

vtCommander

vtCommander provides a **local graphical user interface** (GUI) to manage Hyper-V R2 server. It supports Hyper-V technology on full and core installations of Windows Server 2008 R2 as well as on Microsoft Hyper-V Server 2008 R2, which is Microsoft standalone free hypervisor product. vtCommander allows managing virtual machines, virtual hard disks and networks on both local and remote Hyper-V servers. You can use vtCommander to manage Hyper-V on Windows 2008 R2 core and Hyper-V Sever installations without resorting to remote management via the Microsoft Hyper-V Manager or Virtual Machine Manager Server. vtCommander also eliminates the requirement of an additional Windows license.

Why vtCommander

vtCommander does not extend a potential attack surface on managed Hyper-V servers and does not require any additional components other than .NET features that are available on target platforms 'out of the box', see more below. vtCommander has a small memory footprint and does not consume any resources on managed Hyper-V servers when it's not running. It is a valuable tool for managing the virtualization stack on production environments that are utilizing Windows 2008 R2 Server core installation according to Microsoft Best Practices as well as the Microsoft Hyper-V Server 2008 R2.

Installing and Starting vtCommander

Prerequisites

vtCommander runs only on computers with x64-based processors and 64-bit version of Windows. It can manage only Hyper-V R2 or later versions of Hyper-V. Note: although older versions can be managed as well with a reduced functionality, such scenarios are not supported by VT Technology technical support. vtCommander requires .NET 3.51 or later - these features (NetFx3) can be enabled automatically on Windows and Hyper-V Servers 2008 R2 or Windows 7 by vtCommander bootstrapping software when necessary. You will need to download and install .NET 3.51 manually on other versions of Windows that don't have this feature pre-installed prior to running vtCommander.

Additional considerations

vtCommander can be used on 64-bit versions of Windows that don't support Hyper-V role. For example, Windows 7 can be used to manage remote instances of Hyper-V, although most benefits such as GUI for administration of virtual machines, hard disks, networks and connection binding management can be achieved by running vtCommander on Windows Server 2008 R2 Core or Hyper-V Server 2008 R2 installations, where such tasks would be difficult or impossible to accomplish otherwise without resorting to remote management.

Starting vtCommander

Launch vtCommander bootstrapping program (vtCommander.exe) from a command prompt. This bootstrap program will display End User License Agreement in case vtCommander has not been installed on environment before. Please read this agreement and check 'I have read this license agreement' checkbox and click 'I Agree' button to continue with the installation process. Bootstrap program will check for prerequisites and drive you through the rest of the installation process: it will prompt you to enable .NET features automatically or give you an option to enable it manually when appropriate, and will let configure vtCommander options. You will be able to specify a target program directory defaulted to %ProgramFiles%\VT Technology\vtCommander. Select whether it should be added to the system %Path% so you will be able to start vtCommander from a command console by typing vtCommander going forward, and specify if vtCommander should be started automatically every time you logon to Windows, as well as define the automatic update settings. Note: some of these setting will take effect only after you logoff and re-open command console. Bootstrap program will start vtCommander in case it has been already installed on this system - vtCommander GUI will be opened using a default or last used view

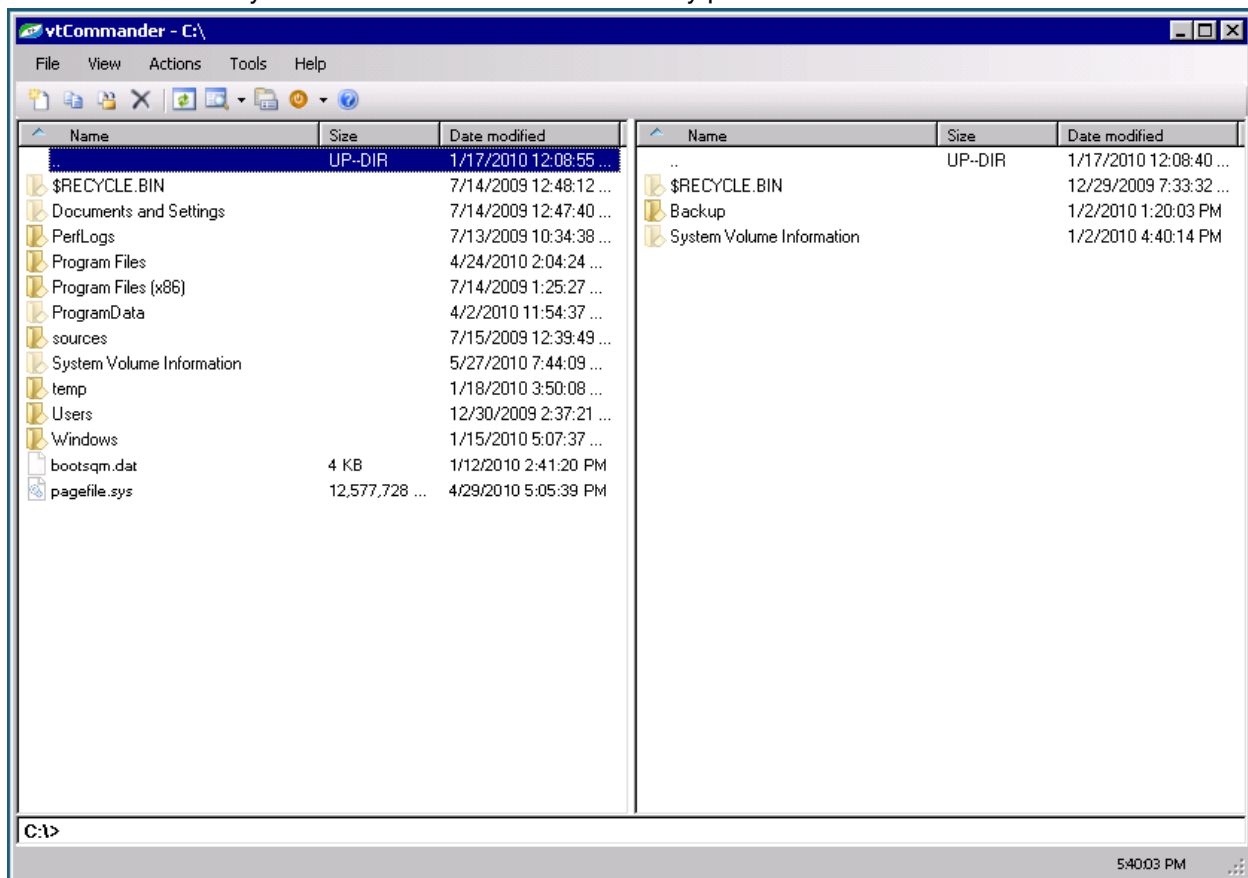
depending on vtCommander options. If you selected to add vtCommander program directory to %PATH% upon installation you can start it from a command console by typing 'vtCommander' and pressing {Enter}. If you install a full version of vtCommander you will be presented with 'Configure Monitor' dialog that allows configuring monitoring options. See 'Resource and Performance Monitoring' section below for more information.

Removing vtCommander

You can remove and/or reinstall vtCommander by running its bootstrapping utility with '/remove' command line argument. Please note that if you started bootstrapping utility that was added to the system path vs. running it from a different location, some files that you selected upon installation from vtCommander program directory may need to be deleted manually.

