

# Automatically viewing the network switch physical connection between iDRAC & server network ports

This technical white paper explains how to reduce cabling errors in data centers and helping the customer catch them by using iDRAC user interfaces. Describes how to visualize physical connectivity between iDRAC and server network ports, and adjacent switches. This can be achieved by using the Connection View feature in iDRAC9 on the 14th generation Dell EMC PowerEdge servers.

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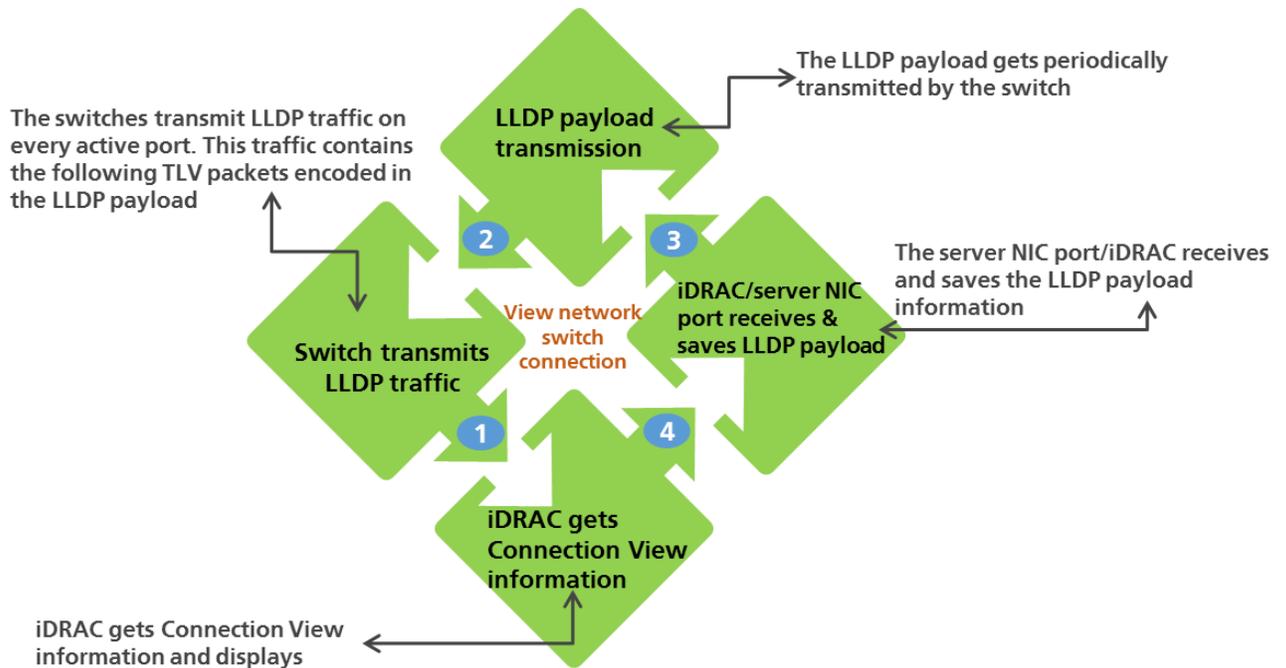
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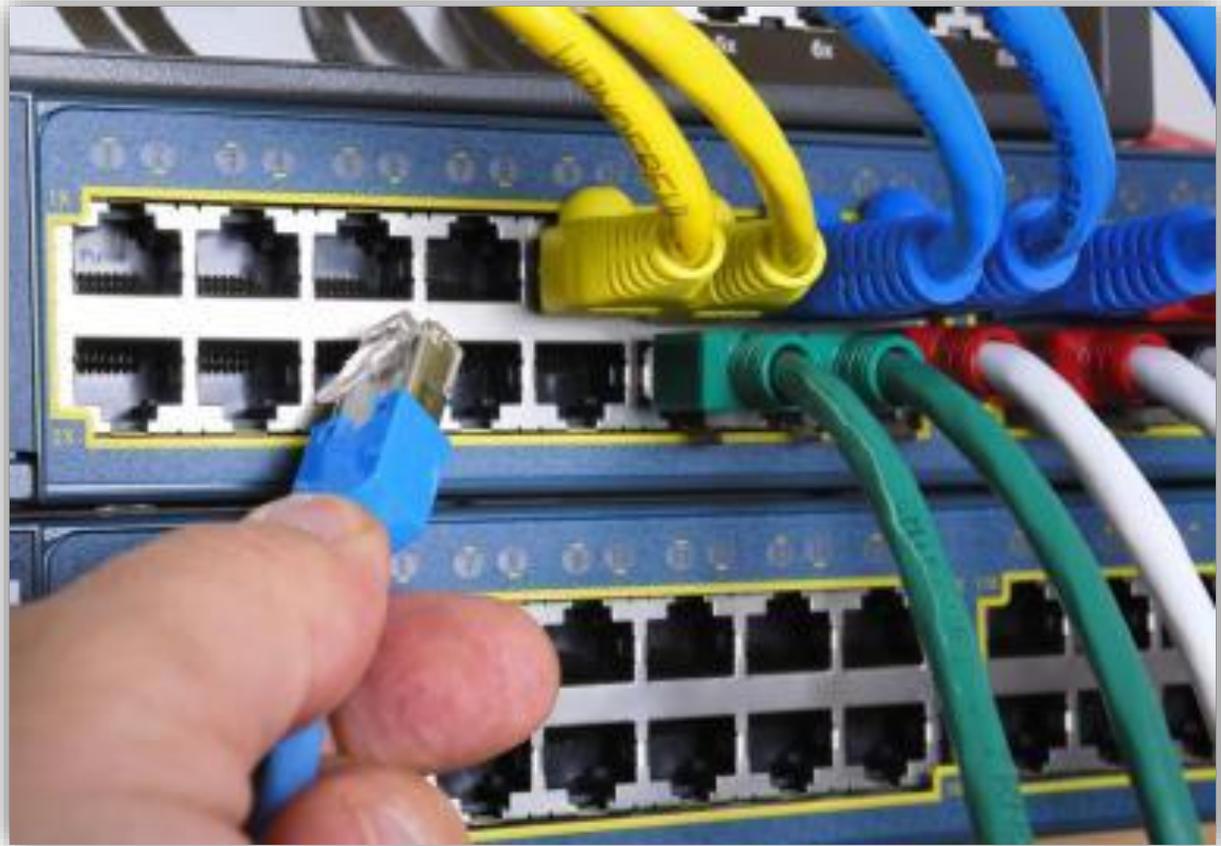
## Executive summary

Network cabling is a big issue in data centers, and helping customers identify those cabling issues using iDRAC user interfaces would save us hundreds of hours per year. Using this feature we can remotely check your server's networking connections. It avoids costly physical dispatch of technicians to remediate wiring errors.



