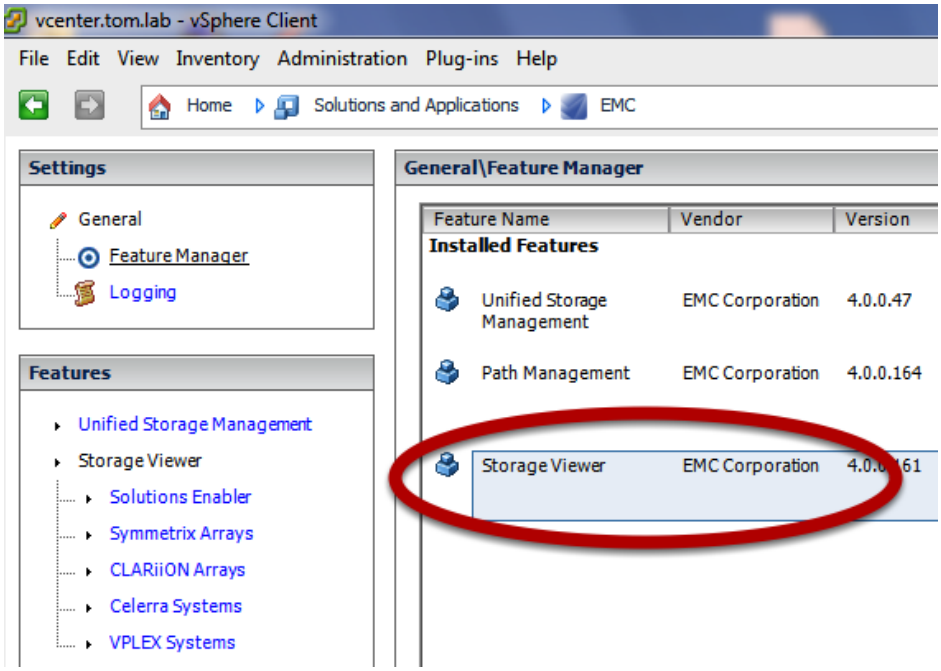


Open Your vSphere Client

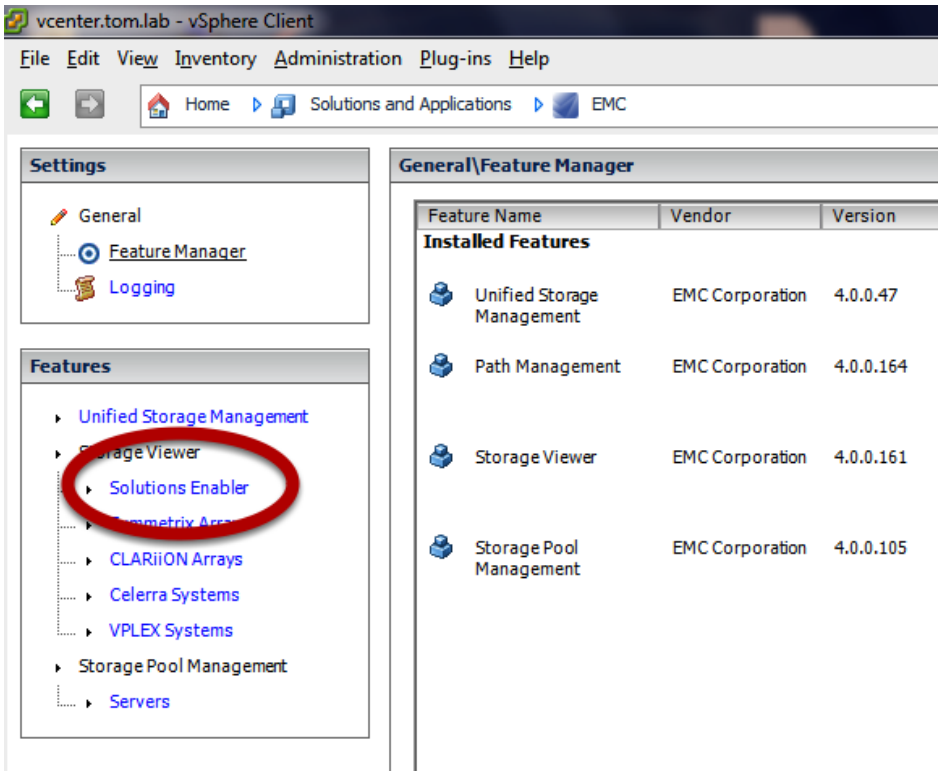


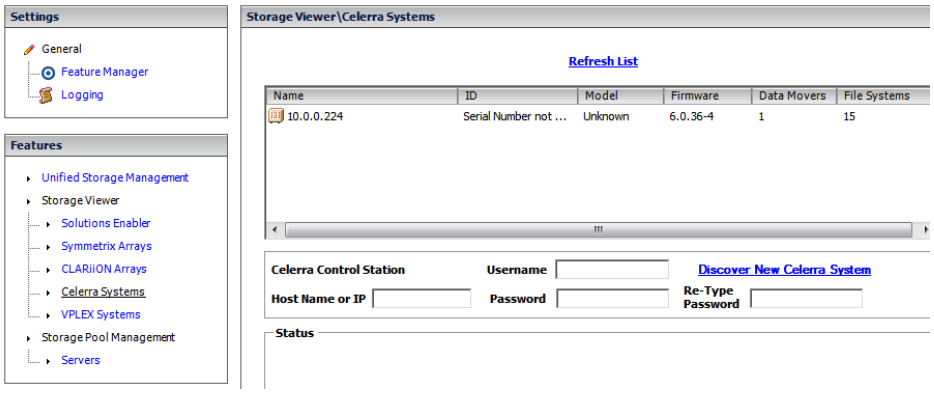
On the Home screen, click the EMC VSI icon.

