EMC® BACKUP AND RECOVERY OPTIONS FOR VSPEX® FOR VIRTUALIZED MICROSOFT SHAREPOINT 2013

EMC VSPEX

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Chapter 1: Introduction

Purpose of this guide

This Solution Guide describes how to design, implement, and size EMC Powered Backup solutions for VSPEX Proven Infrastructure for Virtualized SharePoint.

EMC VSPEX for Virtualized Microsoft SharePoint Server 2013 solution:

- Provides customers with a validated solution, capable of hosting a virtualized SharePoint solution at a consistent performance level.
- Enables customers to quickly and consistently deploy and protect a virtualized SharePoint 2013 organization in the VSPEX Proven Infrastructure.
- Runs on a VMware vSphere® or a Microsoft Hyper-V virtualization layer.
- Leverages the highly available EMC VNX® family, which provides the storage.
- Leverages EMC Powered Backup and Recovery products, including EMC Avamar® and EMC Data Domain®.

Business value

SharePoint Server represents an Enterprise Content Management (ECM) system that is a dynamic repository of vital information, appearing as various names such as a knowledgebase or part of a portal providing collaboration among customers, prospects, partners, and suppliers alike. IT administrators who support SharePoint Server face challenges to maintain the highest possible levels of performance and application efficiency. At the same time, most administrators struggle to keep up with relentless ECM-related data growth, while working to overcome diminishing budgets. Most IT departments experience major challenges when administering, auditing, protecting, and managing a SharePoint Server environment for a modern geographically diverse work force.

Many businesses try to address these challenges by adding physical servers and inefficient direct attached storage, which further compounds the problem. Traditional backups cannot complete backup operations within available windows and businesses struggle to control backup data growth. As an ECM, SharePoint Server represents a hybrid somewhere between a database and a file structure. The farm structure supports traditional backup and recovery configurations. For example, recovering a content database or recovering an item such as a file or calendar event – very similar to recovering a text file.

EMC has joined forces with industry leading providers of IT infrastructure to create a complete virtualization solution that accelerates the deployment of a private cloud and SharePoint Server.
VSPEX enables customers to accelerate their IT transformation with faster deployment, more simplicity, greater choice, higher efficiency, and lower risk. Validation by EMC ensures predictable performance and enables customers to select technology that leverages existing IT infrastructure while eliminating planning, sizing, and configuration burdens. VSPEX provides SharePoint infrastructures for customers who are looking to simplify the environment while at the same time gaining more choice in individual stack components.

EMC Powered Backup and Recovery solutions – EMC Avamar and EMC Data Domain - deliver the protection confidence needed to accelerate deployment of virtualized SharePoint.

**Scope**

This Solution Guide describes how to design, implement and size EMC Powered Backup and Recovery solutions for VSPEX Proven Infrastructure for Virtualized SharePoint environments by using the following configurations:

- EMC Avamar to protect SharePoint Server 2013 that runs within VMware vSphere or Microsoft Hyper-V.
- EMC Avamar and EMC Data Domain systems to protect SharePoint Server 2013 that runs within VMware vSphere or Microsoft Hyper-V.
- VMware Data Protection Advanced and Data Domain DD2500 systems to protect SharePoint Server 2013 that runs within VMware vSphere with up to 300 virtual machines.
### Essential reading

EMC recommends that you read the following documents, available on EMC.com and the Powerlink website.

#### Solution Overviews

Review the following VSPEX Solution Overview document:
- [EMC VSPEX Proven Infrastructure for Virtualized SharePoint 2013](#)

#### Design and Implementation Guides for SharePoint

Review the following VSPEX Design and Implementation Guides:
- [Design Guide: EMC VSPEX for Virtualized Microsoft SharePoint 2013](#)
- [EMC VSPEX for Virtualized SharePoint 2013 with Microsoft Hyper-V Implementation Guide](#)
- [EMC VSPEX for Virtualized SharePoint 2013 with VMware vSphere Implementation Guide](#)

#### VSPEX Proven Infrastructure

Review the VSPEX Proven Infrastructures documents on the [EMC Community](#) website.
Chapter 2: Solution overview and sizing

This chapter provides an overview of the VSPEX Proven Infrastructure for virtualized SharePoint Server 2013, the EMC Powered Backup and Recovery products used in this solution, and critical guidance about backup and recovery solution sizing.

