Extended Edge Switching

A Versatile, Easy-to-Deploy Option for the Switched Edge

Hightlights

- Seamlessly extend advanced switching features to the network edge
- Collapse multiple network layers into a single logical services architecture
- Centralized, single point of control for reduced complexity and operational expense
- Plug and play edge switch installation- just connect and power-up
- Deploy scalable cost-efficient networks supporting thousands of extended remote ports
- Versatile design options - all based on the 802.IBR standard

Network complexity remains an ongoing challenge for today's network administrator. This challenge is especially acute when extending the wired infrastructure into new enterprise environments. Installing new switches (or moving existing switches) brings with it a heavy administrative overhead – with each switch and switch port needing its own set-up and provisioning. Furthermore, the administrator must ensure that provisioned services match what the edge switch can support.

What if there was a simpler and easier way to deploy, set-up and administer the edge of your network? Extreme's Extended Edge Switching is a solution that lets you deploy and oversee a more versatile and easily managed switched infrastructure that seamlessly extends advanced network services to the edge.

Extreme Networks Extended Edge Switching

Extended Edge Switching is an innovative solution that simplifies the deployment and operation of edge switches - especially across a campus switched network. Based on the IEEE 802.IBR specification, Extended Edge Switching collapses multiple network layers into a single-tier unified services architecture that can greatly reduce the complexity of the traditional two and three-tier switch architectures. The result is a simplified operational model that reduces costs.

With an Extended Edge Switching solution, economical edge switches are meshed with more advanced aggregation switches to form a single logical switch (see Figure 1). Advanced services can then be seamlessly delivered to the edge switch, providing cost-effective price-per-port functionality — without compromising performance.

The solution in essence creates a single switching system that is independent of physical location. This versatility allows enterprises to quickly add wired ports wherever needed across the campus.

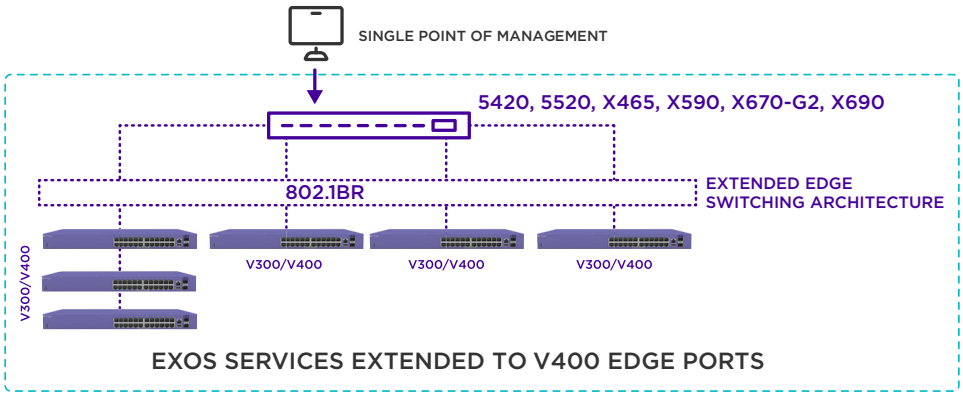

Figure 1: Extended Edge Switching extends aggregation switch features to V400 devices while providing a single point of management.

The Extreme Edge Switching solution effectively replaces traditional full-function access switches with V300 or V400 edge devices. The V300/V400 devices in turn are transparently managed and controlled by the EXOS aggregation switch, eliminating the need to manually provision and configure the individual V300/V400 device. Within this architecture, V300/V400 devices can be seen as functioning as "virtual line cards" of the EXOS aggregation switch - all operating within a larger "distributed chassis" domain. The V300/V400 devcices and the EXOS aggregation switch use the standard 802.1BR protocol to communicate with one another.

As opposed to deploying and maintaining a network of full-function access switches in a remote wiring closet, the Extended Edge Switching solution with the V300 and V400 Series delivers the following capabilities and benefits:

Simplified, Single Point of Management

V300/V400 edge switches and ports are configured and managed through the EXOS aggregation switch interface, or alternatively via Extreme Management Center software. The network administrator can centrally configure services and/or network policies across the campus from a single point in the network.

