**Microsoft System Center**

Guide to System Center Management Pack for Windows Server 2016 Network Load Balancing

Microsoft Corporation

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If you have an idea or suggestion about this management pack, the Operations Manager team encourages you to share it at the [SCOM Feedback site](http://systemcenterom.uservoice.com/forums/293064-general-operations-manager-feedback/filters/top).

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# Guide to System Center Management Pack for Windows Server 2016 Network Load Balancing

The Windows Server Network Load Balancing (NLB) Management Pack provides discoveries, monitors, alerts, and warnings to help the operator understand the state of NLB clusters and NLB servers running Windows Server 2016. The Windows Server NLB Management Pack can provide early warnings that an operator can use to proactively monitor the state of the NLB servers in the computing environment.

## Document Version

This guide was written based on the 10.0.2.1 version of the Windows Server Network Load Balancing Management Pack.

## Revision History

| **Release Date** | **Changes** |
| --- | --- |
| November, 2018 | * Introduced support for Windows Server 1709+ operating system. * Rebranded the display strings and knowledge base articles according to the supported versions of the operating systems: Microsoft Windows Server 2016 and 1709+. |
| December, 2016 | * Added topics in this release: * Changes in version 10.0.2.0. * Appendix: Display Strings Changes History * Updated topics in this release: Known Issues |
| December, 2015 | * Various versioning and naming changes correlated with “Windows Server Technical Preview” to “Windows Server 2016” Management Pack rebranding. * Added topics in this release: * Revision History. * Changes in version 10.0.0.0. * Updated topics in this release: Known Issues |
| August, 2015 | Original release of this guide for Windows Server Technical Preview Network Load Balancing Management Pack (version 6.0.7221.0). |

## Getting the Latest Management Pack and Documentation

You can find the Windows Server 2016 Network Load Balancing Management Pack for System Center Operations Manager on the [Download Center](http://go.microsoft.com/fwlink/?LinkId=717053).

## Changes in version 10.0.2.0

* Fixed issue: Windows Server 2016 NLB cluster discovery was failing on Nano Server
* Fixed issue: Windows Server 2016 NLB cluster discovery was not compatible with Base OS MP of version 10.0.8.0 for Windows Server 2016
* Fixed issue: “Windows Server 2016 NLB cluster discovery” was causing warning 10000 in the event log if NLB feature was not installed on the server.
* Fixed issue: added version 2016 for corresponding view “Load Balanced IIS” in Microsoft Windows Server 2016 Network Load Balancing IIS Integration MP.

## Changes in version 10.0.0.0

* “Windows Server Technical Preview” to “Windows Server 2016” versioning and naming rebranding changes
* Network Adapter performance counters were not populated on NLB MP performance views. These counters are collected by Windows Server MP; fixed in Windows Server 2016 MP

## Supported Configurations

This management pack requires System Center 2012 Operations Manager or later.

The Windows Server Network Load Balancing (NLB) Management Pack supports monitoring NLB clusters on Windows Server 2016, including Windows Server Core installations.

The management pack is not intended to monitor mixed-mode NLB clusters (those that include Windows Server 2003 NLB clusters).

## Getting Started

This section describes the actions you should take before you import the management pack, any steps you should take after you import the management pack, and information about customizations.

### Before You Import the Management Pack

Before you import the Windows Server Network Load Balancing Management Pack, note the following limitations of the management pack:

 Agentless monitoring is not supported.

Before you import the Windows Server Network Load Balancing Management Pack, take the following actions:

 Ensure that System Center Operations Manager is installed.

 Install the Windows Server 2016 Operating System management pack.

 We recommend that you install the QFE referenced in the following article: ”[You may find the WMI Provider Host program wmiprvse.exe crashes on a Windows Server 2008-based computer](http://go.microsoft.com/fwlink/?LinkID=140382),” at http://go.microsoft.com/fwlink/?LinkID=140382.

#### Files in This Management Pack

The Windows Server 2016 Network Load Balancing Management Pack includes the following files:

 Microsoft.Windows.NetworkLoadBalancing.Library.mp

 Microsoft.Windows.NetworkLoadBalancing.2016.mp

* Microsoft.Windows.NetworkLoadBalancing.2016.IISIntegration.mp

#### Optional Management Packs

If you want to monitor NLB clusters that are running Internet Information Services (IIS) 10.0 in an application-aware way, you must import the Internet Information Services (IIS) 10.0 Management Pack (version 10.0.0.0 or later) in addition to the IIS Integration Management Pack.

