FCoE VLAN Discovery

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Problem Statement

- **A common FCoE deployment model is to use independent VLANs**
  - **Put FCoE in one or more dedicated VLANs**
  - **Keep the other traffic on one or more other VLANs**
- **FCoE and FIP are defined on a per VLAN basis**
  - **Supporting this deployment model**
    - VLANs not supposed to carry FCoE and FIP traffic should block this traffic through ACLs at all bridges
- **If FCoE is used on multiple VLANs, these have to be properly configured on both ENodes and FCFs**
- **Is it possible to automate the FCoE VLANs configuration?**
  - **i.e., define new FIP messages to allow ENodes to discover over which VLANs the FCFs are offering FCoE services**

Issues

- **VLANs are supposed to isolate information among themselves, not to share it!**
  - **Transmitting information about certain VLANs over another VLAN is kind of ugly!**
- **The protocol has to limit the uglyness**
  - **Use separate FIP messages**
- **Alternative solution: have ENodes to listen to Advertisements over all VLANs**
  - **Too burdensome for many implementations**

FIP Operation Codes and SubCodes

Operation Code	SubCode	Operation
0001h	01h	FIP Discovery, Solicitation
	02h	FIP Discovery, Advertisement
0002h	01h	FIP Login, Request
	02h	FIP Login, Reply
0003h	01h	FIP Keep Alive
	02h	FIP Clear Virtual Link
0004h	01h	FIP VLAN Discovery, Request
	02h	FIP VLAN Discovery, Reply
All others	All others	Reserved

FIP VLAN Discovery Protocol (1)

- **Mandatory to implement, optional to use**

  If an administrator has manually configured FCoE VLANs on ENodes and FCFs, there is no need to use this protocol

  FIP and FCoE will run over the configured VLANs

  An ENode without FCoE VLANs configuration may use this protocol to discover over which VLANs FCoE is running

- **Protocol requirement:**

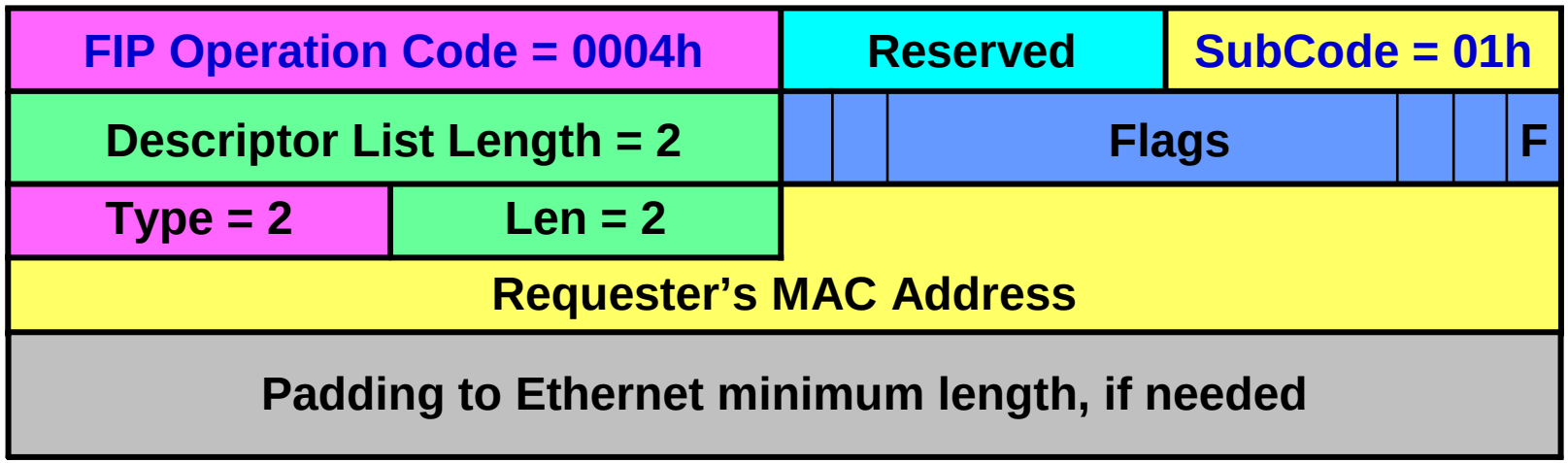
  FCFs need to listen to the All-FCF-MACs multicast MAC address over all VLANs

