SANInsight®
Fiber TAP Patch
Panel System

VirtualWisdom SANInsight TAP Patch Panel

10G and 16G-capable Traffic Access Points (TAPs) provide real time instrumentation at the Fiber Channel and Ethernet layers.

The Challenge: Optimizing Performance, Availability & Utilization

A best practices-compliant physical layer must be capable of being both maintained and monitored in order to meet those demands. Physical layer maintenance requires the ability to quickly and easily add, change, or remove links and devices. Physical layer monitoring is the real-time acquisition of error, performance, and utilization data via Traffic Access Points, or TAPs. Monitoring ensures the accuracy of the changes and validates that they produce only the desired results. Physical layers that address both requirements enable NAS Networks and Fiber Channel SANs operating on top of them to be iteratively optimized for maximum availability, performance, and utilization.

Infrastructure teams have long recognized the value that TAPs enable in the data center. Fiber optic cable plants make broad use of patch panels, which simplify changing device connections to preinstalled cabling, improving overall flexibility, and adding passive, out-of-band monitoring via TAP technology, has become the new norm.

Utilization

Virtual Instruments' new SANInsight TAP Patch Panel System provides a range of options for integrating the unique, patented technology of our TAPs into patch panels from both Virtual Instruments and other leading vendors.

By unifying TAPs and patch functions into a single layer of physical infrastructure, SANInsight significantly reduces the cost, complexity, and infrastructure impact of TAP deployment. SANInsight facilitates the broad installation of TAPs into both new and existing physical infrastructures, fully addressing the

Product Features

• Allows passive, out-of-band monitoring of all Fiber Channel traffic

• Adds no latency and does not alter live traffic

• High density: 8-24 TAPs per cartridge and up to 48 tapped patch links in 1U of rack space

• Standard 70/30 or 80/20 light split provides deployment options

• Supports LC or MPO/MTP connectors for flexibility

• Optimized, low-loss LC and MPO/MTP adapters; industry standard color coding for all trunk and patch adapters

best practices monitorability requirement and enabling complete SAN optimization.

Solution Components

The TAP Patch Panel System incorporates TAPs into TAP Patch Cassettes that are installed into rack-mounted Patch Shelves. Each of these components is detailed below.

Figure 1: SANInsight 6 link TAP Patch Cassette

Traffic Access Point (TAP)

A TAP uses a passive (unpowered) fiber optic splitter to create an exact copy of the light signal passing through it. The fiber carrying the signal from a device's transmit port is connected to the splitter input; the splitter's live output is connected to the receive port of the downstream device, while a second output carries the copy of the live signal for out-of-band access. A TAP uses two of these splitters, installed on the two fibers supporting both channels of a duplex Fiber Channel link, to create a complete copy of all traffic between the two devices.

Virtual Instruments offers two models of splitters; one that uses a 70/30 ratio, and a higher sensitivity splitter that uses an 80/20 ratio. The first number (e.g. 80) represents the percentage of light that continue on to the live output, while the second number (e.g. 20) is the percentage of light that travels to the TAP output. TAPs do not introduce latency, nor do they alter the original signal in any way, making this a very effective method of metric collection.

Virtual Instruments' TAPs use patented technology s and are certified to provide a fully readable signal copy up to a 16 Gb/s line rate. Our TAP technology is superior to products that use a symmetrical 50/50 split ratio, which may attenuate the live signal to unworkably low levels, or that have not addressed jitter issues and therefore and will not produce a readable TAP output at higher line rates. All TAP models comply with INCITS-ANSI, TIA, IEC, and IEEE standards.

TAP Patch Cassette

The TAP Patch Cassette houses the TAPs and provides standard fiber optic adapters for

connecting the trunk, patch, and TAP cabling. The dimensions of the standard VI TAP Patch Cassette body (an example is shown in Figure 2) allow it to mount in both Virtual Instruments' TAP Patch Shelves and Panduit's OptiCom® QuickNet™ enclosures. TAP Patch Cassettes with dimensions compatible with other patch enclosures or shelves are available by special order.
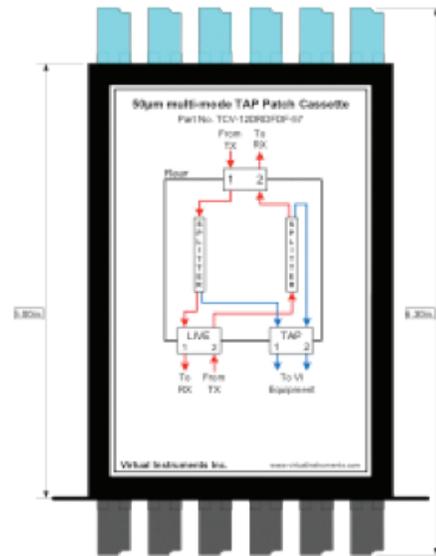

Figure 2: Top Diagram View of Example VI TAP Patch Cassette

The VI TAP Patch Cassette is available in four standard configurations with varying fiber densities and mixes of LC and MPO/MTP trunk, patch, and TAP connections on the front and rear panels. These configurations, shown in detail in Figure 3, are as follows:

- 8 live fibers/4 duplex links; front duplex LC adapters for trunk, patch, and TAP connections. Part # TCV-008LFLFLF-XY-AB.

- 12 live fibers/6 duplex links; rear duplex LC adapters for trunk connections; front duplex LC adapters for patch and TAP connections. Part # TCV-012LRLFLF-XY-AB.

- 12 live fibers/6 duplex links; rear MPO/MTP adapters for trunk connections; front duplex LC adapters for patch and TAP connections. Part # TCV-012MRLFLF-XY-AB.

