

HP ProLiant Network Adapter Scripting Utility User Guide



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Audience assumptions

This document is for the person who installs, administers, and troubleshoots servers and storage systems. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

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Overview

Network Configuration Utility and Scripting

The HP Network Configuration Utility (NCU) enables configuration of network adapters and teams of network adapters. The scripting feature of the utility provides the ability to perform adapter configuration using a batch process.

This guide provides information about using the HP Network Adapter Scripting Utility to configure HP adapters.

Scripting functionality

Scripting functionality provides the capability to configure a target system based on configuration information saved from a source server. The target system is not required to be identical to the source server. The configuration of the source server may not be duplicated in its entirety on the target system.

Both adapters and teams of adapters can be configured on the target system. When scripting is run, the adapter properties specified in the data file from the source server are used to modify the configuration of the adapters on the target system. Refer to "Preliminary scripting information (on page 5)" for details about running the scripting utility.

Scripting

Preliminary scripting information

When using scripting to configure target systems, adapters are identified by their relative order in the system.

The relative order is determined by the following properties.

- Slot and port order for adapters in non-HP BladeSystem configurations
- Enclosure switch bay number and switch port order for adapters in HP BladeSystem configurations

Adapters embedded on the system board are assigned the lowest numbers, followed by adapters ordered by their slot or switch bay number with the lowest slot or switch bay number first. Multiport adapters are ordered by ascending port or switch port number within each slot.

Order of adapters on target systems

Adapters on the target system are configured to match the corresponding adapter number on the source server.

- The first adapter on the target system is configured using data from the first adapter on the source server.
- The second adapter on the target system is configured using data from the second adapter on the source server, and so on.
- If the target system has more adapters than the source server, then the extra adapters retain their current settings.
- If the target system has fewer adapters than the source server, data for additional adapters on the source server is ignored.

HP Multifunction adapters on target systems

To transfer iSCSI, TCP/IP Offload Engine (TOE), or Receive-Side Scaling (RSS) parameters on an HP multifunction adapter, the following conditions apply:

- The multifunction adapter must be located in the same relative position on the target server as on the source server.
- If these multifunction parameters are assigned to an adapter that does not support iSCSI, TOE, or RSS, they are ignored.
- If an adapter supports these multifunction parameters but the parameters are not assigned, the existing settings are left unchanged.

Microsoft Scalable Networking Pack (SNP) is required when enabling TOE or RSS and is included on systems running Windows Server 2003 (SP2) and Windows Server 2003 x64 (SP2). SNP also is supported, but not included, on systems running Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). To enable TOE or RSS adapter functionality on a system running Windows Server 2003 (SP1) or Windows Server 2003 x64 (SP1), you must download SNP and required Microsoft hotfixes and install them on the system. See the Microsoft (<http://www.microsoft.com>) website to

download the latest version of the Microsoft Windows Server 2003 Scalable Networking Pack (SNP) and required Microsoft Windows Server 2003 (SP1) hotfixes in article numbers 921136, 919948, and 923187 of the Microsoft Knowledge Base (KB). These Microsoft hotfixes are required only for Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1).

RSS support on PCIe gigabit server adapters

RSS is supported on NC110T, NC360T, and NC364T PCIe gigabit server adapters running Microsoft Scalable Networking Pack (SNP) on Windows Server 2003 (SP2) and Windows Server 2003 x64 (SP2). These adapters also support RSS running SNP on Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1); however, SNP is not included with SP1 and must be downloaded and installed along with required Microsoft hotfixes. See the Microsoft (<http://www.microsoft.com>) website to download the latest version of the Microsoft Windows Server 2003 Scalable Networking Pack (SNP) and required Microsoft Windows Server 2003 (SP1) hotfixes in article numbers 921136, 919948, and 923187 of the Microsoft Knowledge Base (KB). These Microsoft hotfixes are required only for Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1).

To transfer the RSS parameter on one of these adapters, the following conditions apply:

- The adapter must be located in the same relative position on the target server as on the source server.
- If the RSS parameter is assigned to an adapter that does not support RSS, it is ignored.
- If an adapter supports the RSS parameter but the parameter is not assigned, the existing settings are left unchanged.

Teams on target systems

The target system is configured with the same number of teams that were present on the source server.