File System View

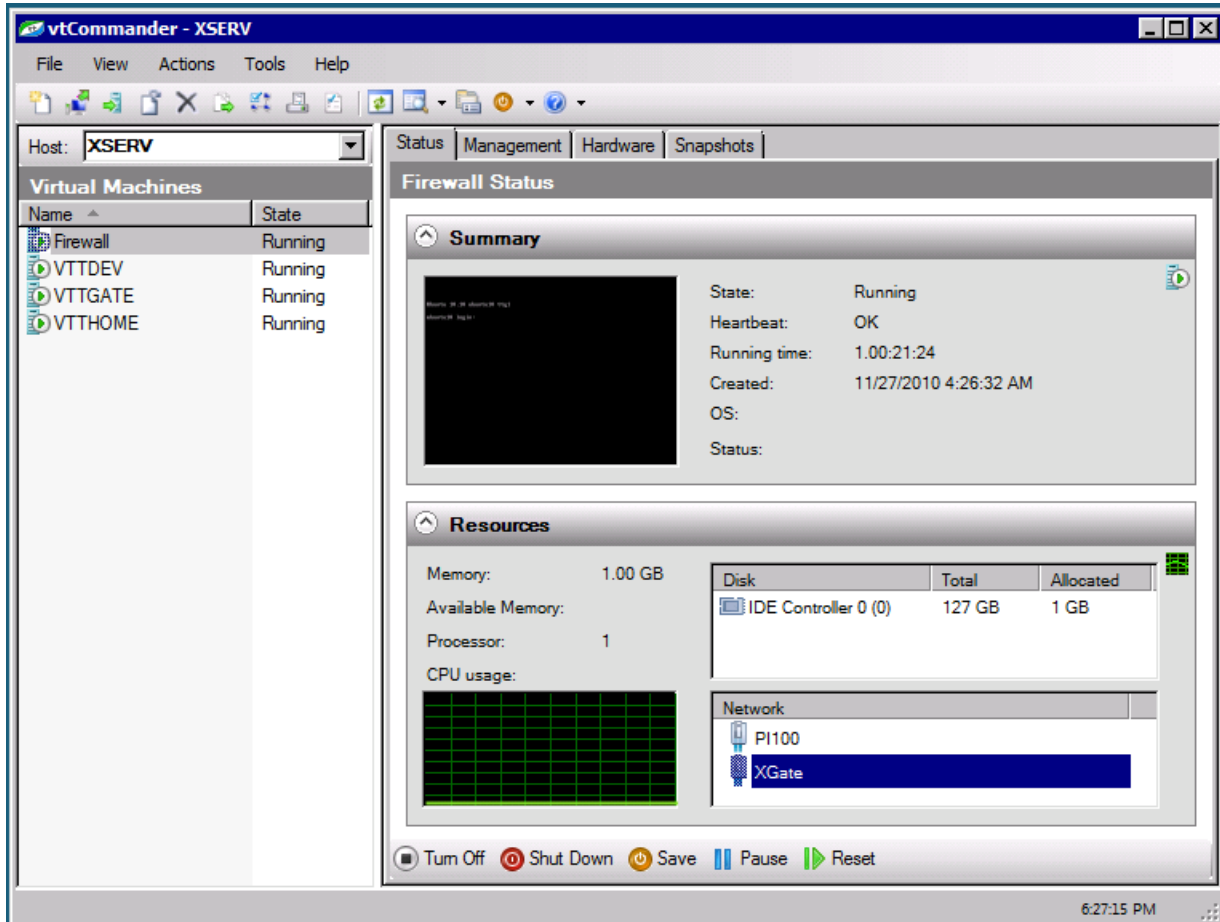
vtCommander File System View shows either two directory panels or file viewer/editor.



You can use directory panes to navigate file system hierarchy in the active view while a second directory view can serve as a target for 'Move' and 'Copy' operation. You can perform 'Create' {F7}, 'Delete' {F8}, 'Copy' {F5} and 'Move' {F6} operations in active directory pane. These commands can be invoked via corresponding File menu command or a toolbar button when applicable and usually will be applied to the selected entry in active directory panel. You can use {Enter} key along with mouse double-click to open (drill-down) directory, starting executable application or launching the application associated with a selected file. Use {F3} and {F4} or 'File|Open' and 'File|Edit' to open the selection in vtCommander internal viewer or editor. Use {Esc} or 'File|Close' command to exit from internal viewer/editor to file system view. Use {Tab} key to switch between directory panels in file system view.

Guest List View

vtCommander provides a view of all virtual machines a.k.a. *guests* hosted by the locally or remotely managed instance of Hyper-V server. Guest List View displays virtual machine names along with their current states.

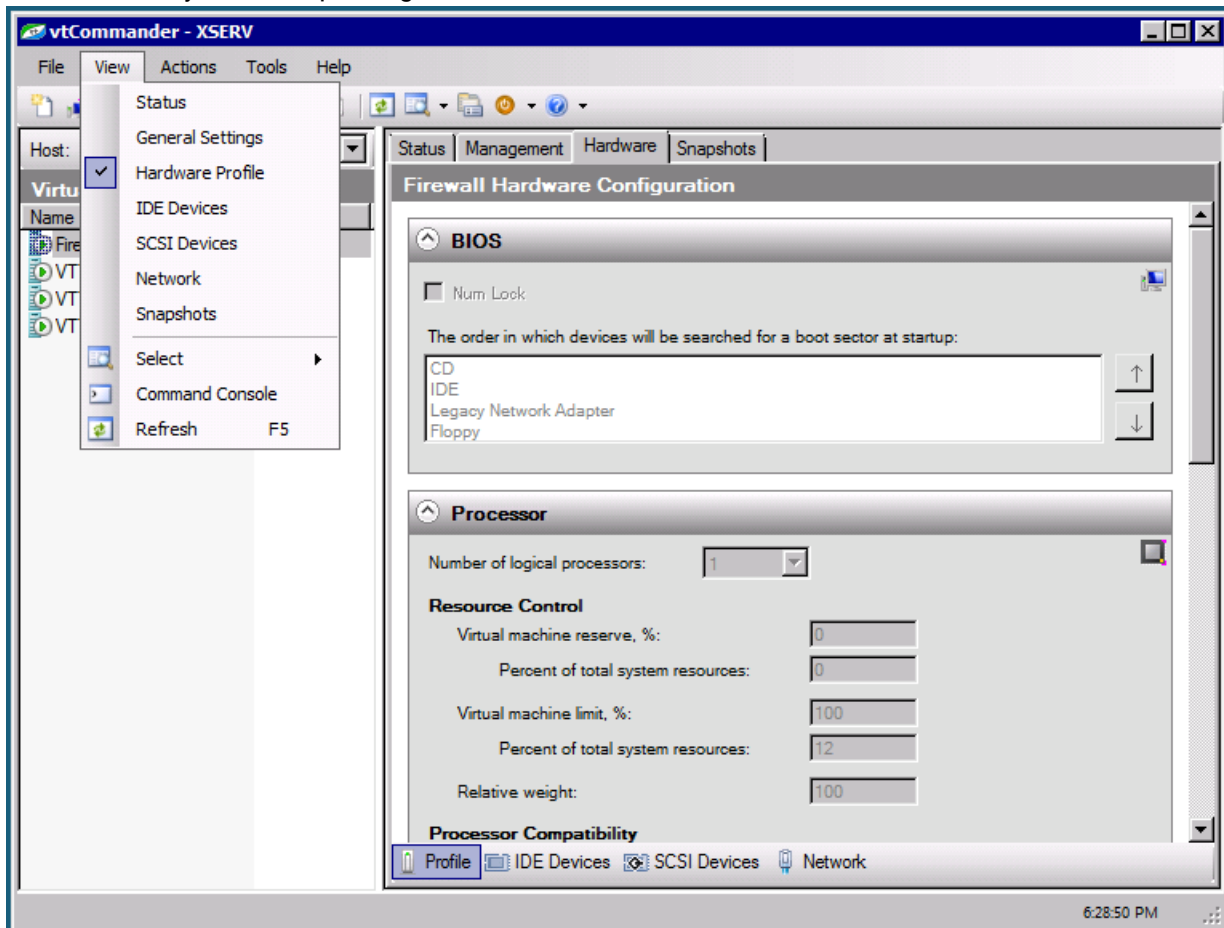


You can control virtual machine state by performing actions applicable for the current selected machine state such as 'Start', 'Shut Down', 'Turn Off', 'Save', 'Pause' and 'Reset' either via content menu by clicking a right mouse button and/or by using corresponding Actions menu items. State control actions available for the selected machine depend on its current state as well as on availability of Integration Services components running on this virtual machine. In addition to these state control actions you can also apply 'Delete' and 'Export' actions for the machine currently selected in the Guest List View. The latest can be invoked either via corresponding Actions menu commands, or by using toolbar buttons. Note: 'Export' action availability depends on current virtual machine state, i.e. guest operating system should shut down before you can export a virtual machine. Guest List View has a complimentary Definition View (or Remote Control view, which is not available in preview version of vtCommander) displayed in a second pane that is automatically synchronized with a selection in Guest List View pane. This complimentary definition view is in a 'preview' mode that doesn't allow guest configuration changes. You can use 'Edit' action via content menu for current selection or 'ActionsEdit' command or a corresponding toolbar button to switch into edit mode that allows modification of the virtual machine settings. Guest List View also supports creation of new and importing of the existing virtual machines via

'Create New Virtual Machine' and 'Import Virtual Machine' Actions menu commands and corresponding toolbar buttons.

Guest Definition View

vtCommander Guest Definition View contains the details of the hosted virtual machine currently selected in the Guest List View, including virtual machine state, configuration settings and snapshots. This view is divided into 4 tabbed sub-views: 'Status', 'Management', 'Hardware' and 'Snapshot' with 'Hardware' tab further divided into 'Profile', 'IDE Devices', 'SCSI Devices' and 'Network'. Each of these sub-views can be selected directly via corresponding View menu item.