- 24 live fibers/12 duplex links; rear MPO/MTP adapters for trunk and TAP connections; front duplex LC adapters for patch connections. Part # TCV-024MRLFMR-XY-AB.

- Each of these configurations is available in several fiber types and split ratios; these are specified in the X and Y characters of the part numbers, respectively, as follows:

- X= 5 for OM3 50Qm laser-optimized multi-mode fiber; 6 for 62.5Qm multi-mode fiber, and 9 for 9um single-mode fiber.

- Y=5 for 50/50 split ratio; Y=7 for 70/30 split ratio; Y=8 for 80/20 split ratio

Additional fiber density and adapter configurations of the VI TAP Patch Cassette, as well as VI MPO/MTP--to-LC Cassettes without TAPs and MPO/MTP - MPO/MTP and LC-LC adapter plates, are available by special order.

TAP Patch Shelves

The SANInsight TAP Patch Panel System includes two 1U shelves, each mounting up to 4 TAP Patch Cassettes:

- TPS-01OF is a fully enclosed patch shelf with a removable cover. It is 14 inches / 35.5 cm deep and mounts up to 4 TCV series TAP patch cassettes; typically used with cassettes having both rear and front adapters

- TPS-01OS, is an open patch shelf. It is 9 inches / 22.8 cm deep and mounts up to 4 TCV series TAP patch cassettes; typically used with cassettes having only front adapters.

Both shelves are for EIA standard 19" racks (adapter ears for 23" racks are available separately), with multiple cable tie-downs and embosses for included rings for secure and serviceable and cable management.

TPS-010F also has multiple cable entry knockouts on the sides and rear, and uses screwed-on plates to secure the entry grommets to prevent accidental dislodging and potential abrasion damage to the cables.

TAP Patch Panel Installation Locations

TAPs are typically installed on the storage links (between the core switches and storage devices), as these are far fewer in number than the server links and still provide full access to all Fiber Channel traffic. There are three potential locations for installing TAP Patch Panels along the storage links:

1. In place of patch-only panels at the core switches;

2. In place of patch-only panels at the storage edge;

3. As an additive layer between the storage edge patch panel and storage devices (or between the storage edge trunk cabling and devices, if directly cabled).

Note that the patch panels in the first two options may be proximate to the switches and storage devices, or may be centrally located with trunk cabling run directly to the device ports.

The first two deployment options are strongly preferred as they avoid introducing an extra cable hop into the live data path.

Option #3 above is the least preferred, as it inserts an additional cable hop with attendant insertion loss, material and installation cost, and rack space requirements into the live data path. This may, however, be the only viable option for retrofitting TAPs into live environments, as the live links can be reconnected through the TAP Patch Panel a single link at a time, minimizing disruption.

Component Selection Considerations

TAP Patch Cassette selection is driven by the existing or planned trunk cabling and rack access requirements in the target installation locations, as follows:

- If trunk cabling is MPO/MTP terminated, select the TCV-012MRLFLF-XY-AB Cassette.

- If trunk cabling is LC terminated, the TCV-012LRLFLF-XY-AB Cassette provides the highest available density by connecting the trunk cabling to the rear of the Cassette. If the rear of the Cassette cannot be accessed—when retrofitting into existing patch links, for example—then the TCV-008LFLFLF-XY-AB , which has all front-mounted adapters, is the correct Cassette.
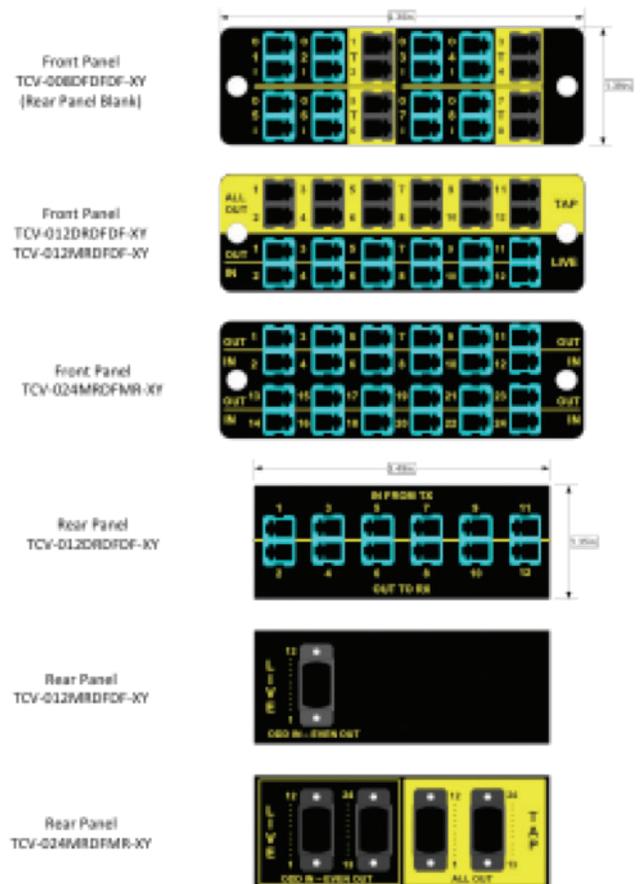

Figure 3: TAP Patch Cassette Configuration— Front and Rear Panels

The TCV-012 series Cassettes can be mounted in either the TPS-010F or TPS-010S shelves. Choose the former if you have significant cable lengths that you want to manage in the shelf, or the latter if cable management is in the rack itself (or MPO/MTP cabling is pre-terminated to the exact required lengths) and you need only to mount the Cassettes and secure the trunk cables. The TPS-010S is the best shelf choice for the TCV-08 series Cassettes.