### How to Import the Windows Server 2016 Network Load Balancing Management Pack

For instructions about importing a management pack, see [How to Import an Operations Manager Management Pack](http://go.microsoft.com/fwlink/?LinkID=219431) (http://go.microsoft.com/fwlink/?LinkID=219431).

After the Windows Server Network Load Balancing Management Pack is imported, perform the following procedures to finish your initial configuration:

1. Create a new management pack in which you store overrides and other customizations.

2. Enable proxying on all agents that manage servers that are part of a Network Load Balancing (NLB) cluster.

Warning

Discoveries and monitoring do not function unless proxy is enabled.

To enable the Agent Proxy setting on all agents managing a Windows Server NLB cluster

|  |
| --- |
| 1. Open the Operations console, and then click Administration.  2. In the Administrator pane, click Agent Managed.  3. Double-click an agent in the list.  4. Click the Security tab.  5. Select Allow this agent to act as a proxy and discover managed objects on other computers.  6. Repeat steps 3 through 5 for each agent that is installed on a clustered server. |

### Create a New Management Pack for Customizations

By default, Operations Manager saves all customizations such as overrides to the Default Management Pack. As a best practice, you should instead create a separate management pack for each sealed management pack you want to customize.

When you create a management pack for the purpose of storing customized settings for a sealed management pack, it is helpful to base the name of the new management pack on the name of the management pack that it is customizing, such as “Biztalk Server 2006 Customizations”.

Creating a new management pack for storing customizations of each sealed management pack makes it easier to export the customizations from a test environment to a production environment. It also makes it easier to delete a management pack, because you must delete any dependencies before you can delete a management pack. If customizations for all management packs are saved in the Default Management Pack and you need to delete a single management pack, you must first delete the Default Management Pack, which also deletes customizations to other management packs.

## Optional Configuration

The Windows Server Network Load Balancing (NLB) Management Pack includes the capability to monitor the NLB cluster in an application-aware way. Application-aware monitoring provides the following benefits:

1. The health state of the load-balanced application can directly affect the health state of the cluster node and the health state of the cluster itself.

2. The health state change of the load-balanced application can trigger a system response that manipulates the cluster nodes in the following ways:

 If the load-balanced application is in an unhealthy state, the current NLB node is taken out of the cluster

 If the load-balanced application returns to a healthy state, the current NLB node is added back into the cluster

To provide the application-aware monitoring capabilities, you must import an additional management pack that links the NLB Management Pack with the load-balanced application management pack.

The NLB Management Pack includes a management pack that provides application-aware monitoring capabilities for Internet Information Services (IIS) 10.0. The name of the management pack file is: Microsoft.Windows.NetworkLoadBalancing.2016.IISIntegration.mp.

If you want the NLB Management Pack to take action based on health state changes reported by the IIS 10.0 Management Pack, you must take the additional step of enabling the following two recoveries that are disabled by default:

| **Recovery Name** | **Target** | **Associated Monitor** |
| --- | --- | --- |
| Start NLB Node | NLB Server Role | NLB Node depends on load-balanced application |
| Stop NLB Node | NLB Server Role | NLB Node depends on load-balanced application |

## Security Considerations

You might have to customize your management pack. Certain accounts cannot be run in a low-privilege environment or must have minimum permissions.

### Low-Privilege Environments

The Windows Server Network Load Balancing (NLB) Management Pack requires local administrator privileges to discover, monitor, and execute tasks. For the management pack discoveries, monitors, tasks, diagnostics, and recoveries that require administrative privileges, the management pack uses the NLB Monitoring Action Account Run As profile. The management pack elements in the following tables are configured to use the NLB Monitoring Action Account Run As profile.