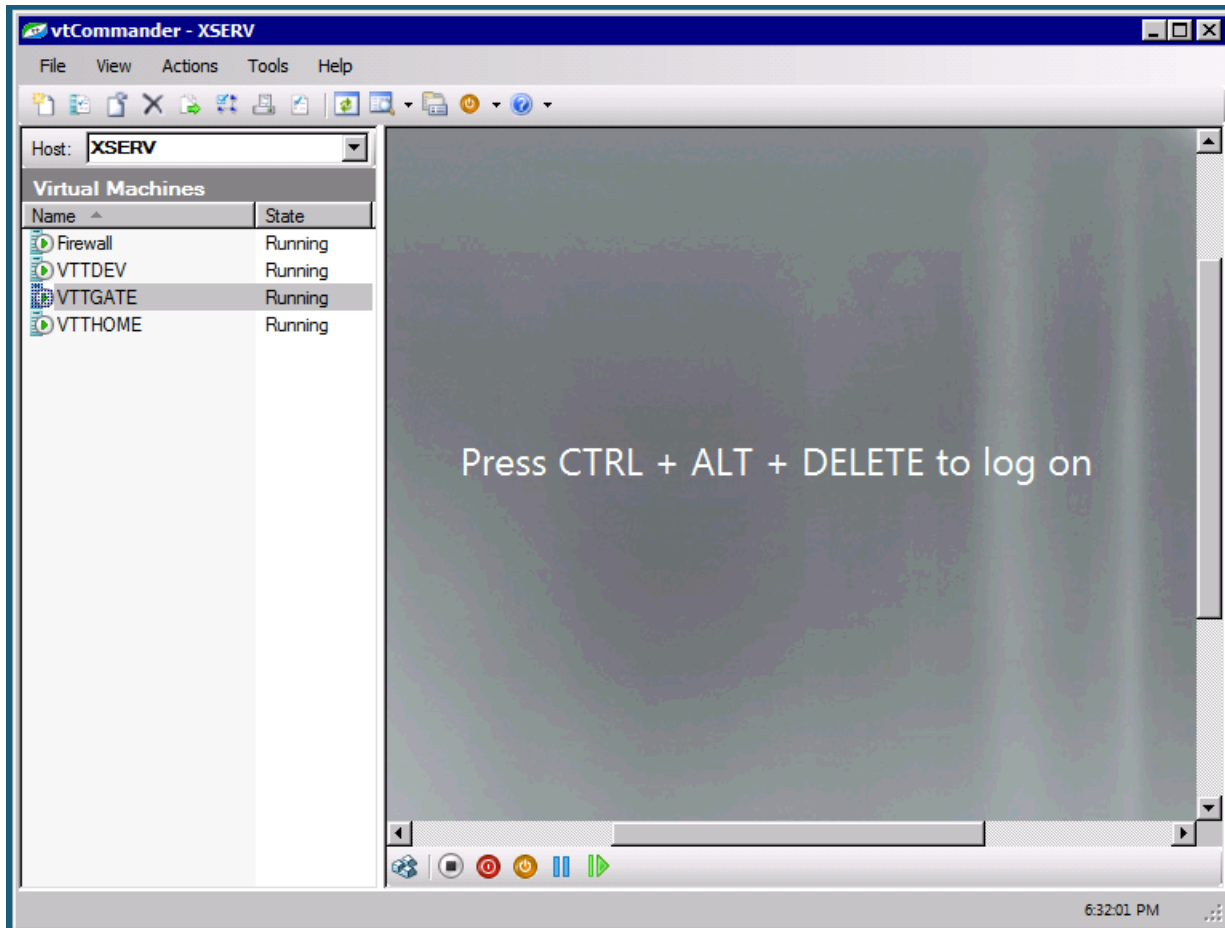
'Status' panel shows virtual machine summary information, including its state, creation and running time as well as guest OS information and heartbeat status when available. Status field represents virtual machine additional status information when available, for example, export progress information. Currently available virtual machine state control actions are represented with 'Status' panel toolbar located at the bottom of this panel in addition to the corresponding Actions menu commands. 'Management' panel displays virtual machine settings such as name, integration services, automatic stop and start actions and its snapshot files location. 'Hardware' panel represents virtual devices grouped into 'Profile' corresponding to the virtual machine key configuration settings such as BIOS, memory, processor, COM ports and virtual floppy drive configurations. Other hardware configuration is factored into 'IDE Devices', 'SCSI Devices' and 'Network'. Both IDE and SCSI devices information can be accessed via their respective views. These devices can be added, removed, or their definitions can be edited as well as SCSI controllers can be

added and removed when Guest Definition View is in edit mode. 'Network' settings contain information for both emulated and synthetic network adapters, which can be also added or removed in edit mode. 'Snapshots' panel displays all virtual machine snapshots with a possibility to add, delete or apply snapshot. These actions are available via 'Snapshot' panel toolbar located at the bottom of the panel screen and corresponding 'Actions' menu commands. Guest Definition View doesn't allow guest configuration changes when in 'preview' mode. You can use 'Actions|Edit' command or a corresponding toolbar button to switch it into edit mode that allows modification of the virtual machine settings. Guest Definition View occupies a whole screen when in edit mode and mentioned view panels can be used to update configuration settings. Note: 'IDE Devices', 'SCSI Devices' and 'Network' latched buttons shown at the bottom of 'Hardware' sub-view have drop-down arrows that allows invocation of commands / operations creating or modifying corresponding virtual hardware when in edit mode. These commands are also available via corresponding Actions menu items. Some panels can be 'removed' by clicking on top-right panel 'close' hot area, which is equivalent to corresponding 'Remove' operation for hardware component. All edit mode modifications will not be applied until 'Save' command is explicitly selected via corresponding Actions menu or toolbar button. You can use {Esc} button or 'Actions|Close' menu command to switch back into preview mode.

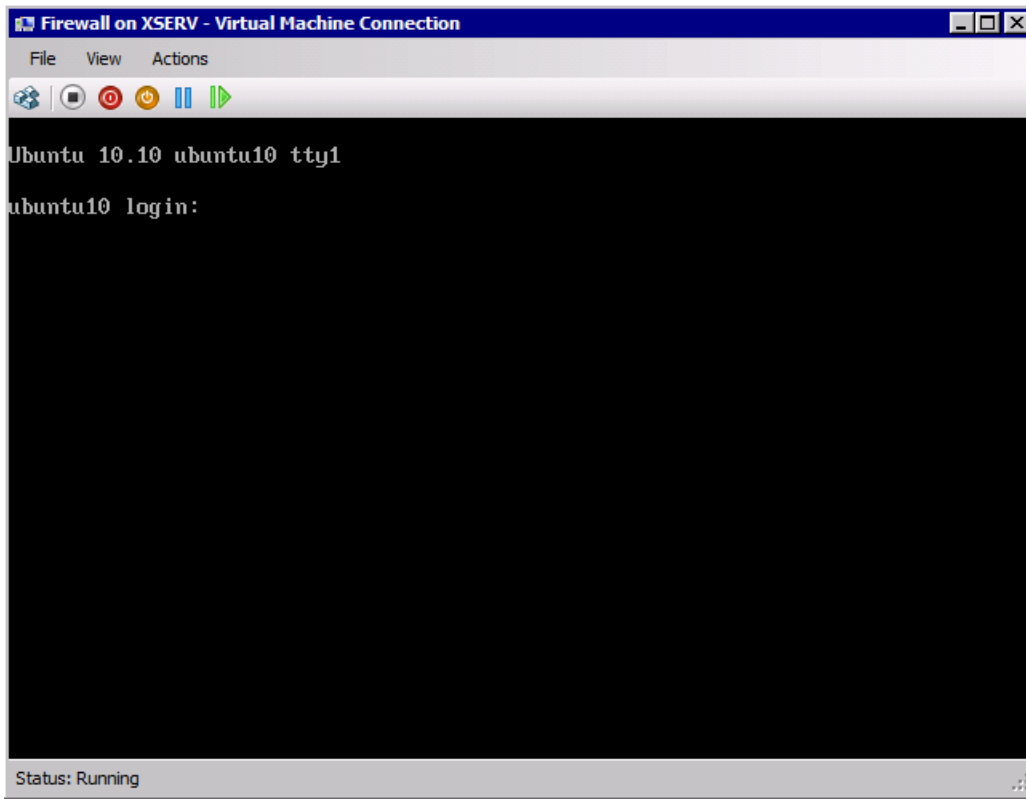
Note: GUI for management of the new Hyper-V features introduced in Windows Server 2008 R2 SP1 (Service Pack 1) such as dynamic memory and RemoteFx will be available only for virtual machines that are hosted on Hyper-V hosts upgraded to SP1 and have RemoteFx role enabled in case of RemoteFx. Please refer to Microsoft Hyper-V and RemoteFx documentation available on Microsoft TechNet for more information about these technologies and pre-requisites.

Guest Connection View

vtCommander Guest Connection View allows installing or interacting with the guest operating system of the virtual machine currently selected in the Guest List View. You can also control the state of the selected virtual machine from this view. You can use the 'Actions|Connect to Virtual Machine' menu command or the toolbar command to connect to the virtual machine from Guest List View or Guest Definition View. Use 'Actions|View Virtual Machine Settings' to switch to Guest Definition View from the guest connection view.



