Aggregation Taps: A Key Network Monitoring Tool

Technical Brief

Network Test Access Points (TAPs) have emerged as one of the primary sources of data for network security and performance monitoring. Among the many industry-leading features present in APCON intelligent data traffic management switches is the ability to create an aggregation tap. An aggregation tap creates an exact copy of a full duplex data stream that can be filtered and routed to a network monitoring tool for inspection, analysis or management.

Taps are central to any network monitoring plan because they offer an uncensored view of all network traffic. In contrast, a mirror or SPAN port will drop malformed packets before feeding the data stream to monitoring devices.

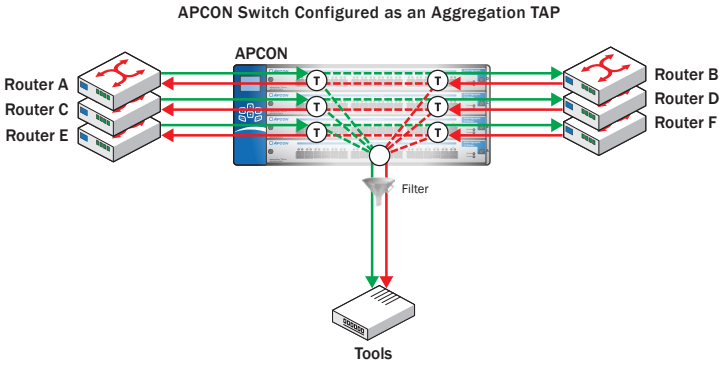
This paper details the process of creating an aggregation tap and the advantages of these taps compared to other network data sources. It is intended to offer network architects an additional tool to achieve 100% network visibility.

The APCON Solution for Aggregation Taps

In a network where standard in-line passive taps might be used, it is often more efficient and cost effective to deploy an IntellaPatch® Series 3000 switch populated with IntellaFlex™ blades configured as aggregation taps.

A single APCON switch combines the features typically found in large deployments of function-specific taps – passive taps, regeneration taps, and port or link aggregation taps. At the same time, this switch also consolidates traffic and allows network managers to filter different sets of packets to specific tools.

An aggregation tap uses two IntellaFlex ports for the pass-through link, as a standard switch. A third port is configured as an output for the aggregated traffic of the pass-through link. The APCON solution offers unprecedented scalability by allowing up to 17 links on a single blade to simultaneously tap full-duplex traffic in both directions. This extends to a market-leading capacity of up to 136 taps in a single chassis. At any capacity, each pass-through link traversing the APCON switch operates at full line rate without dropping packets or becoming prone to Layer 1 and 2 transmission errors.



Using the APCON switch to create aggregated taps, traffic from three pairs of duplexed ports is combined, filtered and directed to a monitoring device. A different filter can be applied to each destination.

Once the links are provisioned, each direction of a full duplex link can be easily configured to copy packets, aggregate individual directionalized streams of data into a single stream, and direct that stream to one or many ports for analysis. Optionally, each of these output streams may be independently egress-filtered to pass only the data relevant to the attached tool.

Additional Advantages of APCON Technology

The APCON solution offers additional advantages over standard in-line passive taps, such as:

- Supporting a range of media types simultaneously
- Offering media conversion and signal regeneration
- Optimally utilizing available tool bandwidth

IntellaFlex blades can simultaneously support various media at different data rates on the same blade, including copper, single-mode optical fiber, and multimode optical fiber. These media can also be mixed and matched as needed to provide an exact-fit solution for any network architecture, without the need to purchase additional media conversion equipment. Combined with APCON's overall scalability, media conversion capabilities help network managers to fully utilize their available tool resources and reduce budgets for duplicate tools in different media formats.

For an example of these savings, consider a network manager who has 10 lightly loaded 1G links providing source data and a single 1G tool to monitor that data. With a standard tap solution, this scenario requires 10 individual split optical taps and an additional 20:1 aggregation switch.

With the APCON solution, the same scenario requires only a single IntellaFlex port blade. This saves equipment costs in tap purchases, and APCON's scalable architecture preserves the initial hardware investment as network monitoring requirements change.

The standard tap solution becomes even more costly and complex when the monitored links are a mix of 1G and 10G. The software configuration remains identical; APCON easily converts 10G to 1G as well as 1G to 10G data rates appropriate to the analysis tool to be used.