## Discoveries

| **Name** | **Target** |
| --- | --- |
| Windows Server NLB cluster discovery | Windows Server 2016 Computer |
| Windows Server NLB cluster discovery (event based) | Windows Server 2016 Computer |

## Monitor

| **Name** | **Target** |
| --- | --- |
| NLB node status | NLB server role |

## Tasks

| **Name** | **Target** |
| --- | --- |
| Display NLB cluster settings | NLB server role |
| Drain and stop NLB node | NLB server role |
| Reload configuration | NLB server role |
| Resume NLB node | NLB server role |
| Start NLB node | NLB server role |
| Stop NLB node | NLB server role |
| Suspend NLB node | NLB server role |

## Diagnostics

| **Name** | **Target** | **Monitor Name** |
| --- | --- | --- |
| Node status diagnostic | NLB server role | NLB node status |

## Recoveries

| **Name** | **Target** | **Monitor Name** |
| --- | --- | --- |
| Start NLB node | NLB server role | NLB node depends on load balanced application |
| Stop NLB node | NLB server role | NLB node depends on load balanced application |

## Object Groups

You can delegate authority to a precise level with user roles. For more information about user roles, see the "[Implementing User Roles](http://go.microsoft.com/fwlink/?LinkID=221238)" topic in the System Center 2012 Operations Manager Help (http://go.microsoft.com/fwlink/?LinkId=221238).

The following object groups can be used for scoping and roles authorization:

 NLB Clusters Group

 NLB Computers Group

 Windows Server 2016 Computer Group

## Understanding Management Pack Operations

### Objects that the Management Pack Discovers

The Windows Server Network Load Balancing Management Pack discovers the object types that are described in the following list.

The following is the list of objects discovered. All the objects are discovered automatically.

 NLB Cluster

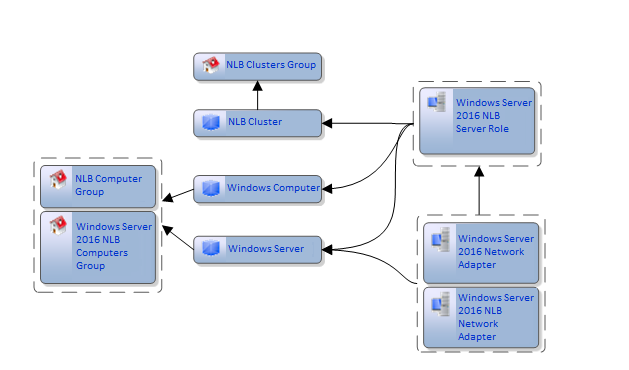
 NLB Server Role

 Windows Server 2016 NLB Server Role

 Windows Server 2016 NLB Network Adapter

### How Health Rolls Up

The following diagram shows how the health states of components roll up in this management pack.



## Key Monitoring Scenarios

The following section describes some of the most common monitoring scenarios.

 Monitor the NLB Node status.

 Based on the status of individual cluster nodes, determine the overall state of the cluster.

 Where an integration management pack exists, determine the health state of a cluster node by looking at the health state of the load balanced application, such as IIS.

 Alert on errors and warnings that are reported by the NLB driver, such as an incorrectly configured NLB cluster.

 Take the node out of the NLB cluster if the underlying load-balanced application becomes unhealthy, and add the node back to the cluster when the application becomes healthy again.

## Placing Monitored Objects in Maintenance Mode

When a monitored object, such as a computer or distributed application, goes offline for maintenance, Operations Manager detects that no agent heartbeat is being received and, as a result, might generate numerous alerts and notifications. To prevent alerts and notifications being generated, place the monitored object into maintenance mode. In maintenance mode, alerts, notifications, rules, monitors, automatic responses, state changes, and new alerts are suppressed at the agent.

For general instructions on placing a monitored object in maintenance mode, see [How to Suspend Monitoring Temporarily by Using Maintenance Mode](http://go.microsoft.com/fwlink/?LinkId=717054) (http://go.microsoft.com/fwlink/?LinkId=717054).

## Known Issues and Troubleshooting

Mixed-Mode NLB Clusters

The Windows Server NLB Management Pack is designed for monitoring only Network Load Balancing (NLB) servers that are running Windows Server 2016. Monitoring mixed-mode NLB clusters (those that include Windows Server 2003 NLB clusters) is not a supported scenario. This management pack might not report the correct health state of a mixed-mode NLB cluster. Monitoring of Windows Server 2016 mixed-mode clusters is supported.

Windows Server Core

There is an issue on Windows Server Core that prevents the Windows Server NLB Management Pack from discovering and monitoring the network adapter that is used by NLB. Consequently, performance data about the network adapter used by NLB is not collected and the adapter status is not rolled up to the status of the NLB server role.

There is currently no QFE or workaround for this issue.

NLB Node Participating in Multiple Clusters

If an NLB node is participating in multiple clusters and you disable the network adapter that binds that node into a cluster, the node is not discovered the next time the discovery is run.