You can open guest connection view (a.k.a. guest console) in a separate window by using 'Actions|Open Guest Console' or a corresponding toolbar button or simply by double-clicking on the virtual machine in the Guest List View:



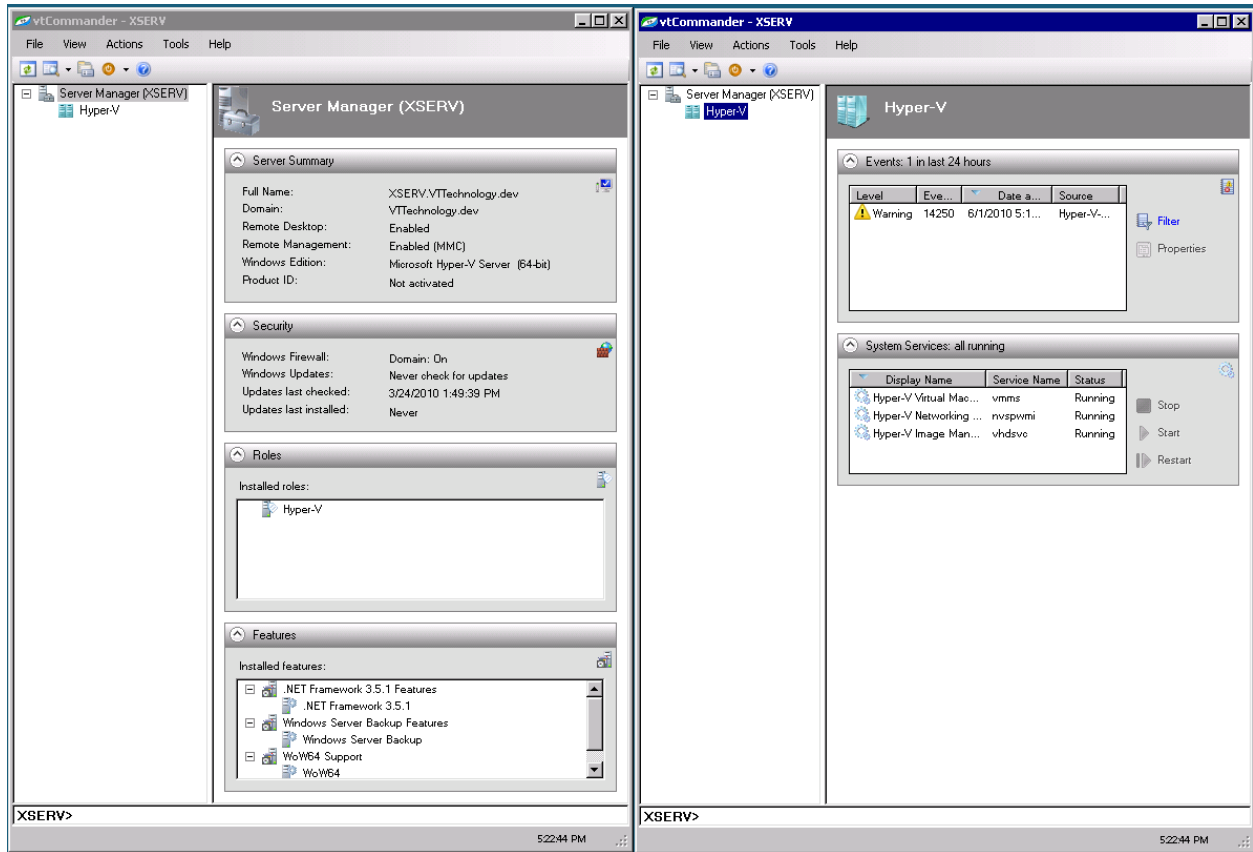
Note: there can be only one active guest connection at a time, so vtCommander will hide 'Open Guest Console' menu and toolbar button when in Guest Connection View.

You may find the following tips to be helpful when using guest connection view:

- Use the 'Actions|Ctrl+Alt+Del' menu command or the corresponding toolbar button at the bottom of the connection view to send {Ctrl-Alt-Delete} combination to a virtual machine.
- The mouse may not work seamlessly between the operating system on the physical computer running vtCommander and the guest operating system when integration services are not available on the guest operating system depending on Windows version running on the host.
- You can switch Guest Connection View to a full screen mode using 'View|Full Screen Mode' menu command or {Ctrl-Alt-Enter} combination. {Ctrl-Alt-Enter} can be used to switch back to a window mode or you can also use the connection bar Restore button.

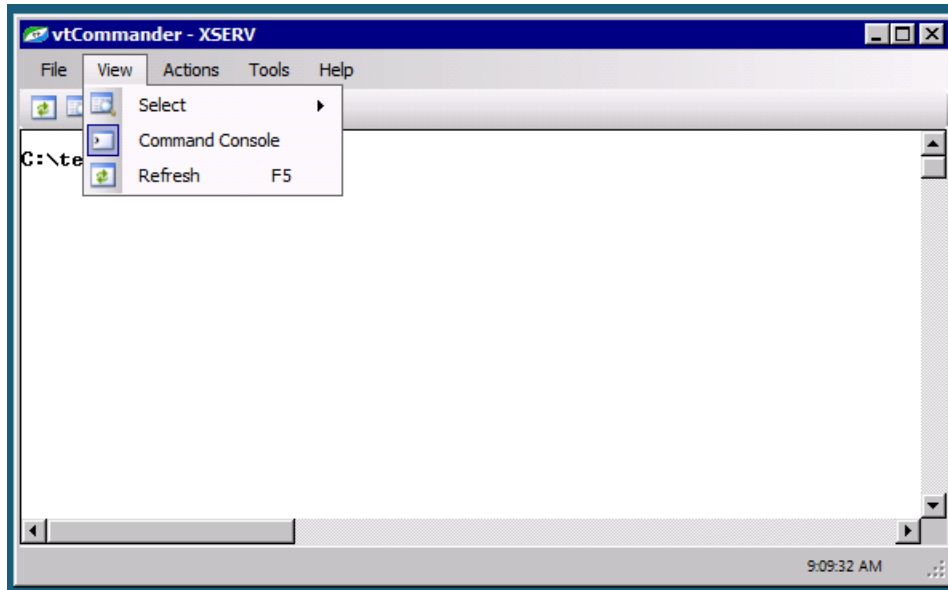
Server Manager View

vtCommander Server Manager View contains server summary information as well as status information for sever Hyper-V role when available. This view shows two panels that allow selection of the server management or role data to display and corresponding selected information such as server summary information, installed roles and features and server security settings. Server Manager View content depends on current operating system and is optimized for Windows 2008 R2 or later. When Hyper-V role is enabled on local machine 'Hyper-V' item can be selected in Server Manager View that provides access to Hyper-V event logs and system services. Relevant information is displayed in two panes in complimentary Hyper-V panel. 'Events' pane allows events filtering and properties visualization, while 'System Services' pane allows Hyper-V services state management.



Console View

vtCommander Console View hosts an instance of command processor console that allows direct access to command processor functionality from vtCommander. You can use {Ctrl-O} combination or 'View|Command Console' to switch to console view. Use {Ctrl-Break} or toggle { View|Command Console} item to exit console view.



