



FCoE: Distributed FCF Functionality

T11/09-648v0, December 2009

Silvano Gai

Background material

- **This presentation assumes familiarity with the architecture described in:**

<http://www.t11.org/ftp/t11/pub/fc/bb-6/09-539v0.pdf>

<http://www.t11.org/ftp/t11/pub/fc/bb-6/09-425v0.pdf>

Agenda

- **Message Flow**

 - FIP and FLOGI messages are exchanged**

 - Distributed Zoning Information is installed**

 - Traffic starts to flow**

 - Shortcuts are created**

- **Control Plane organization**

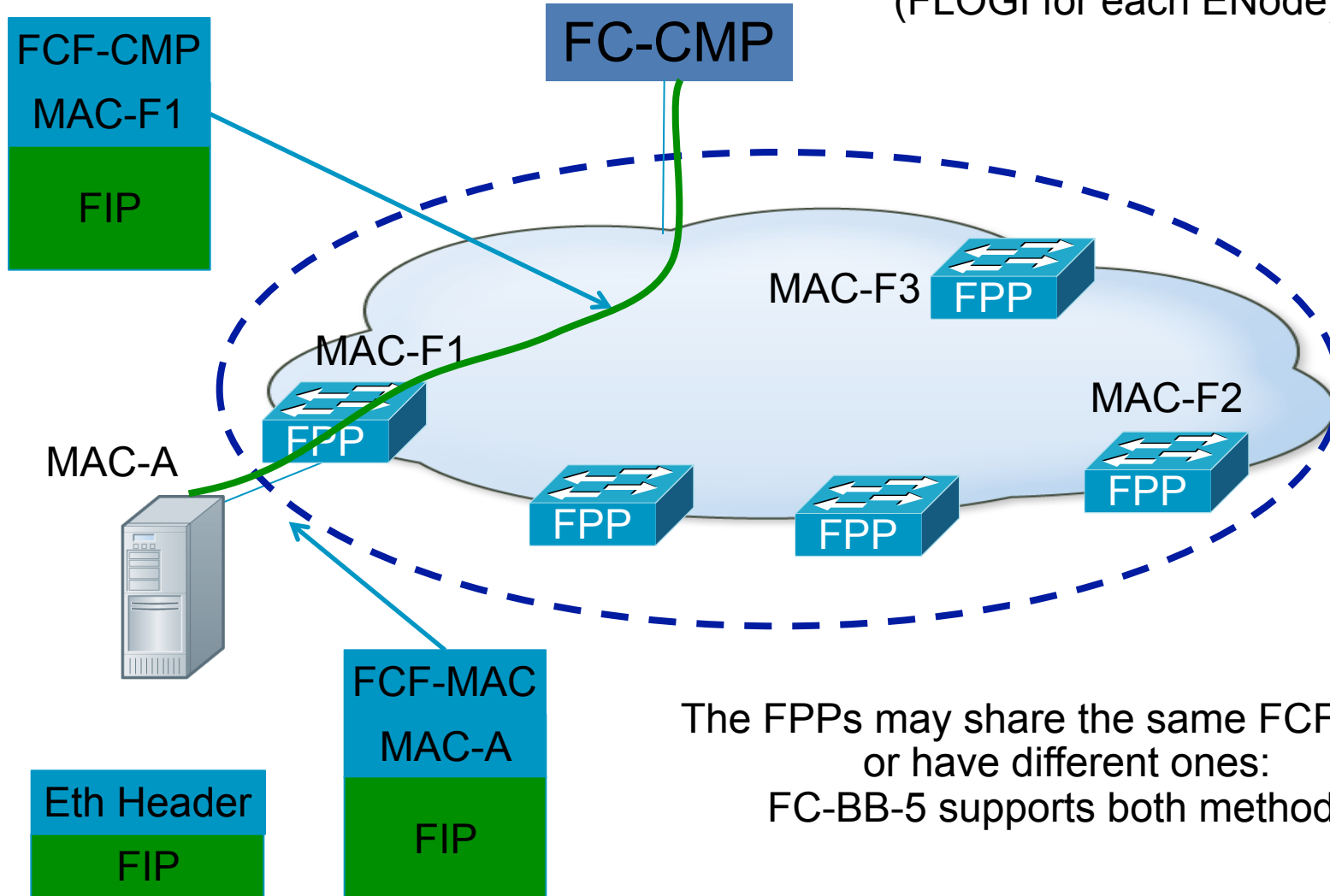
 - Additional FIP messages**

 - Statistic Collection**

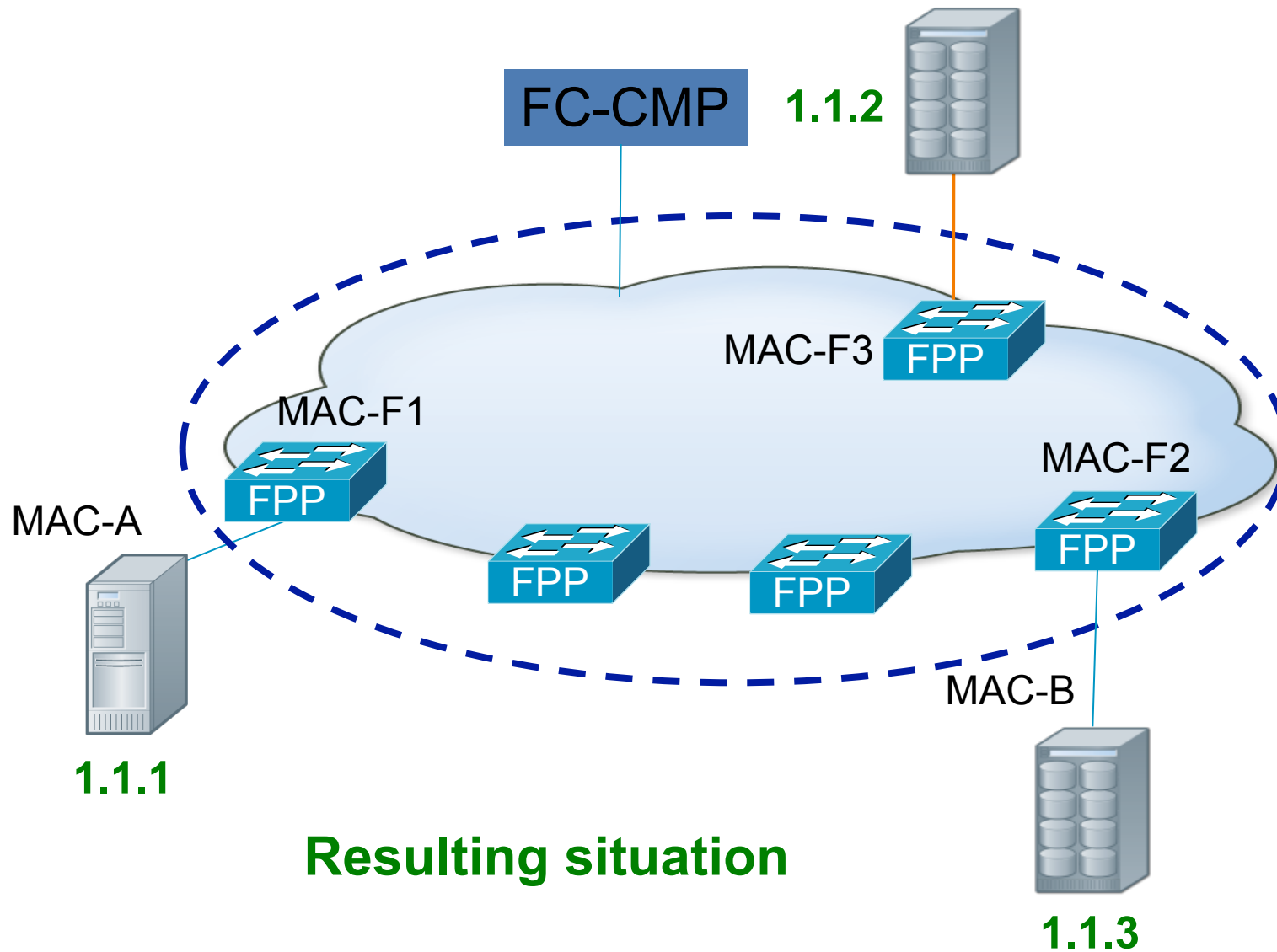
 - Security**

FIP (including FLOGI)

This is repeated independently for each FPP (FLOGI for each ENode)



