Optical nTAP with LC Connector Installation

Features

Key features of the Optical nTAP with LC Connector include:
- No AC power required
- Passive access without packet tampering or introducing a single point of failure
- All traffic (including errors) is passed from all OSI layers for analyzing
- Enhanced security because the nTAP does not require or use an IP address, making it undetectable compared to a SPAN
- Allows you to connect and disconnect the analysis device as needed without taking the network down
- Fully IEEE 802.3 compliant
- Fully RoHS compliant
- Front-mounted connectors make installation simple
- Optional 19-inch 1U rack mount panel holds up to three nTAP

Standard and Optional Parts

Parts
The Optical nTAP with LC Connector comes with several parts. If any part is missing or damaged, contact VIAVI immediately.
The Optical nTAP with LC Connector ships with the following items:
- Optical nTAP with LC Connector
- Quick Reference Card
Your kit may also contain optionally available parts (for instance, patch cables).

Optical nTAP with LC Connector Installation

Installing

Prerequisite(s):
- Decide where to place the nTAP and physically mount it, if desired. Depending on the form factor purchased, this may be in a drive bay, rack mount bracket, or wherever it is most convenient.
- Connect your device of interest (for instance, switch, router, etc.) to the Optical nTAP with LC Connector using standard optical cables with an LC connector to complete the pass-through connection.
- Connect the nTAP to your analyzer or other monitoring device using optical cables. Be certain to connect to the receive ports of the capture card in your analyzer.
- The network adapter you connect to the Analyzer side of the Optical nTAP with LC Connector must have auto-negotiation disabled, otherwise no traffic will be passed to that network adapter. This also means the network adapter must support the ability to disable auto-negotiation; not all third-party network adapters support this. However, all Gen3 capture card models can enable and disable auto-negotiation.

An Optical TAP splits the full-duplex signals, allowing the monitoring device access to a copy of the data stream while maintaining uninterruptable data flow through the monitored link. Optical TAPs require no external power.

When traffic comes in to Link A, two copies are made in the TAP. One copy is sent out Link B to the switch and the other copy is sent out the Analyzer port A to the analysis device. A similar thing happens with traffic that comes in Link B. Two copies are made. One copy is sent out Link A and the other copy is sent out the Analyzer port B. Due to how the TAP is designed, it is not possible for traffic from the Analyzer side to pass to the Link side.

Caution: Before you temporarily break the link between the device of interest and the network, you may want to shut down access to that device and notify users of the down time.

1. Disconnect the cable from your device (typically a switch) and connect it to Link B.
2. Use another full-duplex cable to connect the network device (or primary device in a failover arrangement) to Link A port, thus completing the pass-through link.
3. Use a Y-cable (i.e., a splitter cable) to connect the nTAP's Analyzer port to the receive sockets on your analyzer's capture interface. Be certain to connect the cable to the capture card in your analyzer. As an alternative, you can split your own duplex cable (or use two simplex cables) to connect each side of the Analyzer ports on the TAP to the receive ports on each of the NICs in the analyzer.
4. Ensure that auto-negotiation is disabled on the receiving capture card in your analyzer. See the documentation for your capture card or analyzer for details. If auto-negotiation is enabled, the analyzer will not be able to receive the stream from the TAP until it is.

All Optical TAP devices contribute to optical attenuation. See a fuller discussion of it in Attenuation.

Attenuation

Network administrators who manage optical links have the added challenge of dealing with signal attenuation—the rate at which light dissipates over a network.

Attenuation is caused by a number of factors and can affect both network performance and the ability to analyze the network.
Excessive signal attenuation can cause link failure. Understanding signal levels, selecting the right split ratio on TAPs, and carefully managing the location of repeaters can prevent problems. This section defines attenuation, explains how it is affected by fiber and other optical elements on a network, and how it can be efficiently managed.

**Attenuation** is the reduction of signal strength during transmission caused by the absorption of light from the materials through which it travels. Greater signal loss equals higher attenuation. A signal can lose intensity or experience increased attenuation with each surface or medium it traverses. Many factors contribute to the attenuation rate of signals including devices such as TAPs and transmission through optical cables.