  Easier for FCFs than for ENodes

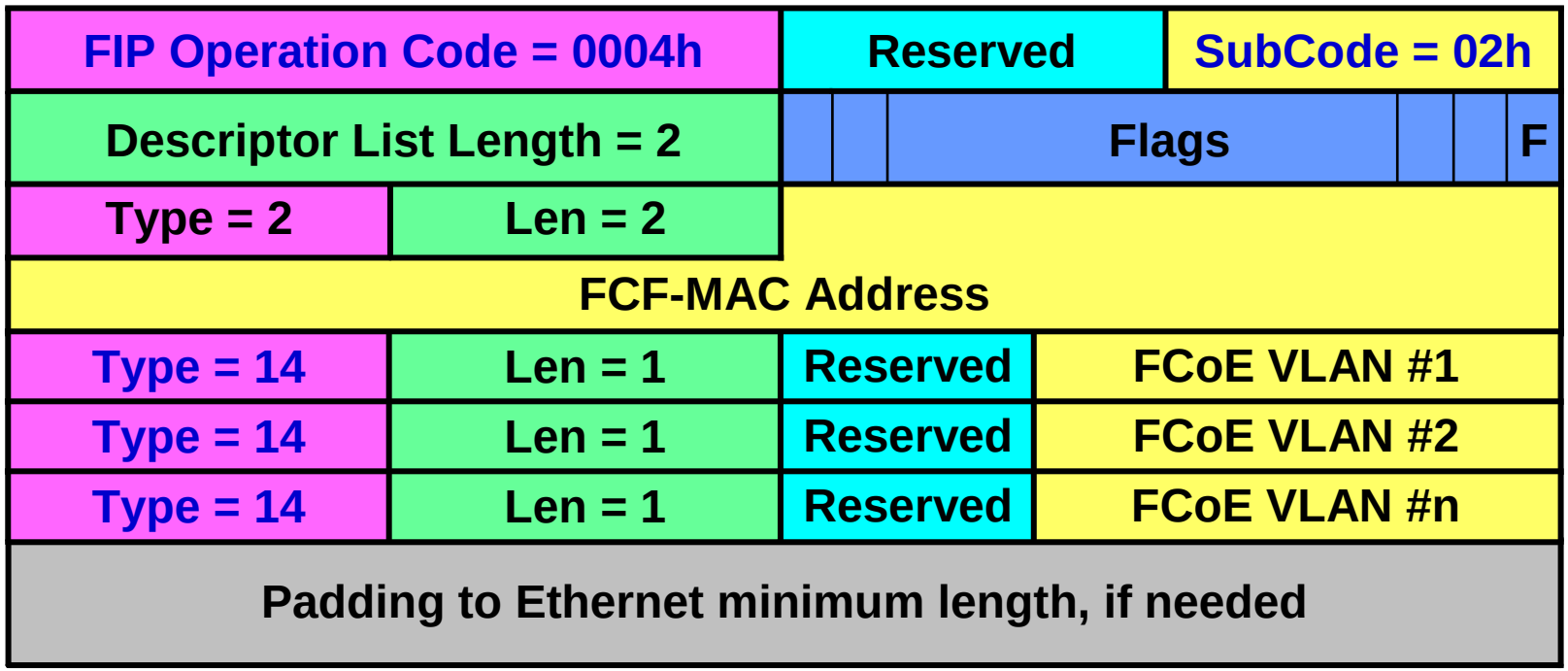
FIP VLAN Discovery Protocol (2)

- **An ENode without FCoE VLANs configuration may send a FIP VLAN Request message to the MAC address All-FCF-MACs over a VLAN available to the ENode**
  - **FCFs reachable through that VLAN receive the FIP VLAN Request message because they listen to that MAC address across all VLANs**
- **Each FCF that receives the FIP VLAN Request message replies with a unicast FIP VLAN Reply message over the same VLAN**
  - **The FIP VLAN Reply message carries the list of VLANs over which the FCF offers FCoE services**
- **The ENode may enable a subset of these VLANs for FCoE**
  - **Running the FIP protocol in these VLANs on a per VLAN basis**
    - Same processing of a “configured” ENode
    - Some VLANs that offer FCoE services on an FCF may not be reachable from the ENode
    - A FIP Solicitation with no Advertisement in reply detects these unreachable VLANs

FIP VLAN Request



FIP VLAN Reply



Extensions

- **Best practice for ENodes, from a threat model perspective:**

  Enable FIP traffic only over the default VLAN in addition to the FCoE VLANs

- **The same mechanism could be used between VE_Port capable FCF-MACs**

  Rather than only between ENodes and FCFs

Thank You