Solution architecture

Figure 2 illustrates the architecture that characterizes a VSPEX Proven Infrastructure, which supports SharePoint Server 2013.

Figure 2. Solution architecture that includes VSPEX Proven Infrastructure for virtualized SharePoint Server 2013 and the supporting infrastructure components.
This example has the following components:

- Five SharePoint servers on a VMware vSphere cluster:
  - One SharePoint server in the Farm acts as a Web Front End (WFE) server
  - Two SharePoint Servers act as Application Servers (query server, crawl server)
- One SharePoint server acts as a Database Server.
- EMC VNX series that has been validated as part of the VSPEX Proven Infrastructure provides the back-end storage functionality.
- NFS datastores contain the SharePoint Server virtual machine boot volumes virtual machine data file (VMDK) format.
- iSCSI native disks store the content database and log volumes in RDM format.
- EMC Powered Backup and Recovery systems that have been validated as part of VSPEX Proven Infrastructure provides the backup and recovery functionality

**Essential reading** provided more information.

**Microsoft SharePoint Server 2013 Overview**

Microsoft SharePoint Server 2013 is an enterprise content management system that enables businesses and customers to collaborate and share information. EMC enhances SharePoint 2013 with a selection of storage platforms, software, and services.

With SharePoint 2013, Microsoft continues with its SQL Server underpinnings to provide robust Content Server deliverables. Microsoft continues to leverage the original design of the SharePoint Server Farm, using as many WFE, Application and Database servers as required to maintain a high availability (HA) and disaster recovery (DR) platform. With the strength of an SharePoint Server farm, you can:

- Implement shared end user content that leverages Microsoft Outlook, Outlook Web Access, or browser-driven programs.
- Build and maintain resilient configurations at the Farm, Site, and local user level.
- Continue to use the dual capabilities of SharePoint as both a development platform and a complete ECM system. The SharePoint application enables you to easily develop customized content on secure portals that provide exclusive access to partners, suppliers, and other vendors
- Protect the environment from logical corruption by implementing a VSS backup with point-in-time recovery solution.
A SharePoint Server 2013 farm includes the following server roles:

- **Web Front-End**: Hosts all web pages, web parts, and web services required by the server.
- **Database Server**: An SQL Server that stores most of the data associated with a SharePoint 2013 implementation, including configuration settings, administration information, service applications data, and user content.
- **Application Server**: Hosts the service applications that run in the farm. For example, Visio services, Forms service, and Excel calculations services.
- **Query Server**: Responsible for querying the index, finding the matching content, and returning content back to the Web servers for presentation to users.
- **Crawl or Index Server**: Crawls the content sources, writes the results to the database, and then the database is propagated to the query servers. The crawl server uses a crawl database in a Microsoft SQL Server to store the URLs of all sources crawled.

The first two server roles are the essential components in every SharePoint.

A SharePoint Server 2013 configuration uses of the following elements:

- **SharePoint farm**: A cohesive collection of interconnected server that work together as a complete ECM system.
- **Web part**: Reside on the WFE and are the building blocks for web sites and applications that leverage web sites.
- **Central Administration (CA)**: The command and control web page for SharePoint Server.
- **WSS 3.0 Components**: Provides the underlying framework on which to build applications. In the context of this guide, a recoverable component from a full backup of a SharePoint farm.
EMC Powered Backup and recovery overview

This section provides backup and recovery options, as well as recommended EMC Powered Backup and Recovery configurations and sizing for the EMC VSPEX for Virtualized SharePoint solution.

Optimized for virtualized application environments, EMC Powered Backup and Recovery solutions:

- Deliver the confidence and efficiency that accelerates a VSPEX Private Cloud with Sharepoint deployment.
- Use software that is proven to reduce backup times by 90% and improve recoveries times by 30x, for worry-free protection.
- Use EMC protection storage to add another layer of reliability by providing end-to-end verification and self-healing, which ensures successful recoveries.
- Deliver big savings. With industry-leading deduplication, you can reduce:
  - Backup storage by 10-30x
  - Backup management time by 81%
  - WAN bandwidth by 99% for efficient Disaster Recovery (DR)
- Deliver up to a 7-month payback. With EMC Powered Backup and Recovery solutions, you can simply and efficiently scale backup and recovery configurations, as your environment grows.