# 1 Introduction

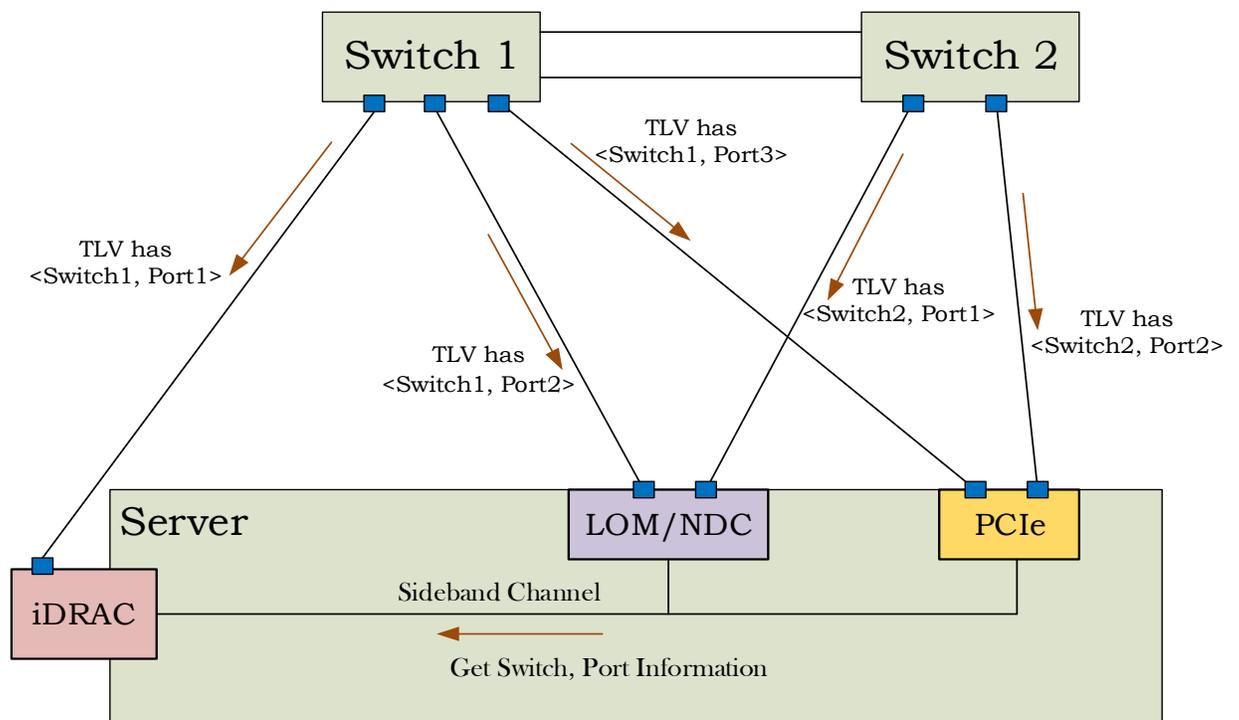
Manually checking and troubleshooting your server's networking connection is a challenge. In data centers, there is always a requirement to visualize physical connectivity between servers and adjacent switches. This feature provides details of the physical mapping of iDRAC & server network ports to the switch. The server network ports include those on PowerEdge LOM, NDC, Mezz cards, PCIe add-in cards, and standard PCIe cards. Using the connection view feature, iDRAC user interfaces provide the switch port details which help the customers in resolving cabling errors in data centers and catch them through iDRAC user interfaces would save hundreds of hours per year. This feature is supported on the Dell EMC 14th generation and later PowerEdge servers.



## 2 Feature Methodology

On a high-level, this feature is summarized in the following steps and also captured in the architecture diagram:

- The switches will transmit LLDP traffic on every active port. This traffic contains the following TLV packets encoded in the LLDP payload:
  - Switch connection ID - Chassis Identifier – this corresponds to a unique identifier for the switch (For example, the switch MAC address).
  - Switch port connection ID - Port identifier – this is an identifier for the switch port
- The LLDP payload gets periodically transmitted by the switch.
- The server NIC port will receive and store the LLDP payload information.
- iDRAC will query NIC port (by using the sideband channels) and display the switch port information.



## 2.1 Feature constraints

- This feature does not work if the switch does not send LLDP packets to its connected ports. iDRAC interfaces displays **Not Available** for switch connection and switch port connection fields.
- The LLDP may not be implemented in some switches because it is not mandatory.
- The LLDP is not enabled by default on some switches. So the LLDP has to be enabled for this feature to work on those switches. For example, Cisco switches.
- Only the PowerEdge Mezz/LOM/NDC/PCIe cards are supported.
  - Only cards supporting NC-SI will support this feature, others will not.
  - Only cards supporting LLDP decode will support this feature, others will not.
  - Some cards supporting LLDP may not be able to support this feature if/when the OS has claimed control of LLDP processing.
  - The Mezz/NDC/LOM/PCIe add-in cards will have to support the new NC-SI command to retrieve the TLV information from LLDP packet.
- If the IOM in the chassis is an IOA or a PowerConnect switch, this feature will not work for server ports as the IOA or PowerConnect switch will block all the LLDP packets coming from the TOR switch. The iDRAC interfaces will show “Not Available” for the fields that are part of this feature. If LLDP is enabled in IOA, iDRAC interfaces will show the switch connection and switch port connection information received from IOA.
- This feature will not work for iDRAC Dedicated Port Mode in the modular chassis if the CMC is not connected to the TOR switch. The iDRAC interfaces will show “Not Available” for the fields that are part of this feature.
- If LLDP is enabled in the IOA and other types of switches in the modular chassis, the switch connection and switch port connection information will be received from IOA and not from the TOR switch. LLDP is disabled by default in IOA.
- When CMCs are daisy chained, only the first CMC (CMC which is connected to TOR switch) will receive LLDP packets. Other CMCs will not receive LLDP packets. So the iDRAC network port (only in the case of dedicated mode) LLDP information will be not available in the blades whose corresponding CMC is not the first CMC in the daisy chain. The LLDP information is also not available for every CMC in the daisy chain which is not connected to TOR switch directly.

