



Extreme Fabric Connect

Automating Campus Networks

The complexity of today's networks limit enterprises' ability to quickly roll-out new services and applications. In fact, a recent survey by IDC showed that almost half of the respondents said that their network is not well suited for making changes and loses resiliency when doing so (source: IDC's Why the Network Matters Survey – 2013).

Extreme Networks has also commissioned research that shows 90% of companies admit that the complexities of their current network limit the timing and type of applications they are able to deploy. This research also showed that businesses end up waiting an average of 27 days for an appropriate maintenance window to implement any significant network change or to roll-out new applications. Even then, over 80% of these businesses still experience network downtime due to configuration errors in their network core.

A New Way to Build Networks

A completely new way to build networks, Extreme Fabric Connect delivers a simplified, agile and resilient infrastructure that makes network configuration and deployment of new services faster and easier.

A standards-based fabric technology based on enhanced IEEE 802.1aq Shortest Path Bridging and IETF 6329, Extreme Fabric Connect combines decades of experience with Ethernet and Intermediate System-to-Intermediate System (IS-IS) to deliver a next generation technology that combines the best of Ethernet with the best of IP.

Extreme Fabric Connect creates a multipath Ethernet network that leverages IS-IS routing to build a topology between nodes dynamically. Traffic always takes the shortest path from source to destination, increasing performance and efficiency.

Extreme Fabric Connect takes the complexity out of networking. Delivering a comprehensive array of network services, including Layer 2 and Layer 3 virtualization with optimized routing and IP multicast support, it allows customers to phase out multiple complex legacy technologies gradually and enables all services through a single, next-generation technology. Accelerating time to service and reducing errors, simple end point provisioning can extend any service anywhere in the infrastructure. Physical topology becomes irrelevant and complex design rules are eliminated, enabling network operators to build any logical topology wherever and whenever it's required.

Steps to integrate a non-fabric enabled Extreme Switch:

- Take Extreme Switch Out-of-the-Box
 - No Configuration on the Uplink/Trunk ports
 - No Configuration on any of the Access Ports
 - No VLAN defined
 - No VLAN port membership
 - No ISID defined
 - No VLAN-ISID mapping

- FA Switch is connected to Fabric Connect Core via the FA Server
- FA Switch discovers it is connected to a FA Server through FA signaling
- FA Switch provisions itself for Fabric Attach services

Compared to a traditional network, Extreme Fabric Connect offers a dynamic, agile network that is much easier to plan, build and run. It also reduces or eliminates wait times for maintenance windows and significantly lowers the risk of human error during updates with its ability to set and forget the network core.

Extending Fabric Connect Benefits to Non Fabric-Enabled Devices and End-points

Although Fabric Connect technology runs on campus core and wiring closet switches, integrating non-fabric-based platforms and their associated end-points into the virtualized fabric remains a problem for Extreme Networks and the industry, in general.

Fabric Attach is a software-based feature that leverages the flexibility and extensibility of Extreme Fabric Connect to further deliver automation and time-to-service enhancements. It extends the ease of provisioning inherent in Extreme Fabric Connect to non-fabric platforms. This can dramatically reduce the manual intervention required today to provision large numbers of commodity devices (phones, wireless access points and IP cameras) and legacy edge switches across the network. Fabric Attach technology is especially valuable where networking skills are at a premium, such as remote offices, and for solutions, such as video surveillance, that require connecting devices beyond the scope of the campus fabric.

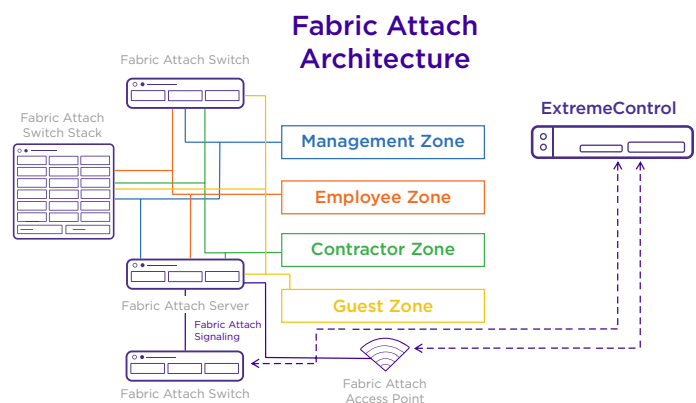
The Fabric Attach (FA) architecture includes the following components:

- **FA Servers** - The FA Server is a Fabric Connect capable box at the edge of the Fabric Connect cloud. These switches complete the association between the conventional networks/ flows and the fabric-based virtual services networks.
- **FA Switches or End-Devices** - FA Switch extends Fabric Connect services to non Fabric Connect capable edge switches. The FA Switch will automate attachment of end-points allowing them to take advantage of fabric services. The FA Switch uses the FA Signaling protocol for discovery and for auto joining the Management VLAN/Service for connectivity to management services.

Further more, when end-points connect to the FA Switch, if it is an FA End-point it will use FA Signaling to automate attachment. If it is a non-FA End-point, it will use ExtremeControl (a component of the Extreme Management Center suite) to authenticate, authorize and automate attachment to fabric services.

How It Works: Integration of Non-Fabric Enabled Switches

Attaching non-Fabric Connect enabled Ethernet switches, to a Fabric Connect network is as easy as taking the Fabric Attach switch “out of the box” and plugging it into a Fabric Connect enabled edge switch – which has been designated as a Fabric Attach Server – so that it can automatically configure itself with fabric-based services that have already been pre-configured in the Fabric Connect Core.



How It Works: On-Boarding Users Onto the Non-Fabric Enabled Switch

Fabric Attach also allows for “zero touch” on-boarding of end-points onto the Non-Fabric Enabled Switches. Extreme Networks has deployment experience in some of the largest BYOD environments in the world, like the Sochi 2014 Olympic Winter Games. One of the main challenges within the Sochi deployment was providing services for 40,000 different users and 120,000 devices – all connecting simultaneously – the day of the Opening Ceremonies.

In this network, ExtremeControl played a critical role in authenticating the devices and then dynamically assigning them to the correct VLAN based on the credentials. That VLAN was then manually assigned to the correct virtualized network. With Fabric Attach we take this concept one step further and dynamically attach the end-point directly into the virtualized network. This can be done through FA Signaling between Fabric Connect and Fabric Attach network. It can also be done through ExtremeControl. In this scenario, a policy is added that allows the network to not only create the VLAN, but also create the virtualized network (or I-SID) as well as map the VLAN to the virtualized network (or I-SID) all without user intervention.

This capability would have even further simplified things for the Sochi team; especially considering that we had to plan for 120,000 wireless devices connecting at peak periods such as the Opening and Closing ceremonies – bringing a higher degree of automation and simplicity into this BYOD environment.

This feature doesn't just simplify deployment, it also dramatically simplifies moves, adds and changes. When users move to a different location, their configuration moves with it.

It is erased from the first access port and dynamically enabled on the new access port as the user reconnects. This eliminates the old world practice of IT having to manually assign and re-assign VLANs, I-SIDs and port memberships and allows for a much more dynamic environment.

Onboarding end-points and users onto the Fabric Attach Switch with “zero touch”

- User connects laptop to FA Switch
- User laptop challenged to perform secure access using 802.1x

- FA Switch authenticates user against FA Policy in ExtremeControl
- ExtremeControl authenticates and authorizes user against Federated Directories
- ExtremeControl signals VLAN and VLAN-ISID mapping to FA Switch
- FA Switch creates VLAN locally and signals VLAN and VLAN-ISID mapping to FA Server
- User granted access and able to appropriate virtual service connecting to corporate resources

Summary

Extreme's Fabric Connect and Fabric Attach extensions deliver an “Automated Campus” network that is radically simplified, removing time-consuming manual intervention from the critical path of everyday service delivery. Leveraging this innovative technology, businesses can transition valuable IT resources away from error-prone network provisioning duties and end the network waiting game.