EMC Avamar provides fast, efficient backup and recovery through a complete software and hardware solution. Equipped with integrated variable-length deduplication technology, Avamar facilitates fast, daily full backups for virtual environments, remote offices, enterprise applications, network-attached storage (NAS) servers, and desktops/laptops

EMC Avamar® Virtual Edition (AVE) is a single-node server that runs as a VM in a VMware® ESX/ESXi 4.1 or ESXi 5.0/5.1/5.5 environment.

Note: VMware ESX/ESXi 5.5 requires AVE 7.0 SP1 or later.

AVE:

- Integrates the latest version of the Avamar software with SUSE Linux.
- Runs autonomously as a target for all Avamar client backups and performs replication to a physical Avamar system or another AVE.
- Cannot scale to a multi-node Avamar server and does not support VM resizing. To increase storage capacity, perform one of the following actions:
  - Deploy additional AVE VMs, and then divide the backup workload on the VMs.
  - Replicate the data to another Avamar server and delete the smaller VM. Create a larger VM, and then replicate the data from the Avamar server to the larger VM.
The Avamar SharePoint VSS plug-in supports backup and recovery operations of SharePoint data that ranges from Content Databases to an item level, such as a calendar or web part.

**Note:** The plug-in requires Kroll Ontrack to perform an item-level restore.

When you use Avamar Virtual Machine Image Protection to protect a virtual machine, you can restore the virtual machines without installing the Avamar client on the destination hosts. If the destination host has the SharePoint Server role, then you can restore the databases from a SharePoint Volume Shadow (Copy) Service (VSS) backup.

The Avamar SharePoint VSS plug-in performs the application backup and uses the base Avamar Windows Client. For disaster-level recovery, perform an image-level restore of the operating system by using VMware or Hyper-V. After the OS-level recovery completes, use the Avamar plug-in to recover the SharePoint application.

**Note:** The implementation of VMware or Hyper-V image-level protection is beyond the scope of this guide, but you can use this option to recover the base operating system.

**Figure 3** provides a high-level overview of the Avamar installation and configuration process in a SharePoint farm. In this example, the Avamar Plug-in communicates from WFE to all other Farm members to provide a summary of workorders. The workorder outlines which servers contain the components for backup.
EMC Data Domain deduplication storage systems continue to revolutionize disk backup, archiving, and disaster recovery with high-speed, inline deduplication for backup and archive workloads.

EMC recommends that you use Data Domain systems as a backup target for Avamar in the following configurations:

- VSPEX Private Clouds with VMware.
- VSPEX Private Clouds with Hyper-V for 300 VMs or greater.

Install the Avamar client and plug-ins in the same way as when you use an Avamar device as the backup target. If you use a Data Domain system as the backup target for Avamar, then after the Data Domain system has been discovered within the Avamar
Manager software application, specify the backup target by checking the appropriate box in the Avamar data set definition interface.

For 300 VMware-based VSPEX deployments or less, VSPEX offers VDP Advanced for SharePoint. Powered by EMC Avamar technology, VDP Advanced delivers fast and efficient image-level backups and recoveries combined with SharePoint-specific plug-ins, to make deployments as simple as possible.

VDP Advanced enables you to protect up to 10 VDP Advanced system in each vCenter instance. A VDP Advanced system:

- Provides up to 8 TB of capacity.
- Supports up to 400 concurrent VM backups.
- Operates independently from other VDP Advanced virtual appliances within the vCenter server instance. Individual deduplication of each VM occurs in a VDP Advanced virtual appliance. To take advantage of global deduplication, implement Data Domain Protection Storage Architecture.
- Provides high efficiency - VDP Advanced uses an industry-leading and patented variable length deduplication algorithm that minimizes storage and bandwidth consumption. The use of CBT reduces backup and recovery times, which minimizes the cost of application downtime.
- Provides resiliency - VDP Advanced provides agentless, image-level backups to disk and guest-level, application-consistent protection for Microsoft Exchange (including granular Exchange mailbox recovery), SQL Server, and SharePoint. Network efficient, encrypted backup data replication enables you to back up data offsite, which ensures business continuity and compliance.
- Provides simplicity - VDP Advanced provides full integration with vCenter Server and end-to-end management by using the vSphere Web Client provides:
  - Familiar user interface, which makes the product easy to use and manage.
  - Flexible and simplified schedules, which reduce operational overhead for vSphere administrators.