Execution of several NLB tasks fails on Windows Server 2016 Core

Execution of the following NLB tasks fails on Server Core:

* Display Cluster Settings
* Drain Stop
* Reload Configuration
* Resume Node
* Start Node
* Stop Node
* Suspend Node

Workaround: No workaround available.

NLB performance report is empty

Cluster Performance data is collected and can be seen in the performance view, but NLB Performance report contains no collected performance data.

Workaround: No workaround available.

NLB Cluster could not be completely undiscovered after deletion

NLB Cluster could not be completely undiscovered in the Operations Manager after deletion: both new and deleted clusters are displayed in NLB Cluster State view.

Workaround: No workaround available.

## Appendix: Monitors and Overrides for Management Packs

This section provides detailed information about the management packs that you import. Except where noted, these all apply to Windows Server 2016 NLB clusters.

### How to View Management Pack Details

For more information about a monitor and the associated override values, see the knowledge for the monitor.

To view knowledge for a monitor

|  |
| --- |
| 1. In the Operations console, click Authoring.  2. Expand Management Pack Objects, and then click Monitors.  3. In the Monitors pane, expand the targets until you reach the monitor level. Alternatively, you can use the Search box to find a particular monitor.  4. Click the monitor, and in the Monitors pane, click View knowledge.  5. Click the Product Knowledge tab. |

### Unit Monitors for a Management Pack

The following applies to all unit monitors listed in the tables below:

 All are enabled by default

 All generate an alert by default (unless otherwise noted). This can be changed by creating an override.

#### Unit Monitors: Network Load Balancing Components

| **Name** | **Target** | **Interval (sec)** | **Severity** | **Auto Resolve** |
| --- | --- | --- | --- | --- |
| NLB node status | NLB Server Role | 180 | True | MatchMonitorHealth |

#### Unit Monitors: Event Log

| **Name** | **Target** | **Log** | **Source** | **Event** | **Severity** | **Auto Resolve** |
| --- | --- | --- | --- | --- | --- | --- |
| Frequent node convergence | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 29 | Warning | True |
| DEPRECATED  NLB cluster IP address is invalid | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 16 | Error | True |
| DEPRECATED  NLB cluster network address is invalid | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 14 | Error | True |
| DEPRECATED  NLB cluster network mask is invalid | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 31 | Error | True |
| DEPRECATED  Number of port rules exceeds the configured maximum | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 22 | Error | True |
| SYN Attack | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 92 | Error | True |
| Timer starvation | Windows Server NLB Server Role | System | Microsoft-Windows-NLB | 105 | Error | True |

### Dependency Monitors for a Management Pack

The following applies to all dependency monitors listed below:

 All are enabled by default

 All generate an alert by default (unless otherwise noted). This can be changed by creating an override.

| **Name** | **Target** | **Algorithm** |
| --- | --- | --- |
| Cluster availability depends on server role | NLB Cluster | BestOf |
| Cluster configuration depends on server role | NLB Cluster | BestOf |
| NLB node depends on load balanced application | NLB Server Role | WorstOf |
| NLB node depends on network adapter | NLB Server Role | WorstOf |

### Performance Collection Rules for a Management Pack

The following applies to all performance collection rules listed below:

 All are enabled by default

 Default interval (in seconds): 300

| **Name** | **Target** | **Object** | **Counter** |
| --- | --- | --- | --- |
| Network Adapter\Packets Received/sec | Windows Server NLB Network Adapter | Network Interface | Packets Received/sec |
| Network Adapter\Packets Sent/sec | Windows Server NLB Network Adapter | Network Interface | Packets Sent/sec |

### Event Log Rules for a Management Pack

The following applies to all event log rules listed below:

 All are enabled by default

 All generate an alert by default (unless otherwise noted). This can be changed by creating an override.