Seamless Unified Services

V300/V400 edge devices offer the same unified network services and software features since they are an extension of the EXOS aggregation switch. This includes Extreme Policy and advanced Layer 3 Services, such as OSPF.

Streamlined Licensing and Maintenance

The flattened architecture of the Extended Edge Switching network simplifies the provisioning and support of edge device ports. Software licensing, service turn-up, and debugging/maintenance can all be done centrally from the EXOS aggregation switch.

Plug and Play Edge Deployment

V300 and V400 edge devices support plug and play installation. After physically connecting the V300 or V400 edge device and powering it up, it automatically finds the central EXOS aggregation switch. It then downloads its configuration from the EXOS aggregation switch and is ready to operate. There's no need to connect a local console to configure V300/V400 edge devices or ports. In addition, the V300-8P-2T-W model can draw power from the aggregation switch, eliminating the need for separate power supply.

Unified Control Plane Eliminates Complex Protocols

The Extended Edge Switching domain employs a unified control and forwarding plane, eliminating the need for Layer 2 Spanning Tree Protocol (STP) or complex Layer 3 protocols, like OSPF. Multi-pathing is also supported from edge devices to aggregation switches with all links active and load-balanced to optimize performance and provide resiliency.

Cascade of Edge Devices for Flexible Design

V300 and V400 devices can be cascaded to create a virtual stacking capability. Up to four (4) V300 or V400 edge devices can be cascaded off a single high-speed link or alternatively via a LAG back to the EXOS aggregation switch. This minimizes the need for individual fiber cable runs from each V400 device, providing flexible deployment either within the wiring closet or at the network edge (see Figure 2).

Ring Support* for Additional Edge Resiliency

Cascaded V300 or V400 devices can also be configured in a ring topology for additional resiliency (see Figure 3). In this topology, the first and last V300/V400 devices in the cascade are connected to the EXOS aggregation switch.

If any V300/V400 device in the ring should fail, traffic can then be re-routed in the other direction across the ring to the aggregation switch. Up to eight V300/V400 devices can joined in a ring.

*Ring support on V300 devices is available with ExtremeXOS Release 30.7.

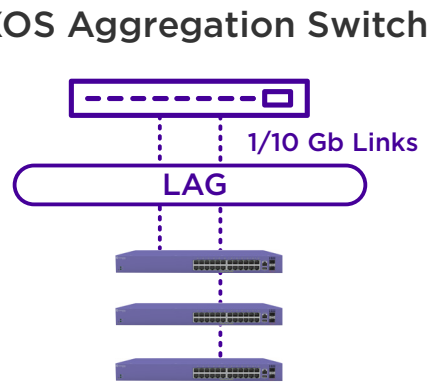

Figure 2: V300 or V400 switches can be cascaded to provide a virtual stacking capability.

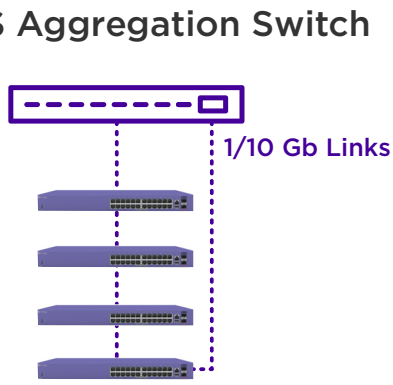

Figure 3: Ring topologies can be used to improve resiliency.

High-Availability, Redundant Aggregation Switches

EXOS aggregation switches can be linked together via an MLAG to create a highly redundant design that minimizes service interruption in event of a failure of one of the aggregation switches (see Figure 4).

V300/V400 switches can be connected to each EXOS aggregation switch via a cascade or ring configuration to minimize the impact of aggregation switch failure or interruption of service.

