

7.9.2 FIP VLAN discovery protocol

7.9.2.1 Overview

When becoming operational, an ENode MAC or an FCF-MAC may invoke the FIP VLAN discovery protocol to discover the VLANs in the Lossless Ethernet network that provide FC-BB_E services. A VN2VN ENode MAC may use the FIP VLAN discovery protocol to discover the VLANs in the Lossless Ethernet network over which the Locally Unique N_Port_ID protocol may be used. The FIP VLAN discovery protocol is not needed if these VLANs are already known or if VLANs are not used.

7.9.2.2 ENode/FCF VLAN discovery

An ENode MAC may send a FIP VLAN Request frame to the All-FCF-MACs MAC address over an available VLAN (e.g., the port VLAN). VF_Port capable FCF-MACs that receive a FIP VLAN Request frame shall respond with a unicast FIP VLAN Notification frame over the same VLAN. The FIP VLAN Notification frame should provide the list of VLAN IDs over which the originating FCF offers FC-BB_E services. The ENode MAC that received a FIP VLAN Notification frame may enable one or more of these VLANs for subsequent operations. VF_Port capable FCF-MACs may limit the number of VLAN IDs listed in a FIP VLAN Notification frame on a per-requester basis.

Figure 43 informatively shows how an ENode MAC determines the VLANs to use for FCoE.

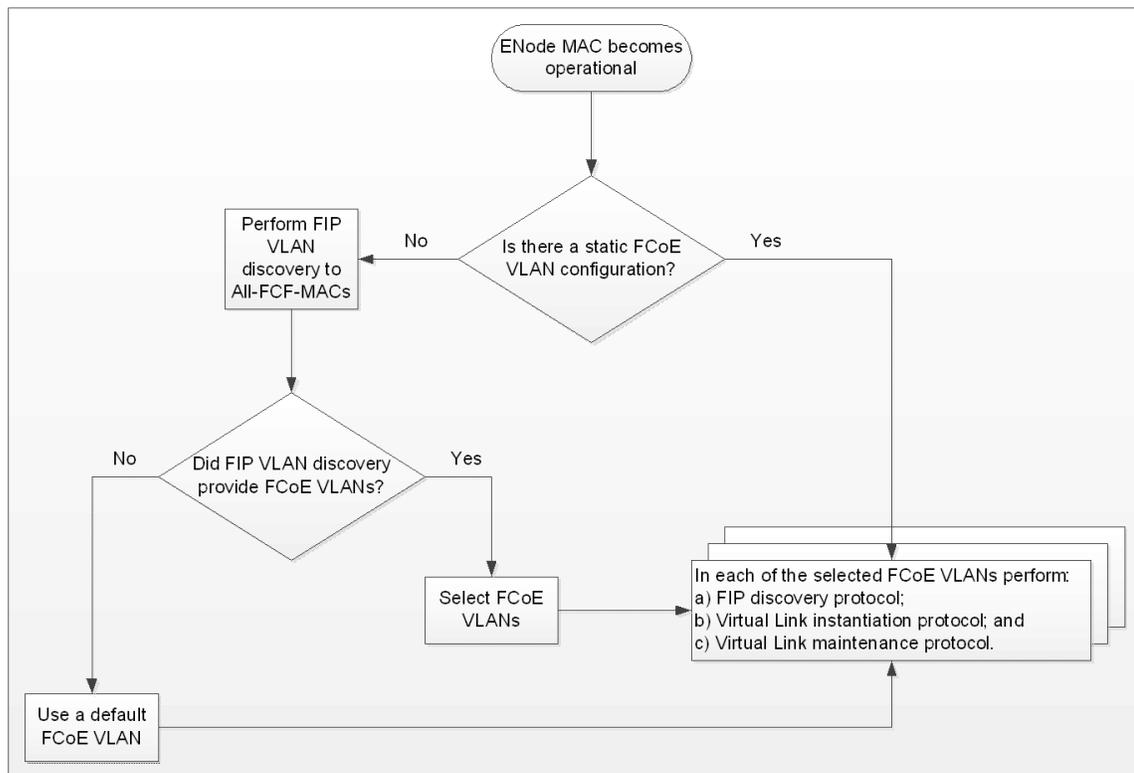


Figure 43 – VLAN discovery processing in an ENode MAC

A VF_Port capable FCF-MAC shall discard a multicast FIP VLAN Request frame that has a source address equal to its FCF-MAC address, and the FIP VLAN Request frame should be reported in a vendor specific way as an indication of a MAC address duplication.