vtCommitter Command Line

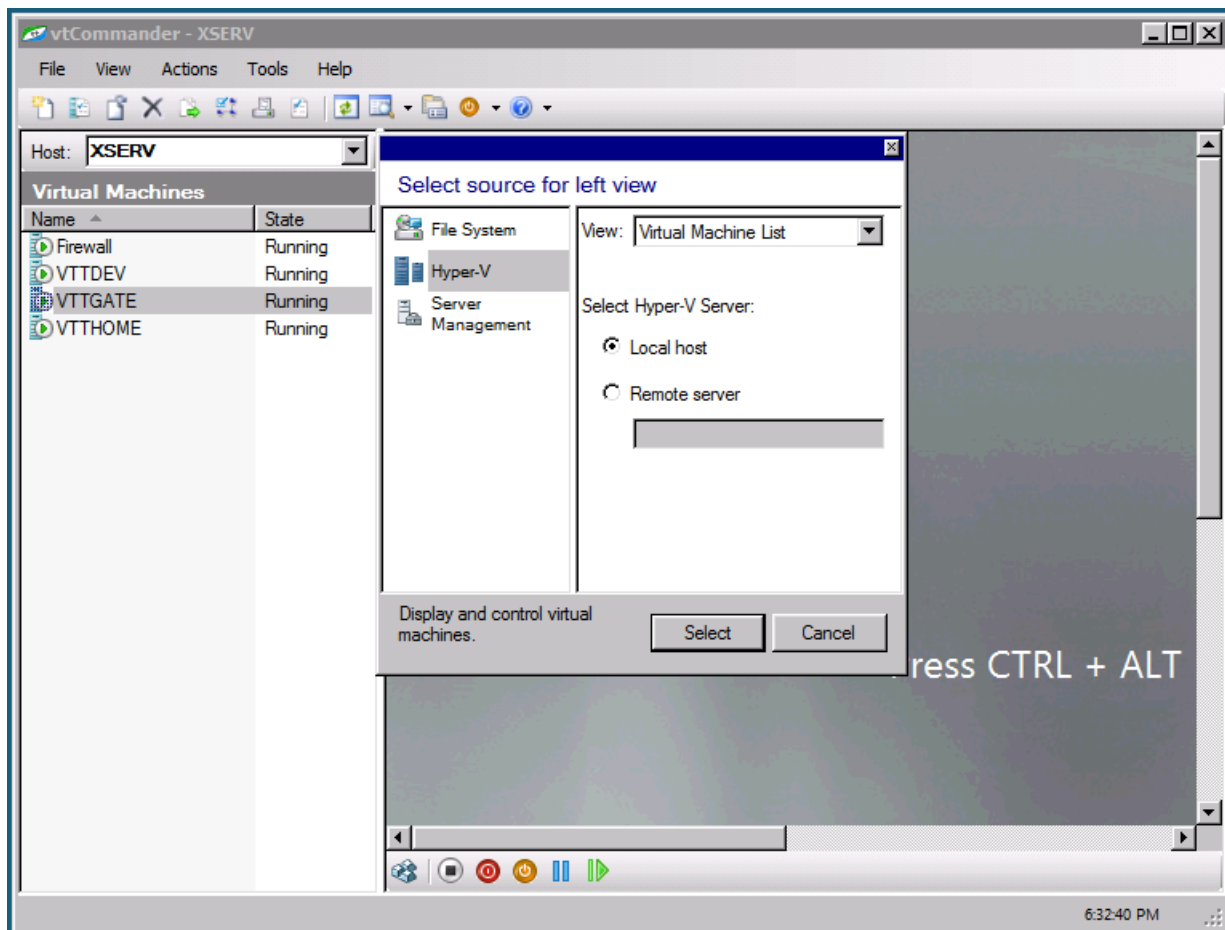
vtCommitter reserves the area on the bottom of its screen to display the command line that can be used for quick invocation of shell commands by typing them into command line and pressing {Enter} key. Note: you can also use {Alt-Enter} key to add currently selected entry in File System View active directory panel to the command line. Use Console View to execute multiple shell commands and/or to view the command processor console output.

Select View

Select View dialog allows selecting File System View, Hyper-V view (Guest List View or Guest Definition View) or Server Manager View supported by vtCommitter. You can invoke this dialog using 'View|Select...' menu commands, corresponding toolbar button, or via {Alt-F1} and {Alt-F2} shortcuts to select vtCommitter left and right pane views respectively.

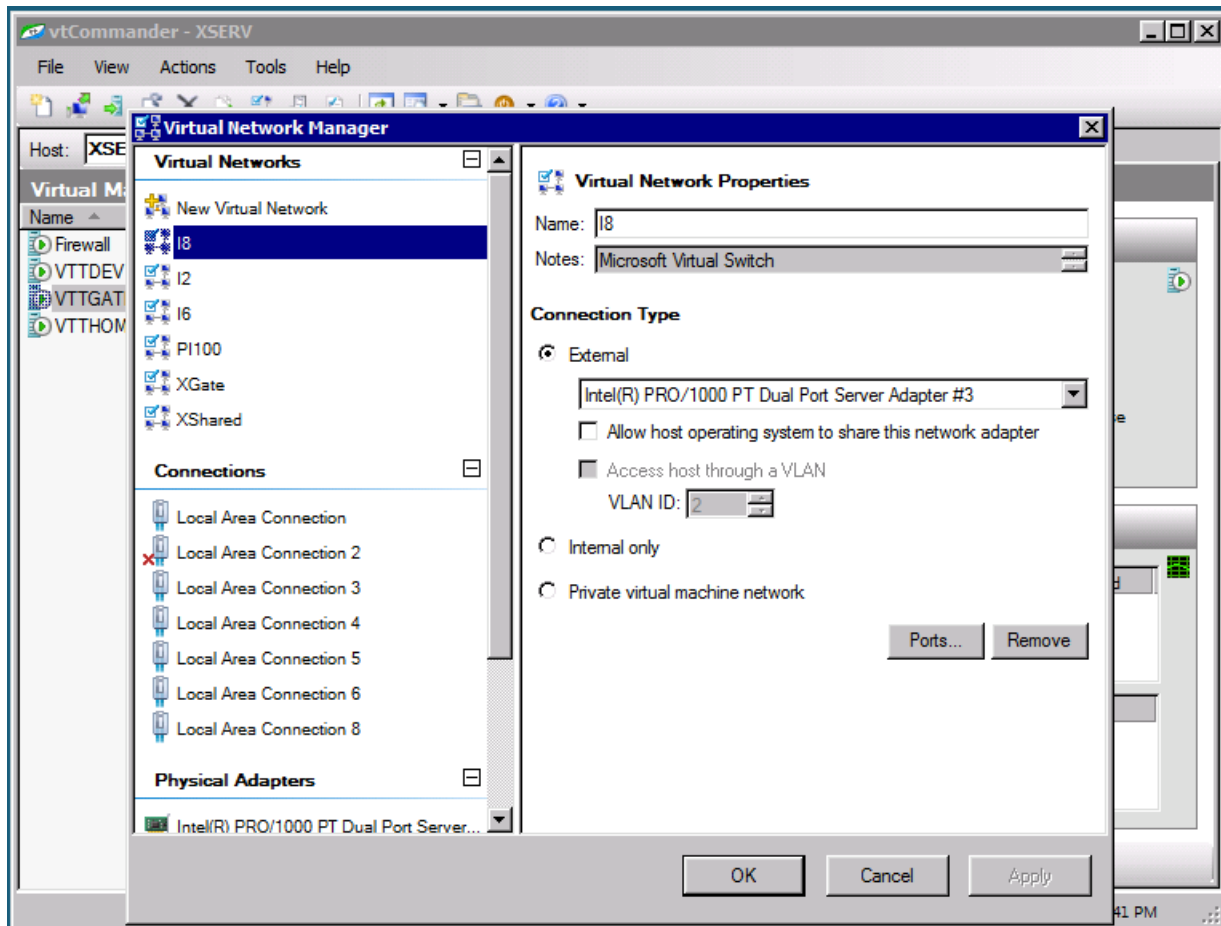
File System View can be assigned one of hard drives, removable storage or remote share using UNC notation.

Guest List View allows selecting either local (when available) or remote Hyper-V server to manage. Note: Guest Definition View will be automatically selected for a complimentary vtCommitter pane. You can switch between these views in left and right panes using 'Select View' dialog. In case your current session identity doesn't have permissions to access selected Hyper-V server vtCommitter will prompt you for user name and password. You can use both server and domain credentials when appropriate. In other words, you can use vtCommitter to manage remote Hyper-V servers that are not members of the same domain presuming that you have enabled remote management on these Hyper-V servers.



