InfraStruxure Operations PRO Pack

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by Schneider Electric

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Getting started with InfraStruxure Operations PRO Pack

The APC PRO-enabled management pack ensures that Virtual Machine Manager is aware of critical physical infrastructure alarms and events and can execute corrective actions to move virtual machines to non-impacted areas within the data center.

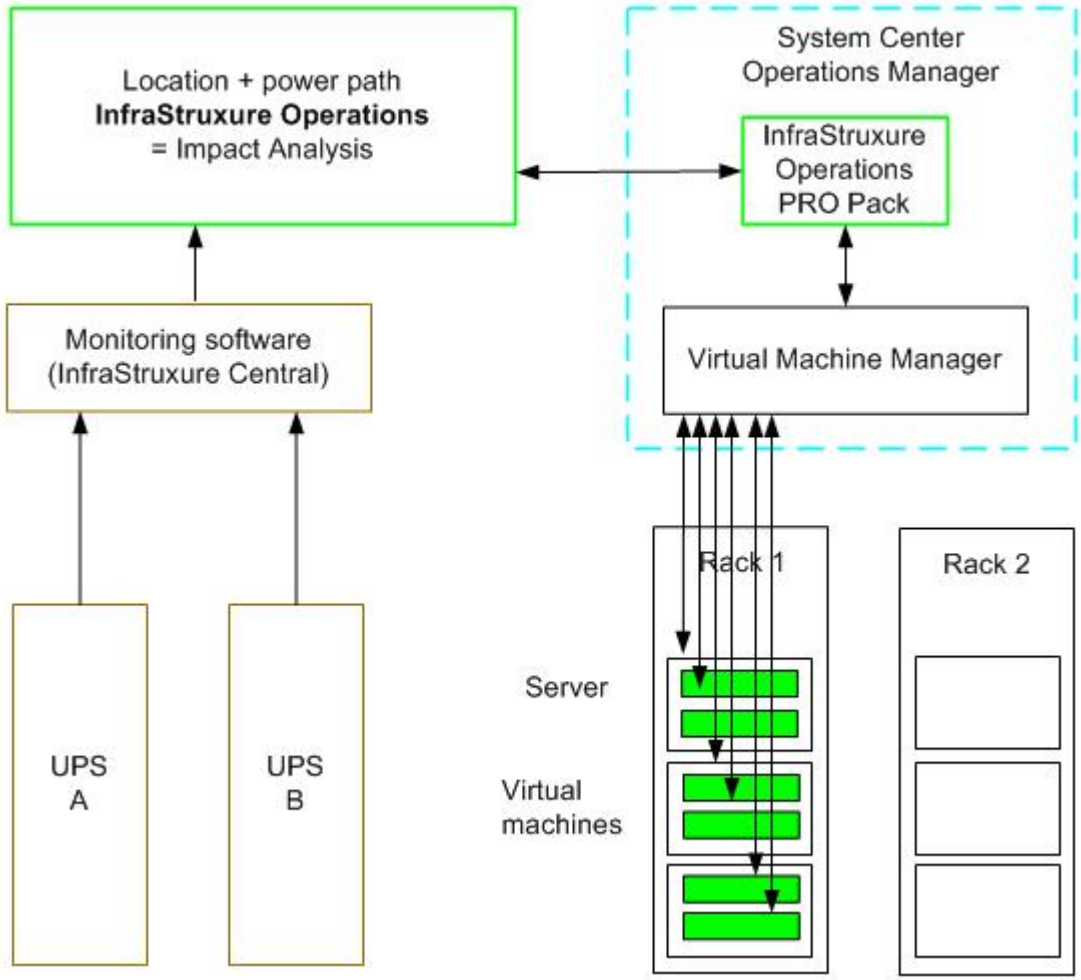
InfraStruxure Operations offers a consolidated view of the data center's physical infrastructure. It holds data about the physical location of the equipment in the data center as well as an advanced configuration of for example power path and alarm data. Combining the data about the modeled physical location from InfraStruxure Operations with real-time device monitoring data from the InfraStruxure Central enables quick assessment of how an alarm on one piece of equipment may impact other equipment located in the data center.

Data is communicated from InfraStruxure Operations to the System Center Operations Manager server. Based on this data, Microsoft Virtual Machine Manager is then able to move the relevant virtual machines to healthy hosts.