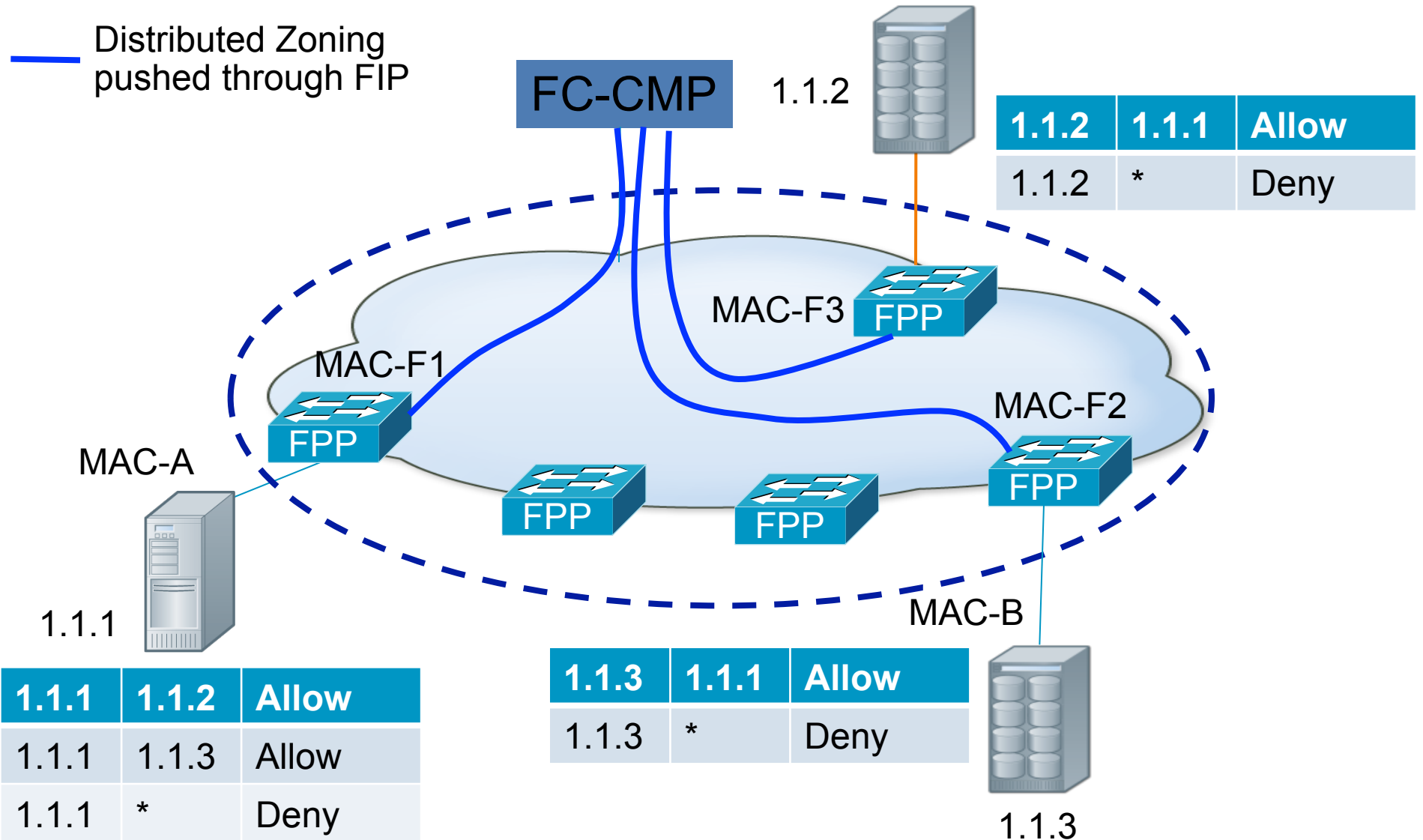
FIP - Other ENodes do FLOGI



Data Plane – Distributed Zoning

- Distributed Zoning is enforced by the FPPs
- The FPPs receive from the FC-CMP triplets
 {Source_FCID, Destination_FCID, Allow/Deny}
- These Triplets need to be updated as new ENodes FLOGI/FLOGO into the fabric
- FIP should be extended to carry **distributed zoning information**

