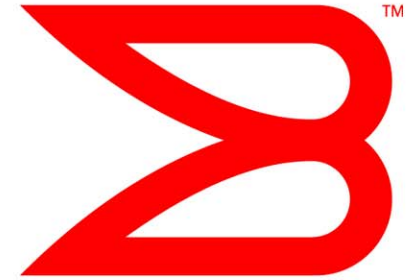


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# Using LLDP for VLAN Configuration

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# Overview

- VLAN basics
- VLAN configuration for FCoE
- LLDP basics
- LLDP-MED
- LLDP for FCoE VLANs
- Summary

# VLAN basics

- An end station may or may not be configured with VLANs
  - If not configured, it can send frames untagged and the switch will assign them to a VLAN
- According to 802.1Q, the switch determines the VLAN of a frame as follows
  - If tagged, use the VLAN in the frame
  - If untagged, use either the port, or the port + protocol (where protocol can come from Ethertype, LLC, or SNAP headers)
- In the absence of VLAN configuration, an end station would be limited to participating on only one VLAN for a given protocol

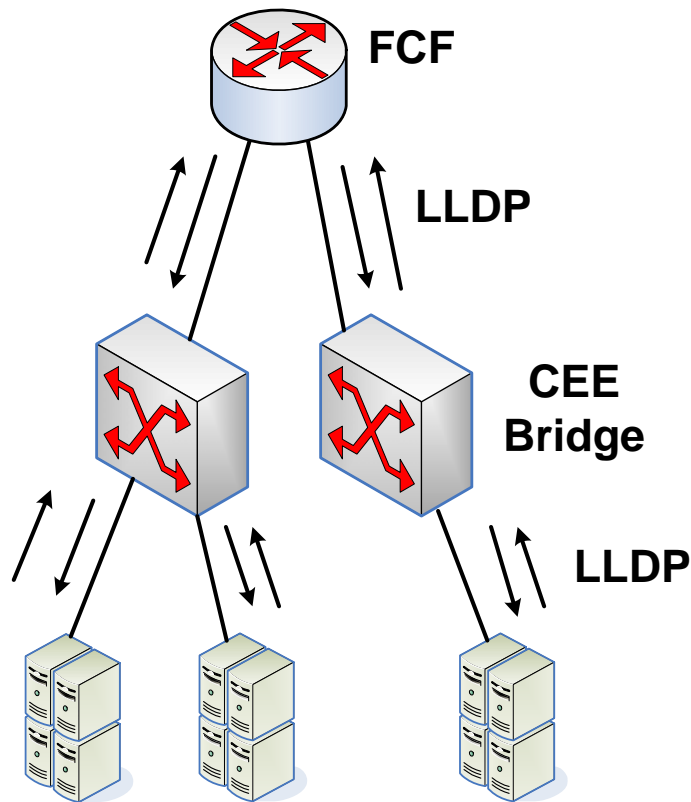


# VLAN configuration for FCoE

- To allow an end station to participate in multiple VLANs, involves manually configuring the end station with each of those VLANs
- At the interim meeting, a proposal was made for automating the process for FCoE using FIP  
<http://www.t11.org/ftp/t11/pub/fc/bb-5/08-545v0.pdf>
- This is an alternative proposal

# LLDP basics

LLDP frames only propagate on a single link



- Link Layer Discovery Protocol – IEEE 802.1AB
- Devices discover neighboring devices on the same link
  - There could be multiple neighbors if the link in hub topologies
- The messages are destined to a “well-known multicast MAC address” that is never forwarded by Bridges
- A device sends information about itself to its neighbor(s)
- The device receives information from its neighbor(s) and stores it in a “remote MIB”
- Supports various kinds of TLVs
  - Mandatory TLVs – must be sent
  - Optional TLVs – may be sent
  - Vendor-specific TLVs – not defined in the standard

# LLDP-MED

- The TIA has defined new vendor-specific TLVs for configuring IP phones

- Details available in the standard

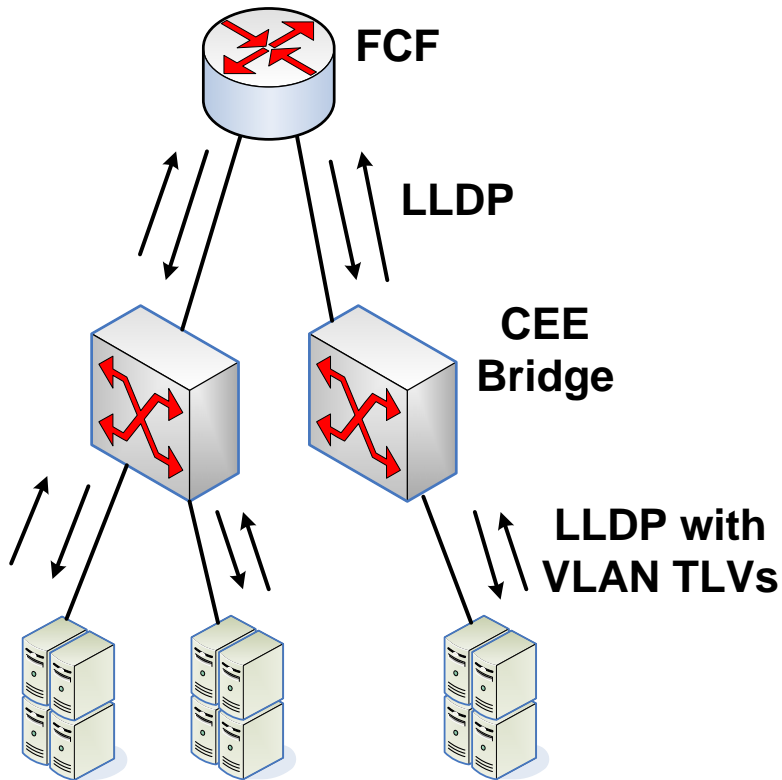
[http://www.tiaonline.org/standards/technology/voip/documents/ANSI-TIA-1057\\_final\\_for\\_publication.pdf](http://www.tiaonline.org/standards/technology/voip/documents/ANSI-TIA-1057_final_for_publication.pdf)

- Includes configuration of VLAN, DSCP, etc.

- There's a precedent for using LLDP for VLAN configuration and it's quite widely used!

# LLDP for FCoE VLAN configuration at the server

**Bridge and FCF ports  
require manual  
configuration for  
VLANs**

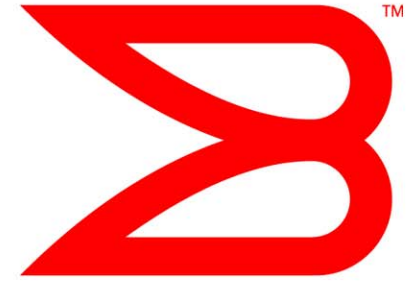


- The edge bridge is “FCoE aware”
  - Recommended practice for security
- The edge bridge already knows which VLANs are allowed on a certain server port
- Add a configuration to the switch port for FCoE-enabled VLANs
- T11 defines a vendor-specific TLV that provides all of those VLANs to the server
- The server can then use FIP to discover the FCFs and fabrics that are reachable over that VLAN
- There is a proposal in IEEE 802.1 to configure the priority to be used by a given protocol using LLDP (DCBX – Data Center Bridging eXchange)

# Summary

- LLDP can be used for automated VLAN configuration at the server
  - There is already a precedence for doing this – LLDP-MED
- Needs new TLVs for LLDP
- No changes required to FIP
- Can be made protocol-neutral if desired

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**THANK YOU**