With VDP Advanced, you will benefit from fast, efficient image-level and file-level backup, recovery, and replication combined with reliable, scalable, and efficient storage protection.

Built-in Data Replication

The vSphere Replication feature provides an offline copy of a VM by copying changes in the vmdk for a running VM to a vmdk file at a secondary location. Each copy operation creates a replica of the VM at the secondary location and vSphere Replication supports up to 24 concurrent point-in-time replicas. User-defined Recovery Point Objectives (RPOs) determine the frequency of the replication operation. You can set RPOs to occur at intervals between 15 minutes and 24 hours.

VDP Advanced provides a built-in replication solution that supports the replication of deduplicated, encrypted backup data to a secondary location. The replication solution in VDP Advanced provides longer retention periods with less aggressive RPOs than vSphere Replication. When you use VDP Advanced replication, you can
store replicas at the secondary location for periods in the range of 30 and 60 days and use RPO intervals of 24 hours and higher.

VDP Advanced replication supports the following destination storage types:

- VDP Advanced
- EMC Avamar
- EMC Avamar with Data Domain

Table 1 represents a possible sizing for this Solution based on assumptions contained within the *VSPEX for Virtualized SharePoint Design Guide*.

**Note:** Sizing can vary significantly depending on initial and day-over-day commonalities, application change rates, retention periods that are required for the business.

For example, based on assumptions within the *Design Guide: EMC VSPEX for Virtualized SharePoint*:

- If a configuration uses a retention period of 30 days for 300 VMs, then you can use a Data Domain DD2500.
- If a configuration uses a retention period of 3 years for 300 VMs, then use a Data Domain DD4200.

Always use the **DPAD Sizing tool** to provide formal sizing metrics for an environment.

The remainder of this document focuses on design and implementation for Avamar deployments and Avamar and Data Domain deployments for the EMC VSPEX for Virtualized SharePoint solution.
Table 1. Recommended configurations for EMC Powered Backup and Recovery solutions for VSPEX Private Cloud deployments

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Chapter 3: SharePoint backup and recovery considerations

This chapter details and discusses SharePoint backup and recovery considerations you need to be aware of when using EMC Avamar and EMC Avamar with Kroll OnTrack.

Avamar provides protection for all scales of SharePoint deployment, from stand-alone farms that contain all SharePoint roles on a single server, to small, medium, or large enterprise distributed farms.

Avamar provides complete protection for a SharePoint farm by using the:

- Avamar Client for Windows to protect the operating system, system state, and Windows Server.
- Avamar Plug-in for SharePoint VSS to protect the SharePoint farm structure and content. The Avamar Plug-in for SharePoint provides granular level recovery (GLR) when used with optional third-party recovery tools, such as Ontrack PowerControls, which you purchase separately.

General considerations

Before you use the Avamar Plug-in for SharePoint VSS to backup a SharePoint environment, review the following information.

You can only perform a backup and restore of:

- Individual websites, lists, or list items, as a part of the backup or restore of the parent Content Database.
- Configuration database or the Central Administration (CA) content database of a SharePoint farm, as part of the backup or restore of the entire farm.

Note: These databases are special databases that must be backed up or restored with everything (all content databases). A backup of these components provides a snapshot that you can use for troubleshooting. For instance, you can use the backup with SQL Server tools to compare the present state of the components.
You cannot use the Avamar Plug-in for SharePoint VSS to:

- Back up a SharePoint farm to tape.
- Back up an IIS metabase.
- Back up Registry keys or files on web front-end (WFE) servers. This content includes files located outside any content database, such as certain master pages, .aspx files, web.config files, and other configuration files. The Avamar Client for Windows includes this content in a full Windows Server backup.

**Multistreaming backups**

Avamar Multistreaming enables parallel processing of up to ten backup jobs by using multiple processors. Each stream requires a separate processor core. Avamar Multistreaming improves backup performance when you store backup data on the Avamar server or on a Data Domain system. You can configure multistreaming to group backups by volume or by database. If volumes have varying database sizes, for example 500 GB on G:, 100 GB on H:, and 100 GB on Z:, then the time to release the volume is slower for streams that back up bigger databases.