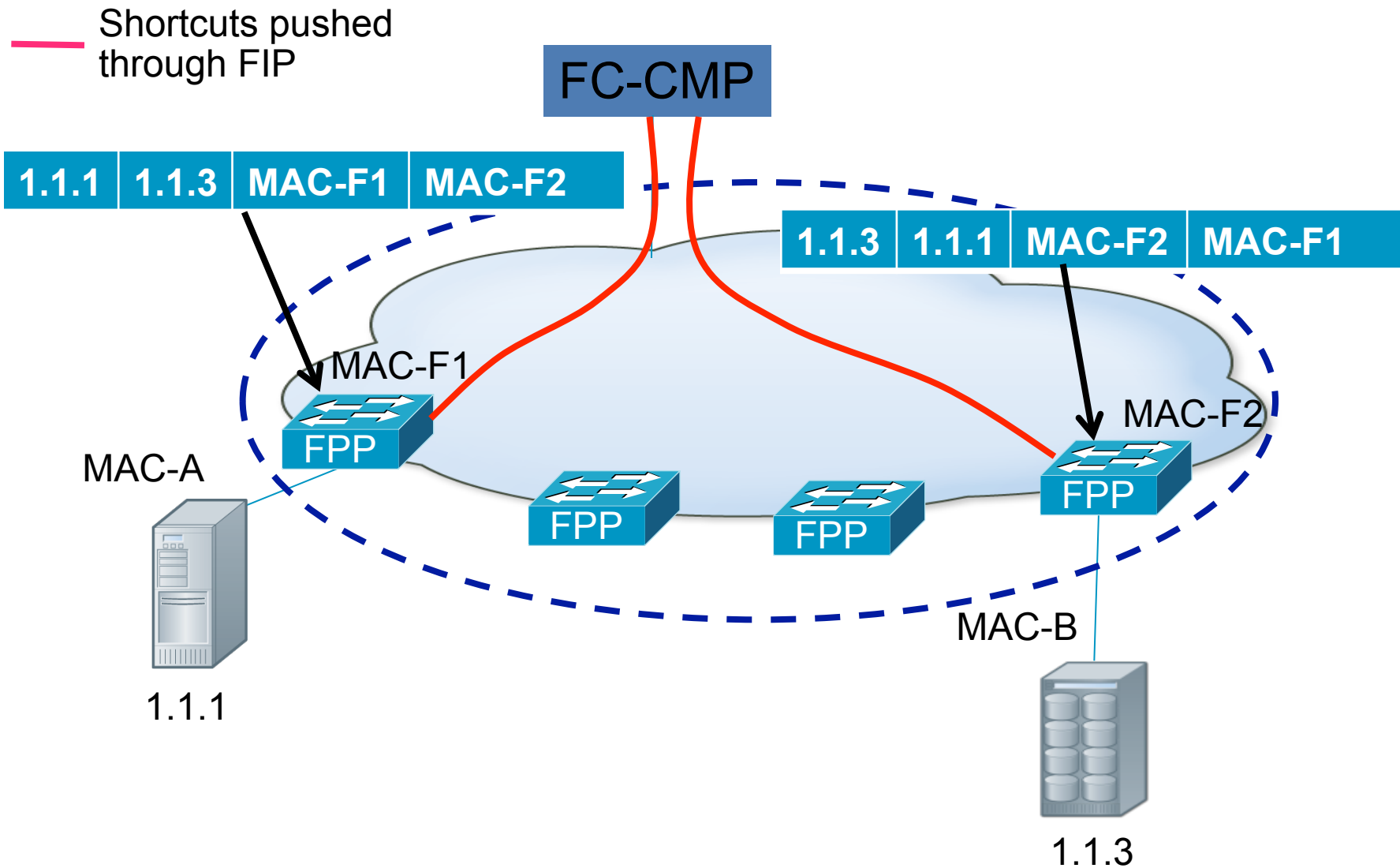
Data Plane – Distributed Zoning



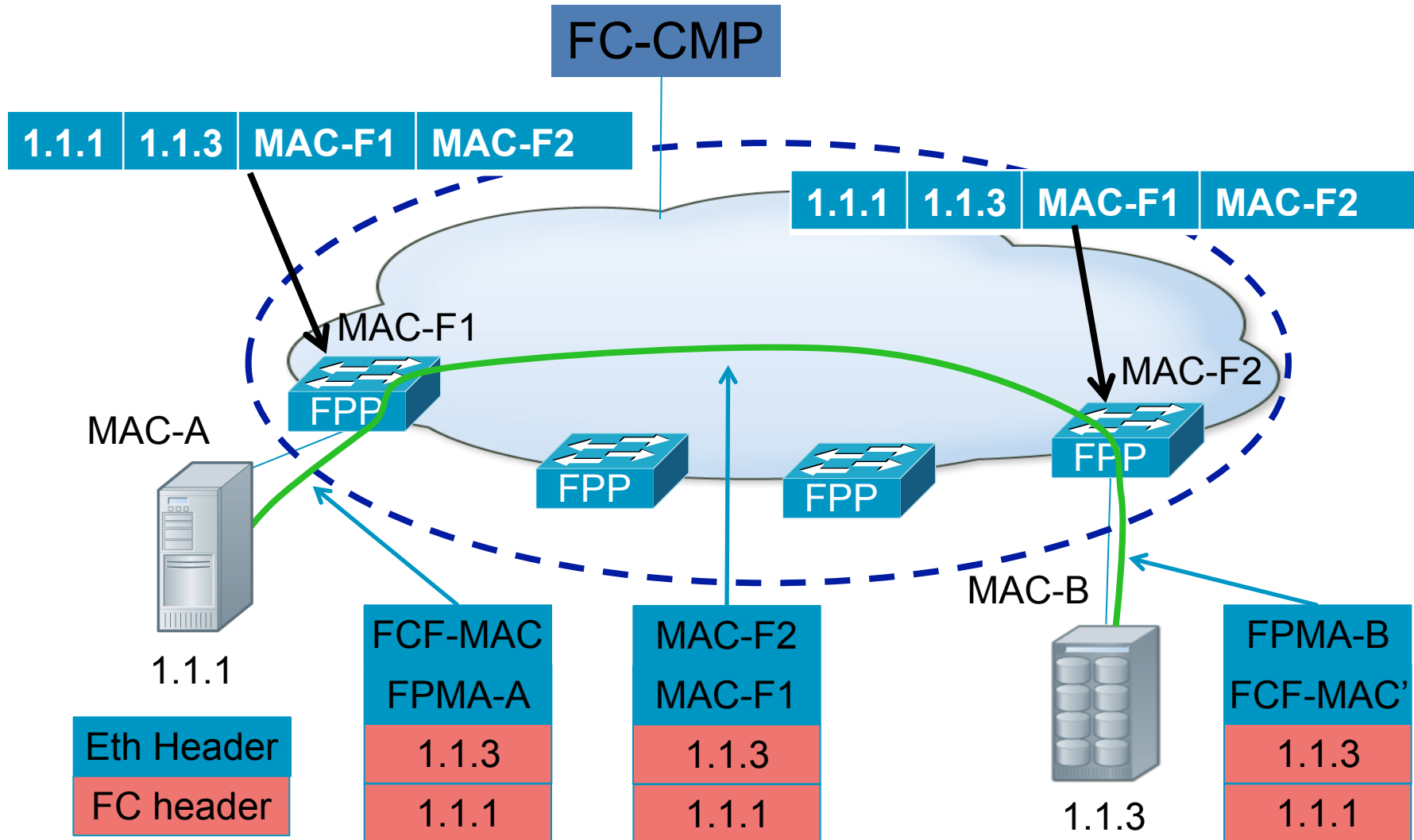
Data Plane – Redirection/Shortcut

- **Each time an FC-CMP:**
(receives an FCoE frame from an Ethernet interface) and (it forwards it on the same Ethernet interface)
then a shortcut is possible
- **FC-CMP policies control shortcuts activation**
- **Shortcuts are typically triggered by PLOGI after:**
 - the FLOGIs are completed successfully
 - the distributed zoning information is in place
 - failure to install distributed zoning disables this feature
- **FIP should be extended to carry **rewrite information** for shortcuts**