### 3 Enabling/Disabling Switch Connection View

Configuration of connection view capability is exposed as an iDRAC attribute with the following characteristics:

Attribute	Allowed Values	Default Value	Privilege required for viewing	Privilege required for modifying	Required License
Enable	Enabled, Disabled	Enabled	Login	Login + Configure iDRAC	None (that is, unlicensed)

The factory-wipe, `racresetcfg`, System Erase will set this attribute to its default value. If the feature is disabled, it is mandatory to enable the switch connection view to view the connection view information. To enable the feature use the following interfaces:

#### 3.1 Enabling Switch Connection View by using iDRAC GUI

1. Log in to the iDRAC GUI.
2. Navigate to **iDRAC Settings** → **Connectivity** → **Common Settings** → **Switch Connection View**.
3. From the **Switch Connection View** drop-menu, select **Enabled**.

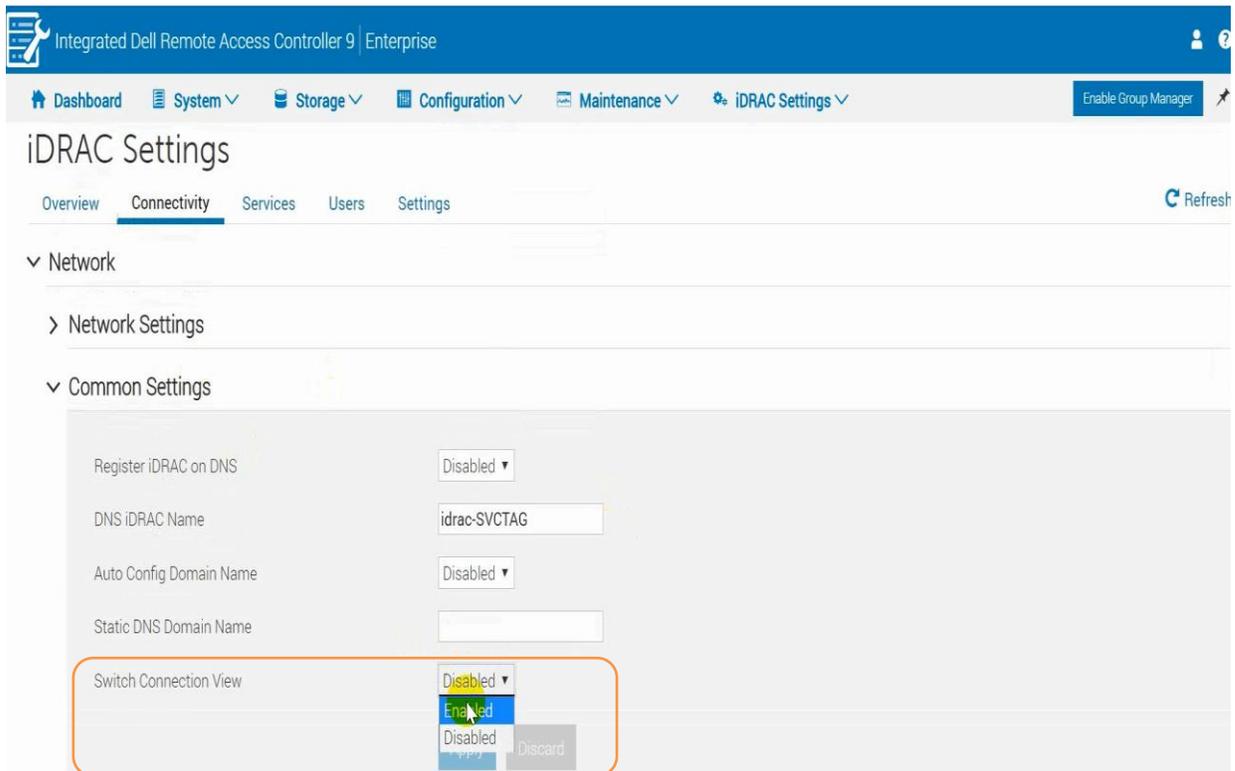


Figure 1 Enabling Switch Connection View by using iDRAC GUI

## 3.2 Enabling Switch Connection View by using RACADM CLI

To View connection view capability attribute:

```
racadm get iDRAC.SwitchConnectionView.Enable
```

To modify setting of the connection view capability attribute:

```
racadm set iDRAC.SwitchConnectionView.Enable Enabled
```

```
login as: ConfigiDRAC
ConfigiDRAC@100.97.44.36's password:
/admin1->
/admin1-> racadm set idrac.SwitchConnectionView.Enable Enabled
[Key=idrac.Embedded.1#SwitchConnectionView.1]
Object value modified successfully
/admin1-> racadm set idrac.SwitchConnectionView.Enable Disabled
[Key=idrac.Embedded.1#SwitchConnectionView.1]
Object value modified successfully
```

```
login as: LoginUser
LoginUser@100.97.44.36's password:
/admin1->
/admin1-> racadm set idrac.SwitchConnectionView.Enable Disabled
ERROR: Insufficient user privileges to perform operation.
```

Figure 2 Enabling Switch Connection View by using RACADM CLI

## 3.3 WS-Man

- To globally enable or disable the Connection View feature, the management application can use the DCIM\_iDRACService.ApplyAttribute () method from Switch Connection Profile to set the SwitchConnectionView.1#Enable attribute. This enumeration attribute can be set to Enabled or Disabled.
- For more information, see the iDRAC Card Profile\_4.0.0 Session 8.21 and 7.5.52 in <http://en.community.dell.com/techcenter/systems-management/w/wiki/1906.dcim-library-profile>.
- Here is an example WS-Man workflow by using SOAP to set SwitchConnectionView.1#Enable? In this workflow, the current value of SwitchConnectionView.1#Enable will be checked and the invoke request is sent to set a new value to the SwitchConnectionView.1#Enable attribute.
- Management applications can send the GET request for the following form to check the Current value of the SwitchConnectionView.1#Enable attribute.

