

GENERAL DESCRIPTION

MetroXS is a complete carrier class 5G multi-service access reference design that achieves Ethernet & Resilient Packet Ring (RPR) transport over SONET/SDH networks. MetroXS is composed of several market-proven Exar devices: the EXtendAR 48 (XRT95L53) multi-protocol framer, and Exar's OC-48/STM-16 SONET/SDH PHY (XRT91L80), plus a channelized 5G Resilient Packet Ring (RPR) MAC, and 4 GE/24 FE port Ethernet aggregator. In addition, MetroXS includes Exar's unified software API structure enabling system vendors to port their innovative applications on this platform with ease.

The hardware supports point-to-point or ring network configuration for the efficient and cost effective transport of packet data. The data path of processing elements is defined by a MPoS mapper (the XRT95L53), a 5G BW RPR-MAC, and a 4-port triple-rate Ethernet aggregation device. The RPR-MAC east-side client port is sourced from the Ethernet aggregator while the un-occupied client port may be sourced from a third party network processor. The configuration and control of these data-path processing elements is performed with an MPC866 SBC hosting embedded Linux 2.6.

The MetroXS software comprises of a suite of embedded Linux 2.6 low-level device drivers and OS transparent API for configuration and control of the data-path. The stacked architecture lends itself for easy portability of the device drivers and API across other OS platforms. A PC hosted GUI client communicates over a 10/100Base-Tx link with the MetroXS CLI shim layer over the API. The software suite also supports a diagnostic back-door serial port during bring-up and debug for future system level enhancements.

BENEFITS

- Best of SONET and Ethernet:
 - Fair access to ring bandwidth
 - Guaranteed BW allocation to high priority traffic
 - 50 ms ring protection
 - Optimized and cost-effective for data/cell based traffic
- Flexible architecture supports multiple services:
 - TDM services with flexible and dynamic provisioning
 - Efficient transport of PDU traffic over NG SONET/SDH
 - MEF E-Line Services
 - MEF E-LAN services

- Software:
 - Full suite of software:
 - Embedded Linux 2.6 Low level drivers
 - API for configuring and controlling Client, RMAC & Transport
 - Optional higher layer software to implement a full-featured RPR system
 - Highly portable software
 - Platform independent API
 - OS adaptation layer features

FEATURES

CLIENT SIDE FEATURES

- 4 10/100/1000 Base-Tx copper ports
 - IEEE 802.3x Flow control including jumbo frames
 - IEEE 802.1p Class of service, priority protocols
 - IEEE 802.3ad link aggregation
 - IEEE 802.1ad VLAN Stacking
- Traffic Engineering & QoS
 - Flexible BW Oversubscription up to 4:1 using MDRR scheduling algorithm
 - Class of Service, CoS per port identified by
 - IEEE 802.1Q VLAN tagging
 - IEEE 802.1p with 8 queues per port
 - IP DSCP field
 - Port based ingress traffic policing using TRTCM with a granularity of 64Kbps
 - WRED based scheduling algorithm per queue
 - Port-based egress traffic shaping in 64Kbps steps
- Extensive RMON statistics

TRANSPORT FEATURES

- Supports 2xOC-48 SONET/SDH rings
 - Sub 50ms of failure recovery
- Efficient transport for multi-protocol PDUs: ATM, Ethernet, LAPS, PPP, HDLC, GFP-F
- Compliant to G.7042 next-gen SONET/SDH for dynamic bandwidth provisioning using VCAT/LCAS
- Support for GR-253 compliant alarms and performance monitoring RPR FEATURES
- Compliant to IEEE 802.17
- RPR node Topology Database, 256 entries
- Supports Steering, and ringlet selection
- Supports 4 Class of Service
 - Class A0 (guaranteed bandwidth) & A1
 - Class B: B-CIR and B-EIR
- Supports rate limiting of Class A, B-CIR, B-EIR, C

INDUSTRY-FIRST, 5G MULTI-SERVICE ACCESS PLATFORM

- Separate shapers for 4 Classes
- Supports Spatial reuse
- Support wrap and steer protection with WTR < 50 ms
- Each ringlet can support bandwidth of 2.5 Gbps
- Client side add/drop of 5 Gbps
- Provide counters for unicast, multicast, broadcast frame and byte counters for 4 Classes

- RS232 DB-9 Serial craft port

Collateral supplied:

- H/W Schematics
- Board PCB Layout
- Board Design Guidelines
- Quick User's Guide
- S/W API Documents
- Datasheets for each device