Verify the Plugin is Installed



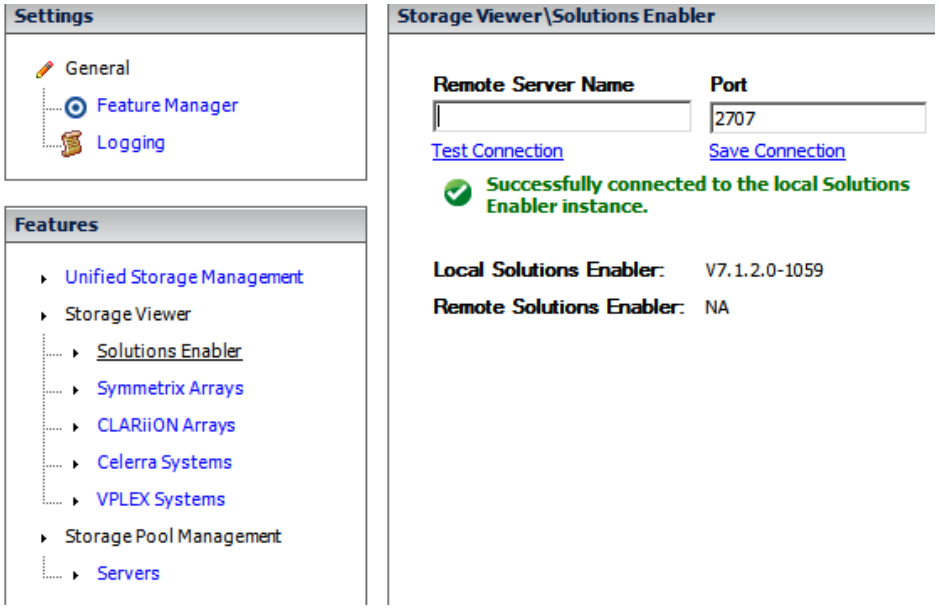
You should see the Storage Viewer Plugin listed in the details pane.





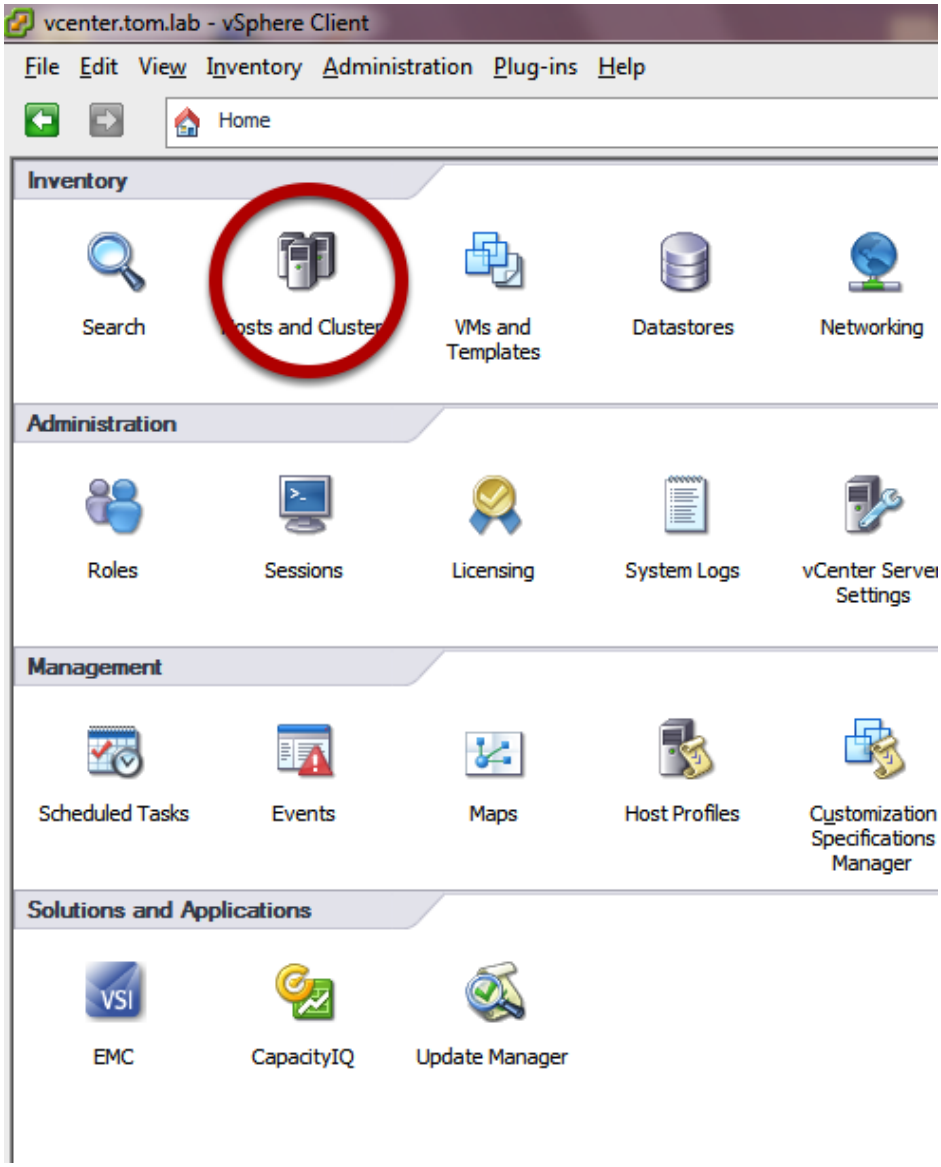
Use the hyperlinks on the left to finish configuring the Storage Viewer, and enable viewing of all your EMC storage platforms.