## SOAP Request for the GET SwitchConnectionView.1#Enable attribute.

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd" xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To s:mustUnderstand="true">https://iDRAC_IP_ADDRESS:443/wsman</wsa:To>
    <wsman:ResourceURI s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-
      schema/2/DCIM_iDRACCardEnumeration</wsman:ResourceURI>
  - <wsa:ReplyTo>
    <wsa:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:Address>
  </wsa:ReplyTo>
    <wsa:Action s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/09/transfer/Get</wsa:Action>
    <wsman:MaxEnvelopeSize s:mustUnderstand="true">512000</wsman:MaxEnvelopeSize>
    <wsa:MessageID s:mustUnderstand="true">urn:uuid:ac269d80-3186-11e7-b92a-340286bae004</wsa:MessageID>
    <wsman:OperationTimeout>PT120.0S</wsman:OperationTimeout>
  - <wsman:SelectorSet>
    <wsman:Selector Name="InstanceID">iDRAC.Embedded.1#SwitchConnectionView.1#Enable</wsman:Selector>
    <wsman:Selector Name="__cimnamespace">root/dcim</wsman:Selector>
  </wsman:SelectorSet>
  </s:Header>
  <s:Body/>
</s:Envelope>
```

## SOAP Response for the GET SwitchConnectionView.1#Enable attribute.

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-
  schema/2/DCIM_iDRACCardEnumeration" xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-
  envelope">
  - <s:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:daa84bf0-3a40-11e7-bef0-340286bae004</wsa:RelatesTo>
    <wsa:MessageID>uuid:b899e530-4f98-1f98-8291-3a6ad5eb7b84</wsa:MessageID>
  </s:Header>
  - <s:Body>
    - <n1:DCIM_iDRACCardEnumeration>
      <n1:AttributeDisplayName>Enable</n1:AttributeDisplayName>
      <n1:AttributeName>Enable</n1:AttributeName>
      <n1:CurrentValue>Enabled</n1:CurrentValue>
      <n1:DefaultValue>Enabled</n1:DefaultValue>
      <n1:Dependency xsi:nil="true"/>
      <n1:DisplayOrder>1</n1:DisplayOrder>
      <n1:FQDD>iDRAC.Embedded.1</n1:FQDD>
      <n1:GroupDisplayName>Switch Connection View</n1:GroupDisplayName>
      <n1:GroupID>SwitchConnectionView.1</n1:GroupID>
      <n1:InstanceID>iDRAC.Embedded.1#SwitchConnectionView.1#Enable</n1:InstanceID>
      <n1:IsReadOnly>false</n1:IsReadOnly>
      <n1:PendingValue xsi:nil="true"/>
      <n1:PossibleValues>Disabled</n1:PossibleValues>
      <n1:PossibleValues>Enabled</n1:PossibleValues>
    </n1:DCIM_iDRACCardEnumeration>
  </s:Body>
</s:Envelope>
```

Management applications can send the `ApplyAttribute` request for the following form to set the `SwitchConnectionView.1#Enable` attribute.

SOAP request for the `ApplyAttribute` method to Set `SwitchConnectionView.1#Enable` attribute.

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_iDRACCardService"
  xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd" xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To s:mustUnderstand="true">https://iDRAC_IP_ADDRESS:443/wsman</wsa:To>
    <wsman:ResourceURI s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_iDRACCardService</wsman:ResourceURI>
  - <wsa:ReplyTo>
    <wsa:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:Address>
  </wsa:ReplyTo>
  <wsa:Action s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_iDRACCardService/ApplyAttribute</wsa:Action>
  <wsman:MaxEnvelopeSize s:mustUnderstand="true">512000</wsman:MaxEnvelopeSize>
  <wsa:MessageID s:mustUnderstand="true">urn:uuid:ac969d5e-3186-11e7-88fe-340286bae004</wsa:MessageID>
  <wsman:OperationTimeout>PT120.0S</wsman:OperationTimeout>
  - <wsman:SelectorSet>
    <wsman:Selector Name="__cimnamespace">root/dcim</wsman:Selector>
    <wsman:Selector Name="SystemCreationClassName">DCIM_ComputerSystem</wsman:Selector>
    <wsman:Selector Name="SystemName">DCIM:ComputerSystem</wsman:Selector>
    <wsman:Selector Name="CreationClassName">DCIM_iDRACCardService</wsman:Selector>
    <wsman:Selector Name="Name">DCIM:iDRACCardService</wsman:Selector>
  </wsman:SelectorSet>
  </s:Header>
  - <s:Body>
    - <n1:ApplyAttribute_INPUT>
      <n1:AttributeName>SwitchConnectionView.1#Enable</n1:AttributeName>
      <n1:Target>iDRAC.Embedded.1</n1:Target>
      <n1:AttributeValue>Enabled</n1:AttributeValue>
    </n1:ApplyAttribute_INPUT>
  </s:Body>
</s:Envelope>
```

SOAP Response for the `ApplyAttribute` method to Set `SwitchConnectionView.1#Enable` attribute.

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_iDRACCardService"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_iDRACCardService/ApplyAttributeResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:ac969d5e-3186-11e7-88fe-340286bae004</wsa:RelatesTo>
    <wsa:MessageID>uuid:4eb1b7d0-4e60-1e60-baeb-3a6ad5eb7b84</wsa:MessageID>
  </s:Header>
  - <s:Body>
    - <n1:ApplyAttribute_OUTPUT>
      <n1:Message>The command was successful.</n1:Message>
      <n1:MessageID>RAC001</n1:MessageID>
      <n1:ReturnValue>0</n1:ReturnValue>
      <n1:SetResult>Set CurrentValue</n1:SetResult>
    </n1:ApplyAttribute_OUTPUT>
  </s:Body>
</s:Envelope>
```

## 3.4 WS-Man: winrm command

### To GET Connection View Instances

```
winrm g http://schemas.dmtf.org/wbem/wscim/1/cim-  
schema/2/root/dcim/DCIM_SwitchConnectionView?InstanceID=iDRAC.Embedded.1 -u:[USER] -  
p:[PASSWORD] -r:https://[iDRAC_IP_ADDRESS]/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-  
8 -a:basic
```

### To Enable Connection view feature

```
winrm i ApplyAttribute http://schemas.dmtf.org/wbem/wscim/1/cim-  
schema/2/root/dcim/DCIM_iDRACCardService?SystemCreationClassName=DCIM_ComputerSystem+Syst  
emName=DCIM:ComputerSystem+CreationClassName=DCIM_iDRACCardService+Name=DCIM:iDRACCardSer  
vice -u:[USER] -p:[PASSWORD] -r:https://[iDRAC_IP_ADDRESS]/wsman -SkipCNcheck -  
SkipCAcheck -encoding:utf-8 -a:basic  
{Target="iDRAC.Embedded.1";AttributeName="SwitchConnectionView.1#Enable  
";AttributeValue="Enabled"}
```

## 4 Switch Connection View for NDC/LOM/PCIe NIC cards

The following are scenarios on how the switch connection ID and switch port connection ID fields are filled for server network ports.