To balance backup performance, back up data by:

- Volume when all volumes are similar in overall size.
- Database when all databases are similar in overall size.

**Note:** If you balance the databases across volumes so that each database is about the same size, and each volume contains about the same number of databases, then backup performance by database or by volume is the same.

Avamar Multistreaming places additional demands on computer hardware and resources beyond the base requirements for the Windows SharePoint VSS plug-in. Use multistreaming with caution.

**Note:** EMC recommends that you use multistreaming for incremental changes only. To maximize performance and deduplication processing, use a single stream to back up the farm, for the first full backup. After the first full backup completes, subsequent backups can take advantage of multi-streaming because those backups include only new data and incremental changes that have not been deduplicated.

**Full backups**

In SharePoint environments, the administrator configures daily full backups because SharePoint VSS is the foundation for full backups. The full backup is the basis of a routine recovery or disaster recovery (DR), of all databases, applications, and components.
Granular Level Recovery

While you must install the Avamar Client for Windows and the Avamar Plug-in for SharePoint VSS on all servers in a SharePoint farm, you can setup a SharePoint farm role on the farm to provide granular level recovery (GLR). Although GLR is optional, most configurations use GLR to meet recovery objectives.

Unlike a standard recovery that allows you to recover content databases and entire SharePoint farms, a recovery assised by the the Avamar plug-in for SharePoint GLR and an optional third-party recovery tool such as the Kroll Ontrack PowerControls software, can significantly reduce the time, resources, and space that you need to recover individual items such as files or folders.

**Note:** The Avamar Plug-in for SharePoint VSS installation package does not include the Kroll Ontrack PowerControls software, you must purchase and install the software separately.

Before you can perform a GLR, you must install the Avamar Plug-in for SharePoint GLR and the Kroll Ontrack software on the recovery host or SharePoint Administrator Console Server. The virtual drive appears on the recovery host and you can browse and select the data for a granular level recovery. Kroll Ontrack provides the SharePoint farm schema for the Avamar software to recover the granular object.

**Note:** The plug-in appears in the list of plug-ins when you browse for backups but you cannot select the plug-in because it is exclusively used for a SharePoint GLR-based recovery. The plug-in enables GLR by using backups that were created with the Avamar SharePoint VSS plug-in.

When you leverage the plug-in feature, the recovery operation mounts the Avamar backup on the Virtual SharePoint Server as a windows labeled volume, for example Z:\. The Avamar Virtual Drive enables you to use the Ontrack PowerControls software to quickly browse and select the contents of the backup without physically moving any of the files or the underlying databases. Ontrack PowerControls uses Avamar GLR to copy only the items required for the recovery to the original or alternate location (farm or server). The time it takes to recover the selected contents through the mounted virtual drive is considerably less than the time required to recover an entire database, browse the database, and then select the objects or items for recovery.
Chapter 4: Configuring SharePoint Server Backups

This section provides an overview of backup strategies when you use Avamar, VDP Advanced, or Avamar with a Data Domain system to back up a SharePoint Server.

Avamar backup strategies overview

The backup strategy for SharePoint farm can include a robust variety of data types, in addition to SQL Server-based databases and log files. The backup strategy for a SharePoint farm of any size with WSS 3.0 components must include the following objects:

- Content databases
- Website collections
- Web applications
- Content publishing webs services
- Search Windows service, including databases & indexes
- Dependent components that one cannot select, but are backed up as part of a dependency path.

- The Avamar SharePoint VSS plug-in performs the application backup and uses the base Avamar Windows Client. For disaster-level recovery, perform an image-level restore of the operating system by using VMware or Hyper-V. After the OS-level recovery completes, use the Avamar plug-in to recover the SharePoint application.

On-demand backups in a stand-alone environment

In a stand-alone SharePoint farm, all components including the WFE reside on a single server. An on-demand full backup of a stand-alone SharePoint farm, will backup all components in the same manner as a scheduled backup. You do not require a back-end server.

On-demand backups in a distributed SharePoint farm

The Avamar Plug-in for SharePoint VSS can back up and recover objects in a distributed SharePoint farm, including any third-party databases built on a SharePoint foundation and registered within the configuration database.