For example:

- Rack 1 is powered by UPS A
- Rack 2 is powered by UPS B
- An alarm is triggered on UPS A
- Virtual Machine Manager migrates the virtual machines from hosts in Rack 1 to hosts in Rack 2 that is powered by UPS B

InfraStruxure Operations PRO Pack



Initial Setup of InfraStruxure Operations PRO Pack

You must perform the installation and configuration process of the InfraStruxure Operations PRO Pack before you are able to import it into Microsoft System Center Operations Manager. When you have setup a profile, you are ready to monitor the health of the virtual machine hosts and implement the migration of impacted virtual machines to healthy hosts.

Installation and data retrieval configuration

The InfraStruxure Operations PRO Pack installer is available from the APC web site. Once you have run the installer, you need to configure the server communication between the InfraStruxure Operations server and the Virtual Machine Manager server, and then import the InfraStruxure Operations PRO Pack into Microsoft System Center Operations Manager.

For information on installation, configuration, and general usage of Microsoft System Center Operations Manager and Microsoft Virtual Machine Manager, refer to the Microsoft documentation.

InfraStruxure Operations PRO Pack is available for System Center Operations Manager 2007 R2 and Virtual Machine Manager 2008 R2. A complete configuration of InfraStruxure Operations 6.1 with InfraStruxure Capacity license is required (including association of monitored devices from InfraStruxure Central).

Data configuration in InfraStruxure Operations

The InfraStruxure Operations application must be populated with modeled data representing the physical enterprise infrastructure. This includes objects representing the physical servers, their location in the data center rack layout, and their power connections. Once the data center has been modeled with the correct inventory, virtual machine hosts can be associated to the graphical objects in the layout representing the actual servers. The data is made available to InfraStruxure Operations PRO Pack via web services and retrieved at the defined polling interval.

Installing InfraStruxure Operations PRO Pack

1. In a browser, open the APC web site (http://www.apc.com/tools/download).
2. Download the InfraStruxureOperationsPROPack.msi package to a location on your Microsoft System Center Operations Manager server.
3. Run the installer from the selected location.

The following files are now installed to the specified location on your System Center Operations Manager server in an InfraStruxure Operations PRO Pack folder, and InfraStruxure Operations PRO Pack configuration is available from Start --> InfraStruxure Operations PRO Pack --> Configuration.

- APC.ISXOCmdlet.dll
- APC.ISXOCmdlet.InstallLog
- APC.ISXOCmdlet.InstallState

- com.apcc.ISXO.PRO.mp
- InstallActions.dll
- InstallActions.InstallState
- IsxoMPConfig.exe
- System.Management.Automation.dll

To complete the setup, you must configure the server communication between the InfraStruxure Operations PRO Pack and Virtual Machine Manager servers and import the com.apcc.ISXO.PRO.mp file from the installed location into Microsoft System Center Operations Manager.
Note: If you want to uninstall the InfraStruxure Operations PRO Pack at any time, remove it from Microsoft System Center Operations Manager before you run the uninstaller.

Configuring InfraStruxure Operations PRO Pack

The setup includes setting up the server communication between the InfraStruxure Operations and Virtual Machine Manager servers.

If you selected to launch it in the installation wizard, the configuration dialog box will open automatically. Otherwise, you can open the configuration dialog box at any time from Start --> InfraStruxure Operations PRO Pack --> Configuration.

1. Type the description of the InfraStruxure Operations server that you want to display in Microsoft System Center Operations Manager.
2. Type the host name of the InfraStruxure Operations server that will be sending location, power, and impact data.
3. Click Add and type the host name of the Virtual Machine Manager server or servers that you want to receive this data and from which you want to send virtual machine data.

To complete the setup, import the .mp file from the installed location into Microsoft System Center Operations Manager and setup a new profile.

- Open Microsoft System Center Operations Manager, select Administration --> Management Packs, open the Import Management Packs dialog box from Actions --> Import Management Packs, and browse to the location of the InfraStruxure Operations PRO Pack.mp file.
- In Administration --> Run As Configuration, select Profiles. In the list, right-click InfraStruxure Operations and select Properties. Select Run As Accounts and click Add. Click New account with Simple Authentication, and type the account credentials that match an InfraStruxure Central user with administration rights to InfraStruxure Operations.