Switch Connection ID	Switch Port Connection ID	Description
Feature disabled	Feature disabled	Connection view feature is disabled. Enable the feature to view connection view data.
No Link	No Link	Network Controller port link is down. And the prior Switch Connection ID and Switch Port Connection Id information is not available.
Not Supported	Not Supported	Network Controller doesn't support connection view feature.
Not Available	Not Available	LLDP is not enabled on the top of the rack switch.
Stale Data	Stale Data	Last known good data, either the Network controller port link is down or the system is powered off. Use the refresh option to refresh the connection view details to get the latest data.
Valid Data	Valid Data	The network controller reads valid chassis Id and Port Id TLVs from incoming LLDP packets.

### 4.1 iDRAC GUI

To view the network device's connection view information, click **System** → **Network Device** → **Network Device FQDD** → **Ports and Partitioned ports**.

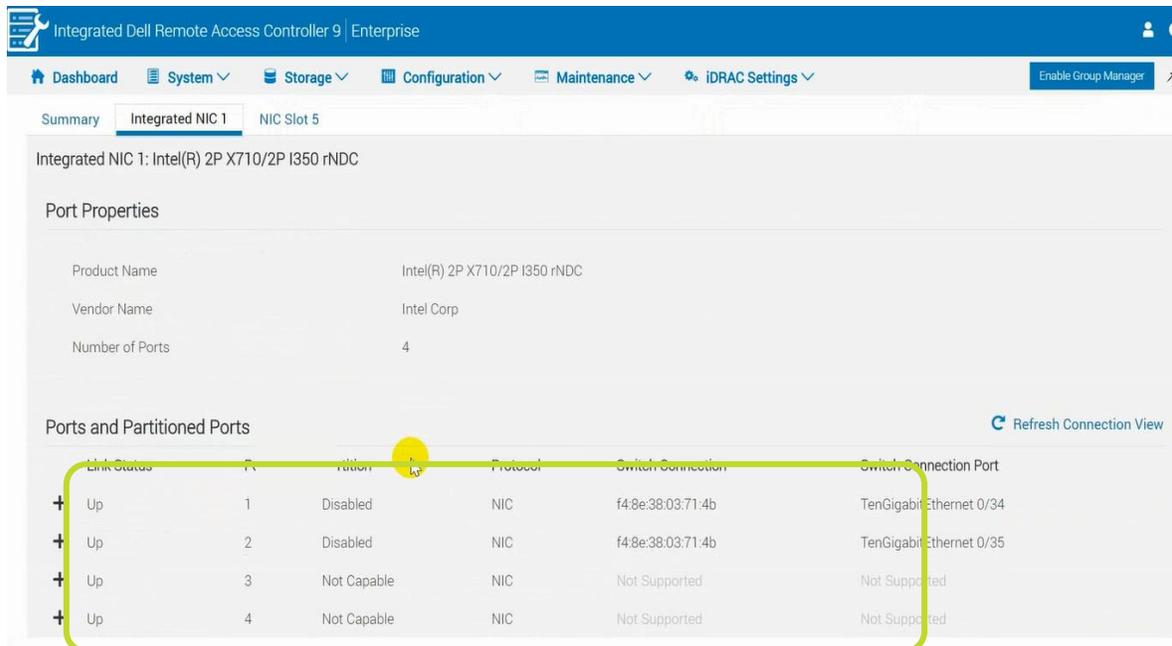


Figure 3 Viewing network device's Connection View information

Stale data is a last-known valid data. Switch connection and switch port connection fields will show as stale data either in case of the network controller port link is down or when the system is powered off. Refresh operation can be used to clear the stale data (Check refresh operation explained at the end).

The screen shot depicts the situation when stale data is displayed and user can pause the pointer over stale data and can see the reason for the display of stale data.

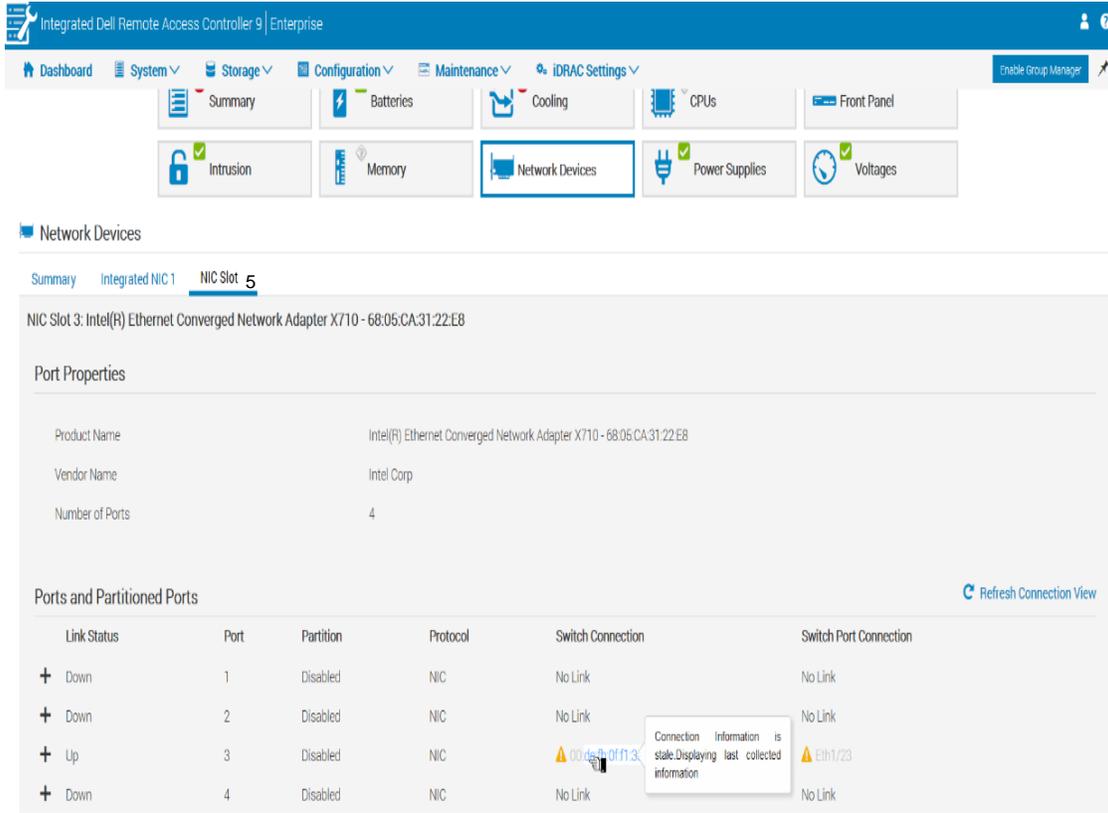


Figure 4 Viewing stale data

## 4.2 RACADM

Run the following RACADM command to view the connection view data:

```
racadm switchconnection view
```