- Teams are created on the target system consisting of the same relative adapters that were teamed on the source server. For example, if adapters 3 and 5 were teamed on the source server, then that teaming information is saved in the data file, and adapters 3 and 5 are teamed on the target system.
- In general, the adapters on the team on the target system do not have to be the same type of adapters that were teamed on the source server. However, some adapters cannot be teamed and if an attempt is made to form a team with invalid combinations of adapters an error occurs. For example, teams with different speed capabilities cannot be teamed on a load balancing team.
- An error occurs in the configuration if the adapters forming the team on the source server are not present on the target system. For example, if adapters 3 and 5 are teamed on the source server, but the target system has only four adapters, an error is reported and the configuration is not applied.
- When teams are configured on the target system, the team properties are set to the values read from the data file for the corresponding team on the source server. Properties not specified in the data file (and properties specified with invalid data values) are configured using their default settings.
- If no teams are configured on the source server, no teaming information is written to the data file and configuration of the target system consists only of configuring individual adapters.

Script conversion

Scripts created with previous versions of the NCU are supported; however, HP recommends that you recreate the script using the latest version of the NCU. Several operating modes in scripts generated with NCU versions 7.7x and earlier have changed and are converted as follows:

- Manual is converted to Network Fault Tolerance Only (NFT).
- SmartSwitch is converted to Network Fault Tolerance Only with Preference Order.
- For Smart Switch Teams, the existing PreferredPrimaryNic attribute determines which team member should be more highly ranked than others within the PreferredPrimaryRanking attribute.

All other unspecified parameters use their defaults.

Scripting application (CQNICCMD)

CQNICCMD is a Windows utility that processes a network adapter configuration script file to duplicate the adapter teaming configuration of a source ProLiant BL/ML/DL server on a target server.

This utility is supported on the following Windows operating systems:

- Windows Server 2008
- Windows Server 2008 x64 Editions
- Windows Server 2003
- Windows Server 2003 x64 Editions

Run the utility from the command line in a Command Prompt window, from the **Run** option on the Windows Start menu, or from a Windows command file. To execute the CQNICCMD utility from the command line, the HP Network Configuration Utility (NCU) must be closed.

HP recommends that you use this application as part of the SmartStart Scripting Toolkit (SSST) deployment. However, the application can be used outside of this environment. Follow these steps when using the scripting application.

1. Configure adapter teaming on the source server.
2. Generate a script file on the source server by clicking **Save** in the HP NCU user interface or running CQNICCMD /S<filename> in the Command Line utility.
3. Modify the script file as necessary.

If you modify the script file, HP recommends that you run CQNICCMD/ P to check the syntax of the modified file and check the log file for errors and warnings. The default location of the log file is \cpqsystem\log\cpqteam.log on the system drive. The syntax of the /P option is cqniccmd /p<filename>

4. Install the HP NCU on the target system.
5. Run the Command Line utility with the following syntax.
cqniccmd /c<filename>
6. Check the log file for errors and warnings. The default location of the log file is \cpqsystem\log\cpqteam.log on the system drive.

For use of this utility with the SmartStart Scripting Toolkit (SSST), refer to the documentation included with SSST. The SSST can be downloaded from <http://www.hp.com/servers/proliantessentials> (<http://www.hp.com/servers/proliantessentials>).

Command line syntax

```
CQNICCMD [[F/] /C<filename>] [/D] [/L <filename>] [/P <filename>]
[/S<filename>] [/?]
```

Only one of the following configuration options can be specified at a time:

/S
/D
/C
/P

The /L argument can be used with any of the configuration options. The /F argument can only be used with the /C configuration option.

Command line arguments

Argument	Description
/S	This configuration option causes the source server configuration to be saved. The name of the XML configuration data file must be specified and the path to the data file must exist. This option is identical to saving the source server configuration by clicking Save in the Network Teaming Configuration user interface.
/D	This configuration option causes all teams on the target server to be dissolved, all VLANs to be removed, and 802.1p/q Packet Tagging to be disabled for all adapters that had no VLANs. No additional arguments are required or allowed with this option.
/C	This configuration option applies the configuration specified in the data file to the target system. An existing XML configuration data file must be specified following the target switch. A space following the switch is optional. Any teams that exist on the target server will be dissolved before the configuration is applied, all VLANs will be removed, and 802.1p/q Packet Tagging will be disabled.
/P	This option is identical to the /C option, except that the configuration options are not applied to the target system. This is useful for syntax checking the XML data file.
/L	This option can be used to change the name and location of the cpqteam.log default log file that is created in \cpqsystem\log on the system drive. The supplied path must exist. An invalid log file name will cause the configuration to terminate with no changes. HP recommends this option only in batch files.
/F	This option causes all errors, including those errors normally treated as non-fatal errors, to be treated as fatal errors. This argument can be used only with the /C option.

