Extreme™
Customer-Driven Networking

10 Reasons Why Extreme Fabric Connect Provides the Right Foundation for Your Digital Business

Digital Transformation Requires Network Transformation

The age of digital business is upon us, and networking is fundamental to its success. The modern enterprise demands agility, security and 24/7 access to critical applications, and the network is the foundation to enable that. As the network becomes more important, new, simple and agile network architectures need to be deployed that don't force trade-offs with security and resiliency - since all are absolute requirements in the digital era.

With Extreme Fabric Connect, organizations can say goodbye to the complex and inflexible networks of the past and move towards a network that will enable them to be more responsive to their organization's needs, reduce operations costs and increase their ability to innovate.

Introducing Extreme Fabric Connect: Networking for the Digital Era

Fabric Connect represents a simpler way to design, build, manage and troubleshoot networks. It has been field proven to reduce operations costs by as much as 66%[1] while at the same time increase time to service by 11x[2]. It is a standards-based, network virtualization technology that enables multiple isolated, secure virtualized (or cloud-based) networks to run as "ships in the night" over a single physical network. These virtualized networks are inherently secure and can be set up and modified very quickly with edge-only provisioning, eliminating instability and the risk of errors.

[1] Based on internal analysis by Extreme Networks
[2] Based on Fabric Connect Customer Experience third party survey

> "When you look at Extreme Fabric Connect, you'll say 'It can't be that easy,' but I'm telling you it works."
>
> **Bruce Meyer**
> **Technical Coordinator Network, Engineering, ProMedica**

Based on an enhanced implementation of IEEE 802.1aq Shortest Path Bridging and IETF RFC 6329, Extreme Fabric Connect combines decades of experience to deliver a next-generation technology that combines the best of Ethernet with the best of IP.

This paper examines ten attributes of Fabric Connect that contribute to it being one of the most agile and simple networking technologies on the market today; facilitating the roll out of advanced digital technology and business critical applications.

1. Supports all of your Network Services with Just One Protocol

Extreme Fabric Connect delivers the full breadth of integrated network services including Layer 2 virtualized services, Layer 3 virtualized services (with multiple Virtual Routing and Forwarding instances), and fully optimized IP Routing and IP Multicast services. As a result, Fabric Connect enables organizations to gradually migrate away from a host of legacy overlay technologies (such as STP, OSPF, RIP, BGP and PIM) and to enable all services with a single technology – delivering unprecedented levels of network simplification and resiliency.

2. Accelerates Time-to-Service Through Network Service Automation

With Fabric Connect, new services or service changes can be configured easily at the edge of the network, thereby eliminating current error-prone and time-consuming network-wide configuration practices. Because there are no requirements to touch any of the core or aggregation nodes, maintenance windows can either be eliminated or shortened significantly - increasing time to service. With Fabric Connect, many moves, adds and changes can be conducted in real-time without staff needing to come in off business hours.

3. Simple and Flexible Network Design

Fabric Connect also offers new levels of flexibility in network design. It allows any logical topology to be built, whether it is Layer 2, Layer 3, or a combination of the two – anywhere where there is Ethernet connectivity. It works over rings, mesh or partial mesh networks or any combination of the above. It eliminates the complex design constraints of the past and gives network operators the freedom to build services wherever and whenever needed on demand.

4. Delivers PIM-Free IP Multicast That is Scalable, Resilient, and Easy to Manage

IP Multicast is making a come-back. Many technologies such as next generation video surveillance, IPTV, digital signage, desktop imaging and financial applications are reliant on multicast. Extreme Fabric Connect offers a scalable, reliable and efficient way of supporting IP Multicast Routing, without the onerous requirement of configuring, deploying, and maintaining a complex overlay. It eliminates RPF checks, rendezvous points, and complex configuration. With Fabric Connect, multicast can be enabled with edge only configuration, while at the same time offering vastly enhanced scale, performance, and reliability.

5. Inherent Secure and Stealth Networking Capabilities

Extreme Fabric Connect is inherently secure; even proving to be unbreakable in multiple Hack-a-thon events. This innovative technology enables the creation of thousands of private virtual networks to segment and protect critical applications, data or users. Each of these Virtual Service Networks (VSNs) is completely isolated without any IP reachability in or out (unless specified). And as an added benefit, these secure virtual networks can be deployed quickly and without complexity at the network edges.

Some of the attributes of this capability include:

- **Breach containment and prevention of lateral movements through hyper-segmentation** – The ability to create thousands of secure zones that can extend across the network infrastructure (from point of ingress to point of egress) offers the ability to isolate traffic by different service types, applications or IoT devices. In the event a breach occurs, the vulnerability remains isolated within that segment, preventing potentially catastrophic lateral movements.

