

Using USB NIC to Manage OEM Appliances

Abstract

This Whitepaper provides information on OS – BMC pass through functionality via USB NIC Interface. System management and Firmware updates via USB-NIC channel when iDRAC has no physical network connectivity and there is no network connectivity between host OS and iDRAC.

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Author: Abhishek Raj, Ganesh Viswanathan

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Executive summary

This white paper is intended to provide information on OS-to-BMC passthrough functionality using the USB NIC interface on the 13th and 14th generation of Dell EMC PowerEdge servers. You can access OS-to-BMC feature by two channels—shared LOM and USB NIC. In this document, we discuss the USB NIC channel.

USB NIC feature provides a unique functionality to access the iDRAC web interface and command-line interface through host operating system without knowing the IP address of the iDRAC. Network connectivity is not required between iDRAC and host OS.

In the later sections of this document we discuss how to access server configurations, iDRAC features, and perform firmware updates using USB NIC IP address. The firmware update process is discussed in detail.

The OS-to-BMC BMC passthrough functionality using the USB NIC Interface is relevant for OEM customers who buy customized Dell EMC servers and have limited access to BMC or iDRAC through external network connection.

This document is relevant for system management when server NIC is disabled or has no external network connection, or when a management station is not present to manage servers remotely.

1 Introduction

USB NIC feature is available on all PowerEdge systems. It enables access to iDRAC interfaces including the web interface, CLI (RACADM), Redfish, WSMAN, and SSH. Following are some of the key aspects of this features:

- Enables you to access iDRAC through the host OS without knowing the iDRAC IP address.
- Provides access to the iDRAC using USB NIC IP address.
- Especially helpful when there is no physical network connection to iDRAC or there is no management station available.
- Access iDRAC from host OS even if the server NIC is disabled.
- Available on most Windows, Linux and ESX operating systems.

OS to iDRAC pass-through link is established through the internal USB bus. When using this method to access iDRAC, all the functionalities of iDRAC, including login credentials, remain the same.

When the USB NIC feature is enabled, default IP addresses are assigned to iDRAC and the host OS. The following table provides the default IP addresses:

Table 1 Default IP addresses for USB NIC

Server generation	iDRAC IP	OS IP
13 th generation	169.254.0.1	169.254.0.2
14 th generation	169.254.1.1	169.254.1.2

2 Enabling USB NIC feature

You can enable the USB NIC features using the following:

- Dell EMC OEM Identity Module
- iDRAC web interface
- Command line interface (RACADM)
- F2 setup screen at POST

2.1 Dell EMC OEM Identity Module

Dell EMC OEM Identity module (IDM) is a software that provides enhanced branding, customization, and configuration.

USB NIC feature can be enabled using custom identity module used by OEM customers. You can request custom identity modules using the DellYourID website www.dellyourid.com.

Snapshot of USB NIC setting on DellYourID website:

OS-BMC Passthru Configuration Edit

OS-BMC Passthru Configuration Revert to No Preference ×

LC and Host Private Channel State

OS-BMC PT HOST IP Address

OS-BMC PT Mode

USB NIC IP Address

OK

OEM appliances have the IDMs preinstalled by Dell EMC. This installation process is ideal for configuring USB NIC feature on the systems. It eliminates the requirement of remote RACADM or local RACADM software in the OS for accessing iDRAC features. You can manage such appliances through scripts using the USB NIC IP address.

2.2 iDRAC web interface

2.2.1 13th generation systems

1. Log in to iDRAC web interface.
2. Navigate to **Overview**→ **iDRAC Settings**→ **Network**→ **OS to iDRAC Pass-through**.
3. For **Pass through Configuration**, select **USB NIC** and save the settings.

2.2.2 14th generation systems

Same setting as 13G.

2.3 Command line interface (RACADM)

Local RACADM:

```
RACADM set iDRAC.OS-BMC.AdminState enabled
```

Remote RACADM:

```
RACADM -r <iDRAC IP> -u <username> -p <password> set iDRAC.OS-BMC.AdminState enabled
```

2.4 F2 setup screen at POST

1. Reboot the system and press F2 at the POST screen.
2. Navigate to **iDRAC settings**→ **Communications Permissions**
3. For the **Pass-through Configuration** field, select **USB NIC** and save the settings.



3 Applications of USB NIC

When no management station is available to manage the servers through iDRAC IP:

- Access iDRAC interfaces through the operating system.
- Access iDRAC web interface by entering the USB NIC IP address in the web browser.
- Access iDRAC through SSH using USB NIC IP address.
- Access iDRAC through RACADM, Redfish, and WinRM commands using USB NIC IP address.
- All iDRAC functionalities remain same through USB NIC interface.

When no physical connection to iDRAC network is available:

- Access iDRAC through host OS even when there is no physical network connectivity to the iDRAC NIC.
- Access the iDRAC through host OS using USB NIC IP address.
- Access iDRAC using USB NIC IP address even when iDRAC NIC is disabled in the server.

