EVPL: Secure, Reliable, High-Speed Connectivity Between Multiple Locations

OVERVIEW

Ethernet Virtual Private Line (EVPL) service from IFN provides high-speed, point-to-multipoint connectivity across the IFN network. EVPL's "hub and spoke" distribution model amasses all data traffic on one network between one central location and several smaller locations, making EVPL service an attractive option for businesses with a main headquarters and multiple branch offices. EVPL is a reliable, flexible, and higher bandwidth alternative to time-division multiplex (TDM) private lines.

EVPL connects three or more locations using an Ethernet Virtual Connection (EVC), but it also enables customers to multiplex multiple services on a given User-to-Network Interface (UNI).

Key Highlights of EVPL:

- **Point-to-Multipoint Connectivity:** Link three or more business locations on one network.
- **Private & Secure:** All data travels within the secure domain of a Layer 2 dedicated, high-capacity, point-to-point connection at native Ethernet speeds.
- **Fast & Reliable:** With speeds ranging from 10Mbps to 10Gbps, EVPL is a reliable, flexible, and higher bandwidth alternative to TDM private lines like T1, DS3, and SONET.
- **Cost Savings:** Enables customers to connect their locations using a lower cost Ethernet interface.

Service Description

- IFN Ethernet Virtual Private Line (EVPL) Service is a reliable, flexible, and higher bandwidth alternative to TDM private lines (T1, DS3, SONET, etc.)
- The EVPL Service enables customers to connect their locations using a lower cost Ethernet interface
- The EVPL Service allows the customer to use VLANs or Ethernet control protocols across the service with prior coordination with IFN via a C-VLAN/EVC Map.
- The EVPL Service provides on Ethernet Virtual Connection (EVC) between two customer locations.
- 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 bidirectional, full-duplex transmission of Ethernet frames using a standard IEEE 802.3 Ethernet interface. Figure 1 lists the available UNI physical interfaces, their associated Committed Information Rate (CIR) bandwidth increments and the Committed Burst Sizes (CBS).

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

CIR Increments	CBS (bytes)
1Mbps	25,000
10Mbps	250,000
100Mbps	2,500,000
1000Mbps	25,000,000

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 a 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 802.1p) 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.

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 1 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.

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 LsCP 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	Peer or Tunnel (all UNIs)

Figure 5: *L2CP Frame Behaviors*

More advanced technical information can be found in the appendix »