Command line examples

```
/S  
cqnccmd /Sc:\HP\teamcfg.xml  
cqnccmd /S c:\HP\teamcfg.xml  
cqnccmd /S"c:\HP\teamcfg.xml"
```

```
/D  
cqnccmd /D
```

```
/C  
cqnccmd /Cc:\HP\teamcfg.xml  
cqnccmd /C c:\HP\teamcfg.xml  
cqnccmd /C"c:\HP\teamcfg.xml"
```

```
/P  
cqnccmd /Pc:\HP\teamcfg.xml  
cqnccmd /P c:\HP\teamcfg.xml  
cqnccmd /P"c:\HP\teamcfg.xml"
```

```
/L
```



```
cqniccmd /Cc:\HP\teamcfg.xml /Lc:\HP\config.log
cqniccmd /C c:\HP\teamcfg.xml /L c:\HP\config.log
cqniccmd /C"c:\HP\teamcfg.xml" /L" c:\HP\config.log"

/F
cqniccmd /F /C c:\HP\teamcfg.xml
```

Command line help

The following option can be used to display usage information.

```
/?
```

For example:

```
cqniccmd /?
```

Usage:

```
cqniccmd [[/F] /C<filename>] [/D] [/L<filename>] [/P<filename>]
[/S<filename>] [/?]
```

/C Configures the source server according to the specified filename.

/D Dissolves all teams on the target server.

/F Causes all errors to be treated as fatal errors.

/L Changes the name and location of the logfile to the specified filename.

/P Parses the specified filename to check for syntax errors.

/S Saves the source server configuration to the specified filename.

Examples:

To apply a script:

```
cqniccmd /Cc:\teamcfg.xml
```

To apply a script and specify the logfile location:

```
cqniccmd /Cc:\teamcfg.xml /Lc:\logs\teamcfg.log
```

Configuration properties

Adapter configuration properties

The following properties are configured on the target server adapters from the source server data.

Properties that are common to all HP adapters include:

- **SpeedDuplex**—Determines the current speed and duplex of the adapter. Possible values include Auto/Auto, 10/Half, 10/Full, 100/Half, 100/Full, 1000/Full. The default is Auto/Auto. The value must be valid for the adapter on the target system.
- **PreferredPrimaryRanking**—Determines the preferred primary ranking of the adapter. This value is written only for adapters that are teamed.
- **ConfiguredPortCost**—Defines the port cost for the adapter. The default is 0. This value is written only for adapters that are teamed.
- **DefaultVlanId**—Determines the VLAN ID used for any un-tagged packets received by the adapter. This only applies to adapters that have VLANs defined.
- **VlanID**—Specifies the VLAN identifier value for the device.
- **VlanName**—Specifies the descriptive name for the VLAN ID. Every VLAN must have a name assigned to it. Duplicate names are allowed if you want to use the same names for different VLAN IDs.
- **NetworkAddress**—This value is written only for adapters that are not teamed. It overrides the burned-in address with a locally administered address. A null value is always written to the XML data file because locally administered addresses must be unique. A null value is valid and indicates the network address is the burned-in address. This value must be a valid unicast address if it is edited.

HP Multifunction adapter properties

The following properties are common only to HP Multifunction adapters.

To transfer iSCSI, TCP/IP Offload Engine (TOE), and Receive-Side Scaling (RSS) parameters on an adapter, the adapter must be located in the same relative position on the target machine as on the source machine.

If the following parameters are assigned to an adapter that does not support iSCSI, TOE, or RSS, they are ignored. If an adapter supports these multifunction parameters but the parameters are not assigned, the existing settings are left unchanged.

- **iSCSIEnabled**—Causes Internet Small Computer System Interface (iSCSI) to be configured for the adapter. 0=Disabled. 1=Enabled. The default setting is Disabled.
- **iSCSIVlanId**—Specifies the iSCSI VLAN identifier value for the iSCSI enabled device.
- **iSCSIVlanName**—Specifies the descriptive name for the iSCSI VLAN ID.