The InfraStruxure Operations PRO Pack is now imported and configured in Microsoft System Center Operations Manager. It appears in Monitoring --> InfraStruxure Operations PRO.
Note: The list of virtual machine hosts is not a complete list of all hosts monitored in Microsoft System Center Operations Manager, it is a list of those that have been associated with modeled objects in InfraStruxure Operations.

You can customize what details to display in Microsoft System Center Operations Manager from InfraStruxure Operations. Select InfraStruxure Operations or Impacted Virtual Machine Hosts in Monitoring --> InfraStruxure Operations PRO, and select Actions --> Personalize view... and check the columns to display in the Detail View.

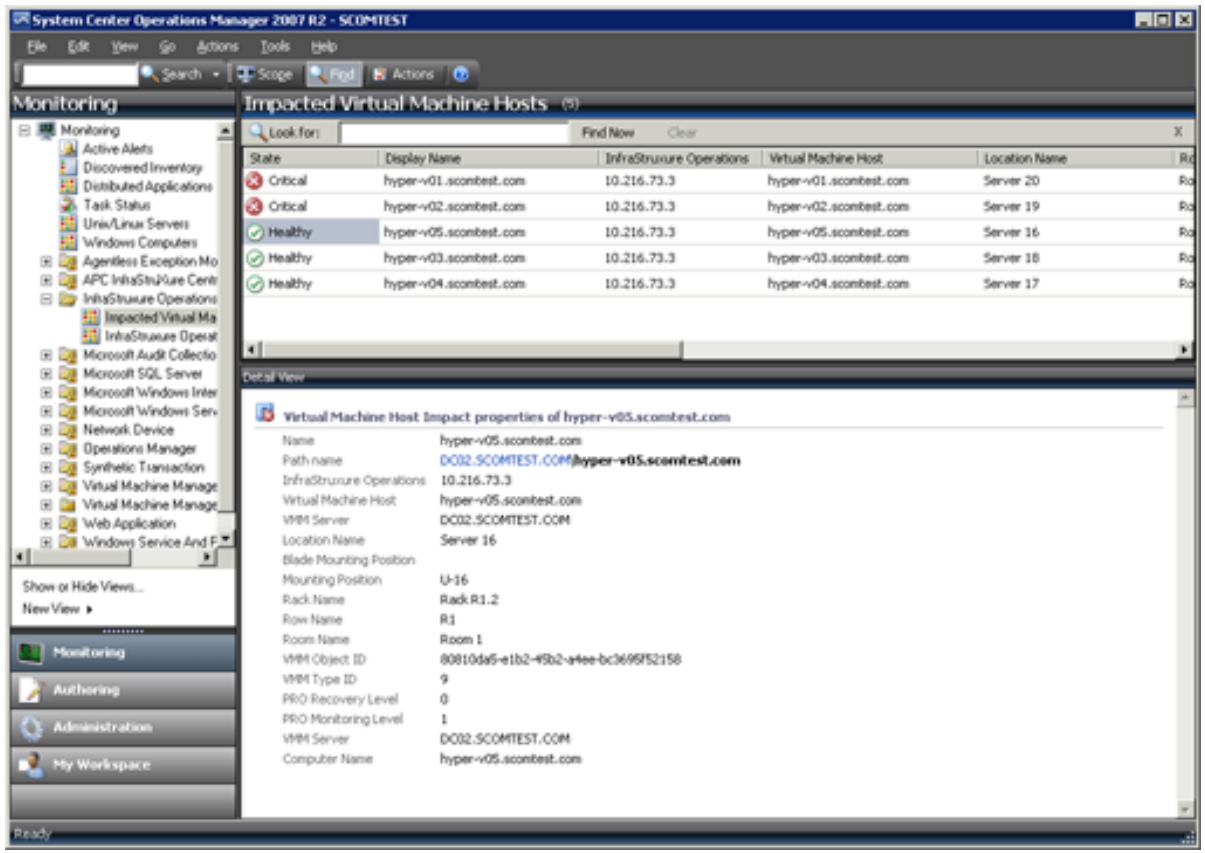
Working with InfraStruxure Operations PRO Pack in System Center Operations Manager, Virtual Machine Manager and InfraStruxure Operations

Overview of how to work with InfraStruxure Operations PRO Pack in the applications involved.

Before you can begin using InfraStruxure Operations PRO Pack, you must have finished the installation and configuration process by completing these steps.