Before you can backup a distributed SharePoint Farm, you must install the Avamar Plug-in for SharePoint VSS on all machines in the farm, including the Web Front-end (WFE) server even if the WFE does not have SharePoint data. When you install the plug-in you must specify whether the server is a front-end or back-end server.
The main server in the distributed farm is the Web Front-end server (WFE). The Avamar Plug-in for SharePoint VSS coordinates the farm backups through the selected WFE server. If there is no SharePoint data on a WFE server, then the SharePoint VSS writer does not backup the WFE server.

**Avamar with Data Domain backup strategies overview**

Avamar 6.1 and later versions support SharePoint farm backups to a Data Domain system, however only Avamar 7.0 and later versions support SharePoint Server 2013. Although beyond the scope of this paper, the Avamar/Data Domain TC-based sizing tools have formally included SharePoint farm support for some time.

**VDP Advanced backup strategies overview**

Use the VMware vSphere Web Client interface to select, schedule, configure, and manage VM backups and recoveries, including file level recovery (FLR). FLR allows local administrators to browse and mount backups for the local machine, then restore individual files.

During a backup, VDP Advanced creates a quiesced snapshot of the VM, and then automatically deduplicates the backup data.

Before you use VDP Advanced, you must install and configure the VDP Appliance. The chapter *Installing and Configuring vSphere Data Protection* in the *vSphere Data Protection Administration Guide* provides more information.

To configure VMware backups:

1. Use a web browser to connect to the VDP vSphere Web Client. For example: https://<IP_address_vCenter_Server>:9443/vsphere-client/

2. In the **Credentials** window, specify the vCenter user name and password that provides access to the VDP appliance.

3. In the **Welcome to vSphere Data Protection** window, select VDP, and then click **Connect**. The VDP window appears as shown in Figure 4.
4. On the **Backup** tab, select **Backup Job Actions**, and then click **New** to launch the Backup Job Wizard.

5. The Virtual Machines page displays an inventory tree that contains all the objects and VMs that the vCenter Server manages. Click on each rotating triangle to display the tree contents of the object.

6. Enable the check boxes next to the items you want to add to the backup job and then click **Next**.

7. On the **Schedule**, **Retention Policy** and **Name** windows, select the parameter that you require for the backup.

8. In the **Ready to Complete** window, review the summary information for the backup job and then click **Finish**. An information dialog box appears to confirm that the wizard created the backup job successfully.

9. Click **OK**. The newly created backup job appears on the **Backup** tab.
Chapter 5: Solution Verification Methodologies

This section provides guidance and the steps required to verify the backup configuration by performing recovery operations that use the EMC Avamar deduplication software and the VDP Advanced software.

Backup and recovery verification methodology

Verification of the SharePoint backup configuration and the ability to restore the data requires a number of recovery options. The highest level is to recover an entire SharePoint farm. You can recover the data to the original location or to alternate location, correctly sized for performance and capability.

There are other lower level elements to confirm in the event that the environment is configured with GLR. When you recover items and other lower level objects, Avamar recovers the object in conjunction with The Kroll OnTrack software provides the SharePoint farm schema to the Avamar plug-in during the recovery process which allows the plug-in to recover a single, several items, or web parts without mounting the content database.

The following core Avamar SharePoint VSS documents outline the specific steps for recovery of lower level objects:

- EMC Avamar 7.0 for SharePoint VSS User Guide
- EMC Avamar 7.0 Operational Best Practices
- EMC Avamar 7.0 Administration Guide
- vSphere Data Protection Administration Guide -vSphere Data Protection Advanced 5.5.5
Chapter 6: Reference Documentation

This chapter summarizes the documentation to review for more information about EMC Avamar, Microsoft SharePoint, and VMware vSphere.

Product documentation

The following documents provide additional and relevant information. If you do not have access to a document, contact your EMC representative.

- **EMC Avamar 7.0 for SharePoint VSS User Guide**
- **EMC Avamar 7.0 Administration Guide**
- **EMC Avamar 7.0 for VMware User Guide**
- **vSphere Data Protection Administration Guide - vSphere Data Protection 5.5.5.**

Other documentation

The Microsoft website provides documentation on Microsoft SharePoint:

http://www.microsoft.com

The VMware website provides documentation on VMware vSphere and vCenter:

http://www.vmware.com