

2E1 over Packet / TDM over IP



Product Overview

Valiant's 'VCL-EoIP' E1 over Packet (2 E1 Port GE Version) TDM over IP equipment supports transmission of up to 2 x E1 links over IP / Ethernet, MEF or MPLS networks.

The 'VCL-E1oP' E1 over Packet (2 E1 Port GE Version) TDM over IP equipment, equipped with a powerful PowerPC 400 MHz Processor which provides a highly reliable clock recovery mechanism for low jitter and wander control, even under variable network conditions.

2 x E1 Port E1oP (E1 over Packet) TDM over IP equipment provides 2 x GigE electrical ports along with 2 x Gigabit optical ports which allow the Users to implement 1+1 add-drop (Drop-Insert), Ethernet link redundancy (Spanning Tree Protocol) and QoS by implementing Differentiated Services (Diffserv) and packet priority classification protocols for network optimization.

The 'VCL-E1oP' E1 over Packet (2 E1 Port GE Version) TDM over IP equipment also optimizes on the network usage, such that the bandwidth used by the E1oP equipment on the packet network is limited to the corresponding to the number of E1 ports and the time-slots that are being transported over the Ethernet / packet network.

Purpose of TDM over Packet technology

Telecom companies and enterprise users can save network and equipment cost and generate additional revenue by offering different types of services over a single packet-switched infrastructure by the use of E1oP equipment. The E1oP equipment is also suitable for connecting to Ethernet / packet wireless equipment to achieve fast deployment of E1 services over wireless Ethernet networks. One particular application is to build E1 links with low cost Wireless LAN bridges, replacing expensive TDM / E1 microwave radios.

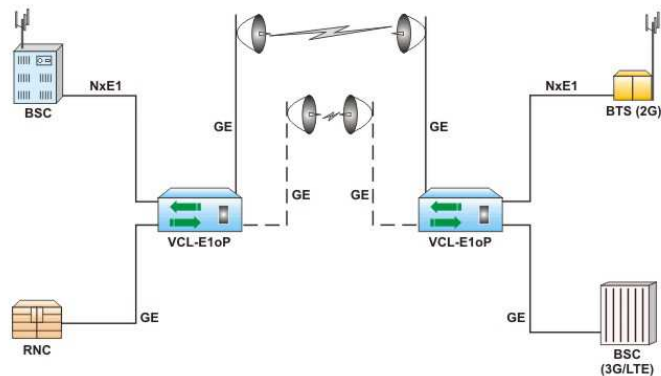
The 2 x E1 over Ethernet (VCL-E1oP) multiplexer may be used to provide legacy TDM services over Gigabit Ethernet optical fiber, or wireless Ethernet/IP networks.

How the TDM over Packet (2 E1 Port GE Version) equipment works

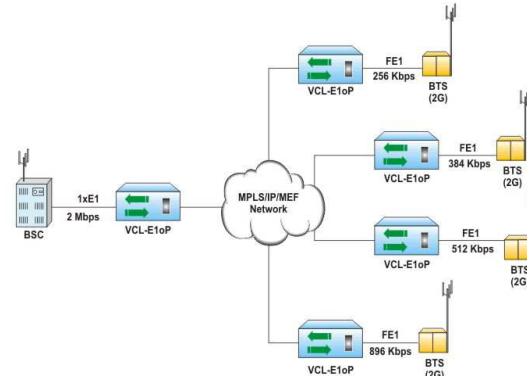
The E1 data streams received on the E1 interfaces are converted by the E1oP engine of the E1oP equipment to Ethernet data packets (of a fixed size) and transported over the Ethernet network with UDP / IP, MEF or MPLS headers. At the receiving end the E1oP reconstructs the original data streams by removing the IP, MEF or MPLS headers and converts the Ethernet data packets back to E1 frames using highly reliable and accurate clock recovery mechanism. The 'VCL-E1oP' (2 E1 port GE Version) offers the user a choice of standard, E1 to packet and packet to E1 conversion mechanisms that include SAToP and CESoPSN technologies.

TDM over IP with 2E1.

Supports CESoPSN, SAToP, Pseudowire, Diffserv, QoS, point-to-multipoint, drop and insert applications.