APCON Aggregated Tap Features

APCON IntellaPatch chassis with IntellaFlex blades support locating various source duplex pairs on different blades, as long as each pair resides on a single blade. The new firmware also supports multiple tap stream destination ports that reside on different blades, and managers may specify one or more Load Balance Groups to be specified as tap destination ports.

Source Duplex Pairing

Each aggregated tap is created using a pair of switch ports for the primary pass-through connection. These pairs may be located on any blade, but both halves of the pair must reside on the same blade. In Figure 2, you can see three valid source pairs where both ports are located on a given blade, and one invalid pair where the selected ports are located on different blades. However, the destination ports for any valid source pair's tap data stream, including Load Balance Groups, may reside on any blade in the chassis. Note that source pairs may be a mix of 1G and 10G, and that data rate may be converted to 1G for the output stream.

Load Balance Groups

Once the tap source duplex pair of ports are established, network managers may choose to aggregate the tap data streams or assign them to separate egress ports. Managers may specify any number of output ports for any tap data stream as shown in Figure 1.

APCON Switch Configured for Aggregation Tapping and Load Balance Group

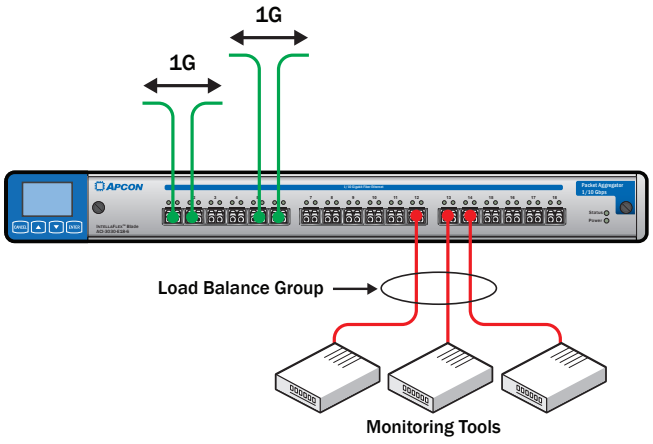


Figure 1 – Single blade Load Balance Group

Load Balance Groups are a common destination for aggregated tap data streams, especially when monitoring 10G links with 1G tools. Any number of Load Balance Groups may be specified, but all ports on a given Load Balance Group must be located on the same switch fabric processor on a blade, as shown in Figure 2.