In case “iDRAC.SwitchConnectionView.Enable” is set to “Disabled”, RACADM does not allow view operation and the following Event and Error Message is displayed:

**RAC1221: The switch connection details cannot be retrieved because the switch connection view is disabled. Enable the switch connection view by running the following RACADM command at the command line interface (CLI), and then retry the operation: racadm set idrac.switchconnectionview.enable 1.**

To know more about view command, run `racadm switchconnection help view`

```
/admin1-> racadm switchconnection view
FQDD = iDRAC.Embedded.1
SwitchConnectionID = Not Available
SwitchPortConnectionID = Not Available
-----
FQDD = NIC.Slot.4-1-1
SwitchConnectionID = No Link
SwitchPortConnectionID = No Link
-----
FQDD = NIC.Slot.4-2-1
SwitchConnectionID = No Link
SwitchPortConnectionID = No Link
-----
FQDD = NIC.Slot.2-1-1
SwitchConnectionID = 4c:76:25:e8:c2:c0
SwitchPortConnectionID = twentyFiveGigE 1/3/1
-----
FQDD = NIC.Slot.2-2-1
SwitchConnectionID = 4c:76:25:e8:c2:c0
SwitchPortConnectionID = hundredGigE 1/29
-----
FQDD = NIC.Integrated.1-1-1
SwitchConnectionID = f4:8e:38:03:71:4b
SwitchPortConnectionID = TenGigabitEthernet 0/17
-----
FQDD = NIC.Integrated.1-2-1
SwitchConnectionID = f4:8e:38:03:71:4b
SwitchPortConnectionID = TenGigabitEthernet 0/23
-----
FQDD = NIC.Slot.7-1-1
SwitchConnectionID = f4:8e:38:03:71:4b
SwitchPortConnectionID = TenGigabitEthernet 0/18
-----
FQDD = NIC.Slot.7-2-1
SwitchConnectionID = f4:8e:38:03:71:4b
SwitchPortConnectionID = TenGigabitEthernet 0/24
/admin1->
```

```

/admin1->
/admin1-> racadm switchconnection view NIC.Slot.7-2-1
FQDD = NIC.Slot.7-2-1
SwitchConnectionID = f4:8e:38:03:71:4b
SwitchPortConnectionID = TenGigabitEthernet 0/24
/admin1->

```

## 4.3 WS-Man

Single instance of the `DCIM_SwitchConnectionView` class provides `SwitchConnectionID` and `SwitchPortConnectionID` properties of iDRAC dedicated port and shared LOM for server.

For more information, see the switch *Connection Profile 4.0.0 Session 7.1* profile document at <http://en.community.dell.com/techcenter/systems-management/w/wiki/1906.dcim-library-profile>.

Here is an example WS-Man workflow using SOAP to enumerate all the instances of `DCIM_SwitchConnection` class or get the particular instance of `DCIM_SwitchConnetionView` by instance.

Management applications can send the Enumeration request for the following form to view the `DCIM_SwitchConnectionView` class instance.

### SOAP Request for `DCIM_SwitchConnectionView` Enumeration

```

<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd" xmlns:wsen="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
- <s:Header>
  <wsa:To s:mustUnderstand="true">https://iDRAC_IP_ADDRESS:443/wsman</wsa:To>
  <wsman:ResourceURI s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionView</wsman:ResourceURI>
- <wsa:ReplyTo>
  <wsa:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:Address>
</wsa:ReplyTo>
<wsa:Action s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/09/enumeration/Enumerate</wsa:Action>
<wsman:MaxEnvelopeSize s:mustUnderstand="true">512000</wsman:MaxEnvelopeSize>
<wsa:MessageID s:mustUnderstand="true">urn:uuid:ab5bd370-3186-11e7-9599-340286bae004</wsa:MessageID>
<wsman:OperationTimeout>PT120.0S</wsman:OperationTimeout>
- <wsman:SelectorSet>
  <wsman:Selector Name="__cimnamespace">root/dcim</wsman:Selector>
</wsman:SelectorSet>
</s:Header>
- <s:Body>
- <wsen:Enumerate>
  <wsman:OptimizeEnumeration/>
  <wsman:MaxElements>256</wsman:MaxElements>
</wsen:Enumerate>
</s:Body>
</s:Envelope>

```

## SOAP Response for DCIM\_SwitchConnectionView Enumeration

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dell.com/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionView"
  xmlns:wsmn="http://schemas.dmtf.org/wbem/wsmn/1/wsmn.xsd" xmlns:wsen="http://schemas.xmlsoap.org/ws/2004/09/enumeration"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/09/enumeration/EnumerateResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:ab5bd370-3186-11e7-9599-340286bae004</wsa:RelatesTo>
    <wsa:MessageID>uuid:4e95a450-4e60-1e60-bae4-3a6ad5eb7b84</wsa:MessageID>
  </s:Header>
  - <s:Body>
    - <wsen:EnumerateResponse>
      - <wsman:Items>
        - <n1:DCIM_SwitchConnectionView>
          <n1:FQDD>iDRAC.Embedded.1</n1:FQDD>
          <n1:InstanceID>iDRAC.Embedded.1</n1:InstanceID>
          <n1:StaleData>0</n1:StaleData>
          <n1:SwitchConnectionID>d0.67:e5:a3:6b:01</n1:SwitchConnectionID>
          <n1:SwitchPortConnectionID>1/0/19</n1:SwitchPortConnectionID>
          </n1:DCIM_SwitchConnectionView>
        </wsman:Items>
        <wsen:EnumerationContext/>
        <wsman:EndOfSequence/>
      </wsen:EnumerateResponse>
    </s:Body>
  </s:Envelope>
```

Management applications can send the GET request for the following form to view the DCIM\_SwitchConnectionView class instance by instance.

## SOAP Request for GET DCIM\_SwitchConnectionView

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:wsmn="http://schemas.dmtf.org/wbem/wsmn/1/wsmn.xsd" xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing"
  xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To s:mustUnderstand="true">https://iDRAC_IP_ADDRESS:443/wsmn</wsa:To>
    <wsman:ResourceURI s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionView</wsman:ResourceURI>
  </s:Header>
  - <wsa:ReplyTo>
    <wsa:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:Address>
  </wsa:ReplyTo>
  <wsa:Action s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/09/transfer/Get</wsa:Action>
  <wsman:MaxEnvelopeSize s:mustUnderstand="true">512000</wsman:MaxEnvelopeSize>
  <wsa:MessageID s:mustUnderstand="true">urn:uuid:db718f61-3a40-11e7-86d7-340286bae004</wsa:MessageID>
  <wsman:OperationTimeout>PT120.0S</wsman:OperationTimeout>
  - <wsman:SelectorSet>
    <wsman:Selector Name="InstanceID">iDRAC.Embedded.1</wsman:Selector>
    <wsman:Selector Name="__cimnamespace">root/dcim</wsman:Selector>
  </wsman:SelectorSet>
  </s:Header>
  <s:Body/>
</s:Envelope>
```