VF_Port capable FCF-MACs shall listen to the All-FCF-MACs group address in the default VLAN and in other VLANs that ENodes may use to invoke this protocol.

If the configuration of VLANs on which a VF_Port capable FCF-MAC supports FC-BB_E services changes, that FCF-MAC should send a unicast FIP VLAN Notification frame to each ENode MAC address with which that FCF-MAC has established VN_Port to VF_Port Virtual Links. The unicast FIP VLAN Notification frame shall carry the revised list of VLAN IDs over which the originating VF_Port capable FCF-MAC offers FC-BB_E services and should be sent over the VLAN from which VLAN discovery requests were received.



Additional VLANs may provide FC-BB_E services when additional FCFs are connected to the network to which an ENode MAC is connected. In order to discover these additional VLANs, an ENode MAC may send a FIP VLAN Request frame to the All-FCF-MACs MAC address on a periodic basis.

NOTE 17 – Given that the availability of additional VLANs is due to network configuration changes, an appropriate period value for this activity is 20 seconds.

7.9.2.3 FCF/FCF VLAN discovery

A VE_Port capable FCF-MAC may send a FIP VLAN Request frame to the MAC address All-FCF-MACs over an available VLAN (e.g., the default VLAN). VE_Port capable FCF-MACs that receive a FIP VLAN Request frame shall respond with a unicast FIP VLAN Notification frame over the same VLAN. The FIP VLAN Notification frame carries the list of VLAN IDs over which the originating FCF offers FC-BB_E services. The VE_Port capable FCF-MAC that received a FIP VLAN Notification frame may enable one or more of these VLANs for subsequent operations.

A VE_Port capable FCF-MAC shall discard a multicast VLAN Request frame that has a source address equal to its FCF-MAC address. Such a VLAN Request frame should be reported in a vendor specific way as an indication of a MAC address duplication.

VE_Port capable FCF-MACs shall listen to the All-FCF-MACs group address in the default VLAN and in other VLANs that FCFs may use to invoke this protocol.

If the configuration of VLANs on which a VE_Port capable FCF-MAC supports FC-BB_E services changes, that FCF-MAC should send a unicast FIP VLAN Notification frame to each FCF-MAC address with which that FCF-MAC has established VE_Port to VE_Port Virtual Links. The unicast FIP VLAN Notification frame shall specify the revised list of VLAN IDs over which the originating VE_Port capable FCF-MAC offers FC-BB_E services and should be sent over the VLAN from which VLAN discovery requests were received.



Additional VLANs may provide FC-BB_E services when additional FCFs are connected to the network to which a VE_Port capable FCF-MAC is connected. In order to discover these additional VLANs, a VE_Port capable FCF-MAC may send a FIP VLAN Request frame to the All-FCF-MACs MAC address on a periodic basis.

NOTE 18 – Given that the availability of additional VLANs is due to network configuration changes, an appropriate period value for this activity is 20 seconds.

7.9.2.4

A VN2VN ENode may discover VLANs that provide fabric FC-BB_E services as specified in 7.9.2.2.