- **iSCSIPacketPriority**—Specifies the QoS Packet Priority for the iSCSI enabled device. Possible values are D=Disabled and 1-7. The default setting is D (Disabled).
- **iSCSIDHCPEnabled**—Specifies that DHCP is used to acquire an IP configuration for the iSCSI enabled device. Possible settings are Enabled and Disabled. The default setting is Enabled.
- **iSCSIIPAddress**—If DHCP is not used, this specifies the IPv4 address (dotted decimal) for the iSCSI enabled device. If DHCP is enabled, the value is 0.0.0.0; otherwise, enter the actual IP address.
- **iSCSISubnetMask**—If DHCP is not used, this property specifies the network subnet mask (dotted decimal) for the iSCSI enabled device. If DHCP is enabled, the value is 0.0.0.0, otherwise, enter the actual subnet mask.
- **iSCSIGateway**—If DHCP is not used, this specifies the default route for the iSCSI enabled device. If DHCP is enabled or no gateway is used, the value is 0.0.0.0, otherwise, type the actual IP address.
- **iSCSILAA**—(Locally Administered Address) specifies the user-defined MAC address of the iSCSI enabled device. A null value is always written to the XML data file because locally administered addresses must be unique. A null value is valid and indicates the network address is the burned-in address. This value must be a valid unicast address if it is edited.
 - The following team types are not supported for iSCSI-enabled adapters. Disable iSCSI on the adapter or team before changing to any of the incompatible team types.
 - Automatic
 - 802.3ad Dynamic with Fault Tolerance
 - Switch-assisted Load Balancing with Fault Tolerance (SLB)
 - If the NCU does not detect the presence of the Microsoft® iSCSI Software Initiator 2.0 or later on systems running Windows Server 2003 (SP1), Windows Server 2003 x64 (SP1), Windows Server 2003 (SP2), or Windows Server 2003 (SP2), iSCSI cannot be enabled. Windows Server 2008 and Windows Server 2008 x64 comes with the iSCSI Initiator included.
- **TOEEnabled**—Enables the offloading of TCP connections to the Multifunction Server Adapter. Microsoft Scalable Networking Pack (SNP) is required when enabling TOE and is included on systems running Windows Server 2003 (SP2) or Windows Server 2003 x64 (SP2). SNP also is supported, but not included, on systems running Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). To enable TOE adapter functionality on a system running Windows Server 2003 (SP1) or Windows Server 2003 x64 (SP1), you must download SNP and required Microsoft hotfixes and install them on the system. See the Microsoft (<http://www.microsoft.com>) website to download the latest version of the Microsoft Windows Server 2003 Scalable Networking Pack (SNP) and required Microsoft Windows Server 2003 (SP1) hotfixes in article numbers 921136, 919948, and 923187 of the Microsoft Knowledge Base (KB). These Microsoft hotfixes are required only for Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1).

TOE teaming performance is reduced if a switch or network device is configured with the round robin aggregation load balancing method. Configure the aggregation load balancing method on the switch or network device to something else other than round robin and then re-start the team (disable the team and enable the team for all VLANs).
- **RSSEnabled**—Enables the receive processing of networking traffic to be load balanced across teamed adapters. Microsoft Scalable Networking Pack (SNP) is required when enabling RSS and is included on systems running Windows Server 2003 (SP2), Windows Server 2003 x64 (SP2), Windows Server 2008, or Windows Server 2008 x64. SNP also is supported, but not included, on systems running Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). To enable RSS adapter functionality on a system running Windows Server 2003 (SP1) or Windows Server 2003

x64 (SP1), download SNP and required Microsoft hotfixes and install them on the system. See the Microsoft (<http://www.microsoft.com>) website to download the latest version of the Microsoft Windows Server 2003 Scalable Networking Pack (SNP) and required Microsoft Windows Server 2003 (SP1) hotfixes in article numbers 921136, 919948, and 923187 of the Microsoft Knowledge Base (KB). These Microsoft hotfixes are required only for Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1).

Team configuration properties

Team configuration properties that are configured on the target server include:

- **TeamName**—Determines the unique identifier for the adapter team. Each team name on the target system must be unique.
- **OpMode**—Determines the operating mode of the team. Possible values are Auto, DynamicSingleSlb, StaticSingleSlb, TransmitLoadBalancing, TLBwithPref, FailOnFault, PrefPrimary
- **LoadBalAlgorithm**—Determines the team load balancing algorithm. Possible values are MACAddress, IPAddress, TCPConnection, RoundRobin, and Auto.
- **TeamNetworkAddress**—Establishes the MAC address for the adapter team. A null value is always written to the XML data file because locally administered addresses must be unique. A null value is valid and computes a default address. This value must be a valid unicast address if it is edited.
- **TxPathValidationMode**—Enables or disables the packet signal transmitted between the teamed adapters. Possible values are Enabled or Disabled.
- **RxPathValidationMode**—Enables or disables the packet signal received between the teamed adapters. Possible values are Enabled or Disabled.
- **TxPathValidationInterval**—Determines how frequently the packet signals are transmitted. The range of acceptable values is 3 to 60. Values less than 3 are set to 3, and values greater than 60 are set to 60.
- **RxPathValidationInterval**—Determines how frequently the packet signals are received. The range of acceptable values is 3 to 60. Values less than 3 are set to 3, and values greater than 60 are set to 60.
- **RxPathValidationVlanId**—Determines the VLAN on which Receive Path Validation packet frames are transmitted. This value is only written when a VLAN is defined for the team. The default is the VLAN on the team with the lowest VLAN ID at the time the team is created.
- **DefaultVlanId**—Determines the VLAN ID used for any un-tagged packets received by the team. This property only applies to teams that have VLANs defined.
- **TOEEnabled**—Enables the offloading of TCP connections to the Multifunction Server Adapter. Microsoft Scalable Networking Pack (SNP) is required when enabling TOE and is included on systems running Windows Server 2003 (SP2) or Windows Server 2003 x64 (SP2). SNP also is supported, but not included, on systems running Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). To enable TOE adapter functionality on a system running Windows Server 2003 (SP1) or Windows Server 2003 x64 (SP1), you must download SNP and required Microsoft hotfixes and install them on the system. See the Microsoft (<http://www.microsoft.com>) website to download the latest version of the Microsoft Windows Server 2003 Scalable Networking Pack (SNP) and required Microsoft Windows Server 2003 (SP1) hotfixes in article numbers 921136, 919948, and 923187 of the Microsoft Knowledge Base (KB). These Microsoft hotfixes are required only for Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). The TOEEnabled property is

only valid when all the team members are HP Multifunction Server Adapters. 0=Disabled. 1=Enabled. The default setting is Enabled.

TOE teaming performance is reduced if a switch or network device is configured with the round robin aggregation load balancing method. Configure the aggregation load balancing method on the switch or network device to something else other than round robin and then re-start the team (disable the team and enable the team for all VLANs).

TOE and RSS teaming are not supported on Windows Server 2008 and Windows Server 2008 x64 in this release.

Currently not supported on HP NC51xx 10 GbE adapters.

- **RSSEnabled**—Enables the receive processing of networking traffic to be load balanced across teamed adapters. Microsoft Scalable Networking Pack (SNP) is required when enabling RSS and is included on systems running Windows Server 2003 (SP2), Windows Server 2003 x64 (SP2), Windows Server 2008, or Windows Server 2008 x64. SNP also is supported, but not included, on systems running Windows Server 2003 (SP1) and Windows Server 2003 x64 (SP1). To enable RSS adapter functionality on a system running Windows Server 2003 (SP1) or Windows Server 2003 x64 (SP1), download SNP and required Microsoft hotfixes and install them on the system. 0=Disabled. 1=Enabled. The default setting is Enabled on multifunction server adapters and Disabled on NC110T, NC360T, and NC364T PCIe gigabit server adapters.

TOE and RSS teaming are not supported on Windows Server 2008 and Windows Server 2008 x64 in this release.

Currently not supported on HP NC51xx 10 GbE adapters.

XML data file

XML elements and typical adapter teaming script

The XML data file contains configuration properties for adapters and teams and consists of the following XML elements:

- <teamingconfig>-Brackets the entire data file and is required.
- <nic>-Defines adapter properties.
- <team>-Defines teams and their properties.
- <vlan>-Defines VLANs and their properties.

The 'relnics' attribute of the <team> element lists the adapters that are to be configured on the team.

The following example is a typical adapter teaming script.

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
- <teamingconfig>
- <!-- The comment lines in this file make it convenient
-->
- <!-- to reference <nic>, <team>, and <vlan> elements
-->
- <!-- within the file. It is recommended that these
-->
- <!-- comment lines remain unchanged if the user edits
-->
- <!-- the file.
-->
- <!--
-->
- <!--          Version Data
-->
- <!--
-->
  <version UtilityVersion="9.00.0.7" ScriptVersion="3.1" />
- <!--
-->
- <!--          Adapter Data
-->
- <!--
-->
- <!-- <nic> element 1
-->
- <nic>
  <property id="SpeedDuplex" value="Auto/Auto" />
  <property id="NetworkAddress" value="" />
</nic>
- <!-- <nic> element 2
-->
- <nic>
  <property id="SpeedDuplex" value="Auto/Auto" />
```