## SOAP Response for GET DCIM\_SwitchConnectionView

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionView"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/09/transfer/GetResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:db718f61-3a40-11e7-86d7-340286bae004</wsa:RelatesTo>
    <wsa:MessageID>uuid:b8ab4a50-4f98-1f98-8292-3a6ad5eb7b84</wsa:MessageID>
  </s:Header>
  - <s:Body>
    - <n1:DCIM_SwitchConnectionView>
      <n1:FQDD>iDRAC.Embedded.1</n1:FQDD>
      <n1:InstanceID>iDRAC.Embedded.1</n1:InstanceID>
      <n1:StaleData>0</n1:StaleData>
      <n1:SwitchConnectionID>d0:67:e5:a3:6b:01</n1:SwitchConnectionID>
      <n1:SwitchPortConnectionID>1/0/19</n1:SwitchPortConnectionID>
    </n1:DCIM_SwitchConnectionView>
  </s:Body>
</s:Envelope>
```

## 4.4 WS-Man: winrm command

To enumerate Connection View class

```
winrm e http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dcim/DCIM_SwitchConnectionView -u:[USERNAME] -p:[PASSWORD] -r:https://[
iDRAC_IP_ADDRESS]/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-8 -a:basic
```

GET Connection View Instances

```
winrm g http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dcim/DCIM_SwitchConnectionView?InstanceID=iDRAC.Embedded.1 -u:[USER] -
p:[PASSWORD] -r:https://[iDRAC_IP_ADDRESS]/wsman -SkipCNcheck -SkipCAcheck -encoding:utf-
8 -a:basic
```

## 5 Connection View for iDRAC

The following are scenarios on how the switch connection ID and switch port connection ID fields are filled for iDRAC network port.

Switch Connection ID	Switch Port Connection ID	Description
Feature disabled	Feature disabled	Connection view feature is disabled. Enable the feature to view connection view data.
No Link	No Link	iDRAC network port link is down. And the prior Switch Connection ID and Switch Port Connection Id information is not available.
Not Available	Not Available	LLDP is not enabled on the top of the rack switch.
Stale Data	Stale Data	Last known good data, either the Network controller port link is down or switch stopped sending LLDP packets to iDRAC network port. Use the refresh option to refresh the connection view details to get the latest data.
Valid Data	Valid Data	The iDRAC reads valid chassis Id and Port Id TLVs from incoming LLDP packets.

### 5.1 RACADM

Either of the following RACADM commands can be used to view the Switch Connection View information for iDRAC:

- `racadm switchconnection view`
- `racadm switchconnection viewiDRAC.Embedded.1`

For more information, see the racadm section in [Connection View for NDC/LOM/PCIe NIC cards](#).

### 5.2 WS-Man

Refer to the WS-Man section in [Connection View for NDC/LOM/PCIe NIC cards](#).

## 5.3 iDRAC GUI

To view the iDRAC Connection View data, click **iDRAC Settings** → **Overview** → **Connection View**.

The screenshot displays the iDRAC GUI interface for an Integrated Dell Remote Access Controller 9 | Express. The navigation menu includes Dashboard, System, Storage, Configuration, Maintenance, and iDRAC Settings. The iDRAC Settings dropdown is expanded, showing options for iDRAC Details, Current Network Settings, iDRAC Service Module, Connection View, Current IPv4 Settings, and Current IPv6 Settings. The Connection View section is highlighted with a green border and contains the following data:

Field	Value
State	Enabled
Switch Connection ID	00:01:e8:96:2c:2a
Switch Port Connection ID	GigabitEthernet 0/34

Other visible sections include:

- iDRAC Details:** Device Type (14G Monolithic), Hardware Version (0.01), Firmware Version (3.00.00.00), Firmware Updated (Thu Mar 23 19:56:02 2017), RAC Time (Tue Apr 25 07:39:32 2017), Number of Possible Sessions (8), Number of Current Sessions (1), IPMI Version (2.0), and User Interface Title Bar Information (Auto, idrac-SVCTAG).
- iDRAC Service Module:** Status (Not Running).
- Current Network Settings:** iDRAC MAC Address (5e:23:b7:4c:af:56), Active NIC Interface (Dedicated), DNS Domain Name.
- Current IPv4 Setting:** IPv4 Enabled (Enabled), DHCP (Enabled), Current IP Address (10.94.227.100), Current Subnet Mask (255.255.255.0), Current Gateway (10.94.227.1), Use DHCP to Obtain DNS Server Addresses (Enabled), Current Preferred DNS Server (8.8.8.8), Current Alternate DNS Server (8.8.4.4).
- Current IPv6 Settings:** IPv6 Enabled (Disabled), Autoconfiguration (Enabled), Current IP Address (:), Current IP Gateway (:), Link Local Address (:).

Figure 5 Viewing iDRAC Connection data

## 6 Refreshing the Connection View status

An option to refresh the switch connection ID and switch port connection ID information of all network ports will be provided on iDRAC user interfaces. When this option is used, the iDRAC will clear staled/valid switch connection and switch port connection information and gets latest information of switch connection ID and switch port connection ID, only if the link status is up.

### 6.1 iDRAC GUI

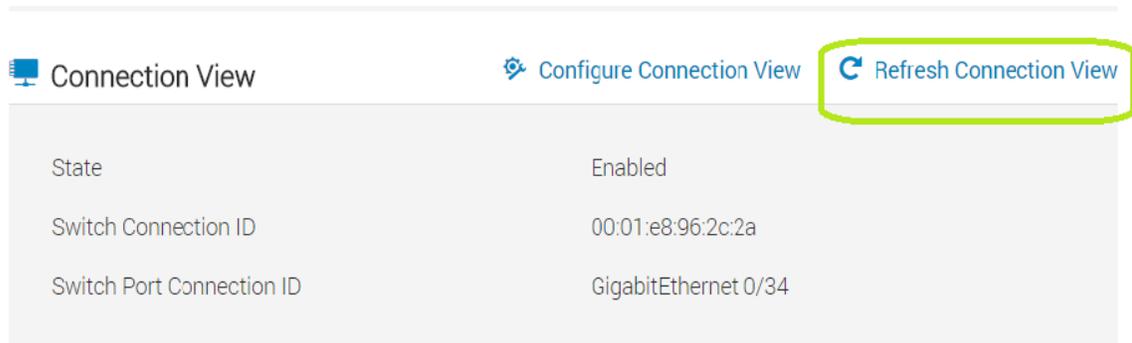


Figure 6 Refreshing iDRAC Connection View status

### 6.2 RACADM

If `iDRAC.SwitchConnectionView.Enable` is set to **Disabled**, RACADM does not allow view operation and the following Event and Error Message is displayed:

**RAC1228: The switch connection details cannot be refreshed because the switch connection view is disabled. Enable the switch connection view by running the following RACADM command at the command line interface (CLI), and then retry the operation: `racadm set idrac.switchconnectionview.enable 1`.**

To know more about the `refresh` command, run `racadm bioscert help refresh`.