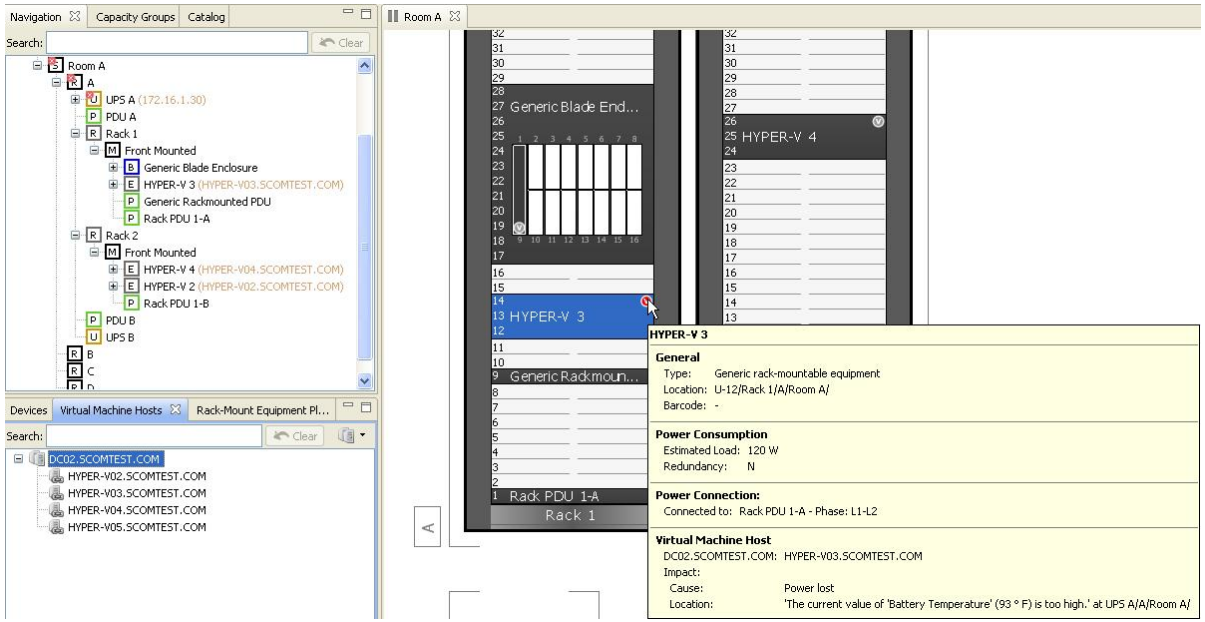
1. In Microsoft System Center Operations Manager, review the list of configured Virtual Machine Manager servers.

   Note: The management pack runs discovery tasks at an interval of 4 hours, so it may take a while for the list to refresh.