Update the server firmware using a repository on a FTP, TFTP, CIFS, NFS, or HTTP(S) share:

- Perform batch updates through various iDRAC interfaces, including web interface, CLI, and API.
- Create a repository locally in the host OS and perform catalog-based updates using USB NIC IP address.
- Use SSH to send RACADM commands to iDRAC thus eliminating the need of RACADM software.
- TFTP server setup in the host OS provides the easiest solution. USB NIC OS IP address can be used as the TFTP server IP address that can communicate with USB NIC iDRAC IP address.
- To perform repository updates using other shares such as FTP, CIFS, NFS, and HTTP(S), iDRAC needs external network connection and iDRAC network should be in same subnet as of the external share.

When iDRAC web interface, SSH, and server NIC are disabled through identity module, and RACADM software is not installed on host OS:

- Access iDRAC via WSMAN and Redfish interfaces using USB NIC IP address.
- Use WinRM commands to access server attributes and perform firmware updates.
- Perform repository updates by creating a TFTP server locally in the host OS and accessing it through USB NIC OS IP address.
- Use Redfish to access server attributes and perform non-repository-based firmware updates.

USB NIC feature removes the dependency on RACADM and local RACADM software:

- When iDRAC IP of the server is not known and RACADM software is not installed in the host OS, use USB NIC IP address to access iDRAC web interface and SSH.
- Execute RACADM commands in the host OS via SSH to iDRAC using USB NIC IP address.
- Manage Dell OEM appliances shipped through Dell factory through USB NIC IP address without manual interaction.
- Connect to iDRAC through SSH keys in host OS and send RACADM commands for server monitoring and firmware updates without using any additional software in the host OS.
- Set up a local TFTP server in the host OS to schedule periodic updates using Dell Repository Manager using scripts. While scheduling the firmware updates jobs, server reboot must be user driven and not iDRAC driven as there may be unsaved data or ongoing process on the host. Script should be customized to schedule server reboot as per user request.

- WSMAN can also be used for the firmware updates.
- Redfish can be used for iDRAC and BIOS attributes management. It currently does not support repository-based updates.

Install non-DUP format software when system does not have physical network connectivity:

- When system has no physical iDRAC network connectivity, use USB NIC feature to install or update software that is not in DUP format and cannot be run directly on the host OS. For example, when the installer is in .pm, d7, or d9 file format.
- Use the web interface, SSH, or RACADM to install the software.
Example: `racadm -r 169.254.0.1 -u <username> -p <password> update -f <filepath><filename>.pm`

Configuration, monitoring, and troubleshooting

- Modify BIOS and iDRAC attributes by sending request through USB NIC interface.
- Modify attributes from multiple interfaces on the host OS such as web interface, SSH, WSMAN, RACADM, and Redfish.
- Use RACADM through SSH to eliminate the need of additional software on the host OS. RACADM commands via SSH can be sent through a script, which eliminates manual interaction.
- By default, all servers have the same USB NIC IP. This enables you to use a single script to configure attributes on multiple servers. Server logs can also be collected for monitoring and troubleshooting using this interface. Scripts may be used for collecting the logs periodically, which eliminate manual interaction.

4 Repository-based firmware updates using RACADM over SSH

You can perform repository-based firmware updates by establishing a SSH connection to iDRAC using USB NIC IP address and sending RACADM commands directly to the server via SSH interface. It is best to use a TFTP server with USB NIC OS IP address locally in the host OS. This process eliminates the need for having RACADM software installed on the server.

Example: `racadm update -f Catalog.xml -e 169.254.0.2/Repo/MyCatalog -a TRUE -t TFTP`

4.1 Commands for repository-based updates through RACADM

TFTP — Perform update from a TFTP repository and reboot the server to apply the updates.

```
racadm -r 169.254.0.1 update -f Catalog.xml -e 169.254.0.2/Repo/MyCatalog -a TRUE -t TFTP
```

Repository based firmware Updates can be performed through other share types that are not available locally, in that case iDRAC will need external network connectivity and iDRAC network should be in same subnet as of share used.

FTP — Perform update from an FTP repository and reboot the server to apply the updates.

```
racadm -r 169.254.0.1 update -f Catalog.xml -e 192.168.11.10/Repo/MyCatalog -a TRUE -t FTP
```

NFS — Perform update from a NFS repository and reboot the server to apply the updates

```
racadm -r 169.254.0.1 -u root -p calvin update -f Catalog.xml -l 192.168.11.10:/Repo -u test -p passwd -t NFS -a TRUE
```

CIFS — Perform update from a CIFS repository and reboot the server to apply the updates.

```
racadm -r 169.254.0.1 update -f Catalog.xml -l //192.168.11.10/Repo -u test -p passwd -a TRUE -t CIFS
```

HTTP/HTTPS — Perform update from an HTTP repository and reboot the server to apply the updates

```
racadm -r 169.254.0.1 update -f Catalog.xml -e 192.168.11.10/Repo/MyCatalog -u test -p passwd -a TRUE -t HTTP
```

Note: `-a` option reboots the server after firmware update jobs are scheduled.
`-t` option is used to define repository type.

You can also send WSMAN commands for firmware updates through host OS with the availability of RACADM and WinRM services.

5 Contact information

For further questions about this document or the feature, contact your account manager or the Dell EMC OEM representative.