

Cisco Fabric Extender Technology: Update on Relevant Technology Standards

- Q.** Why is Cisco standardizing the technologies included in its fabric extender architecture?
- A.** As part of our long-standing practice, Cisco is working with many industry partners and the relevant standards bodies to standardize the technologies embedded in its fabric extender architecture to enhance its interoperability and to increase the range of supporting products available for our customers. Cisco® Fabric Extender Technology (FEX Technology) has been widely deployed among Cisco customers and is supported by top vendors including Broadcom, Emulex, and QLogic.
- Q.** Under what auspices is Cisco FEX Technology being standardized?
- A.** There are many components to Cisco FEX Technology. In the IEEE, components of the technology are being standardized under projects P802.1Qbg and P802.1BR. In addition, the Distributed Management Task Force (DMTF) is working on a variety of supporting standards. Official projects pages are available at <http://www.ieee802.org/1/pages/802.1br.html> and <http://www.ieee802.org/1/pages/802.1bg.html> and a Cisco white paper comparing the two is available at http://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps9902/whitepaper_c11-620065_ps10277_Products_White_Paper.html.
- Q.** What is VN-Tag, and what are the differences from IEEE 802.1Qbh and IEEE 802.1BR?
- A.** VN-Tag refers to the format of the information tag inserted into each frame exchanged between the Cisco fabric extenders and the Nexus parent switch, that enables the advanced functions provided by such architecture. The IEEE is defining a similar tag, referred to as E-Tag, under the IEEE 802.1BR working group (Bridge Port Extension). E-Tag provides the exact same functions as VN-Tag but uses a slightly different format.

Initially, Bridge Port Extension and its tag definition effort was under the IEEE 802.1Qbh working group, but it was moved to the IEEE 802.1BR group in July 2011. IEEE 802.1Qbh was withdrawn and is no longer an approved IEEE project. After the overall fabric extender standard becomes ratified under IEEE 802.1BR, Cisco intends to deliver its fabric extender architecture and the products within this architecture to support both VN-Tag and E-Tag with transparent translation between the two formats.

Because VN-Tag is used in Cisco FEX Technology spanning the Cisco Unified Computing System™ (Cisco UCS™) and the Cisco Nexus® Family of switches with more than 10 million ports shipped, VN-Tag already has a huge footprint in the market with an ever-expanding ecosystem. Cisco will continue to work with other leading manufacturers, including QLogic, Emulex, and Broadcom, on fabric extender products based on VN-Tag, with support for E-Tag IEEE 802.1BR included at the appropriate time.

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- Q.** Does Cisco favor IEEE 802.1BR over IEEE 802.1Qbg?
- A.** No. The IEEE 802.1Qbg and 802.1BR standards provide a set of functions equivalent to that provided by Cisco FEX Technology and will be supported as necessary to enable interoperability and performance. However, Cisco will not need to implement all portions of these standards. For example, one of many technologies being defined in the IEEE 802.1Qbg standard is Virtual Ethernet Port Aggregator (VEPA), which enables an external switch to view local virtual machine-to-virtual machine traffic. For the many implementations of embedded virtual switches that provide limited visibility of local virtual machine-to-virtual machine traffic, this particular capability provides a workaround, but this problem does not exist in Cisco products. Although this technology is not applicable to Cisco products such as the Cisco Nexus 1000V Series Switches, which already provide visibility of local virtual machine-to-virtual machine traffic, Cisco is working with our industry partners to assist in producing a quality standard for VEPA for the benefit of the industry.
- Q.** Will Cisco implement IEEE 802.1BR? If so, how will this implementation work with current VN-Tag implementations?
- A.** Yes. After the IEEE 802.1BR standard is ratified, Cisco plans to deliver standards-compliant products in conjunction with our industry partners. Since Cisco actively participates in the standards bodies and works closely with industry partners, our engineering support will map to whatever specifications emerge from the standards working groups. By performing transparent translation between tag formats, these products will provide the capability to simultaneously support VN-Tag and the ratified standard, whatever format the standard may take.
- Q.** Will Cisco implement IEEE 802.1Qbg?
- A.** Yes. Cisco will implement the relevant portions of IEEE 802.1Qbg. Much of IEEE 802.1Qbg standardizes technologies already being deployed in the Cisco UCS platform, and as previously discussed, the VEPA portion of IEEE 802.1Qbg addresses a limitation that does not exist in Cisco products and therefore is not relevant to Cisco customers.
- Q.** When do you expect these standards to be ratified?
- A.** Both standards moved to sponsor ballot after November 2011 IEEE meeting. We expect them to be ratified probably in the first half of calendar year 2012.



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