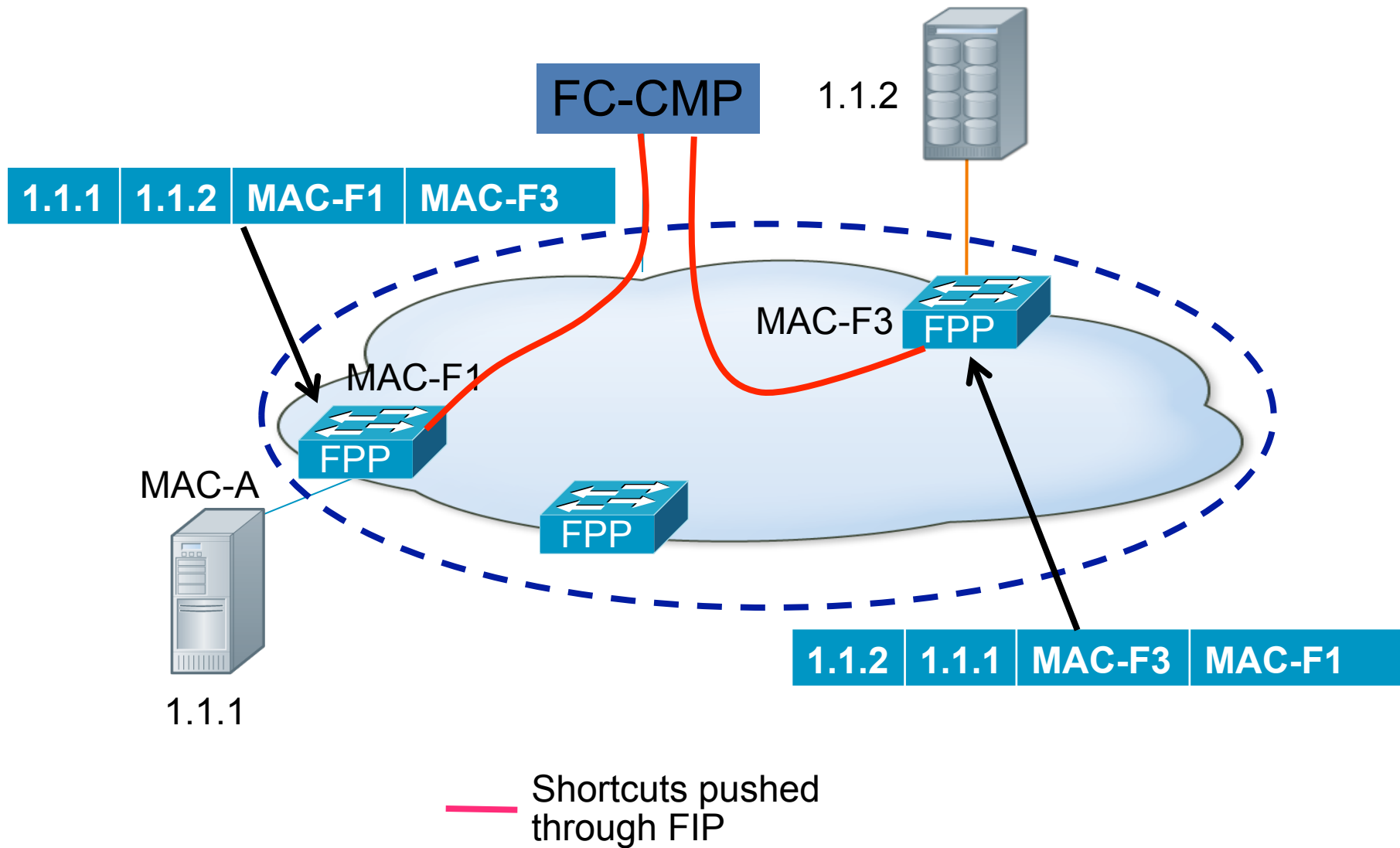
Data Plane Shortcut – Example #1



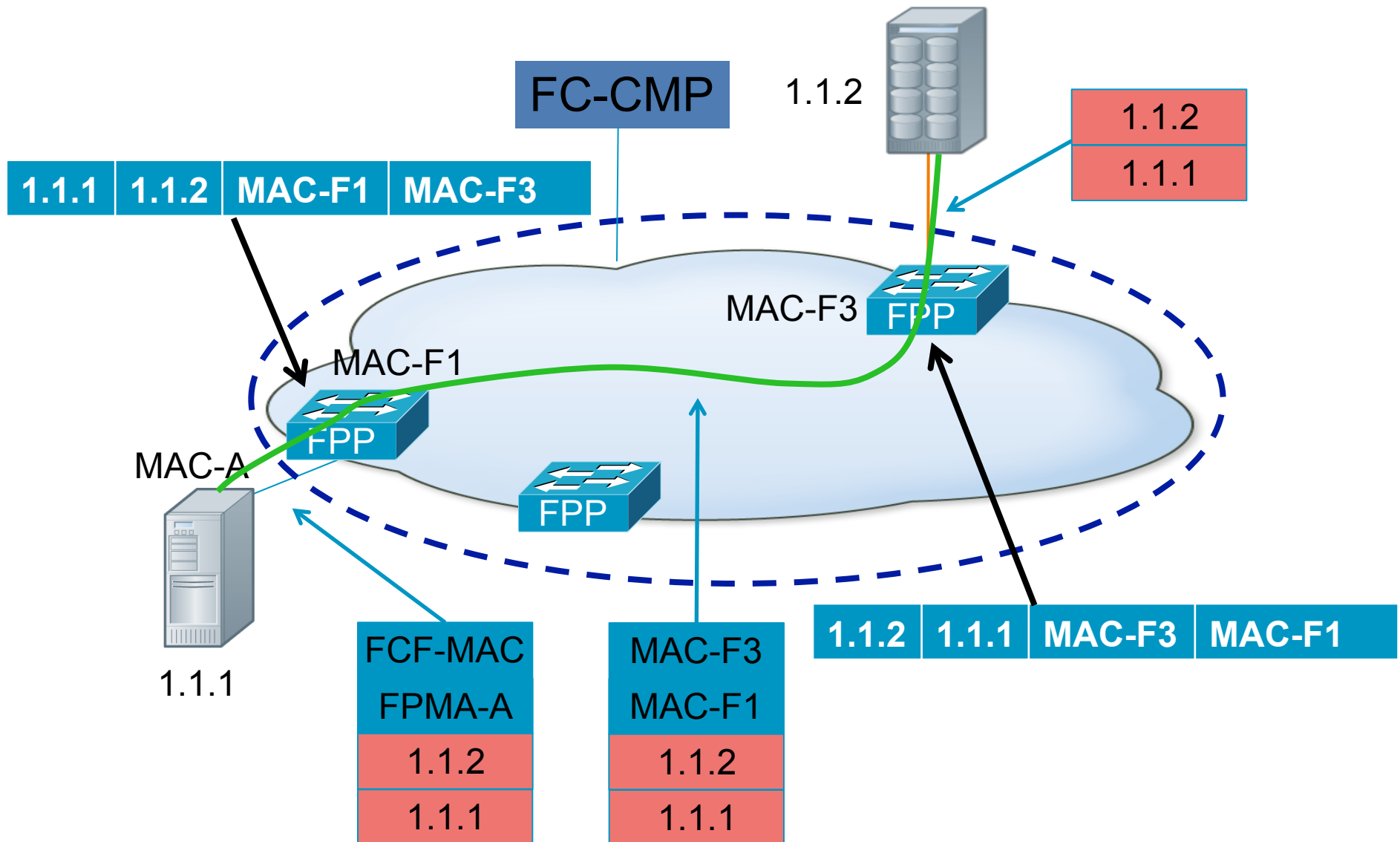
Data Plane Shortcut – Example #1



Data Plane Shortcut – Example #2



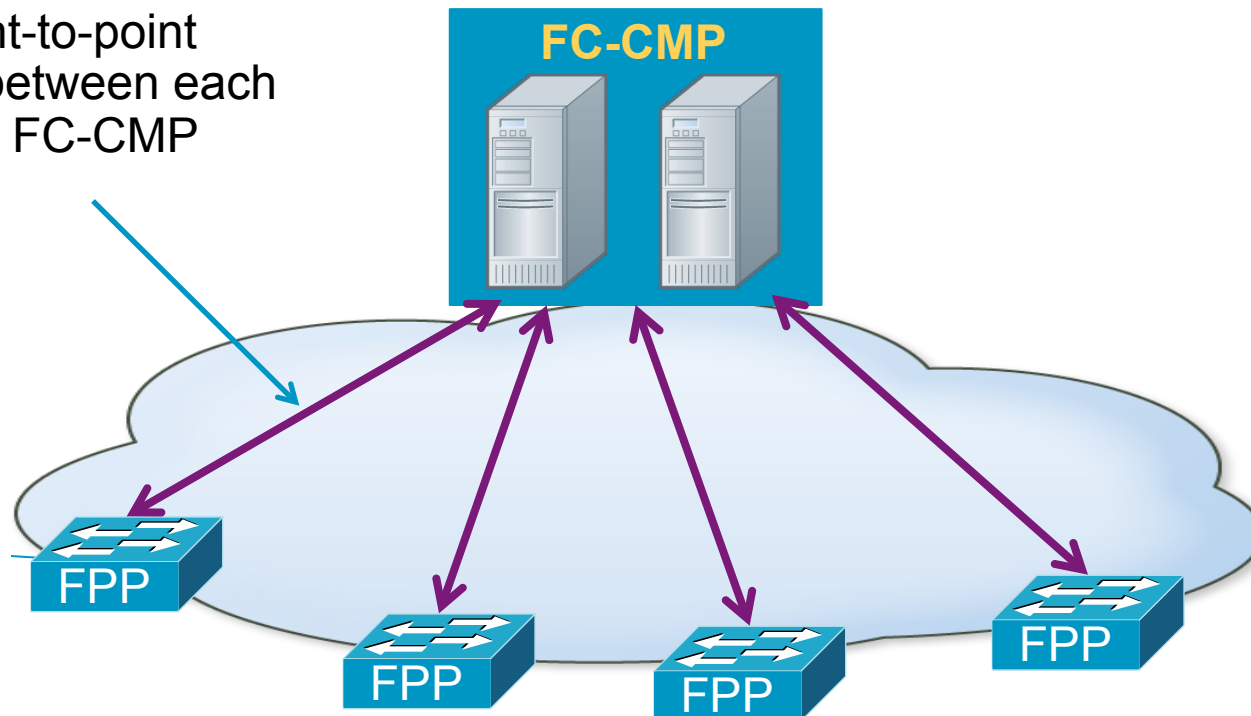
Data Plane Shortcut – Example #2