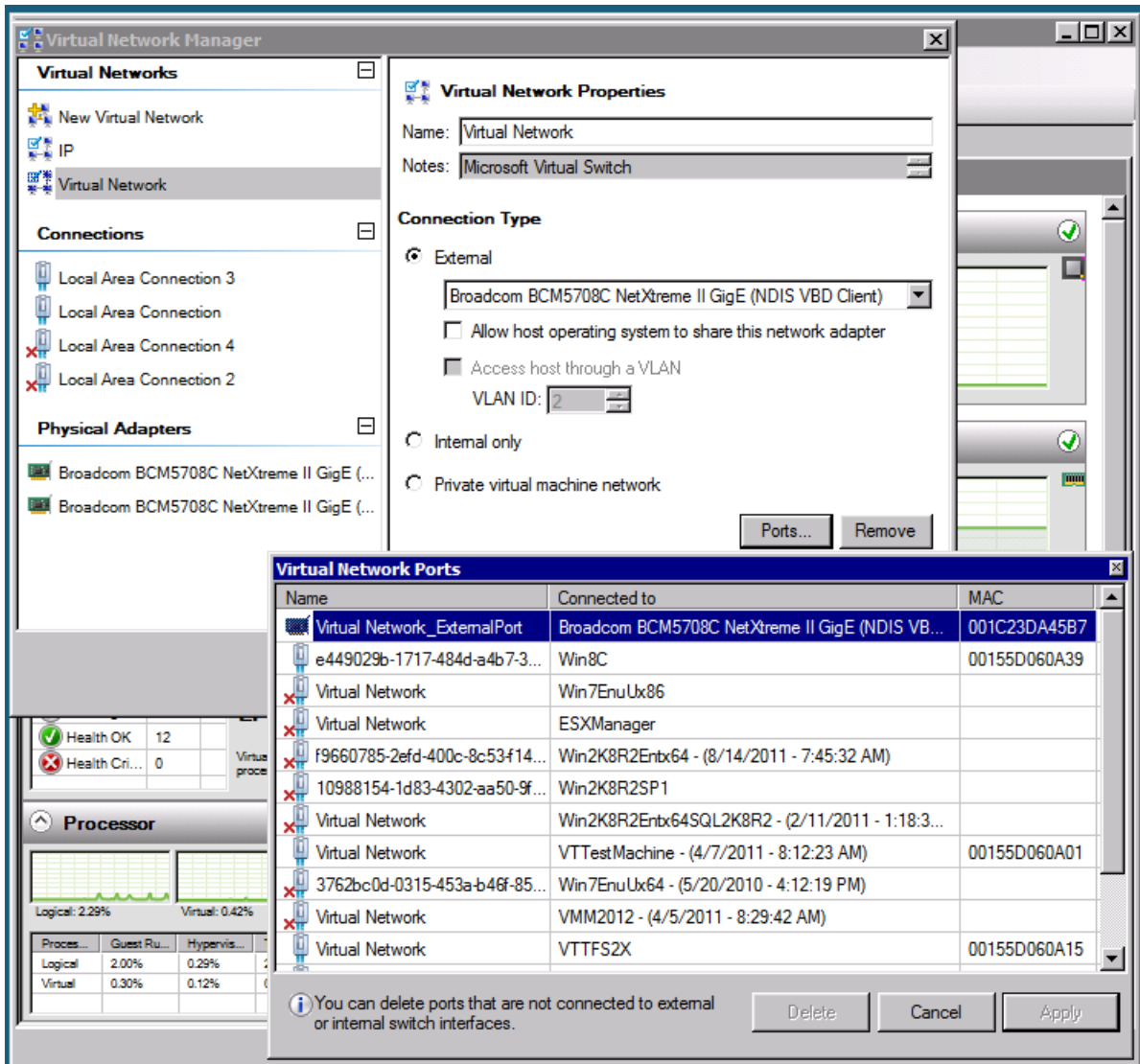
Network Manager

Network Manager allows managing virtual networks and network connection bindings on Hyper-V host server. You can open Network Manager using Actions menu item or toolbar button. Note: this functionality is only available in Guest List View or Guest Definition View. In other words, the Network Manager is always managing virtual network settings and displays physical adapter information for Hyper-V host being managed using corresponding vtCommander views. The Network Manager allows managing network connections only for local Hyper-V host, i.e. this functionality is not available for remote Hyper-V server, see more below.

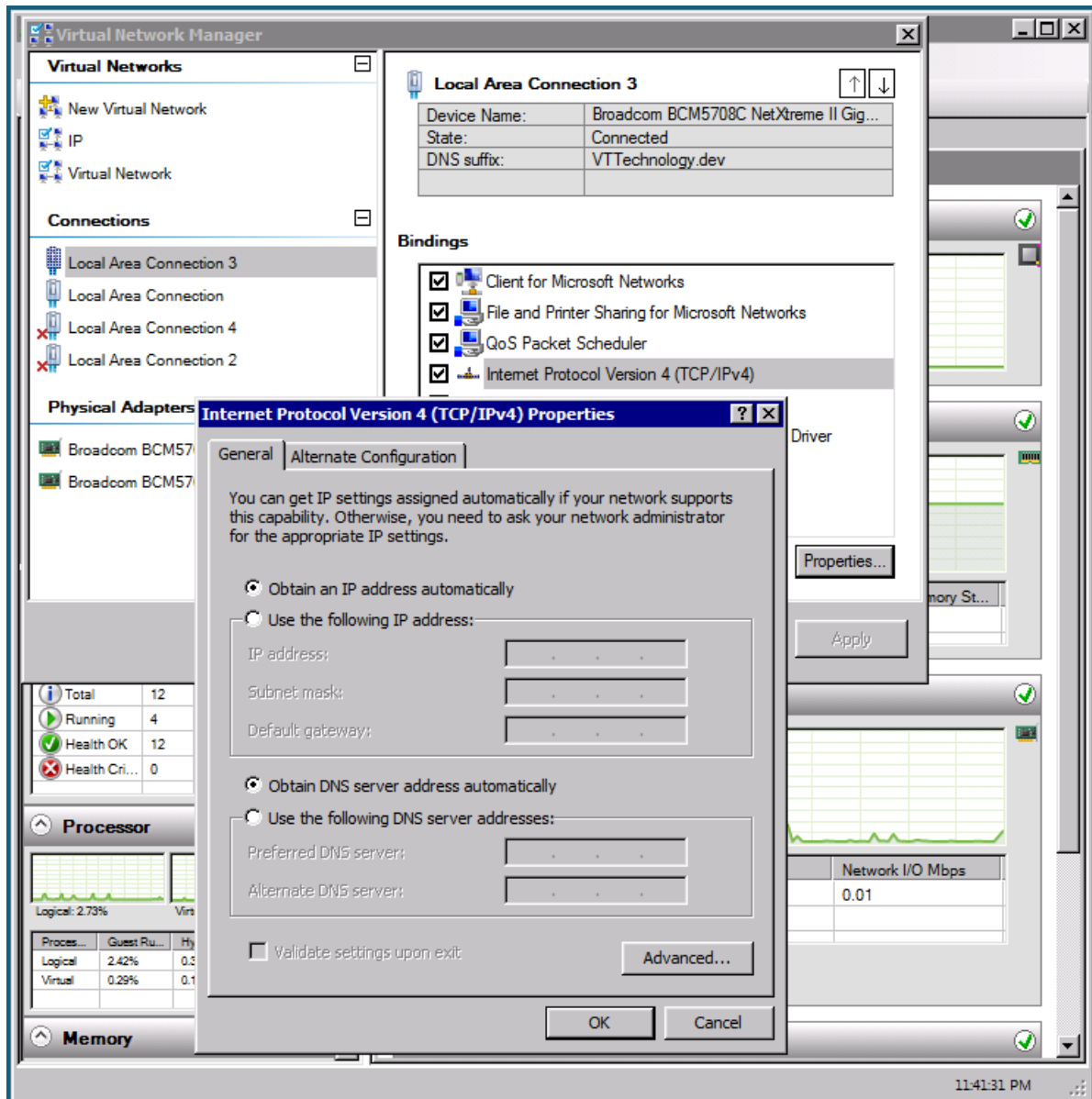


vtCommander Network Manager provides three groups of items in its left pane:

- 'Virtual Networks' contains 'New Virtual Network' item that allows defining of a new external, internal or private virtual network (switch) by providing network name, selecting type, and pressing 'Add' button. Newly created virtual network will appear along with already existing networks, if any, and its settings can be further customized if necessary. Network Manager allows port-level management, including visualization of the MAC addresses for already existing virtual network when applicable. This functionality is available via 'Ports' button in Network Manager's view corresponding to the selected virtual network. A virtual network can be deleted by selecting it in the Network Manager and using 'Remove' button.



- 'Connections' shows network connections on local Hyper-V host server. Network Manager provides GUI that displays corresponding device information and allows bindings modification as well as changing of the connection binding order using up and down arrows next to the connection name as shown on screen below. The enabled components (protocols) properties can be modified by using 'Properties' button at the bottom of the connection bindings view that will open a corresponding dialogue box allowing to manage protocol configuration properties for the selected connection.

