Auto Dedicated NIC Feature in iDRAC7

The new Auto Dedicated NIC feature in iDRAC7 version 1.30.30 automatically configures the iDRAC7 network connection for you.

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Introduction

For IT administrators looking for more flexibility in using the integrated Dell Remote Access Controller version 7 (iDRAC7), Dell offers a new Auto Dedicated NIC feature that provides the option to automatically reroute the iDRAC management traffic for scenarios such as connecting a crash cart or reconfiguring network cables. When this feature is enabled, iDRAC7 automatically and dynamically detects a system’s network mode by sensing the system’s network cable configuration—whether or not a cable is connected to the system’s dedicated NIC port. This paper describes the Auto Dedicated NIC feature and explains how to enable and configure this feature in iDRAC7.

This feature is available with iDRAC7 starting with the firmware version 1.30.30 with an Enterprise license. For Dell™ PowerEdge™ rack and tower servers series 600 and above, the dedicated NIC port is standard on the system, but requires an iDRAC7 Enterprise license to enable the port. Dell PowerEdge rack and tower servers 500 series and below (R520, R420, T420, R320, and T320) come with an add-in card if ordered with an Enterprise license at point-of-sale. If an Enterprise license is purchased later than point-of-sale, the add-in card must also be purchased in order to have the dedicated NIC port. This feature is not available on blade servers.

Manual and automatic NIC selection

In earlier iDRAC versions, you were able to select either a dedicated NIC port or a shared LOM port for the iDRAC network connection. When using the dedicated NIC port, you had to manually change the setting using the iDRAC web interface or a command line, as well as physically connect a cable to the server. The Auto Dedicated NIC feature is available as an enhanced functionality and does not change the existing behavior of manual NIC selection. Since Auto Dedicated NIC switches to the correct network automatically, you don’t need to manually change the setting using the iDRAC7 web interface or a command line.

Figure 1 shows the iDRAC7 dedicated and LOM ports of a PowerEdge R420 server. The Auto Dedicated NIC feature is available only if a system has a dedicated NIC port.

![Figure 1. Network ports](image)

Scanning for dedicated or shared connection

Auto Dedicated NIC can be enabled only when the iDRAC7 NIC selection is in shared mode (LOMs). If this feature is turned on, its scans to see if a cable is connected to the dedicated NIC port. If a cable is connected, the iDRAC7 network interfaces are switched to the dedicated NIC port. When this cable is unplugged, the iDRAC7 network interface switches back to the user-selected NIC port.
You can adjust the time allowed to scan and detect a cable connected or disconnected to the dedicated NIC port from 5 to 255 seconds. By default, cable connection is detected within 5 seconds and disconnection is detected within 30 seconds.

The time it takes to recognize a valid cable connection to a dedicated NIC port is called the “dedicated scan time.” Similarly, the time to recognize a cable disconnection is called “shared scan time.” If the cable scan time is less than the configured time, it will be treated as invalid and ignored. For example, if the dedicated scan time is set to 5 seconds, and a cable is connected to the dedicated NIC port for only 3 seconds, the connection is considered invalid and will be ignored. This helps avoid unnecessary switching of the iDRAC7 network interface on power trips or loose cable connections.

This feature doesn’t scan the shared NIC ports. While the cable is disconnected from the dedicated NIC port, the iDRAC7 network interface is restored to the original NIC selection regardless of cable connection. Even if a cable is not connected to the LOM port, the iDRAC7 network interface will switch if the dedicated NIC cable is unplugged.

This switch is done automatically without user intervention. If the dedicated NIC cable is disconnected on other end, or if the switch (or hub or router) directly connected to the server is powering down, the event is detected as an unplugged cable. For example, if a dedicated NIC port is connected to a hub that is powered down, iDRAC7 will detect the cable as disconnected and switch to the user-selected NIC port. To avoid unintentional switching to shared NICs during short power trips on the hub, increase the shared scan time (see the sections on RACADM and WSMAn).

Auto Dedicated NIC behavior

Table 1 describes the behavior when Auto Dedicated NIC is either on or off, plus the different NIC selections and their failover modes.