Control Plane

- Let's now focus on the control plane connection between each FPP and the FC-CMP
- The FC-CMP can be hosted in an FCF

A virtual point-to-point connection between each FPP and the FC-CMP



FPP to FC-CMP connection

- **Three major functionalities:**

- Forward FIP messages**

- Proxying the FIP protocol

- Including VLAN Discovery

- Proxying the keepalive protocol

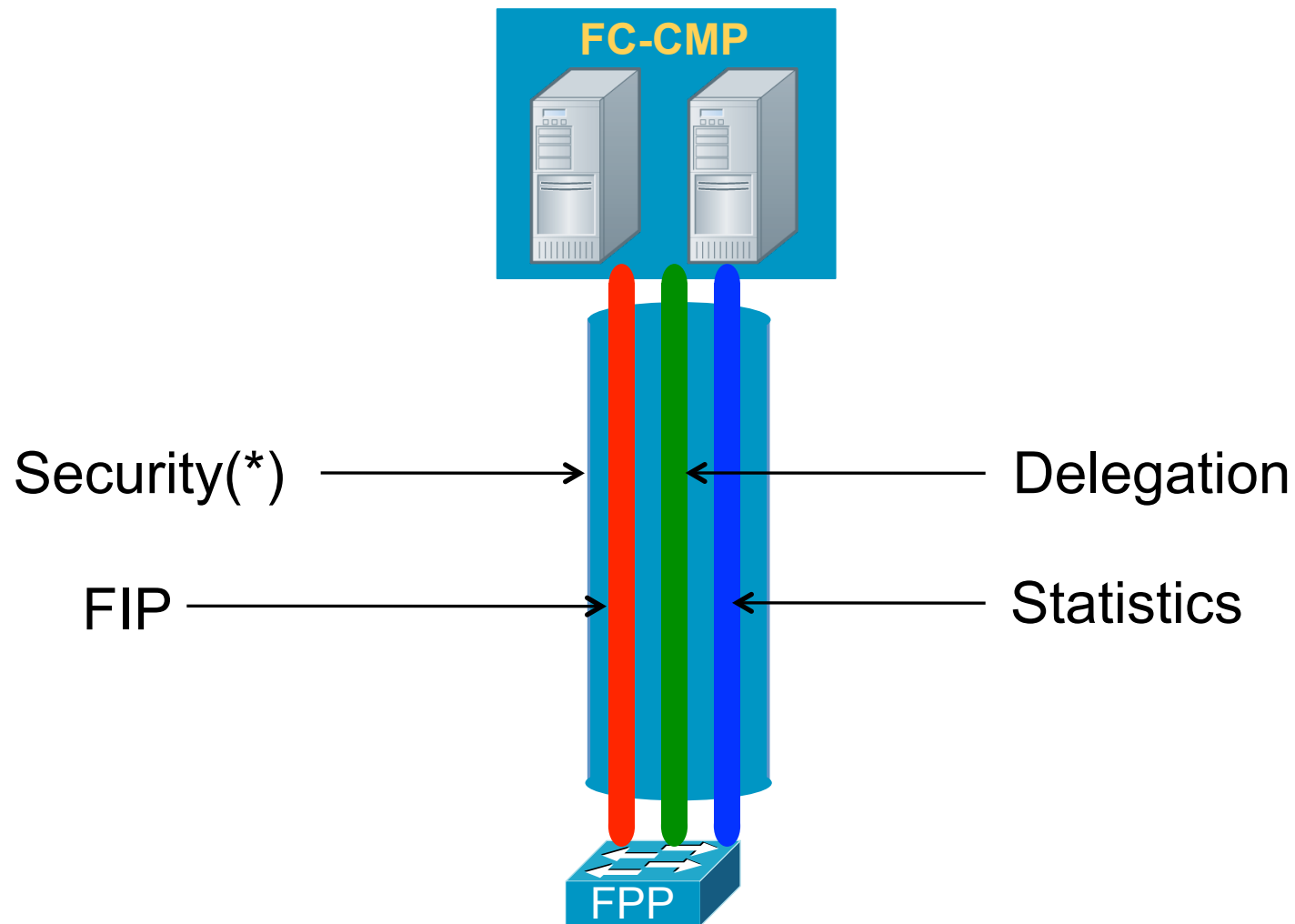
- Support a delegation protocol used by the FC-CMP to delegate to the FPP**