REFERENCE DESIGN

Hardware includes XRT95L53 (MPoS Framer), XRT91L80 (SONET PHY),RPR-MAC, Ethernet Aggr Mux with a MPC866 PPC SBC using embedded Linux 2.6 and associated drivers. The box is shipped with the following interfaces:

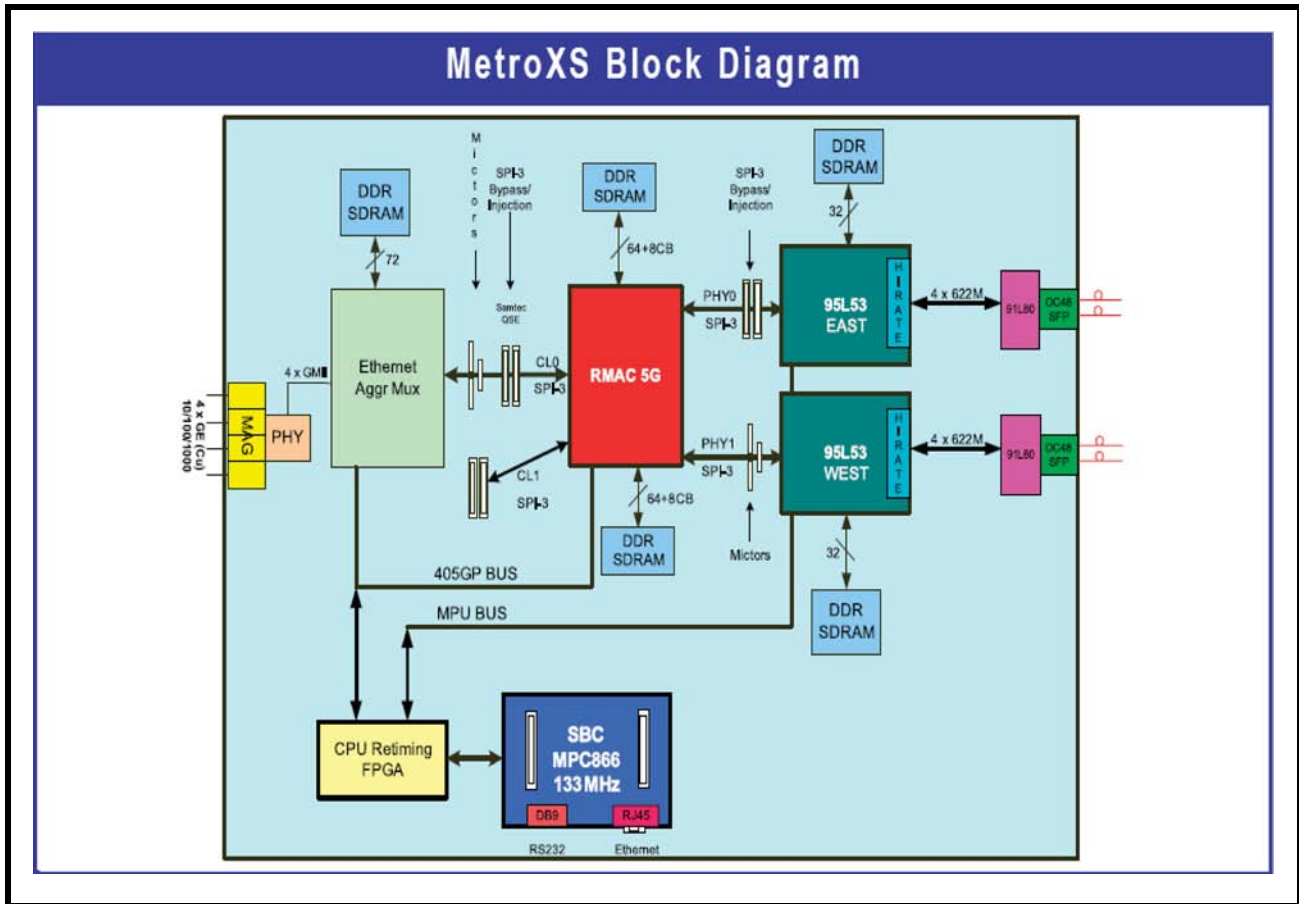
- XRT95L53
- XRT91L80
- RPR-MAC
- Ethernet Aggr Mux

Sheet Metal Enclosure:

- Clients: 4 GE RJ-45 copper ports
- Network Trunk: 2xOC-48 rings
- 10/100 RJ-45 Management port

- 1 RU, 19" Rack mountable

FIGURE 1. BLOCK DIAGRAM OF XRT91L82



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Datasheet March 2007.

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