The network administrator may also configure a subset of the VN2VN ENodes to provide VLANs information to the other VN2VN ENodes. A VN2VN ENode MAC may send a FIP VLAN Request frame to the All-VN2VN-ENode-MACs MAC address over an available VLAN (e.g., the port VLAN). A VN2VN ENode configured to provide VLANs information to the other VN2VN ENodes shall respond with a unicast FIP VLAN Notification frame over the same VLAN. The FIP VLAN Notification frame should provide the list of VLAN IDs over which the Locally Unique N_Port_ID protocol may be used. The ENode MAC that received a FIP VLAN Notification frame may enable one or more of these VLANs for subsequent operations. VN2VN ENodes configured to provide VLANs information to the other VN2VN ENodes may limit the number of VLAN IDs listed in a FIP VLAN Notification frame on a per-requester basis.

Figure 44 informatively shows how a VN2VN ENode MAC determines the VLANs to use for FCoE.

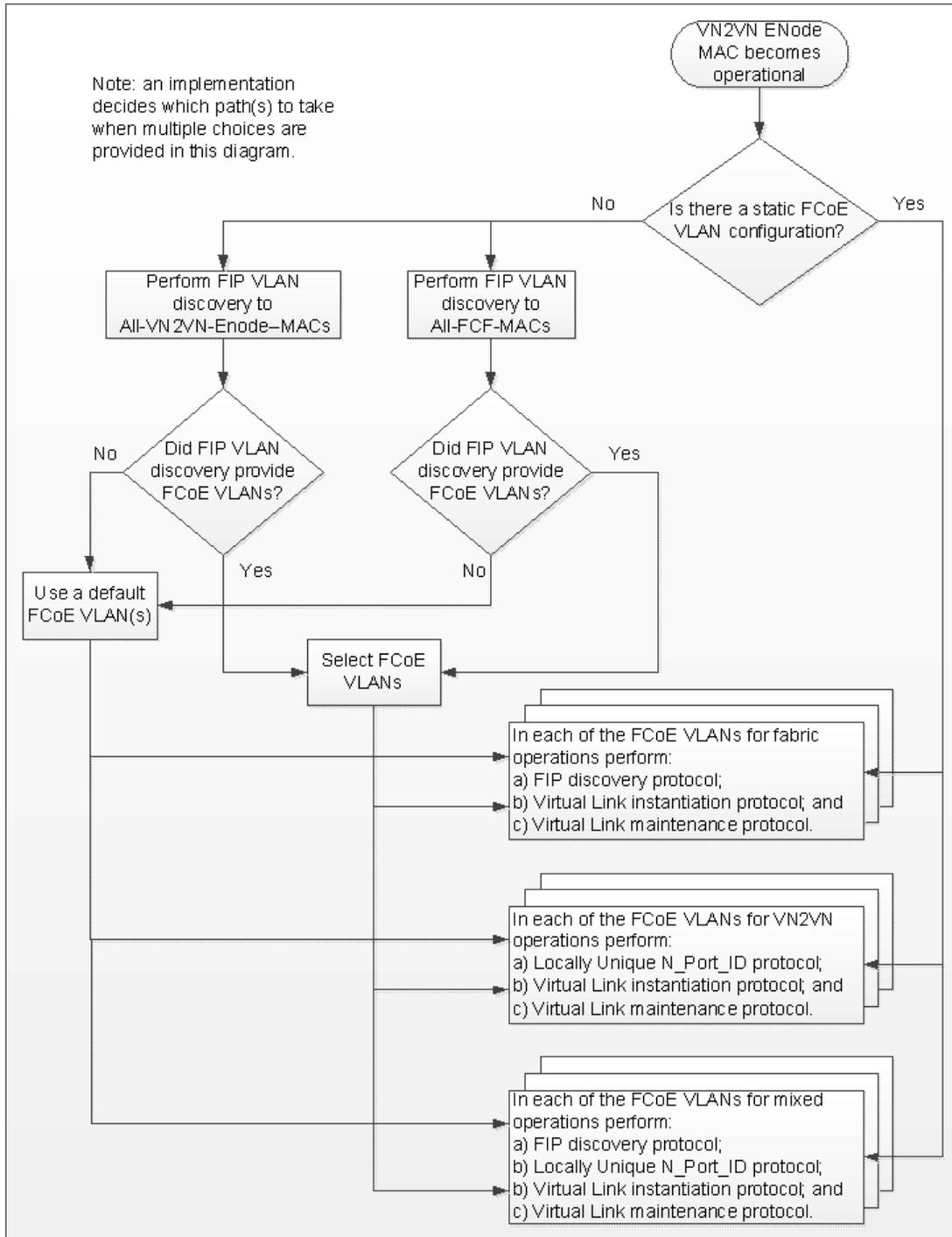


Figure 44 – VLAN discovery processing in a VN2VN ENode MAC

A VN2VN ENode configured to provide VLANs information to the other VN2VN ENodes shall discard a multicast FIP VLAN Request frame that has a source address equal to its MAC address, and the

FIP VLAN Request frame should be reported in a vendor specific way as an indication of a MAC address duplication.

If the configuration of VLANs on a VN2VN ENode configured to provide VLANs information to the other VN2VN ENodes changes, that VN2VN ENode should send a unicast FIP VLAN Notification frame to each ENode MAC address with which that VN2VN ENode has established VN_Port to VN_Port Virtual Links. The unicast FIP VLAN Notification frame shall carry the revised list of VLAN IDs over which the Locally Unique N_Port_ID protocol may be used ~~and should be sent over the VLAN from which VLAN Discovery Requests were received.~~

Additional VLANs may be used for the Locally Unique N_Port_ID protocol when additional VN2VN ENodes configured to provide VLANs information to the other VN2VN ENodes are connected to the network to which a VN2VN ENode MAC is connected. In order to discover these additional VLANs, a VN2VN ENode MAC may send a FIP VLAN Request frame to the All-VN2VN-ENode-MACs MAC address on a periodic basis.

