General Hypervisor How-To's

- How to identify plugged-in SFP module model, manufacturer, and hardware details

How to identify plugged-in SFP module model, manufacturer, and hardware details

Summary:

Identify or verifying SFP/SFP+ transceiver hardware details for hypervisor cli, such as; vendor, model, product code, transceiver type, cable length, and more without physically disconnecting it for visual inspection.

Versions affected:

ALL Hyper-V Versions, ALL ESXI Versions, ALL AHV Versions

Description:

An SFP/SFP+ (Small Form-factor Pluggable) module or transceiver is the physical hardware component that terminates the physical network media and provides the Layer 1 interface to a physical NIC installed in a host. For example, the SFP(+) module may interface SX/LX/SM/MM types of optical fiber, or varying lengths of Twinax copper cabling, between the host and network switch. The host NIC and switch don't need to worry about the physical media type, only the bits being transmitted as 1s and 0s. Whether that is done as pulses of light at varying wavelengths, over solid glass fiber, strands of plastic fiber, or over shielded twisted bits of copper as electrical pulses, the NIC and switch don't care ... that's the SFP transceivers problem!

In certain circumstances, such as troubleshooting or during maintenance and network changes or upgrades, the hardware details of the SFP(+) module plugged into a host NIC may need to be identified and verified. Typically the useful information is printed on the SFP(+) label, however, if the SFP(+) transceiver plugged in and is in use, or is in a remote location where you are not, it may

be impractical or impossible to pull it out for inspection.

To overcome the inability to physically inspect the SFP(+) module, certain hypervisor OS utilities can be used to poll and expose useful SFP(+) details via console/CLI.
Some useful SFP(+) module information may include: Vendor, model, part number, serial number, transceiver type, cable length, connector type, signal quality, and more.

Solution:

AHV

```
ethtool -m <interfaceX>
```

> Example usage and output from an Arista Twinax (1 x 40g -> 4 x 10g) breakout copper SFP+:
> (where "ethX" is the specific NIC you want to poll, such as "eth2")

```
[root@AHV ~]# ethtool -m ethX
    Identifier                : 0x03 (SFP)
    Extended identifier       : 0x04 (GBIC/SFP defined by 2-wire interface ID)
    Connector                 : 0x21 (Copper pigtail)
    Transceiver codes         : 0x01 0x00 0x00 0x00 0x00 0x04 0x80 0x00
    Transceiver type          : Infiniband: 1X Copper Passive
    Transceiver type          : Passive Cable
    Transceiver type          : FC: Twin Axial Pair (TW)
    Encoding                  : 0x06 (64B/66B)
    BR, Nominal               : 10300MBd
    Rate identifier           : 0x00 (unspecified)
    Length (SMF,km)           : 0km
    Length (SMF)              : 0m
    Length (50um)             : 0m
    Length (62.5um)           : 0m
    Length (Copper)           : 5m
    Length (OM3)              : 0m
    Passive Cu cmplnce.       : 0x00 (unspecified) [SFF-8472 rev10.4 only]
    Vendor name               : Arista Networks
    Vendor OUI                : 00:1c:73
    Vendor PN                 : CAB-Q-S-5M
```

```
Vendor rev                : 20
Option values             : 0x00 0x00
BR margin, max            : 0%
BR margin, min            : 0%
Vendor SN                 : xxxxxxxxxx
Date code                 : 180907
```

Vmware ESXi

Unfortunately, there does not appear a way to poll the SFP transceiver module from an ESXi host. Whilst "*ethtool*" exists, it is limited and does not allow the "*-m*" switch to poll the SFP 'module eeprom'.
Many similar functions exist in "*esxcli*", such as "*esxcli hardware pci list*" and "*esxcli network nic get -n vmnicX*", however, relevant to the SFP they only provide Layer 1 speed and connectivity status but no transceiver-specific data.

XenServer

```
[root@XenServer ~]# ethtool -m ethX
```

Example usage and output from an Arista Twinax (1 x 40g -> 4 x 10g) breakout copper SFP+: (where "ethX" is the specific NIC you want to poll, such as "eth2")

```
[root@XenServer ~]# ethtool -m ethX
Identifier                : 0x03 (SFP)
Extended identifier       : 0x04 (GBIC/SFP defined by 2-wire interface ID)
Connector                 : 0x21 (Copper pigtail)
Transceiver codes         : 0x01 0x00 0x00 0x00 0x00 0x04 0x80 0x00
Transceiver type          : Infiniband: 1X Copper Passive
Transceiver type          : FC: Copper Passive
Transceiver type          : FC: Twin Axial Pair (TW)
Encoding                  : 0x06 (64B/66B)
BR, Nominal               : 10300MBd
Rate identifier           : 0x00 (unspecified)
Length (SMF,km)           : 0km
Length (SMF)              : 0m
Length (50um)             : 0m
Length (62.5um)           : 0m
Length (Copper)           : 1m
Length (OM3)              : 0m
Passive Cu cmplnce.       : 0x00 (unspecified) [SFF-8472 rev10.4 only]
```

```
Vendor name                       : Arista Networks
Vendor OUI                        : 00:1c:73
Vendor PN                         : CAB-Q-S-1M
Vendor rev                        : 20
```

Hyper-V

Unfortunately, there does not appear to be a *Powershell* or *cmd* utility available to poll and expose SFP+ vendor make/model/serial details. In certain circumstances, some SFP+ manufacturers may offer a 3rd party utility to install on the host and run to gather this info. Please reach out to the SFP+ manufacturer for further guidance if required.

Note that for ESXi and Hyper-V, if using '*Twinax*' SFP+ modules, then consider polling for the transceiver details from the network switch instead. Twinax cables are typically hard-wired with the same transceiver at each end by the manufacturer, so the network switch transceiver may shed light by assumption on the host-side module also. Consider using host NIC MAC addresses against the switch MACC address table to confirm which switch port to interrogate.
Even for fiber optic connections, the switch-side SFP module metrics may also provide certain useful signal health and connection speed/status/type information, stopping short though of confirming the vendor/model module at the remote host-end.

Cabling Issues

If ethtool returns error strings as shown below the SFP should be confirmed to be fully seated in the correct orientation. You should also validate on the NIC's Compatibility Matrix to ensure the cables have been tested and validated to work with the specific NIC in use.

```
[root@AHV ~]# ethtool -m eth4
Cannot get module EEPROM information: Input/output error


[root@AHV ~]# ethtool --show-fec eth4
Cannot get FEC settings: Invalid argument
```