| **Name** | **Target** | **Event ID** | **Source** | **Log** | **Severity** |
| --- | --- | --- | --- | --- | --- |
| NLB cluster ip address is invalid | Windows Server NLB Server Role | 16 | Microsoft-Windows-NLB | System | Error |
| NLB cluster network address is invalid | Windows Server NLB Server Role | 14 | Microsoft-Windows-NLB | System | Error |
| NLB cluster network mask is invalid | Windows Server NLB Server Role | 31 | Microsoft-Windows-NLB | System | Error |
| Number of port rules exceeds the configured maximum | Windows Server NLB Server Role | 22 | Microsoft-Windows-NLB | System | Error |
| Failed to perform NLB cluster discovery due to a WMI error | Microsoft Windows Server Operating System | 6103 | Health Service Script | Operations Manager | Warning |
| A load distribution error was detected during convergence | Windows Server NLB Server Role | 87 | Microsoft-Windows-NLB | System | Error |
| A port rule operation was issued but there is no port rule that contains this port | Windows Server NLB Server Role | 25 | Microsoft-Windows-NLB | System | Warning |
| An unsupported legacy host was discovered on the network | Windows Server NLB Server Role | 97 | Microsoft-Windows-NLB | System | Error |
| Bi-Directional affinity (BDA) team configuration problem detected | Windows Server NLB Server Role | 57,56,55,114 | Microsoft-Windows-NLB | System | Error |
| Bi-Directional affinity (BDA) team configuration warning | Windows Server NLB Server Role | 62,60,59 | Microsoft-Windows-NLB | System | Warning |
| Dedicated IP (DIP) address is invalid | Windows Server NLB Server Role | 15 | Microsoft-Windows-NLB | System | Error |
| Dedicated network mask is invalid | Windows Server NLB Server Role | 30 | Microsoft-Windows-NLB | System | Error |
| Duplicate dedicated IP address was detected on the network | Windows Server NLB Server Role | 83 | Microsoft-Windows-NLB | System | Error |
| Maximum transfer unit (MTU) reported by the adapter is too small to contain an NLB heartbeat message | Windows Server NLB Server Role | 90 | Microsoft-Windows-NLB | System | Error |
| NLB can't track TCP connections because it was unable to open the TCP connection callback object | Windows Server NLB Server Role | 81 | Microsoft-Windows-NLB | System | Error |
| NLB cluster IGMP multicast IP address is invalid | Windows Server NLB Server Role | 73 | Microsoft-Windows-NLB | System | Error |
| NLB detected a duplicate host priority that is shared between cluster hosts | Windows Server NLB Server Role | 17 | Microsoft-Windows-NLB | System | Error |
| NLB detected an unequal number of dedicated IP (DIP) addresses and network masks | Windows Server NLB Server Role | 32 | Microsoft-Windows-NLB | System | Error |
| NLB detected an unequal number of virtual IP (VIP) addresses and network masks | Windows Server NLB Server Role | 110 | Microsoft-Windows-NLB | System | Warning |
| NLB detected duplicate cluster subnets | Windows Server NLB Server Role | 18 | Microsoft-Windows-NLB | System | Warning |
| NLB driver could not allocate enough memory resources to perform driver operations | Windows Server NLB Server Role | 10 | Microsoft-Windows-NLB | System | Error |
| NLB driver failed to attach to network adapter | Windows Server NLB Server Role | 85,89,98 | Microsoft-Windows-NLB | System | Error |
| NLB driver failed to bind to the adapter | Windows Server NLB Server Role | 9 | Microsoft-Windows-NLB | System | Error |
| NLB driver failed to register for notifications with the IPv4 NSI provider | Windows Server NLB Server Role | 102 | Microsoft-Windows-NLB | System | Warning |
| NLB driver failed to register for notifications with the IPv6 NSI provider | Windows Server NLB Server Role | 103 | Microsoft-Windows-NLB | System | Warning |
| NLB driver failed to register the device object | Windows Server NLB Server Role | 88 | Microsoft-Windows-NLB | System | Error |
| NLB driver failed to register/unregister the hook interface | Windows Server NLB Server Role | 96 | Microsoft-Windows-NLB | System | Warning |
| NLB driver has detected one or more sessions corresponding to a port rule that is improperly configured | Windows Server NLB Server Role | 95 | Microsoft-Windows-NLB | System | Warning |
| NLB failed to add a multicast MAC address to the network adapter | Windows Server NLB Server Role | 50 | Microsoft-Windows-NLB | System | Error |
| NLB failed to add all the dedicated IP (DIP) addresses to this host | Windows Server NLB Server Role | 107 | Microsoft-Windows-NLB | System | Error |
| NLB failed to converge due to inconsistencies in the port rules between this host and another cluster host | Windows Server NLB Server Role | 21 | Microsoft-Windows-NLB | System | Error |
| NLB failed to converge due to port rules with a duplicate single host priority in the cluster | Windows Server NLB Server Role | 20 | Microsoft-Windows-NLB | System | Error |
| NLB failed to read or verify the configuration parameters | Windows Server NLB Server Role | 34,35 | Microsoft-Windows-NLB | System | Error |
| NLB failed to register as a WMI provider | Windows Server NLB Server Role | 115 | Microsoft-Windows-NLB | System | Warning |
| NLB failed to update the adapter multicast list | Windows Server NLB Server Role | 94 | Microsoft-Windows-NLB | System | Error |
| NLB failed to update the NLB host state in the registry | Windows Server 2016 NLB Server Role | 74 | Microsoft-Windows-NLB | System | Warning |
| NLB Host converged with legacy host(s) | Windows Server 2016 NLB Server Role | 86 | Microsoft-Windows-NLB | System | Warning |
| NLB received a heartbeat from a host with an invalid ID | Windows Server NLB Server Role | 91 | Microsoft-Windows-NLB | System | Error |
| NLB will not attach to adapter because it does not support dynamic changing of its MAC address | Windows Server NLB Server Role | 53 | Microsoft-Windows-NLB | System | Error |
| The maximum number of actively serviced connections that could be tracked by NLB is reached | Windows Server 2016 NLB Server Role | 19 | Microsoft-Windows-NLB | System | Warning |
| Version mismatch between the NLB driver and control programs | Windows Server NLB Server Role | 37 | Microsoft-Windows-NLB | System | Error |
| Virtual IP (VIP) address is invalid | Windows Server NLB Server Role | 108 | Microsoft-Windows-NLB | System | Warning |
| Virtual IP address in a port rule is invalid | Windows Server NLB Server Role | 111 | Microsoft-Windows-NLB | System | Error |
| Virtual network mask is invalid | Windows Server NLB Server Role | 109 | Microsoft-Windows-NLB | System | Warning |