```

<property id="iSCSIEnabled" value="1" />
<property id="PreferredPrimaryRanking" value="0" />
<property id="DualChannelGroup" value="0" />
<property id="ConfiguredPortCost" value="0" />
<property id="TOEEnabled" value="1" />
<property id="RSSEnabled" value="1" />
<property id="iSCSIVlanId" value="0" />
<property id="iSCSIVlanName" value="" />
<property id="iSCSIPacketPriority" value="Disabled" />
<property id="iSCSIDHCPEnabled" value="Enabled" />
<property id="iSCSIIPAddress" value="0.0.0.0" />
<property id="iSCSISubnetMask" value="0.0.0.0" />
<property id="iSCSIGateway" value="0.0.0.0" />
<property id="iSCSILAA" value="" />
</nic>
- <!-- <nic> element 3
-->
- <nic>
  <property id="SpeedDuplex" value="100/Full" />
  <property id="NetworkAddress" value="" />
</nic>
- <!-- <nic> element 4
-->
- <nic>
  <property id="SpeedDuplex" value="100/Full" />
  <property id="NetworkAddress" value="" />
</nic>
- <!-- <nic> element 5
-->
- <nic>
  <property id="SpeedDuplex" value="Auto/Auto" />
  <property id="NetworkAddress" value="" />
</nic>
- <!-- <nic> element 6
-->
- <nic>
  <property id="SpeedDuplex" value="Auto/Auto" />
  <property id="NetworkAddress" value="" />
</nic>
- <!-- <nic> element 7
-->
- <nic>
  <property id="SpeedDuplex" value="Auto/Auto" />
  <property id="iSCSIEnabled" value="0" />
  <property id="PreferredPrimaryRanking" value="1" />
  <property id="DualChannelGroup" value="0" />
  <property id="ConfiguredPortCost" value="0" />
  <property id="TOEEnabled" value="1" />
  <property id="RSSEnabled" value="1" />
  <property id="iSCSIVlanId" value="1" />
  <property id="iSCSIVlanName" value="iRon" />
  <property id="iSCSIPacketPriority" value="1" />
  <property id="iSCSIDHCPEnabled" value="Enabled" />
  <property id="iSCSIIPAddress" value="0.0.0.0" />
  <property id="iSCSISubnetMask" value="0.0.0.0" />
  <property id="iSCSIGateway" value="0.0.0.0" />
  <property id="iSCSILAA" value="" />
</nic>
- <!--

```

```
-->
- <!--          Team Data
-->
- <!--
-->
- <!-- <team> element 1
-->
- <team relnics="2 7">
  <property id="TeamName" value="HP Network Team #1" />
  <property id="OpMode" value="TransmitLoadBalancing" />
  <property id="LoadBalAlgorithm" value="Auto" />
  <property id="RxPathValidationInterval" value="3" />
  <property id="TxPathValidationInterval" value="3" />
  <property id="RxPathValidationMode" value="Enabled" />
  <property id="TxPathValidationMode" value="Enabled" />
  <property id="TeamNetworkAddress" value="" />
  <property id="TOEEnabled" value="1" />
  <property id="RSSEnabled" value="1" />
</team>
</teamingconfig>
```

Error handling and reporting

Error checking and completion code

Errors can occur for a variety of reasons including differences between the source and target system NICs or because of errors introduced by editing the XML data file. The software performs extensive error checking as the XML data file is read and processed.

When invalid property values are detected, a WARNING error message is written to a log file and configuration continues with either default or existing values.

When the `cpniccmd` is run from a command line or a Windows command file, a completion code is written as an error level code to both a log file and the screen. This error code can be used by the Windows command file to determine how to proceed. The error level codes are as follows:

- Successful start of the action returns a completion code of error level zero (0).
- Non fatal errors return a completion code of error level one (1).
- An invalid log file returns a completion code of error level two (2).
- Other fatal errors return a completion code of error level three (3) or greater.

The specific information about all errors can be determined by viewing the log file located at `\cpqsystem\log\cpqteam.log` (defaulted location).

Acronyms and abbreviations

iSCSI

Internet Small Computer System Interface

NCU

Network Configuration Utility

NFT

network fault tolerant

RSS

Receive-Side Scaling

TOE

TCP/IP Offload Engine

VLAN

virtual local-area network

XML

extensible markup language

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