- **Dark network topology enabled through stealth networking** – With Fabric Connect, secure zones are dynamically created with L2 Ethernet Switched Paths. These paths are therefore not vulnerable to L3/IP scanning/hacking techniques — ensuring that if breached - the end-to-end network topology is hidden.

- **Elimination of back door entry points with service elasticity** – With Fabric Connect, services dynamically extend and retract dynamically as corporate assets, IoT devices and authorized users connect and disconnect. Network configuration profiles are removed from access edge switches and wireless access points as users and devices disconnect from the network — reducing back door entry points and potential network vulnerabilities.

6. "Lightning Fast" Convergence Times (Sub-Second)

The elimination of overlay protocols has a profound impact on the ability for the network to reconverge. Some Extreme Fabric Connect customers have experienced lightning fast recovery times (sub 50 milliseconds) - networkwide - for core, link, or node failures. This represents a vast improvement over conventional Spanning Tree/OSPF-based networks, and massive improvement when compared to average recovery times in PIM-based Multicast networks.

7. Supports Dynamic Auto-Attach Capabilities

Fabric Attach is a Fabric Connect feature that allows the value of fabric to be extended to non-fabric enabled devices (edge switches, APs and even IP cameras). By communicating with upstream fabric nodes, Fabric Attach offers the secure attachment of users and devices to the appropriate service. With Fabric Attach, the entire network becomes a truly elastic resource where services only exist while people or devices are connected and using business applications. Fabric Attach also contributes to the massive scalability of Fabric Connect by providing the same service attachment function without participating as a full Fabric Connect enabled node.

Extreme Fabric Attach is supported on an eco-system of products and solutions:

- Access points: Extreme Wireless 39xx & WLAN 9100 access points
- Edge switches: Extreme EXOS-based edge switches
- Industrial Ethernet Switches: MicroSens, Nexans, and Hirschmann/Belden
- Video Surveillance Cameras: Axis IP Cameras

8. Works Over Third-party IP Networks

Fabric Extend is a Fabric Connect feature that enables the full value of Fabric to be extended over IP networks. This enables interoperability with 3rd party cores and IP-based WANs to provide end to end services across the entire enterprise. Fabric Connect can extend across IP-based WANs to extend into remote locations and branch offices. It also ensures that the values of Fabric Connect can be realized in mixed vendor networks.

9. Delivers Policy-driven Automation

When Fabric Connect/ Fabric Attach is combined with policy, full network service automation is supported.

A policy-based engine such as ExtremeControl™ can be used to identify, classify and authenticate users/devices and apply the appropriate policy. Then, working in conjunction with Fabric Connect, the policy engine can dynamically provision the end-to-end service (or secure segment) from point of ingress to point of egress. As services are triggered at the edge of the network, the shortest path through the aggregation and core of the network is dynamically established – enabling full network service automation. Furthermore, network services are truly elastic in nature and are only in place for the duration of the application session.

For security purposes, Extreme offers policy-based network segmentation. This provides isolation of groups of IoT devices or users performing a specific function or role by assigning each of these functions their own secure hyper-segment. Access in and out of each segment is controlled by policy. This pragmatic approach to securing the network is cost-effective and simple to implement and manage.

> "The days of provisioning individual devices are long gone, we don't even think about it anymore. The simplicity of Fabric Connect allows hospital staff to seamlessly self-provision their own devices so our network people don't have to get involved, which is another huge time savings."
>
> **Mark Starry**
> **CTO, Concord Hospital**

10. Field-proven in prominent events such as the Sochi 2014 Olympic Winter Games

Fabric Connect has thousands of in-service live deployments spanning every continent and vertical. With features such as Fabric Attach and Fabric Extend, we have customers who have deployed a single fabric that spans the globe and encompasses tens of thousands of switches.

Furthermore, the technology was proven to be Olympic-grade at the Sochi 2014 Olympic Winter Games - serving over 40,000 users during the Games and ensuring all the essential communications to support the delivery of the Games were maintained flawlessly. Seven separate and completely isolated networks were configured protecting critical applications such as video distribution (IPTV), voice communications as well as applications required to run each of the Games events.

Summary

As illustrated throughout this document, Fabric Connect is a technology that delivers unparalleled simplicity and agility while also enhancing resiliency and security.

With Fabric Connect enterprises can say goodbye to the complex and inflexible networks of the past and move towards a network that will enable them to be more responsive to the business, reduce operations costs and increase their ability to innovate.

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