NOTE 19 – Given that the availability of additional VLANs is due to network configuration changes, an appropriate period value for this activity is 20 seconds.

7.9.3 FIP discovery protocol

7.9.3.1 Overview

On a network deploying multiple VLANs, the FIP discovery protocol is performed in the VLANs where FC-BB_E services are offered when these VLANs are known (e.g., upon performing the FIP VLAN discovery protocol (see 7.9.2)).

7.9.3.2 ENode/FCF discovery

The FCoE Controller of a VF_Port capable FCF-MAC shall periodically transmit multicast Discovery Advertisements (see 7.9.8.3) to the All-ENode-MACs group address every FKA_ADV_PERIOD. The FKA_ADV_PERIOD period shall be randomized by adding a random delay uniformly distributed between 0 and 100 ms to avoid synchronized bursts of multicast traffic within the Ethernet network. The FCoE Controller of a VF_Port capable FCF-MAC should begin transmitting unsolicited multicast Discovery Advertisements on completion of Fabric configuration (see FC-SW-5).

The FCoE Controller of an ENode MAC shall discard incompatible Discovery Advertisements and shall create an entry for each compatible FCF-MAC in an internal FCF list.

NOTE 20 – The internal data structures used to describe this protocol are a model to express the behavior, not an implementation requirement.

Each entry in the FCF list has the following bits:

- a) 'Max FCoE Size Verified' - set to zero for entries created from unsolicited multicast Discovery Advertisements, set to one when a solicited unicast Discovery Advertisement is received; and
- b) 'Available for Login' - reflects the value of the A bit provided by the most recently received Discovery Advertisement from that VF_Port capable FCF-MAC.

The FCoE Controller of an ENode MAC selects for login a subset of the FCF-MACs in the FCF list having the 'Available for Login' bit set to one (i.e., the FCF Login Set) on the basis of a local policy that should default to selecting the one(s) with higher priority (i.e., lower priority value) in the absence of explicit configuration of other selection criteria. A FIP FLOGI may be performed with an FCF-MAC in the FCF Login Set only if its 'Max FCoE Size Verified' bit is set to one. In order to perform a FIP