- Redirects using shortcuts

- Distributed zoning (FCoE ACLs)

- Support a protocol to collect statistics and monitor traffic**

Connection Organization



(*) authentication is probably all what we need

In separate presentations

- **Additional FIP messages**

Mister FIP, aka Claudio DeSanti

For next meeting

- **Security**

Landon Curt Noll

T11/09-673v0, December 2009

To IP or not to IP, this is the question

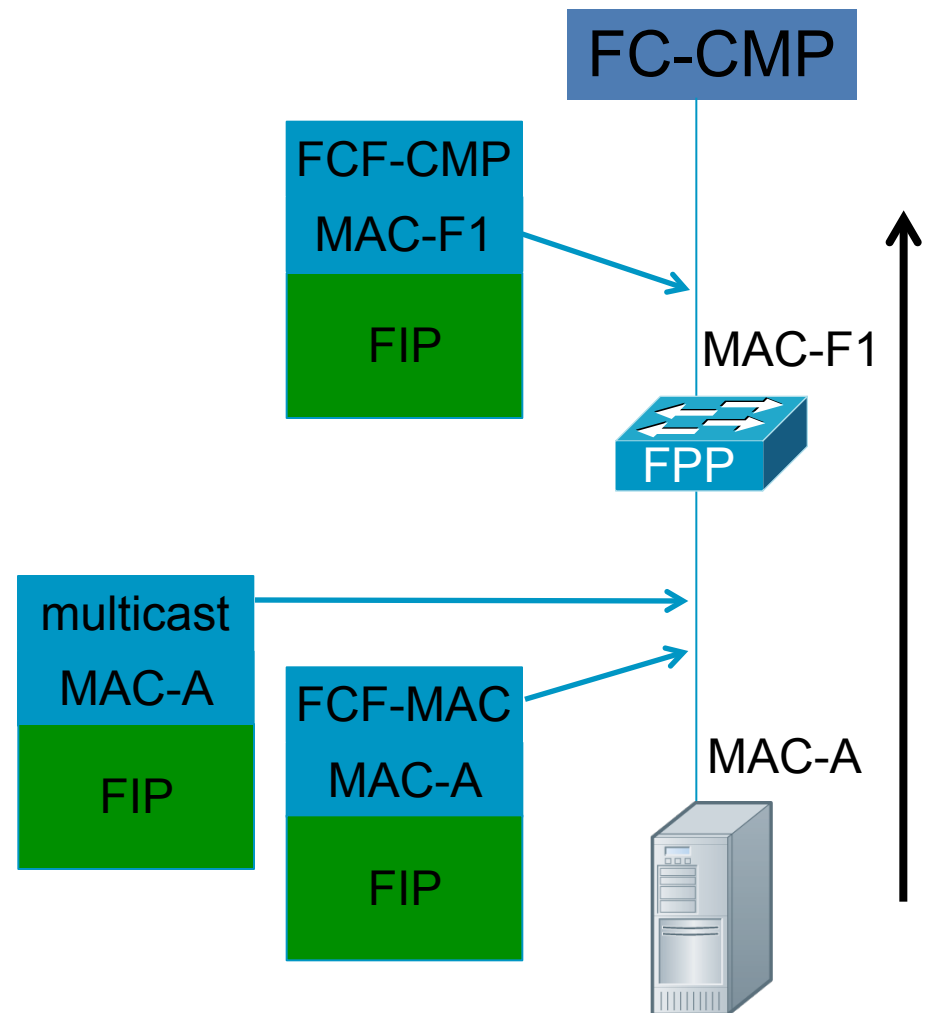
- **Last meeting we spoke of using IP and it seemed a good idea**
 - e.g. IPsec + GRE for FIP
- **Let's remind that in FC-BB-5 ENodes must be in the same layer 2 domain**
 - IP does not buy us much!
- **FCoE and FIP run over a lossless priority, while IP runs over a lossy priority**
 - If we want to use IP, we need TCP
 - Stream vs. frames
- **For these reasons we don't recommend using IP**