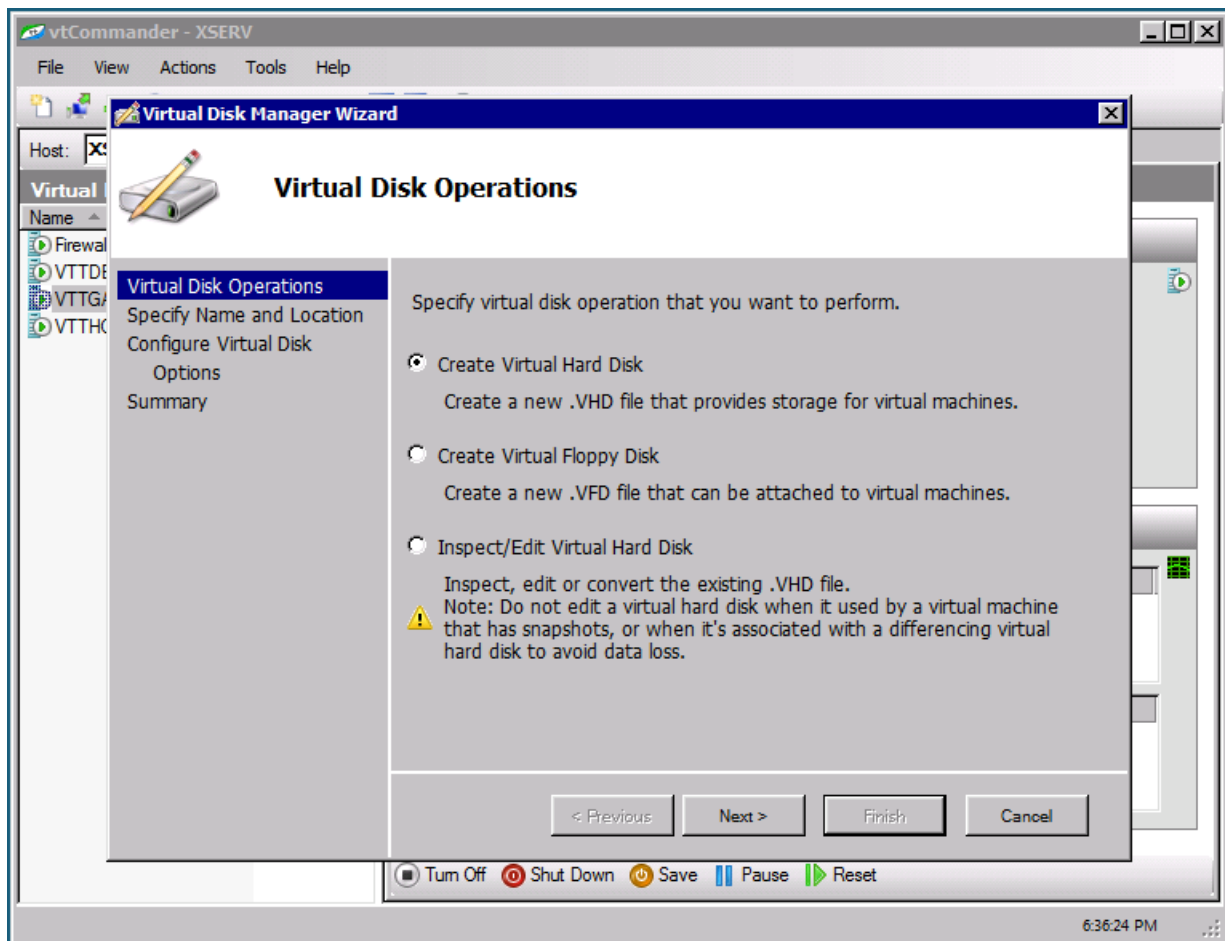


- 'Physical Adapters' represent all physical adapters available on managed Hyper-V host, i.e. there is a separate item in this group corresponding to the physical adapter. Information about the adapter includes network device name, a corresponding connection name, MAC address, state, data rate and IP address when available.

All pending modifications made via Network Manager can be committed by using its 'Apply' or 'OK' button. You can use 'Cancel' button to rollback all the modifications.

Virtual Disk Manager

Virtual Disk Manager provides a simple wizard interface that allows creating and managing virtual hard and floppy disks. Virtual Disk Manager is available only in Guest List View or Guest Definition View and can be started from 'Actions|Virtual Disk Manager' menu item or a corresponding toolbar button.



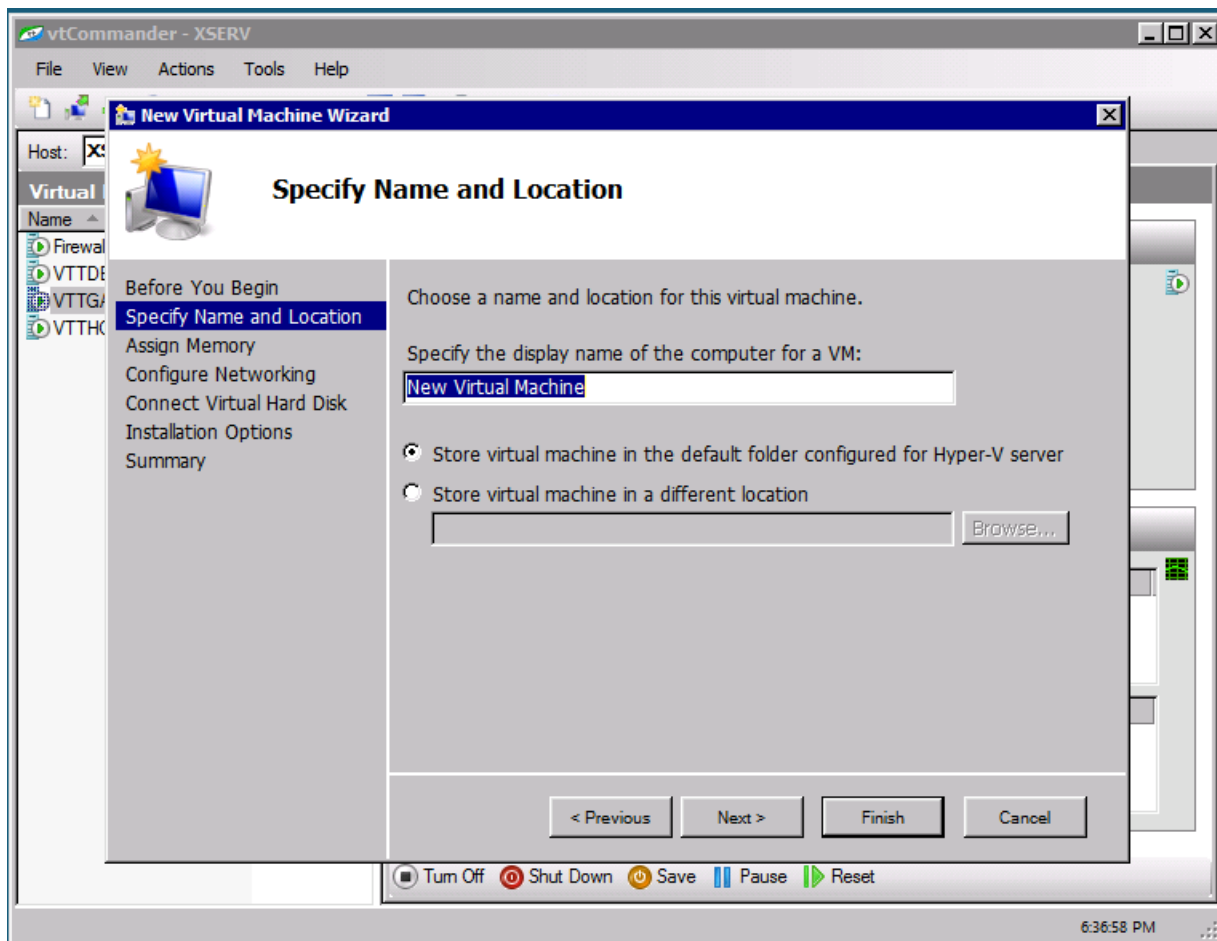
Virtual Disk Manager Wizard's first page allows selecting one of the following operations:

- 'Create Virtual Hard Disk' to create fixed, dynamically expanding or differencing virtual hard disk. You will need to specify a name and a storage location of the new virtual hard disk and to select its type. Virtual Disk Manager will let you customize the options depending on the virtual hard disk type that you selected. You can make certain changes to the virtual hard disk after you create it. Use Virtual Disk Manager and select 'Edit Virtual Hard Disk' option to make the changes.
- 'Create Virtual Floppy Disk' to create a new virtual floppy disk (.vfd) file in the specified location.
- 'Edit Virtual Hard Disk' to modify the existing virtual hard disks by performing one of the actions such as 'Compact', 'Convert', 'Expand', 'Merge' and 'Reconnect'. Virtual Disk Manager Wizard will adjust its pages corresponding to the available actions depending on the selected virtual hard disk type. Note: do not edit a virtual hard disk when it is used by a virtual machine that has snapshots, or when it's associated with differencing virtual hard disk to avoid data loss.

Virtual Disk Manager Wizard will present you a 'Summary' page that allows reviewing the selected action and options before you click 'Finish'. Note: depending on options that you choose it may take a considerable time to complete the wizard.

New Virtual Machine Wizard

The New Virtual Machine Wizard provides GUI for creating a virtual machine supporting both simple 'one click' and customized guest creation scenarios. You can start New Virtual Machine wizard when in Guest List View or Guest Definition View by invoking a corresponding Actions menu item, toolbar button or {F7} shortcut.



Clicking 'Finish' button will result in an attempt to create a new virtual machine with configuration parameters that were not initialized with default values. Virtual machine configuration can be tuned later using Guest Definition View in the edit mode. As an alternative you can follow all the steps and specify machine name, customize its location, assign memory, configure networking, configure storage by connecting the existing virtual hard disk or creating a new dynamically expanding virtual hard disk for this machine and configure OS installation options. The New Virtual Machine Wizard will show a Summary page allowing you to review the selections. Note: In order to attach a fixed or differencing virtual disk, use Virtual Disk Manager prior to creating a new virtual machine. When you create a new virtual machine select 'Use existing hard disk option' on 'Connect Virtual Hard Disk' page and specify the pre-create virtual hard disk location.