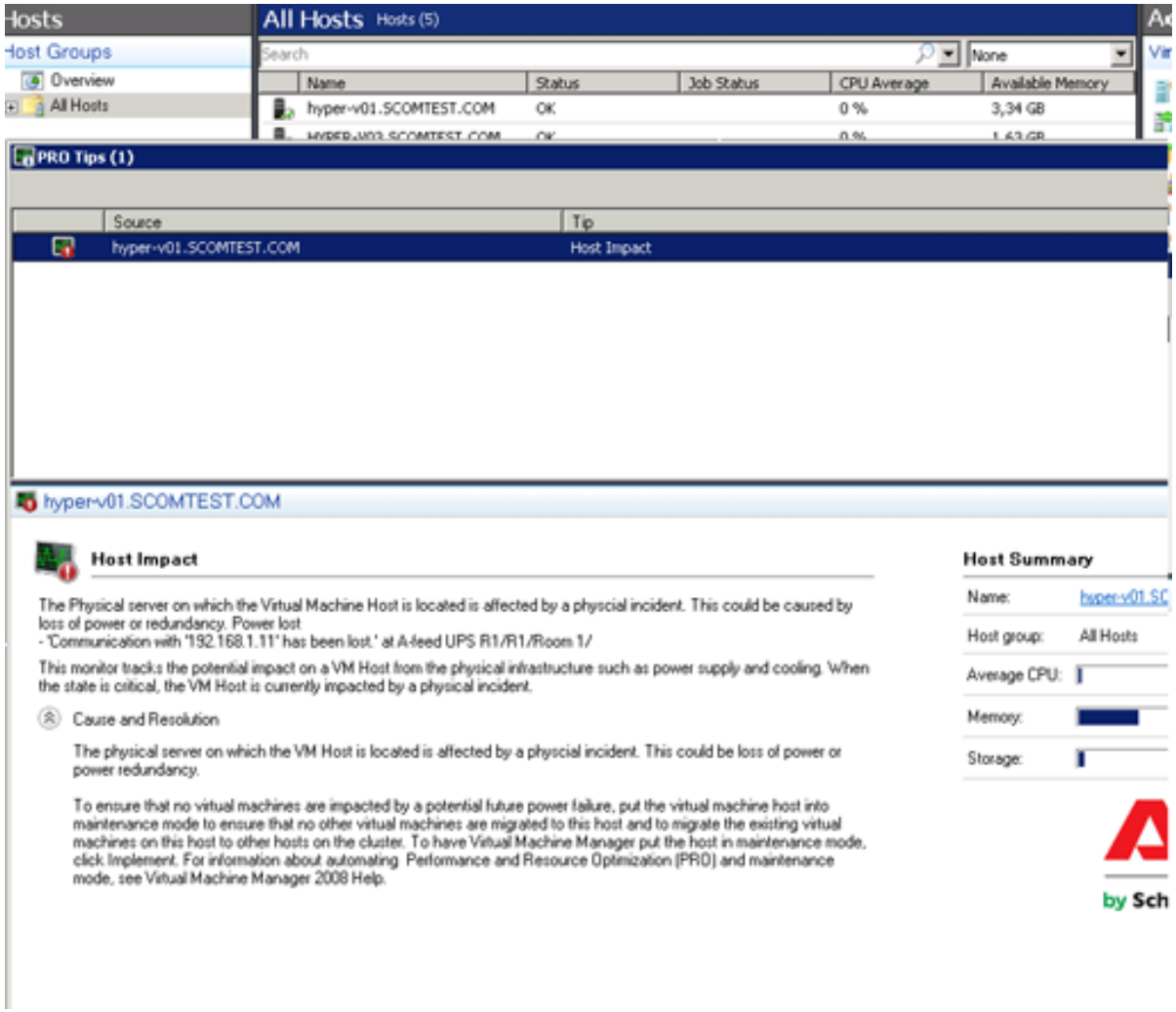
2. In InfraStruxure Operations, review the inventory configuration, power path and alarm setup in the floor layout. Some hosts are fed by one UPS, others by another UPS.
3. In InfraStruxure Operations, setup and review the associations between the hosts and the servers representing them in the rack layout. .

   If a host has been associated, there will be a V icon on it in the layout. If a host is critically impacted, there will be a red V icon on it and a tooltip describing the impact



4. In System Center Operations Manager Virtual Machine Hosts view, review the impact data from InfraStruxure Operations to get an overview and monitor if the hosts are healthy.
5. In Virtual Machine Manager, monitor the hosts and implement the PRO tips.

InfraStruxure Operations PRO Pack



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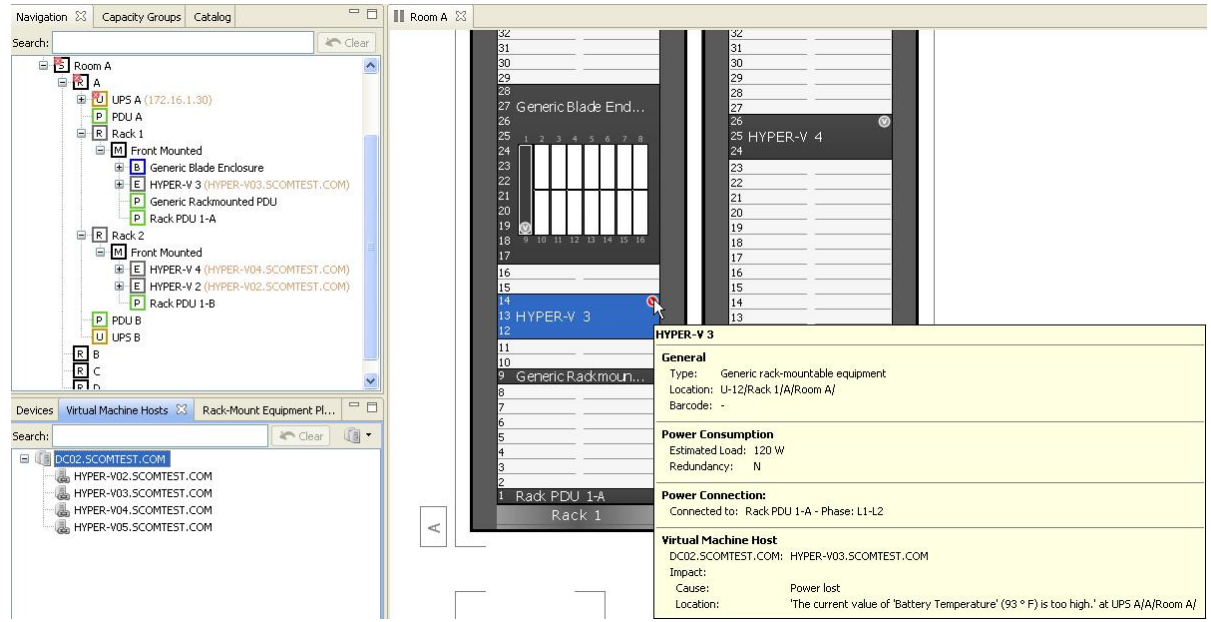
Working with Impact Analysis in InfraStruxure Operations