```
/admin1->  
/admin1-> racadm switchconnection refresh  
The switch connection details will be refreshed  
/admin1->
```

### 6.3 WS-Man

`DCIM_SwitchConnectionView` class instance will be auto-refreshed after every five minutes. If the management application wants to refresh the instance immediately, the management applications can use the `DCIM_SwitchConnectionService.ServerPortConnectionRefresh()` method from the Switch Connection Profile.

For more information, see the switch *Connection Profile 4.0.0 Session 8.1* profile document at <http://en.community.dell.com/techcenter/systems-management/w/wiki/1906.dcim-library-profile>.

Here is an example WS-Man workflow by using SOAP. In this workflow, `DCIM_SwitchConnectionService.ServerPortConnectionRefresh()` is invoked to refresh the `DCIM_SwitchConnectionView` instances.

Management applications can send the invoke request for the following form to refresh the `DCIM_SwitchConnectionView` class instances.

SOAP Request to invoke `DCIM_SwitchConnectionService.ServerPortConnectionRefresh()`

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionService"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope"
  xmlns:wsman="http://schemas.dmtf.org/wbem/wsman/1/wsman.xsd">
  - <s:Header>
    <wsa:To s:mustUnderstand="true">https://iDRAC_IP_ADDRESS:443/wsman</wsa:To>
    <wsman:ResourceURI s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-
      schema/2/DCIM_SwitchConnectionService</wsman:ResourceURI>
    - <wsa:ReplyTo>
      <wsa:Address s:mustUnderstand="true">http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:Address>
    </wsa:ReplyTo>
    <wsa:Action s:mustUnderstand="true">http://schemas.dmtf.org/wbem/wscim/1/cim-
      schema/2/DCIM_SwitchConnectionService/ServerPortConnectionRefresh</wsa:Action>
    <wsman:MaxEnvelopeSize s:mustUnderstand="true">512000</wsman:MaxEnvelopeSize>
    <wsa:MessageID s:mustUnderstand="true">urn:uuid:d9e65b80-3a40-11e7-b4fa-340286bae004</wsa:MessageID>
    <wsman:OperationTimeout>PT120.0S</wsman:OperationTimeout>
    - <wsman:SelectorSet>
      <wsman:Selector Name="__cimnamespace">root/dcim</wsman:Selector>
      <wsman:Selector Name="SystemCreationClassName">DCIM_ComputerSystem</wsman:Selector>
      <wsman:Selector Name="SystemName">DCIM:ComputerSystem</wsman:Selector>
      <wsman:Selector Name="CreationClassName">DCIM_SwitchConnectionService</wsman:Selector>
      <wsman:Selector Name="Name">DCIM:SwitchConnectionService</wsman:Selector>
    </wsman:SelectorSet>
    </s:Header>
    - <s:Body>
      <n1:ServerPortConnectionRefresh_INPUT/>
    </s:Body>
  </s:Envelope>
```

SOAP Response to invoke `DCIM_SwitchConnectionService.ServerPortConnectionRefresh()`

```
<?xml version="1.0" encoding="UTF-8"?>
- <s:Envelope xmlns:n1="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/DCIM_SwitchConnectionService"
  xmlns:wsa="http://schemas.xmlsoap.org/ws/2004/08/addressing" xmlns:s="http://www.w3.org/2003/05/soap-envelope">
  - <s:Header>
    <wsa:To>http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous</wsa:To>
    <wsa:Action>http://schemas.dmtf.org/wbem/wscim/1/cim-
      schema/2/DCIM_SwitchConnectionService/ServerPortConnectionRefreshResponse</wsa:Action>
    <wsa:RelatesTo>urn:uuid:d9e65b80-3a40-11e7-b4fa-340286bae004</wsa:RelatesTo>
    <wsa:MessageID>uuid:b884fda0-4f98-1f98-8290-3a6ad5eb7b84</wsa:MessageID>
  </s:Header>
  - <s:Body>
    - <n1:ServerPortConnectionRefresh_OUTPUT>
      <n1:Message>The refresh operation of switch connection and switch port connection information of all network ports is completed
        successfully.</n1:Message>
      <n1:MessageID>RAC089</n1:MessageID>
      <n1:ReturnValue>0</n1:ReturnValue>
      <n1:ServerPortConnectionRefresh_OUTPUT/>
    </s:Body>
  </s:Envelope>
```

## 6.4 WS-Man: winrm command

```
winrm i ServerPortConnectionRefresh http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/root/dcim/DCIM_SwitchConnectionService?SystemCreationClassName=DCIM_ComputerSys
tem+SystemName=DCIM:ComputerSystem+CreationClassName=DCIM_SwitchConnectionService+Name=DCI
M:SwitchConnectionService -u:[USERNAME] -p:[PASSWORD] -r:https://[iDRAC_IP_ADDRESS]/wsman
-SkipCNcheck -SkipCAcheck -encoding:utf-8 -a:basic
```

## 7 Connection View Supported Network controllers

For a list of supported network controllers for Connection View, see the technical white paper at [www.delltechcenter.com/idrac](http://www.delltechcenter.com/idrac).