

Harpoon—Metro Ethernet Switch

24× Gigabit Ethernet + 2× 10GE



- Reference design for complete Metro Ethernet Switch giving short time-to-market for system vendor's.
- Full access to all design and manufacturing IP.
- Based on the leading key components for Metro Ethernet—the X11 Network Processor from Xelerated and the FAP20VM Traffic Manager from Dune Networks ensuring wirespeed performance and carrier grade QoS handling.
- Compact 19" rack mountable 1U size with front-to-back cooling and fan redundancy for use in carrier environment.
- Includes Xelerated's industry leading, network proven Metro Ethernet Application and with APIs for control plane software integration.
- Incorporates Dune FAP20V Traffic Manager API Driver to configure scheduler and shapers and support multicast schemes

Harpoon is a high functionality Metro Ethernet reference design engineered to telecom standards on equipment practice and availability. It is based on the X11 NPU and the FAP20VM TM. All manufacturing IP and software source code is available to customers.

Introduction

Xelerated's X11 Network Processor and Dune Networks FAP20VM Traffic Manager combines to provide the most powerful and cost effective solution for high function Metro Ethernet switches and IPv6 capable switch/routers. Harpoon is a full-featured reference design based on these-price/performance leading merchant devices in 1U pizabox format for use in carrier environment.

In order to minimize time-to-market, system vendors can use Harpoon with minimal customer adaptations (i.e colour, front panel graphics and table memory sizes), and set up their own production using the full manufacturing IP available from Xelerated/Dune.

The product is designed to comply with European EMC emissions and safety regulations, and to pass certification for multiple other international regulatory requirements.

Target Networks

The target networks for Harpoon are primarily the edge of carrier networks where classification, QoS enforcement and individual service bandwidth management are required.

Support for provider VLAN bridging with customizable classifications to S and C tags, IPv4/v6 routing and MPLS in combination with guaranteed rate access and QoS differentiation makes it an ideal product for PON aggregation, IP-DSLAM aggregation and E-LAN provisioning with VPLS to enterprises.

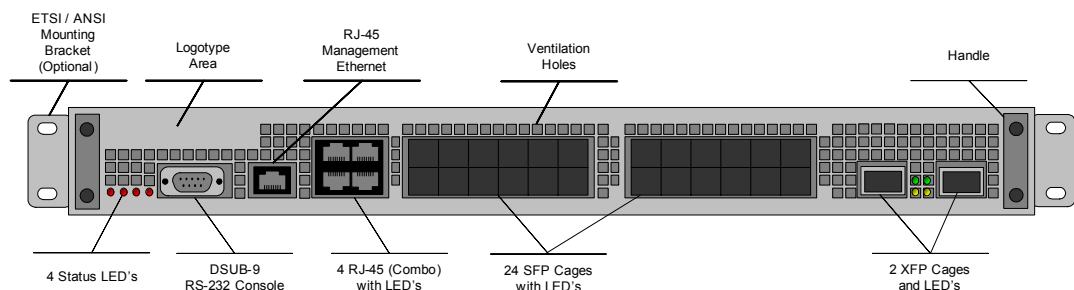
It is also capable of delivering multicast services as needed by IPTV delivery in triple play scenarios.

Interfaces and Product Variants

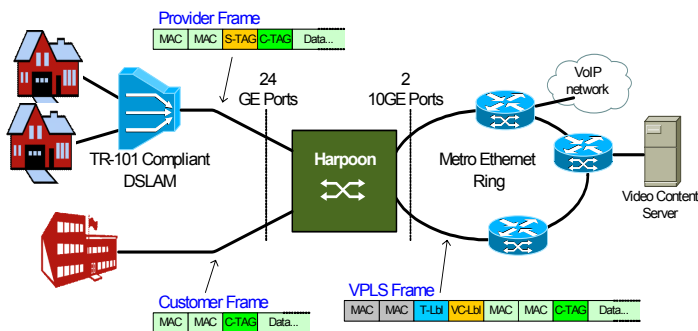
Harpoon is available with 24 SFP cages and four copper RJ45 ports, but can easily be re-designed other interface alternatives. Four of the GE ports are combo copper/fiber, which gives a high degree of flexibility when connecting to other on-site networking equipment.

It also has two XFP cages that hold 10G transceivers for 10GBASE-SR, LR or ER typically used as uplinks.

Further, the product has two management interfaces, one RJ45 ethernet and one DB9 serial console.



Harpoon features two XFP cages for pluggable 10GE optical interfaces, 24 SFP slots for pluggable GE optical interfaces and four copper RJ45 for 10/100/1000BaseT. Management can be done over either Ethernet or serial console port.



The feature set matches the needs for carriers in the Metro Ethernet where reliability and feature flexibility is of high importance. It is an ideal product for IPDSLAM or PON aggregation, FTTH and enterprise VPN provisioning

Contents and Features

Customers to Harpoon gain access to:

- Complete hardware design material for PCB and mechanics including schematics, BOM, Gerber files, CAD files and assembly files.
- X11 Metro Ethernet Application (MEA) in source code for running in the X11 Network processors with C level API's in the control plane CPU.
- FAP20VM software API source code to enable easy configuration of Traffic Manager
- Boot, kernel, file system and debug CLIs for controlling the platform and its key devices
- Drivers for temperature and sensors, front panel LEDs and for fan supervision

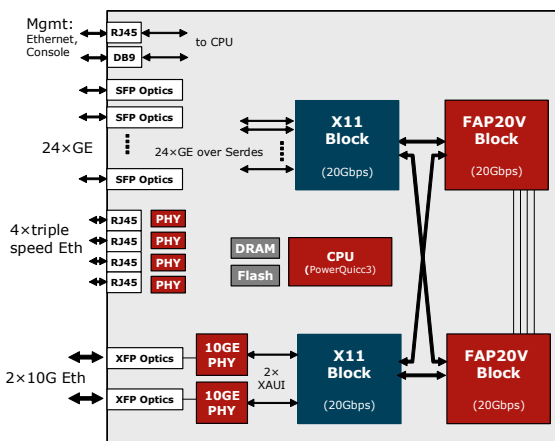
The design is based around two X11 and two FAP20VM devices. The X11 provides the line interface, MAC functionality and the packet processing for both ingress and egress while the FAP20V provides granular queuing, and programmable hierarchical scheduling and shaping.

The forwarding software can be further developed for feature differentiation by the customer by using the Xelerator™ Software Development Kit (SDK), which is a powerful clock-cycle accurate environment for developing X11 applications.

The Metro Ethernet Application

The included Metro Ethernet Application (MEA) that runs in the two X11s is full-featured and designed for the metro environment with features such as:

- IEEE 802.1d/q Bridging with 1M MAC addresses
- IEEE 802.1ad Provider Bridging, Provider Bridge & Provider Edge Bridge with per port VLAN translation
- IEEE 802.1w/s Rapid Reconfiguration of Spanning Trees and Multiple Spanning Trees
- IEEE 802.3ad Link Aggregation
- IEEE 802.1ah MAC-in-MAC
- IEEE 802.1ag, 802.3ah OAM
- MPLS LER, LSR functionality with pop and push of multiple labels, supporting L-LSPs and E-LSPs
- VPLS with 128K service instances (VLANs)
- IPv4 and IPv6 unicast forwarding with up to 512K prefixes
- MEF compliant dual-rate meters and associated counters per colour.
- Hardware based MAC address learning and ageing



Block diagram of Harpoon



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