Alternatives to IPsec

- **Layer 2 alternatives to IPsec include:**
 - MACsec (IEEE 802.1 AE)**
 - A Cryptographic Integrity TLV for FIP**
- **See Landon's presentation**

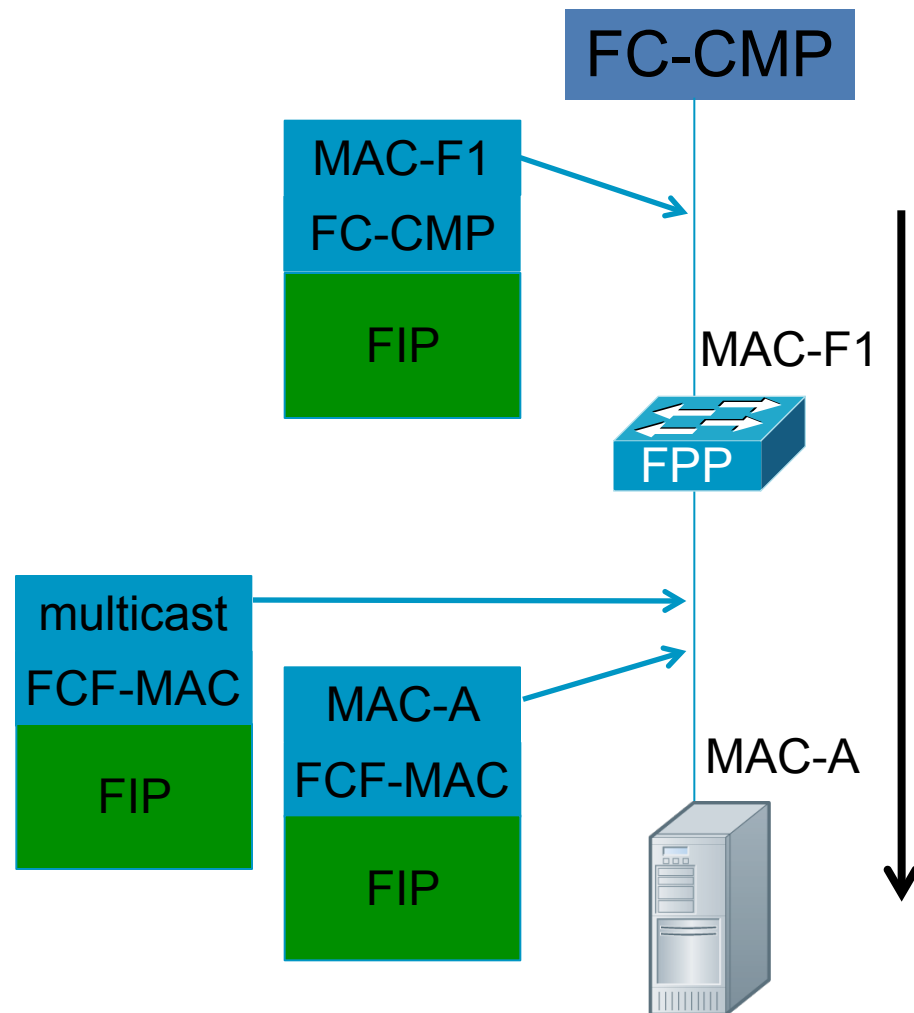
FIP from the ENode

- Both the multicast and the unicast versions of FIP messages are encapsulated into a unicast message from the FPP to the FC-CMP



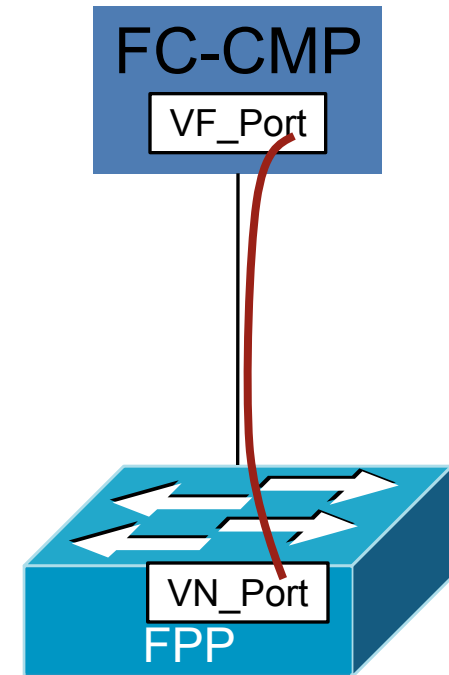
FIP to the ENode

- Both the multicast and the unicast versions of FIP messages are encapsulated into a unicast message from the FC-CMP to the FPP
- The FPP sends a unicast or multicast message depending on the FIP message



How can we deal with statistics

- **Statistics information is available in:**
 - MIB (require IP)
 - FC-GS-6 (does not require IP)
- **Let's define a VN_Port on the FPP whose sole purpose is to pass statistics using FC-GS-6**
- **This VN_Port will have a standard FCoE virtual link (VN_Port to VF_Port) with the FC-CMP**



Summary

- **FIP messages**

 - Existing one are unchanged

 - Some multicast messages between the FPP and the FC-CMP are sent as unicast

- **Distributed Zoning**

 - Add new FIP messages to update the distribute zoning information on the FPPs as a result of FLOGI/FLOGO

- **Shortcuts**

 - Add FIP messages to install rewrite rules in the FPPs

- **Statistics**

 - Add a VN_Port on the FPP to be used for FC-GS-6

Thank you



Image Credit:Flickr user kimerlyfaye
Creative Commons License