1. Configure the inventory, including the position of your host servers in the rack layout, setup the power path down to server level, and associate the power source with devices receiving alarms.
2. Associate the servers in the layout with your virtual hosts by dragging a server from the Virtual Machine Hosts pane over the server representing it in the layout.
3. Review the virtual machine setup. The V icons on the servers in the layout indicate if the hosts have been associated, and if an impact occurred.



Working with InfraStruxure Operations PRO Pack views in System Center Operations Manager

When the InfraStruxure Operations PRO Pack has been imported and configured in System Center Operations Manager, an InfraStruxure Operations PRO Pack folder with two views will be available.

1. In Monitoring, select InfraStruxure Operations PRO Pack and observe the two views listed.
2. Click InfraStruxure Operations and observe the view open with an InfraStruxure Operations list view and a Detail View.

   InfraStruxure Operations servers that have been setup to communicate with the System Center Operations Manager server appear in the list.
   Note: These servers appear as Not monitored in this view. However, this does not mean that the virtual machine hosts are not monitored. It means that the InfraStruxure Operations server itself is not monitored by System Center Operations Manager.
3. Click a list item and observe the details for the selected item.
4. Click Impacted Virtual Machine Hosts and observe the view open with an Impacted Virtual Machine Hosts view and a Detail View.

   Impact analysis data from the InfraStruxure Operations servers appears in this view.
5. Click a list item and observe the details for the selected item.
6. Right-click Impacted Virtual Machine Hosts, and select Personalize view... Then select the InfraStruxure Operations data that you want to display in Virtual Machine Manager, such as Room Name, Rack Name, etc.

Working with InfraStruxure Operations PRO Pack PRO Tips in Virtual Machine Manager

The InfraStruxure Operations PRO Pack PRO tips are communicated to Virtual Machine Manager. You can manually implement the PRO tips, or setup the system to automatically do so.

Before you can work with the PRO tips, you must configure how they should be enabled in the Virtual Machine Manager Administrator Console.
In Administration, click General, and then click PRO Settings, and select Automatically implement PRO tips if you want the system to automatically implement the critical PRO tips. Or if you want the PRO settings to apply to a host group or cluster, in Hosts or Virtual Machines, right-click the group or cluster and select Properties --> PRO.
Note: The option for the system to receive PRO tips of severity level Critical Only or Warning and Critical does not have any effect on InfraStruxure Operations PRO Pack PRO tips as only impacts of severity level of critical are received.

1. Click PRO Tips in the toolbar to open the PRO Tips window to view active PRO tips for the host groups that you are administering.
2. Select the PRO tip, and review the details about the issue that caused the PRO tip and how to resolve the issue.
3. Click Implement to implement the recommended action to resolve the issue, or click Dismiss to remove the tip and close the PRO Tips window.

   Note: If you have configured the PRO tips to be automatically implemented, the issues are automatically resolved and the PRO tips are removed.

You can troubleshoot any issues with discovery, monitoring or recovery in the Event Viewer Application log.

Troubleshooting

- You can troubleshoot any InfraStruxure Operations PRO Pack issues in the Event Viewer Application log.

