EVP-LAN: Secure, Reliable, High-Speed Multi-Site Connectivity

OVERVIEW

Ethernet Virtual Private Local Area Network (EVP-LAN) service from IFN provides high-speed, any-to-any connectivity between multiple business locations across the IFN network. Unlike port-based E-LAN service, EVP-LAN service is VLAN-based. An EVP-LAN connects UNIs on a metro network, while at the same time accessing other services from one or more of those UNIs and allows for multiple VLAN-aware services to be delivered at each UNI.

Key Highlights of EVP-LAN:

- **Private & Secure:** All data travels within the secure domain of a Layer 2 dedicated, high-capacity, any-to-any connection at native Ethernet speeds.
- **Fast & Reliable:** With speeds ranging from 10Mbps to 10Gbps, EVP-LAN is a reliable, flexible and higher bandwidth alternative to traditional hub and spoke topologies utilizing Ethernet or TDM private lines
- **Standards-Based:** Upholds Ethernet Virtual Private LAN (EVP-LAN) MEF 2.0 certifications.
- **Traffic Separation:** Maintain discrete pathways when you consolidate previously separate domains for specific applications or departments onto a single network.
- **Cost Savings:** A single handoff reduces network equipment and management costs.

Service Description

- IFN Ethernet Virtual Private Local Area Network (EVP-LAN) Service is a reliable, flexible, and higher bandwidth alternative to the traditional hub and spoke topologies utilizing Ethernet or TDM private lines (Tl, DS3, SONET, etc.).
- The EVP-LAN service enables customers to connect their locations using a lower cost Ethernet interface.
- The EVP-LAN service provides one Ethernet Virtual Connection (EVC) allowing any-to-any connectivity between multiple customer locations.
- The EVP-LAN service allows the customer to use VLANS or Ethernet control protocol across the service with prior coordination with IFN via a C-VLAN/EVC Map.
- The service is offered with 10Mbps, 100Mbps, 1Gbps or 10Gbps Ethernet User-to-Network Interfaces (UNI) and is available in speed increments from 10Mbps to 10Gbps.

TECHNICAL SPECIFICATIONS

Ethernet User-to-Network Interface:

The service provides full duplex transmission of Ethernet frames using a standard IEEE 802.3 Ethernet interface. The table below lists the available UNI physical interfaces.

UNI Speed	UNI Physical Interface
10Mbps	10Base-T
100Mbps	100Base-T
1Gbps	1000Base-T 1000Base-SX 1000Base-LX 1000Base-SR 1000Base-LR
10Gbps	10GBase-SX 10GBase-SR 10GBase-LR

Figure 1: *Available UNI interface types and CBS values for different CIR increments*

Service Multiplexing:

The service enables customers to multiplex multiple services (EVCs) on a given UNI. Note that when service multiplexing is used, the sum of CIR bandwidth for all EVCs multiplexed at the UNI cannot exceed the UNI port speed.

Traffic Management:

IFN's network traffic-policing policies restrict traffic flows to the subscribed CIR for each service. If the customer-transmitted bandwidth rate for any service exceeds the subscription rate (CIR) and burst size (CBS), IFN will discard the excess frames. For frames with CoS marking the service will transmit them without altering the customer's CoS markings.

Maximum Frame Size:

The service supports a Maximum Transmission Unit (MTU) frame size of 9000 bytes to support untagged or 802.1Q tagged frame sizes. For On-Net Services delivered via the IFN Last Mile Partner Network, frame sizes may not exceed 1518 MTU size (1522 with single VLAN tag). All frames that exceed specifications shall be dropped.

VLAN Tag Preservation:

The service supports IEEE 802.1Q VLAN-tagged customer frames. All customer VLAN IDs and priority code points (IEEE 802.lp) for CoS conforming to the C-VLAN/EVC map are transmitted and received unaltered by the service. If a native VLAN is specified by the customer in the C-VLAN/EVC map, untagged frames are mapped to the native VLAN and transmitted over the corresponding EVC. Customers must coordinate their C-VLAN add/move/delete/changes with IFN. IFN may reserve one VLAN for network management purposes.

Locations:

EVP-LAN services interconnect multiple customer sites in any-to-any manner, limited by the C-VLAN/EVC map. Each customer site is referred to as a Node within the service. IFN EVP-LAN services support a maximum of 20 Node sites. Support for additional Node sites will be considered on an individual case basis.

MAC Learning Support:

In order to efficiently move traffic, EVP-LAN services learn the MAC addresses of any customer devices attached to the service. Each EVC will support learning of 250 MAC addresses. Each UNI will support learning of 250 MAC addresses. Additional MAC learning will be supported on an individual case basis.

Standard number of EVCs per UNI:

Up to 20 for Off-Net Services and On-Net Services delivered via fiber. Additional EVCs are available, charges may apply. Only one EVC is permitted for On-Net Services delivered via the IFN Partner Last Mile Network

Standard number of VLAN IDs per EVC:

Up to 20. Additional VLAN IDs are available, charges may apply. Only 1one VLAN ID is permitted for On-Net Services delivered via the IFN Partner Last Mile Network.

Ethernet Service Frame Behavior:

All Frames are delivered conditionally through the network based on which EVCs they are sent to as specified in the VLAN ID to EVC map provided by the customer. Unicast frames will be forwarded to the UNI that hosts the destination MAC address only. Multicast and Broadcast frames will be flooded to all UNIs in the service.

Layer 2 Control Protocol (L2CP) Processing:

Certain L2CP frames are discarded at the UNI, tunneled across the IFN network or peered at (processed by) the UNI. Refer to the figure below for IFN's L2CP behavior. For L2CPs with multiple behavior possibilities, the customer must specify to IFN which behavior should be taken. The default behavior is to discard these L2CP service frames.

Destination MAC Address	Layer 2 Control Protocol	L2CP Frame Behavior
01-80-C2-00-00-00	STP, RSTP, MSTP	Peer or Discard (all UNIs)
01-80-C2-00-00-01	PAUSE	Discard (all UNIs)
01-80-C2-00-00-02	LACP, LAMP	Peer or Discard (disposition specified per UNI)
01-80-C2-00-00-02	Link OAM	Peer or Discard (disposition specified per UNI)
01-80-C2-00-00-03	Port Authentication	Peer or Discard (disposition specified per UNI)
01-80-C2-00-00-07	E-LMI	Peer or Discard (disposition specified per UNI)
01-80-C2-00-00-0E	LLDP	Discard (all UNIs)
01-80-C2-00-00-20 through 01-80-C2-00-00-2F	GARP, MRP	Tunnel (all UNIs)

Figure 5: *L2CP Frame Behaviors*

More advanced technical information can be found in the appendix »