Resource and Performance Monitoring

vtCommander provides intuitive and simple to use monitoring functionality allowing to view information about the use of host hardware (CPU, memory, network and disk), overall virtualized environment health as well as the individual Virtual Machine performance in real time. The monitoring options can be changed via the vtCommander Options Dialog: you can select the monitoring of the host along with all its guests, the host only, or, you can turn the monitoring off. In this version of vtCommander monitoring starts only when the vtCommander application is launched and all the Hyper-V hosts connected via the vtCommander will be monitored as long as the vtCommander application is running and the monitoring is turned on. The monitoring service will stop automatically after the last instance of the vtCommander application is exited. The Resource Monitor collapsible panel headers corresponding to the

monitored resources include a status icon which matches with one of the states such as 'Normal', 'Warning' or 'Critical'. These status icons will be updated based on predefined utilization thresholds that can't be configured or changed in the current version. The collapsible panels also display a chart for the total corresponding resource utilization.

The screenshot shows the vtCommander interface for a host named BIGBUBBA. The left sidebar contains a 'Virtual Machines' list with Win7EnuUx86 (Off) and Win8C (Running). Below it is a 'Resource Monitor' section with a 'Health' status of OK, 15 virtual processors (VP) and 8 logical processors (LP). The main window displays 'Win8C Performance' with four sections: Processor, Memory, Network, and Storage. Each section includes a line chart and a data table.

Virtual Machines List:

Name	State
Win7EnuUx86	Off
Win8C	Running

Resource Monitor - Health:

Guests	Count	VP	LP
Total	12	15	8
Running	4		
Health OK	12		
Health Critical	0		

Processor Performance:

Logical: 8.92% Virtual: 7.22%

Processor	Guest Run ...	Hypervisor ...	Total Run T...
Logical	7.47%	1.44%	8.92%
Virtual	5.89%	1.33%	7.22%

Memory Performance:

Pages / Sec: 2 Available: 9,187 MB

Total (MB)	Available (MB)	Pages / Sec
16,379	9,187	2

Network Performance:

Network I/O: 0.13 Mbps V Switch I/O: 0.68 Mbps

Adapter	Speed Mbps	Network I/...	Queue
Broadco...	1,000	0.03	0.00
Broadco...	1,000	0.10	0.00
Virtual N...	10,000	0.00	0.00

Storage Performance:

Disk I/O: 11,575 KB/Sec Queue Length: 0.36

Disk	Total (MB)	Free (MB)	MB/Sec	Queue
C: D:	278,776	70,343	0.012	0.00
E:	278,776	135,867	11.292	0.36

Win8C Performance - Processor:

Assigned Memory: 1,024 MB Memory Demand: 604 MB Available Buffer: 277% Memory Status: OK

Win8C Performance - Network:

Adapter	Virtual Network	Network I/O Mbps
Network Adapter 1	Virtual Network	0.02

DNS Name:
IP Address:

Win8C Performance - Storage:

Virtual Disk	Read (B/sec)	Write (B/sec)	Total (B/sec)
IDE Controller 0 (0)	5,315,585	6,516,048	11,831,630

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vtCommander Options Dialog

Options dialog allows configuration of vtCommander global options such as automatic updates, default view, automatic start settings and monitoring options. The dialog can be invoked via Tools menu or corresponding toolbar button. The following startup options can be configured for this version of vtCommander:

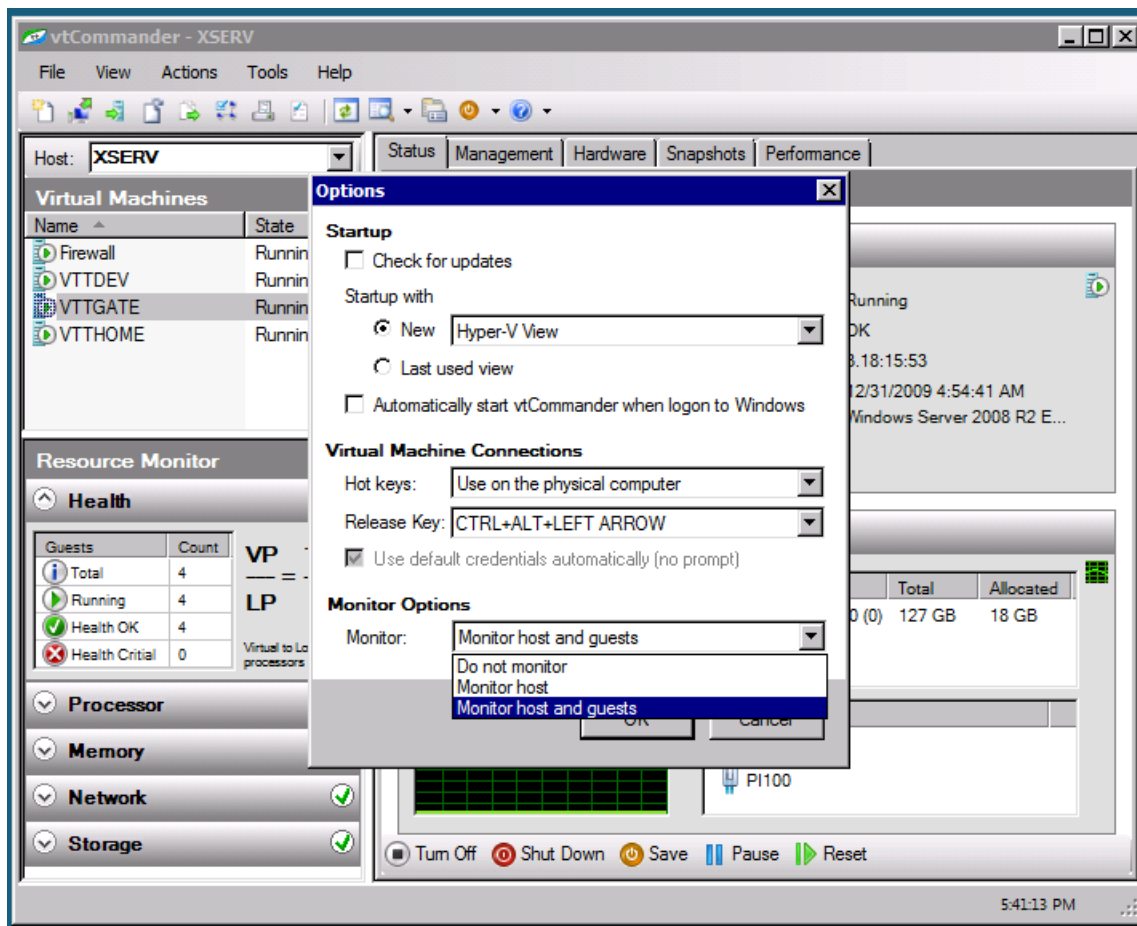
- 'Check for updates'. When checked it will start automatic connection to VT Technology web service to check for updates applicable for currently installed version of vtCommander. vtCommander will display a dialog prompting to download and automatically start updated version or will advise on update availability when appropriate. Note: you can check for available updates manually using 'Help|Check for Updates' menu command.
- 'Startup with' view: you can select either one of the views such as File System View, Guest List View or Server Manager View as vtCommander default view. Note: some views can be unavailable depending on features enabled on your system; select 'Last used view' to open vtCommander view that was active upon its exit.
- 'Automatically start vtCommander when logon to Windows'. When checked vtCommander will be started automatically when you logon to your system.

The following virtual machine connections options are enabled when vtCommander provides Guest Connection View:

- 'Hot keys', which specifies how Windows shortcuts such as {Alt-TAB} will be used in Guest Connection View.
- 'Mouse Release Key', which specifies the key combination to release the mouse captured when connected to the virtual machine without the integration services installed.
- 'Use default credentials'. When checked, current credentials (i.e. used to launch vtCommander) will be used in Guest Connection View to connect to a running virtual machine.

The following monitoring options can be selected:

- Monitor host and guest (default option) to monitor all the hosts and the guests opened in vtCommander.
- Monitor host to monitor all the hosts opened in vtCommander.
- Do not monitor. Select this option to reduce performance overhead if real time monitoring is not required.



Additional Resources

For more information about Microsoft Hyper-V technology see <http://go.microsoft.com/fwlink/?LinkId=93752>. Most of the information about Hyper-V Manager MMC snap-in functionality and features is also applicable to corresponding vtCommander functionality. You can find more information about Microsoft Hyper-V Server here: <http://go.microsoft.com/fwlink/?LinkId=158005>