2G / 3G / LTE - Typical Application in a redundant Wireless Network (1+1 Link Redundancy)



TDM over IP with Fractional E1 (Supports CESoPSN)

Hardware Highlights

- 19-inch rack mountable 1U form factor (44mm)
- 1+1 Redundant Power Supplies, AC and DC, or AC plus DC.
- Extended Temperature Range: (-20°C to +60°C)
- EMI / EMC Compliant
- Real Time battery backed clock with life in excess of 10 Years
- Power over Ethernet (PoE) - Optional

E1 Clock recovery and synchronization techniques:

- Adaptive Clock Recovery (ACKL)
- Recovered Clock (RCLK) / Loop-Timed Clock
- Asymmetrical (One-Clock and Two-Clock) Clock
- Synchronization to an External Clock (ECLK)
- Synchronization to an Internal Clock
- Automatic clock priority selection with fall back
- Plesiochronous Clocking.

Key Features - E1 and E1oP Interface

- Supports 2 independent E1 interfaces.
- Internal, External, Adaptive, Recovered clock and Asymmetrical (One-Clock and Two-Clock) options for the E1 TDM port synchronization. Automatic clock priority selection with fall back.
- Absolute and Differential times tamps.
- Jitter and Wander conforms to G.823/G.824 and G.8261 and TDM specifications.
- Supports three E1 framing modes - Framed, Unframed and Multi-framed with CAS signaling.
- Supports IETF-PWE3 (pseudo-wire), SAToP and CESoPSN transport mechanisms.
- Supports CESoPSN payload mechanism to support the fractional E1 with data rate of 64Kbps to 2.048Mbps (DS0 timeslot level). User configurable data rate from 64Kbps to 2048Kbps, in steps of 64Kbps.
- CESoPSN payload mechanism feature allows the user to optimize the packet switched network by limiting its usage to the corresponding number of timeslots carried by an E1 channel.
- Supports SAToP payload mechanism to transport full E1 (transparent to the structure of the TDM frame useful for transporting framed / unframed E1 channels).
- Supports network latency/packet delay variation/jitter buffer of up to 512ms.
- Supports IP, MPLS and MEF8 (Metro Ethernet) addressing.
- 120 ohms balanced E1 interfaces. Optional 75 Ohms BNC interface (120 Ohms to 75 Ohms cables provided).
- E1 Loopback facility for testing and diagnostics.

Key Features - Ethernet / IP Network Interface

- Switching Capacity upto 6 Gbps, non-blocking
- 4 GigE Ports
- Optical SFP based (1000Base-FX) and Electrical (10/100/1000Base-T) Ethernet Port options
 - 2 x 10/100/1000BaseT Copper Ports
 - 2 x 1000BaseFX Optical Fiber Ports

- Point-to-point and point-to-multipoint applications based on IP addressing
- Supports drop and insert applications
- Port Control Ingress Rate Limiting
- 1+1 Hitless Ethernet Link Redundancy Port Trunking
- Spanning Tree Protocol
- IGMP Snooping
- Supports QoS, 802.1p based packet priority
- Tagged/Un-Tagged/Un-Modified 802.1Q Mode
- Q-in-Q Tagging
- User configurable MTU (E1oP payload) packet size. May be configured from 1 to 1800 Bytes
- Switch supports jumbo frame sizes of up to 9000 Bytes
- Port based and Tag based VLANs
- Single / Double 802.1 VLAN tagging (Q in Q VLAN Tagging) user configurable
- Supports QoS on 802.1p based packet priority
- Supports Packet priority assignment (IP Diffserv / DSCP)
- UDP-specific "Special" Ethernet type
- In band VCCV ARP
- Broadcast DA.

Key Features - System Management, Monitoring and Alarm Interfaces

- NMS (Network Management System) to monitor multiple units from single Central Location
- External Alarm - Dry contact relay alarms are also available at rear of the system to connect the system to an external alarm
- Supports system temperature monitoring with High Temperature and Low Temperature alarms and SNMP Traps
- Supports SNMP V2 Monitoring and Traps
- UDP-specific "Special" Ethernet type
- Self-test for checking system errors upon system bootup
- Event Logging
- Clock Performance Alarms
- Network Performance Alarms
- Network Performance Monitoring and Diagnostics
- Online / remote upgrade of firmware

OAM: Operation and Management Ports

- RS232 (DB9) Serial Port.
- 10/100/1000BaseT Ethernet Management for In-band remote access.

System Access, Control and Management Options

- Telnet.
- CLI Control Interface (HyperTerminal or VT100).
- SNMP V2 Traps (MIB File provided).
- Windows based GUI (Graphical User Interface) for easy configuration, management and access. Ability to monitor multiple units from a single NMS.
- Password Protection.