



Vendor Field Mode

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Vendor field mode (VFM) allows the BMC to work in a restricted mode with limited permissions.

Enabling VFM automatically performs the following on BMC:

1. Creates a new non-superuser user with username `fieldmode` and enables auto-login (only on the serial port) for this user.
2. Stops network services on the BMC and disables the OOB management port. This blocks all network-related operations (e.g., ssh, https, lanplus) to BMC over the Ethernet interface.
3. Disables login for the `root` user.

The `fieldmode` user can perform the following operations over UART:

- Start/stop UART tunneling to the NVIDIA® BlueField® Arm OS (i.e., OS running on the Arm core)
- Secure firmware update and track update status of BMC and CEC components
- Reboot BMC

From the BlueField Arm OS, the user `fieldmode` will be able to enable or disable VFM.

Disabling VFM automatically performs the following on BMC:

1. Enables login for the `root` user.
2. Enables network services on the BMC and the OOB management port. This re-enables all network-related operations to BMC over the Ethernet interface.

Updating BMC Firmware with Vendor Field Mode

1. Get the status of the tunnel through UART. Run the following command on the host where the BMC is connected on the UART port:

```
echo -e "\\g\\@" > /dev/ttyUSBX
```

Expect the following sequence of chars when the tunnel is up and running: 169 150 230.

Expect the following sequence of chars when the tunnel is not running: 165 200.

2. If tunnel is up and running, stop the tunneling on BMC over UART.

```
echo -e "\r~." > /dev/ttyUSBX
```

3. Transfer the BMC firmware image over UART using the XModem tool. Run the following command on the host where the BMC is connected on the UART port:

```
echo -e -n "\ncd /tmp/images\n \nrz\n" > /dev/ttyUSBX  
sz -8b OTA.tar < /dev/ttyUSBX > /dev/ttyUSBX
```

4. Start the firmware update. Run the following command on the host where the BMC is connected on the UART port:

```
echo "touch /tmp/fw-update/fwactivate" > /dev/ttyUSBX
```

5. To check the progress of the firmware update on the BMC, run:

```
echo "cat /tmp/fw-update/fwstatus " > /dev/ttyUSBX
```

Refer to section "[Supported Vendor Field Mode Commands](#)" for different firmware update values. It takes ~40 minutes to complete the BMC firmware update.

6. After a successful firmware update to activate the new firmware, reboot the BMC using the following command on the host where the BMC is connected on the UART port:

```
echo "touch /tmp/fw-update/reboot" > /dev/ttyUSBX
```

7. Keep polling the status of the tunnel through UART to check that the BMC has booted up.
8. Check the new BMC firmware version.

```
echo "cat /etc/os-release " > /dev/ttyUSBX
```

Updating CEC Firmware with Vendor Field Mode

Note

Relevant only for BlueField-2.

1. Get the status of the tunnel through UART. Run the following command on the host where the BMC is connected on the UART port:

```
echo -e "\\g\\@" > /dev/ttyUSBX
```

Expect the following sequence of characters when the tunnel is up and running: 169 150 230.

Expect the following sequence of characters when the tunnel is not running: 165 200.

2. If the tunnel is up and running, stop the tunneling on BMC over UART:

```
echo -e "\r~." > /dev/ttyUSBX
```

3. Transfer the BMC firmware image over UART using the XModem tool. Run the following command on the host where the BMC is connected on the UART port.

```
echo -e -n "\ncd /tmp/cec_images\n \nrz\n" > /dev/ttyUSBX  
sz -8b CEC.bin < /dev/ttyUSBX > /dev/ttyUSBX
```

4. To check the progress of the firmware update on the BMC, run:

```
echo "cat /tmp/cec_images progress.txt " > /dev/ttyUSBX
```

Refer to section "[Supported Vendor Field Mode Commands](#)" for different firmware update values.

5. After a successful CEC firmware update, power cycle the board or run the following on the host to activate the new firmware:

```
host# ipmitool chassis power cycle  
Chassis Power Control: Cycle
```

6. Keep polling the status of the tunnel through UART to check that BMC and CEC are booted up.

Updating BMC and Glacier Firmware with Vendor Field Mode

Note

Relevant only for BlueField-3.

1. Get the status of the tunnel through UART. Run the following command on the host where the BMC is connected on the UART port:

```
echo -e "\\g\\@" > /dev/ttyUSBX
```

Expect the following sequence of characters when the tunnel is up and running: 169 150 230.

Expect the following sequence of characters when the tunnel is not running: 165 200.

