Introduction to Shortest Path Bridging

Chartered to develop standards and recommended best practices in local area networking architectures and internetworking, the IEEE has developed an innovative, next-generation Ethernet control protocol classified as 802.1aq, more commonly known as Shortest Path Bridging (SPB). Essentially a replacement for the Spanning Tree Protocol (STP) and other point technologies (MSTP, RTSP, MMRP, etc.), SPB’s real value is its ability to enable unparalleled flexibility when building, deploying, and managing Ethernet networks. A natural, sympathetic evolution of Ethernet, SPB is all about efficiency, virtualization, and ease-of-use.

In the same way that the Virtual LAN (VLAN) enabled a new design approach for a single network, SPB’s creators see this new technology as a means to dramatically empowering distributed, interconnected, high-performance enterprise networking infrastructure. Based on a proven link state routing protocol, SPB combines decades of experience with IS-IS and Ethernet to deliver more power and scalability than its predecessors. Using the IEEE’s next generation VLAN, called an “I-SID”, SPB supports 16-million unique Services (compared with the VLAN limit of four thousand). And, because SPB’s I-SID is a true Service ID, once it is provisioned at the edge, the network core automatically interconnects like I-SID endpoints to create a contiguous “Service” that leverages all links and equal cost connections using an enhanced shortest path algorithm.

Making Ethernet networks easier to use, SPB preserves the plug-and-play nature that established Ethernet as the de facto protocol at Layer 2, just as IP dominates at Layer 3. And, because it enhances IP management by improving Ethernet, SPB enables more dynamic deployments that are easier to maintain than attempts that use other technologies.

Contrasting SPB with STP: Complexity, Flexibility, & Functionality
Minimizing complexity while delivering vastly more functionality and flexibility, SPB eliminates the need to manage IP subnet overlays and/or to provision complex topologies of tagged trunks between Switches. With SPB, new network services are provisioned at the edge of the network. Decreasing the configuration burden and reducing errors, this model for simplified endpoint provisioning leverages a proven carrier-grade link state protocol to automatically and instantaneously build the logical, optimized topology between access points.

Using this model, network administrators can deploy IP networking anywhere they need it, on the fly, and actually improve application performance. No longer bound by physical topology, associated subnet attachments are located where they are needed and are available when they are needed; time-to-service is dramatically enhanced.

Imagine a network, in the next building or the next state, where adding new ports to an existing application or community of interest is as easy as configuring the access port of local Switches and having the network automatically interconnect all as part of a common service. This is the model that Avaya and the IEEE are delivering: any service, anywhere in your network, available exactly when it is needed. In addition, thanks to its IEEE heritage, SPB can co-exist with your existing Ethernet infrastructure without disrupting your operational model.

With SPB, you choose your migration path and pace. By doing for next-generation networks what the Virtual Machine did for server virtualization, SPB enables truly powerful and dynamic networks that are easier to plan, build, and run.