Optical signal strength is measured in decibels (dB) and is based on a logarithmic scale. If a signal attenuates too much, the destination device cannot identify it or the signal may not even reach the destination. This is why some optical links depend on repeaters, which amplify the signal.

**Attenuation and TAPs**

As with all devices inserted into an optical link, one side effect of TAP usage is signal attenuation. TAPs are used to provide access to the data streams passing through a high-speed, full-duplex network link. TAPs deliver a complete copy of data to a monitoring device for accurate analysis. An Optical TAP optically splits the light power of the full-duplex signal into two copies. One part of the split signal is sent to the other device on the network, while the other is simultaneously passed to the analysis or monitoring appliance.

A TAP attenuates the signal for two reasons:
- A portion of the signal strength is “siphoned off” and sent to the analyzer. How much of the signal strength is redirected for analysis depends on the split ratio of the TAP.
- The connections and internal TAP cables and connectors absorb and refract a small portion of the signal.

An Optical TAP contributes to signal attenuation, but typically not enough to make a significant difference on the network. An optical split ratio must be designated on each TAP. In most cases, a 50/50 split ratio is ideal, providing sufficient light to both the network and monitoring device. However, there may be special cases that require an alternative ratio in order to meet signal power needs. For example, if a TAP is cabled close to the analyzer NIC and the link under test requires a long cable run, you may want to provide more light power back to the network than to the monitoring device. If you do choose a ratio other than 50/50, keep in mind that the signal has to be strong enough for it to be interpreted at the analyzer.

**Managing attenuation**

Managing signal attenuation is critical for running a network at optimal performance. If signal attenuation is too high, destination devices may not be able to establish a link or receive network traffic. Repeaters can help, but they can be costly and inconvenient to implement. In general, unless a signal must travel a long distance or is compromised by patch panels, there should not be a problem using the 50/50 split ratio. The most efficient and cost-conscious way to manage attenuation is to measure signal levels throughout the network and place repeaters only when and where they are needed.
FAQ

Technical Specifications
Product dimensions, weight, power consumption, installed operating system, RAM and details along with photos of the appliance.

Technical specifications
This section lists the dimensions, power requirements, supported media, and environmental requirements.

<table>
<thead>
<tr>
<th>Power requirements</th>
<th>requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC Input</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental requirements</th>
<th>Temperature range</th>
<th>Humidity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-40°F to +185°F / -40°C to +85°C (operating)</td>
<td>35-85% (non-condensing)</td>
</tr>
<tr>
<td></td>
<td>-52°F to +185°F / -47°C to +85°C (storage)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supported media</th>
<th>Fiber support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Multimode or Single-Mode</td>
</tr>
<tr>
<td></td>
<td>Multimode support for 1 Gb and 10 Gb only</td>
</tr>
</tbody>
</table>

| Fiber diameter            | Multimode: 50/125 µm or 62.5/125 µm |
|----------------------------| Single-mode: 9/125 µm               |

| Wavelength ranges         | Multimode: 850 or 1300 nanometers |
|----------------------------| Single-mode: 1310 or 1550 nanometers |

| Wavelength tolerance ranges | Multimode 850/1300 (Dual-window) | +/- 20 nanometers |
|----------------------------| Single-mode 1310 or 1550 (Dual-window) | +/- 40 nanometers |

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Width</th>
<th>Height</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.62 in/14.28 cm</td>
<td>1.15 in/2.93 cm</td>
<td>7.79 in/19.78 cm; LC connector adds .476 in/1.213 cm</td>
</tr>
</tbody>
</table>

Getting started

Why choose a TAP or SPAN port

Troubleshooting

What latency does a TAP create?
Fully optical TAPs (TAPs with only optical connections and that require no power) do not create any latency or delay.

Not seeing traffic at the analyzer from the TAP
If your TAP is not transmitting to the analyzer as you expect, check the following:

- The Link is definitely up and running.
- The cable connected to the analyzer functions properly. Use a different cable to confirm this.