2. If the tunnel is up and running, stop the tunneling on BMC over UART.

```
echo -e "\\r~." > /dev/ttyUSBX
```

3. Transfer the BMC or Glacier firmware image over UART using the XModem tool. Run the following command on the host where the BMC is connected on the UART port:

```
echo -e -n "\\ncd /tmp/images\\n \\nrz\\n" > /dev/ttyUSBX  
sz -8b IMAGE.fwpkg < /dev/ttyUSBX > /dev/ttyUSBX
```

4. Start the firmware update. Run the following command on the host where the BMC is connected on the UART port:

```
echo "touch /tmp/fw-update/fwactivate" > /dev/ttyUSBX
```

5. To check the progress of the firmware update on the BMC, run:

```
echo "cat /tmp/fw-update/fwstatus " > /dev/ttyUSBX
```

Refer to section "[Supported Vendor Field Mode Commands](#)" for different firmware update values. It takes ~40 minutes to complete the BMC firmware update.

6. After a successful firmware update to activate the new firmware, reboot the BMC using the following command on the host where the BMC is connected on the UART port:

```
echo "touch /tmp/fw-update/reboot" > /dev/ttyUSBX
```

7. Keep polling the status of the tunnel through UART to check that the BMC has booted up.
8. Check the new BMC firmware version.

```
echo "cat /etc/os-release " > /dev/ttyUSBX
```

Supported Vendor Field Mode Commands

| Operation Description | Command |
|-----------------------|---|
| Enable VFM | Run from Arm/BlueField OS and reboot NIC-BMC: <pre>ipmitool raw 0x32 0x67 0x01</pre> |
| Disable VFM | Run from Arm/BlueField OS and reboot NIC-BMC: <pre>ipmitool raw 0x32 0x67 0x00</pre> |

| Operation Description | Command |
|---|--|
| Fetch VFM | <p>Run from Arm OS:</p> <pre>ipmitool raw 0x32 0x68</pre> |
| Get the status of the tunnel through UART | <p>Run the following command on the host where the BMC is connected:</p> <pre>echo -e "\\g\\@" > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected. Expect the following sequence of chars when the tunnel is up and running: 169 150 230. Expect the following sequence of chars when the tunnel is not running: 165 200.</p> |
| Start tunneling on BMC through UART | <p>Run the following command on the host where the BMC is connected:</p> <pre>echo "touch /tmp/fw-update/uart-tunneling" > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |
| Stop tunneling on BMC through UART | <p>Run the following command on the host where the BMC is connected:</p> <pre>echo -e "\r~." > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |
| Reboot BMC through UART | <p>Run the following command on the host where the BMC is connected:</p> |

| Operation Description | Command |
|--|---|
| | <pre>echo "touch /tmp/fw- update/reboot" > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |
| <p>To start/activate the BMC firmware update on BMC through UART</p> | <p>Run the following command on the host where the BMC is connected:</p> <pre>echo "touch /tmp/fw- update/fwactivate" > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |
| <p>To check the BMC firmware update status on BMC</p> | <p>Run the following command on the BMC:</p> <pre>cat /tmp/fw-update/fwstatus</pre> <p>Output and their values:</p> <ul style="list-style-type: none"> • Activating – indicates firmware update is in progress • Active – indicates firmware update succeeded • Failed – indicates firmware update failed |
| <p>To check the CEC firmware update status on BMC</p> <div style="background-color: #ffffcc; padding: 10px;"> <p>i Note Relevant only for BlueField-2.</p> </div> | <p>Run the following command on the BMC:</p> <pre>cat /tmp/cec_images progress.txt</pre> <p>Sample output of the <code>progress.txt</code>:</p> <ul style="list-style-type: none"> • CEC update in progress: |

| Operation Description | Command |
|---|--|
| | <pre>TaskState="Running" TaskStatus="OK" TaskProgress="50"</pre> <ul style="list-style-type: none"> • CEC update completed: <pre>TaskState=Firmware update succeeded. TaskStatus=OK TaskProgress=100</pre> |
| <p>Transfer BMC firmware image for firmware update through UART</p> | <p>Run the following command on the host where the BMC is connected:</p> <pre>echo -e -n "\ncd /tmp/images\n\nrz\n" > /dev/ttyUSBX</pre> <p>Run the following command on the host where the BMC is connected:</p> <pre>sz -8b OTA.tar < /dev/ttyUSBX > /dev/ttyUSBX</pre> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |

| Operation Description | Command |
|--|--|
| <p>Transfer CEC firmware image for firmware update through UART</p> <div style="background-color: #ffffcc; padding: 5px;"> <p>i Note</p> <p>Relevant only for BlueField-2.</p> </div> | <p>Run the following command on the host where the BMC is connected:</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>echo -e -n "\ncd /tmp/cec_images\n \nrz\n" > /dev/ttyUSBX</pre> </div> <p>Run the following command on the host where the BMC is connected:</p> <div style="border: 1px solid #ccc; padding: 10px;"> <pre>sz -8b OTA.bin < /dev/ttyUSBX > /dev/ttyUSBX</pre> </div> <p>Where <code>/dev/ttyUSBX</code> is the UART port number to which BMC is connected.</p> |

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