  Type of events that you might see:
  - Discovery
  - Monitoring
  - Recovery
- Why don't I see all my virtual machine hosts in the list in Microsoft System Center Operations Manager?
  - The list of virtual machine hosts is not a complete list of all hosts monitored in Microsoft System Center Operations Manager. It is a list of those that have been associated with modeled objects in InfraStruxure Operations.
  - InfraStruxure Operations PRO Pack retrieves data from InfraStruxure Operations at a specified polling interval. If you do not see all the virtual machine hosts that you expect to see, wait for the specified period of time and the view will be updated with the latest data.
    - Discovery: 4 hours
    - Monitoring: 30 seconds
- I get many reports of impacted virtual machine hosts. What could be the cause of this?

  Make sure that the configuration represents the real-world physical environment as accurately as possible. For example, the system will reflect the real-world more accurately if you configure power connections all the way down to the server level than if you stop at the rack PDU level. If the system is missing the server connection data, it will use the information available. This means that it will report more impacts because it does not know which servers are connected to which rack PDUs.
  - If a rack PDU in a rack is critically impacted by an alarm, the system will assume that all servers are connected to that rack PDU are impacted by the alarm.
  - If there are two rack PDUs in a rack, the system will assume that all servers with redundancy are connected to these two rack PDUs are impacted by the alarm.
- Virtual Machine Manager does not migrate virtual machines to a host. What could be the cause of this?

  If a host outside a cluster was previously impacted, InfraStruxure Operations PRO Pack changed the status of this host from available for placement to unavailable. This means that, once you have resolved the issue and the host is healthy, you must make it available again: In Virtual Machine Manager, right-click the host in Virtual Machines --> Host Groups, select Properties --> Status, and check the box This host is available for placement.

InfraStruxure Operations PRO Pack PRO tip implementation rules

List of recovery rules applied for virtual machine hosts in or outside clusters.

Hyper-V hosts in a cluster	• If there are hosts in a cluster, impacted hosts are put in maintenance mode. • Virtual machines on those hosts are migrated within the cluster.
Hyper-V hosts outside a cluster	• If there are hosts outside a cluster, the recovery script finds potential hosts and virtual machines are migrated from the impacted host. • The status of the impacted host is changed from available to unavailable.
Stand-alone Hyper-V host in a cluster	• If there is one host in a cluster, the virtual machines on the host will be put in saved state and the host is still put in maintenance mode. • Virtual machines on that host are not migrated from that host.

Stand-alone Hyper-V host outside cluster	• If there is a stand-alone host outside a cluster, an error message is displayed in the PRO tip.
	  ◦ PRO cannot migrate virtual machine (virtual machine name) because no other hosts are available in the host group or host cluster.
	  ◦ PRO cannot migrate a virtual machine.
	• The status of the impacted host is changed from available to unavailable.

Multiple Hyper-V hosts in maintenance mode	• If multiple hosts are being impacted at the same time, a PRO tip is created for each impacted host. The PRO tips will be automatically implemented if automatic implementation of PRO tips has been configured. Otherwise, you should manually implement the PRO tips.
Virtual machine is excluded from PRO host-level action	• If there are Hyper-V hosts in a cluster that have been set to be excluded from PRO host-level action, the hosts are put in maintenance

	mode. This means that Virtual Machine Manager will still migrate these virtual machines. • If there are Hyper-V hosts outside a cluster that have been set to be excluded from PRO host-level action, Virtual Machine Manager will not migrate these virtual machines.

Supported InfraStruxure Central Alarm Types

The InfraStruxure Central alarm types that are supported in InfraStruxure Operations PRO Pack.

Note: The alarms with the exact wording as listed are supported. Any alarms with a different wording will not be recognized by the InfraStruxure Operations PRO Pack.

On battery	• On battery power in response to a power failure. • On battery power in response to an input power problem.
Battery failure	• Battery Failure • A battery failure exists.
Low battery	• Low Battery • The battery power is too low to support the load; if power fails, the UPS will be shut down immediately. • The battery power is too low to continue to support the load; the UPS will shut down if input power does not return to normal soon. • A low battery power condition will cause a shutdown soon. • Battery power is too low to support the load if a power failure occurs.
Discharged	• Discharged Battery
Disconnected	• Battery Disconnected
Overload	• Overload
Self-test	• UPS Self-Test Failed. • The UPS failed its diagnostic self-test, due to either an overload or poor battery health.