The following rules apply to the Windows Server 2016 NLB Server Role only.

| **Name** | **Target** | **Event ID** | **Source** | **Log** | **Severity** |
| --- | --- | --- | --- | --- | --- |
| More than one node claims an IP address to be on the client affinity lists | Windows Server 2016 NLB Server Role | 119 | Microsoft-Windows-NLB | System | Warning |
| The maximum number of IP addresses with stickiness to this node that could be tracked by NLB is reached | Windows Server 2016 NLB Server Role | 117 | Microsoft-Windows-NLB | System | Warning |
| Extended affinity configuration is inconsistent | Windows Server 2016 NLB Server Role | 118 | Microsoft-Windows-NLB | System | Warning |

### Overrides

The overrides listed in the following table are enabled by default.

| **Monitor Name** | **Override Name** | **Target** | **Enabled** | **Purpose** |
| --- | --- | --- | --- | --- |
| Network Adapter Connection Health (in the Windows Server Management Pack) | Enable network adapter state monitor for NLB network adapters | Windows Server NLB Network Adapter | False | Enable Network Adapter State Monitor For NLB Network Adapters |

## Appendix: Display Strings Changes History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **ElementID** | **Name before change** | **Name after change** | **Description** |
| 10.0.2.0 | Microsoft.Windows.NetworkLoadBalancing.10.0.IISIntegration.WebServerFolder | * Load Balanced IIS | * Load Balanced IIS 2016 | * This folder contains views with that show information about IIS servers which are running on NLB clusters. |

## Links

The following links connect you to information about common tasks that are associated with System Center management packs:

### System Center 2012 Operations Manager

* [Management Pack Life Cycle](http://go.microsoft.com/fwlink/p/?LinkID=232986)
* [How to Import a Management Pack](http://go.microsoft.com/fwlink/p/?LinkID=219431)
* [Tuning Monitoring by Using Targeting and Overrides](http://go.microsoft.com/fwlink/p/?LinkID=217065)
* [How to Create a Run As Account](http://go.microsoft.com/fwlink/p/?LinkId=232988)
* [How to Export a Management Pack](http://go.microsoft.com/fwlink/p/?LinkId=232990)
* [How to Remove a Management Pack](http://go.microsoft.com/fwlink/p/?LinkId=232991)

For questions about Operations Manager and management packs, see [System Center Operations Manager community forum](http://go.microsoft.com/fwlink/?LinkID=179635).

A useful resource is [System Center Operations Manager Unleashed blog](http://go.microsoft.com/fwlink/?LinkId=246391), which contains “By Example” posts for specific management packs.

For additional information about Operations Manager, see [System Center 2012 - Operations Manager Survival Guide](http://go.microsoft.com/fwlink/?LinkId=246383)

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