Solutions Enabler

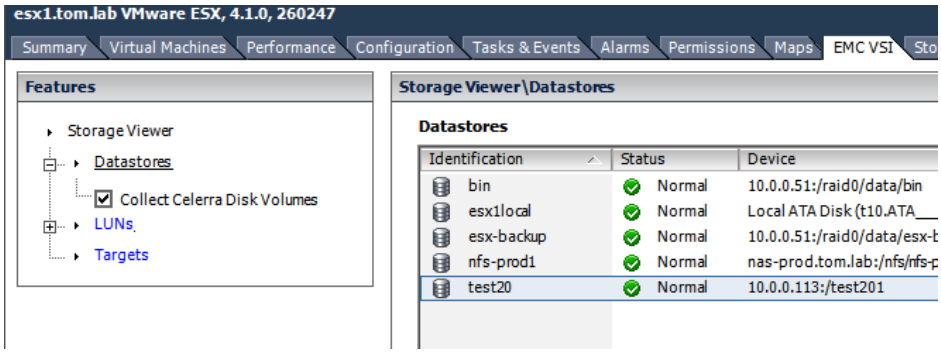


A local instance of Solutions Enabler is installed. You can click the "Test Connection" hyperlink to confirm that it is functional.

Go to the Hosts and Clusters View

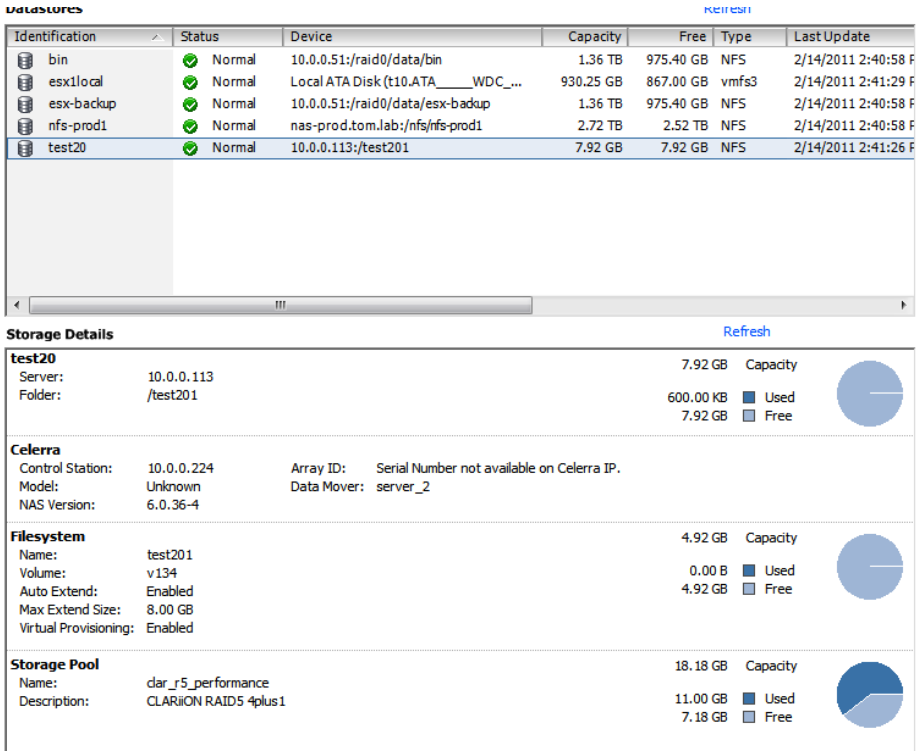


Go to the EMC VSI tab



Highlight one of your ESX servers, and go to the EMC VSI tab.

View Storage Details



Highlight an EMC volume. You should be able to view the details of the underlying storage system in the details pane.