<table>
<thead>
<tr>
<th></th>
<th>Dedicated NIC selection</th>
<th>Shared NIC selection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Failover</td>
<td>No failover</td>
</tr>
<tr>
<td><strong>On</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated up</td>
<td>Not possible</td>
<td>Dedicated</td>
</tr>
<tr>
<td>Dedicated down</td>
<td>Not possible</td>
<td>Dedicated</td>
</tr>
<tr>
<td><strong>Off</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dedicated up</td>
<td>Not possible</td>
<td>Dedicated</td>
</tr>
<tr>
<td>Dedicated down</td>
<td>Not possible</td>
<td>Dedicated</td>
</tr>
</tbody>
</table>

Enabling and configuring Auto Dedicated NIC

By default, the Auto Dedicated NIC feature is disabled. To use this feature, you will first need to enable it. You can use any one of the following interfaces to enable Auto Dedicated NIC:

- iDRAC web interface
- HII
- RACADM
- WSMAn
Table 2 Auto Dedicated NIC of each of the interfaces.

<table>
<thead>
<tr>
<th>Table 2. Interface functionality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Enable/Disable</td>
</tr>
<tr>
<td>Dedicated Scan time</td>
</tr>
<tr>
<td>Shared Scan time</td>
</tr>
</tbody>
</table>

iDRAC7 web interface

In earlier iDRAC7 releases, NIC selection support was limited to manual selection of either the dedicated NIC port or one of the shared NIC ports (LOM1, LOM2, LOM3, LOM4). In the current iDRAC7 release (1.30 or greater), Auto Dedicated NIC is available in addition to manual NIC selection. Auto Dedicated NIC doesn’t change the existing behavior of manual NIC selection.

To enable the Auto Dedicated NIC feature:

1. Log on to the iDRAC7 web interface. The system must have a valid Enterprise license.
2. Select Overview > iDRAC Settings > Network.
3. In the Network Settings section, select the checkbox for Auto Dedicated NIC.

Figure 2. Auto Dedicated NIC checkbox in Network Settings
Since Auto Dedicated NIC is disabled by default, this checkbox will not be selected when you first log into iDRAC7. The behavior will be the same as the existing behavior. User configured NIC selection and failover network settings will work as is.

If the NIC selection is set to **Dedicated**, the Auto Dedicated NIC setting will be inactive. There is no failover option for this mode.

For Dell PowerEdge blade servers, the **NIC Selection** field is always set at **Dedicated**, which means that Auto Dedicated NIC is always disabled and not supported (see Figure 3). Auto Dedicated NIC is supported on Dell PowerEdge tower and rack servers only. A new read-only field **Active NIC Interface** displays the currently active network interface on the iDRAC7 web interface.

![Auto Dedicated NIC disabled for Dell PowerEdge blade servers](image)

Note the following security requirements for using the iDRAC7 web interface:

- Normal web authentication
- User must have configure iDRAC privileges to modify any settings; a user with read-only privileges will not be able to change any settings
- For data in flight, Network Time Protocol is used; this is a well-established industry standard protocol with no known security holes
- Normal web data in flight security used
HII

To enter the HII interface:

1. Press the **F2** key during POST.
2. Select **iDRAC Settings** on the **System Setup** page.

![System Setup Figure 4](image.png)
3. Select **Network** on the **iDRAC Settings** page.

**Figure 5. iDRAC Settings in System Setup**
4. Select **Enabled** in the **Network Settings** table to enable Auto Dedicated NIC. Make sure to save your settings.

**Figure 6. Network Settings in System Setup**

![Network Settings in System Setup](image)

**RACADM**

You can use the racadm command-line utility to set Auto Dedicated NIC properties as well as to check the current settings. Note that racadm commands return an error message if an Enterprise license is not installed; you must have "configure iDRAC privilege" to configure the Auto Dedicated NIC properties using racadm.

To verify whether the Auto Dedicated NIC is enabled (return code 1 is enabled and 0 is disabled), enter:

```
racadm get iDRAC.Nic.AutoDetect
```

To set the Auto Dedicated NIC to enabled, enter:

```
racadm set iDRAC.Nic.AutoDetect 1
```

To set the Auto Dedicated NIC to disabled, enter:

```
racadm set iDRAC.Nic.AutoDetect 0
```
Scan time setting is only available through racadm and WSMan. Scan time defines the timeout after which the iDRAC7 firmware will cause a failover from dedicated to shared mode if there is no link detected on the dedicated NIC port. The default is 30 seconds. The allowed range is 5 to 255 seconds.