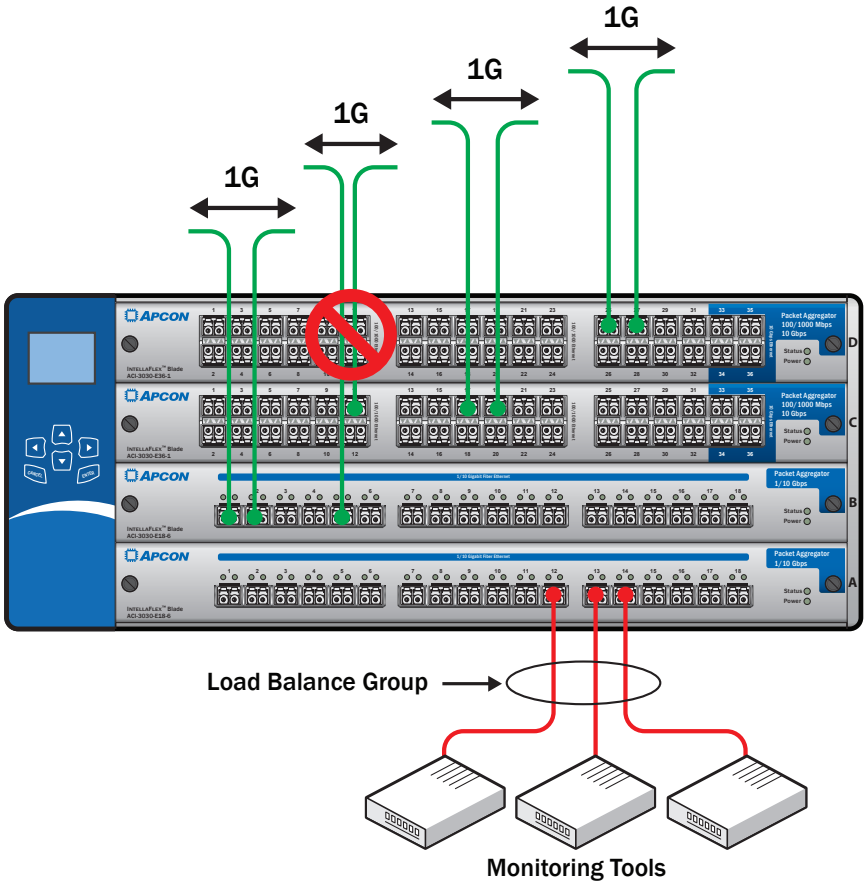


Figure 2 – Multi-blade aggregated taps with Load Balance Group. As an example, one of the port pairs shown above attempts to create an aggregation tap using ports on separate blades, and this tap is not allowed. The output of the three functional taps is routed to the Load Balance Group.

APCON Architecture Delivers Reliable Network Monitoring

APCON IntellaPatch Series 3000 switches are purpose-built for high-availability, enterprise-class deployments to deliver maximum system uptime. APCON's architecture is centered on the core concepts of modularity, redundancy, security and software.

The modular design of APCON's switches incorporates field-replaceable components such as fans, power supplies, blades, controllers and transceivers. Key system components are also designed with redundancy to ensure no single point of failure. Those include:

- Fault-tolerant dual controllers
- Load-sharing redundant power supplies
- Redundant management connections

Additionally, all Series 3000 switches use the same power supply and controller components, and most APCON blades can be used in any APCON switch chassis, allowing less replacement inventory and maximum flexibility of configuration.

Other design features that contribute to higher network uptime are APCON's independent data and control planes, which ensure that failure of any component does not negatively impact the operation of others.

Finally, APCON offers a proven suite of software to ensure total system security and reliability. All APCON interfaces support AAA authentication with RADIUS/ TACACS+, user-definable roles and feature permissions with granular detail, device access restrictions, full audit trail logging, and secure/encrypted communication methods.

ABOUT APCON

APCON develops innovative, scalable technology solutions to enhance network monitoring, support IT traffic analysis, and streamline IT network management and security. APCON is the industry leader for state-of-the-art IT data aggregation, filtering, and network switching products, as well as leading-edge management-software support. Organizations in over 50 countries depend on APCON network infrastructure solutions. Customers include Global Fortune 500 companies, banks and financial services institutions, telecommunication service providers, government and military, and computer equipment manufacturers.

Contact Us

Please email sales@apcon.com if you have any questions

Aggregation Tap Case Study

A national telecommunications provider needed to monitor all of its distributed VoIP traffic. To do so, the data center had to design a strategy to tap multiple VoIP data paths between several Juniper EX4200 Ethernet switches.

The taps specified were required to maintain pass-through data, apply filters (including RTP, SIP, M3UA, Diameter Plus and MCS) to provide access to all Sonus GX9000 and BroadSoft VoIP traffic, and redirect the filtered traffic to a single physical port connected to a Tektronix GeoProbe for monitoring and analysis.

The provider deployed fully redundant mirror networks (a production network and a hot-standby) to 16 data centers nationwide, and needed to replicate this monitoring solution on both networks at each location – a total of 32 monitoring systems. At each location, there were between six and fifteen 1G Ethernet data links per network that needed to be monitored using a mix of copper and optical media.

Implementing a solution using traditional taps would have been technically complex, cost-prohibitive, and difficult to manage. Such a solution would require 12 to 30 passive taps with appropriate media interfaces per data center, plus additional aggregation devices to efficiently consolidate data to the GeoProbe.

In contrast, the same functionality could be achieved easily by installing a single 1RU APCON chassis at each data center. Each APCON chassis contained an IntellaFlex blade populated with transceivers for the appropriate media on each network. Additionally, all 32 APCON switches deployed at data center locations scattered across North America could be provisioned, configured, managed, maintained, and upgraded by a single administrator working at a single workstation. APCON's aggregated tap and packet aggregation switch solution made this deployment straightforward, affordable, scalable for future needs, and easy to manage.

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APCON Solutions for Networks