- The Ethernet/SPAN or Fiber channel is not diverted elsewhere.
- Try swapping the cables between the ports.
- Use a light meter to verify there is enough light power for any optical links.
- If you are using an optical connection from the nTAP to your analyzer, including a GigaStor, ensure that the receive NIC on the analyzer has auto-negotiation disabled. If auto-negotiation on the NIC is enabled, you will not be able to see traffic from the nTAP. If this network adapter does not have the option to disable auto-negotiation, you must obtain a different network adapter that can—there are no exceptions.
- If the system you are monitoring is Linux or UNIX based, you may have an issue with the Maximum Transmission Unit size. The TCP stack in the UNIX system uses algorithms to produce an MTU based on response time from SYN ACK. A small MTU forces a server and client to redo their handshake. Increase the MTU on your server to alleviate this issue.

Can I “team” or bond NICs in my analyzer?
Yes, it is possible with some limitations. Sometimes it is desirable to use two standard full-duplex capture cards to capture full-duplex TAP output for analysis. Because a standard capture card port has only one receive channel you must aggregate the receive channels from two ports to see both sides of the two-way connection being monitored. Intel’s Advanced Network Services allows you to team multiple connections at the driver level, presenting your analyzer with an aggregated view of send and receive channels.

Because of the processing overhead and its effect on capture card performance, this method is not recommended for monitoring moderate to highly saturated links, such as those between switches. However, it can be an economical alternative when monitoring more lightly used connections, such as between a server and switch.

In addition to the bandwidth limitations, connection teaming is also less accurate when timestamping packets, which can cause unexpected results when your analyzer attempts to display certain charts and statistics such as Connection Dynamics or VoIP jitter. You also will not be able to tell which side is DCE vs. DTE. In short, if you do not have a dual-receive analysis capture card, it is always better to analyze the SPAN or port mirror session through a standard capture card rather than using the connection teaming method described here.

Note: You need at least one capture card that supports Advanced Network Services. If the card has two ports, they can be teamed, otherwise another capture card with an unused port must be present.
I am seeing CRC errors on my network

If you are seeing an uncommonly high number of CRC errors, this could indicate that there is an issue with the TAP, but it may also indicate that the TAP is fine and there are other problems on your network. Contact VIAVI Technical Support for assistance.

VLAN tags not visible at the analyzer

All TAPs pass VLAN tags with the packets. If you are not seeing the VLAN tags at the analyzer, check the following:

♦ On the switch:
  - Confirm that the SPAN was created to pass VLAN tags. Sometimes SPANs are created and passing VLAN tags is not enabled.
  - Confirm the communication between the switch and the router is passing the VLAN tags (normally the communication between them is not a trunk).

♦ On a GigaStor, if you are using one:
  - Confirm the capture card has been enabled to receive or pass VLAN tags.

Memory

Fully optical TAPs do not have internal memory or any electronic components and are strictly a pass-through wherein a copy of the data is made. TAPs with any copper connections have two distinct and separate memory stores. The two memory stores are non-volatile memory and volatile memory. They are not connected in any way and no data can move between them. The non-volatile memory provides certain functions that make the device work and cannot be modified or changed during normal operation of the device. Volatile memory holds network data as it is copied and passed through the device. Turning off the device clears any data in the volatile memory buffer.

Maximum frame size

The maximum frame size allowed through an nTAP is up to 16K; 64K super jumbo frames are not supported.

Technical Support

<table>
<thead>
<tr>
<th>Region</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>1.844.GO VIAVI / 1.844.468.4284</td>
</tr>
<tr>
<td>Latin America</td>
<td>+52 55 5543 6644</td>
</tr>
<tr>
<td>EMEA</td>
<td>+49 7121 862273</td>
</tr>
<tr>
<td>APAC</td>
<td>+1 512 201 6534</td>
</tr>
<tr>
<td>All Other Regions</td>
<td>viavisolutions.com/contacts</td>
</tr>
<tr>
<td>email</td>
<td><a href="mailto:customer.care@viavisolutions.com">customer.care@viavisolutions.com</a></td>
</tr>
</tbody>
</table>

Support hours are 7:00 A.M to 7:00 P.M. (local time for each office).