

**Best Practices Guide**

This guide has recommendations of best practices for using in-line taps to provide monitoring access in a network. These practices represent the accumulated wisdom acquired by Net Optics engineers and customer service personnel working for 12 years with more than 5,000 customers in all industries. Following the best practices presented here will enable you to get maximum value from your monitoring solutions and keep your network running smoothly.

**Basic Best Practices**

- Use In-Line Taps instead of Span ports or hubs when
  - It is important that no packets are lost, even when traffic is heavy
  - It is helpful or necessary to see Layer 1 and Layer 2 errors
  - Reconfiguring switches is undesirable
  - Switches do not have spare ports available for Spanning
  - Link speeds are greater than 100 Mbps
- Match the Tap to the type of media in the link to be monitored. For example, use an SX Tap in a fiber SX link, and a triple-speed Copper Tap in a triple-speed Copper link.
- Match the monitoring ports of the Tap to the type of media of the monitoring tool. For example, use a Tap that has LR monitoring ports with LR-based tools. Note that Taps with modular SFP or XFP monitoring ports enable the media type of the monitoring port to be changed simply by plugging the appropriate transceiver module into the SFP or XFP socket.

If it is not possible to match the media types, use a Media Converter Tap to create compatibility. For example, an LR-to-SR Media Converter Tap can be attached to an LR monitoring port to enable it to be used with an SR-based tool. For a complete list of Net Optics Media Converter Taps, see

[http://www.netoptics.com/products/product\\_family.asp?cid=5&Section=products&sid=&menuItem=5&network=Connectivity](http://www.netoptics.com/products/product_family.asp?cid=5&Section=products&sid=&menuItem=5&network=Connectivity).

- For fiber links, match the fiber diameter (50um or 62.5um) in the Tap with the fiber diameter of the link. For a detailed discussion of fiber diameters, see <http://www.netoptics.com/pdf/ConnectingFiberTaps.pdf>
- For fiber links, select a Tap with an appropriate split ratio. In most cases, a 50/50 split ratio works well. If not, a 70/30 split ratio is usually good. For a formal analysis of split ratios, see <http://www.netoptics.com/pdf/FSRCalc.pdf>

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- For fiber Taps, be sure to connect the Transmit side of the link to the Receiver side of the Tap, and the Receive side of the link to the Transmit side of the Tap. If this connection is made incorrectly, it is possible to successfully pass data on the link but have no signal on the monitor ports. For a more detailed explanation of this issue, see <http://www.netoptics.com/pdf/ConnectingFiberTaps.pdf>
- When installing more than a few Net Optics Taps in a rack, consider using a 12-lead Power Supply ([http://www.netoptics.com/products/product\\_family\\_details.asp?cid=5&pid=107&Section=products&menuitem=5&tag=NetOptics+converter+Taps](http://www.netoptics.com/products/product_family_details.asp?cid=5&pid=107&Section=products&menuitem=5&tag=NetOptics+converter+Taps)) to decrease the number of power strips and transformers required.

**Types of Taps**

- When it is useful to monitor the same traffic with multiple tools simultaneously, or when multiple groups may want to monitor the same traffic, use a **Regeneration Tap** (or a Tap such as Director with regeneration capability). Regeneration Taps duplicate the same traffic stream on multiple monitoring ports so multiple tools can be used at the same time without conflict.
- When it is desired to monitor both directions of a full-duplex link but the tool has only a single NIC, use a **Port Aggregation Tap** (or a Tap such as Director with port aggregation capability). Port Aggregation Taps combine the traffic from both directions on a full-duplex link and send the resulting traffic stream to one or more monitoring ports.

However, if the traffic load is such that aggregated traffic from both directions may exceed 100 percent of the monitor port bandwidth, be sure the Port Aggregation Tap has enough buffering to accommodate bursts of high bandwidth traffic; otherwise packets may be dropped.

- When the number of links that need to be monitored exceeds the number of monitoring tools available, use a **Link Aggregation Tap** (or a Tap such as Director with link aggregation capability). Link Aggregation Taps combine the traffic from multiple links (including both directions on full-duplex links) and send the resulting traffic stream to one or more monitoring ports.

However, if the traffic load is such that aggregated traffic from all links may exceed 100 percent of the monitor port bandwidth, be sure the Link Aggregation Tap has enough buffering to accommodate bursts of high bandwidth traffic; otherwise packets may be dropped.

- When installing an in-line device such as an Intrusion Protection System (IPS), use a **Bypass Switch** to create a fail-safe connection, and also to provide in-line Tapping capability on the link. A Bypass Switch sends link traffic through the attached in-line device as long as the device is operating normally; but if the device fails or is removed, the Bypass Switch keeps the link up by automatically routing traffic around the in-line device. In addition, when traffic is being routed around the in-line device, it is also copied to the monitoring ports like a Tap, so link traffic can be monitored without difficulty.
- When it is desirable to monitor a large number of links with a common pool of tools, or to centralize monitoring within the IT department, use a **Director** Data Monitoring Switch. Director

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supports 28 network ports and 10 monitoring ports per 1U-high chassis, and chassis can be daisy-chained to provide additional ports.

- When it is desirable to view link utilization by glancing at the front panel of the Tap, select intelligent Taps (**iTaps, iBypass Switches, and Director**) with front panel LCD displays.
- When it is desirable to view RMON statistics using Web-browser-based or platform-based software, without connecting a monitoring tool, select intelligent Taps (**iTaps, iBypass Switches, and Director**) that support Net Optics Web Manager and Net Optics System Manager.

**Advanced Best Practices**

- When a monitoring tool is oversubscribed, use a Tap with filtering capabilities, such as **Director**, to decrease the amount of data sent to the tool, using filtering to select relevant data. Director can filter traffic by IP address, protocol, VLAN, and other packet parameters; even deep payload content can be used to qualify traffic.
- When a network includes an SNMP-based management tool such as IBM Tivoli or HP OpenView, select intelligent Taps (iTaps) that support an SNMP MIB and report RMON statistics.
- For a “green” equipment room, consider using optical Taps that do not consume any power at all.
- Build monitoring access into the network before problems occur, so tools can be brought to bear on problems more quickly, speeding problem resolution. For more information on building a Monitoring Access Platform (MAP) into the network, see [http://portal.netoptics.com/pdf/MAP\\_whitepaper.pdf](http://portal.netoptics.com/pdf/MAP_whitepaper.pdf)

**For further information:**

<http://www.netoptics.com>

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