To obtain the current settings for scan time, enter:

```
racadm get iDRAC.Nic.DedicatedNICScanTime
racadm get iDRAC.Nic.SharedNICScanTime
```

To set scan time, enter:

```
racadm set iDRAC.Nic.DedicatedNICScanTime supported values 5-255
racadm set iDRAC.Nic.SharedNICScanTime supported values 5-255
```

To set NIC selection to dedicated, enter:

```
racadm config -g cfglannetworking -o cfgnicselection 1
```

**Note:** If NIC selection is set to Dedicated, then setting Auto Dedicated NIC to Enabled will fail.

To obtain the current values for all auto NIC properties, enter:

```
racadm get idrac.nic
```

To see which NIC interface is currently active, enter:

```
racadm getniccfg
```

**WSMan**

You can use the WSMan command-line utility to set Auto Dedicated NIC properties.

To enable Auto Dedicated NIC, enter:

```
winrm i SetAttribute
cimv2/root/dcim/DCIM_iDRACCardService?SystemCreationClassName=DCIM_ComputerSystem+SystemName=DCIM:ComputerSystem+CreationClassName=DCIM_iDRACCardService+Name=DCIM:iDRACCardService -u:<username> -p:<password> -r:https://<iDRAC IP address>/wsman -SkipCNcheck -SkipCAdcheck -encoding:utf-8 -a:basic @{Target="iDRAC.Embedded.1";AttributeName="NIC.1#AutoDetect";AttributeValue="Enabled"})
```

**Note:** Make changes to the parameters as needed.
To configure the dedicated NIC scan time, enter:

```
winrm i SetAttribute
cimv2/root/dcim/DCIM_iDRACCardService?SystemCreationClassName=DCIM_ComputerSystem+SystemName=DCIM:ComputerSystem+CreationClassName=DCIM_iDRACCardService+Name=DCIM:iDRACCardService -u:<username> -p:<password> -r:https://<iDRAC IP address>/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-8 -a:basic @{Target="iDRAC.Embedded.1";AttributeName="NIC.1#DedicatedNICScanTime";AttributeValue="20"}
```

To configure the Shared NIC scan time, enter:

```
winrm i SetAttribute
cimv2/root/dcim/DCIM_iDRACCardService?SystemCreationClassName=DCIM_ComputerSystem+SystemName=DCIM:ComputerSystem+CreationClassName=DCIM_iDRACCardService+Name=DCIM:iDRACCardService -u:<username> -p:<password> -r:https://<iDRAC IP address>/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-8 -a:basic @{Target="iDRAC.Embedded.1";AttributeName="NIC.1#SharedNICScanTime";AttributeValue="20"}
```

**Confirming valid Enterprise licensing**

The Auto Dedicated NIC feature can work only if an Enterprise license is available. The following is a list of what happens when an Enterprise license is deleted or expires:

- iDRAC7 network interface does not switch on network cable connection or disconnection.
- If iDRAC7 is using a shared NIC interface, there is no impact.
- If iDRAC7 network interface is currently in dedicated NIC, it stays on this interface (same as earlier release of iDRAC7) with a warning on the web interface page.
- If you try to log into the web interface and get a message to disable Auto Dedicated NIC, iDRAC7 switches to the selected shared interface on confirmation, and dedicated NIC becomes inactive.
- Other out-of-box interfaces like remote racadm, ssh, telnet are blocked from working.
- Rebooting iDRAC7 will switch the iDRAC network interface to the selected shared NIC interface.

**Conclusion**

Auto Dedicated NIC is a useful feature for seamless access to the iDRAC7 interfaces when network cables are moved. This feature also provides a secure means for locally troubleshooting a server through crash cart, without having to move cables or configure switches. If you configure multiple servers in a central environment, then deploy the servers to various locations, Auto Dedicated NIC allows these servers to access iDRAC7 through the network from a shared LOM as long as the dedicated NIC was used for the initial configuration. Dell continues to listen to our customers and provides features that meet the needs of the ever-changing IT world. By providing the Auto-Dedicated NIC feature, you have the flexibility to route server management traffic as needed—quickly and effortlessly.