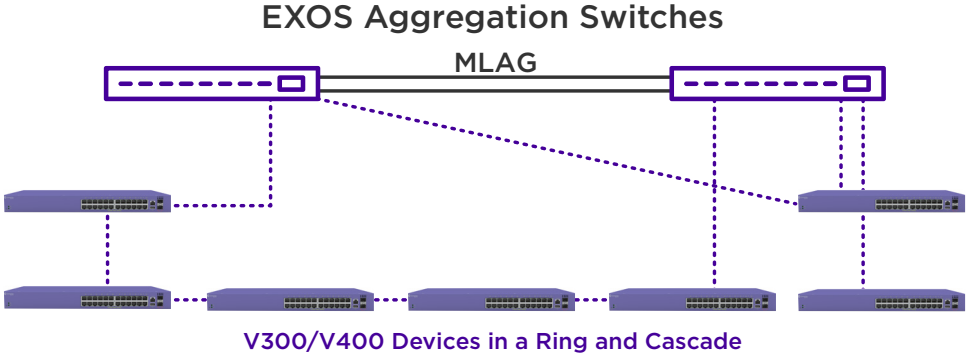

Figure 4: Redundant design can be created using an MLAG between EXOS aggregation switches.

Summary

Extended Edge Switching brings campus networks into the modern era by enabling enterprises to build networks that deliver:

- **Simplified Management –** A single point of control along with the reduction of unnecessary network layers helps eliminate individual switch touch points, thereby reducing maintenance time and costs.
- **Advanced Services to the Edge –** By meshing the feature-rich services of the aggregation switch with the entry-level V300 or V400 device, advanced Layer 2/3 services and policy can be flexibly extended to the edge. Cost-effective price-per-port functionality is delivered without compromising performance.
- **Scale-out Networking –** The Extended Edge Switching architecture can operate over long-distance links, independent of physical location. This allows enterprises to easily add ports whenever and wherever needed across the campus without adding complexity.

In summary, Extended Edge Switching technology offers a level of flexibility, ease of deployment, and total cost of ownership unmatched by traditional access, aggregation, and small-core chassis solutions.

Extended Edge Switching

Supported Platforms

The ExtremeSwitching™ 5420, 5520, X465, X590, X670-G2 and X690 Series platforms are supported as EXOS aggregation switches within an Extended Edge Switching design.

In addition, the following ExtremeSwitching V300 and V400 models are available as Extended Edge Switching edge devices:

Model Numbers	Description
V300-8P-2X	V300-8P-2X with 8 x 10/100/l000BASE-T PoE+ half/full duplex ports, 2 x SFP+ uplinks, fanless, includes 280W power supply
V300-8T-2X	V300-8T-2X with 8 x 10/100/l000BASE-T half/full duplex ports, 2 x SFP+ uplinks, fanless, includes 40W power supply
V300-8P-2T-W	V300-8P-2T-W with 8 x 10/100/l000BASE-T PoE+, 2 x 10/100/l000BASE-T 802.3bt Type 4 30W/60W/90W ports, no power supply required
V300HT-8P-2X	V300HT-8P-2X high-temp model with 8 x 10/100/l000GBASE-T PoE+ half/full duplex ports, 2 x SFP+ uplinks, fanless, PSU not included
V300HT-8T-2X	V300HT-8T-2X high-temp model with 8 x 10/100/l000GBASE-T half/full duplex ports, 2 x SFP+ uplinks, fanless, PSU not included
V400-24t-10GE2	V400 Series 24 x 10/100/l000BASE-T, 2 x 1000/l0GBaseX unpopulated SFP+ ports, fixed power supply and fans
V400-24p-10GE2	V400 Series 24 x 10/100/l000BASE-T PoE+, 2 x 1000/l0GBaseX unpopulated SFP+ ports, fixed power supply and fans
V400-48t-10GE4	V400 Series 48 x 10/100/l000BASE-T, 4 x 1000/l0GBaseX unpopulated SFP+ ports, fixed power supply and fan
V400-48p-10GE4	V400 Series 48 x 10/100/l000BASE-T PoE+, 4 x 1000/l0GBaseX unpopulated SFP+ ports, fixed power supply, fans

Notes: An optional Redundant Power Supply (RPS) is also available for V400 PoE models. Up to 48 x V300/V400 devices can be supported on a single EXOS aggregation switch.