

Xelerator[®] X11 Reference Design Kit 4 - RDK4



- Compact modular design including two X11 devices
- Four internal SPI-4.2 connectors for optional connection to Traffic Manager or external Framer/MACs.
- Compact 19" rack mountable 1U size with front-to-back cooling
 - 24 x Gigabit Ethernet (SFP), of which 4 are combo fiber/copper
 - 2 x 10G Ethernet (XFP)
- On-board PowerPC CPU system with an open Linux environment for management and control plane.
- Integrates with Xelerateds full-featured Metro Ethernet applications with MPLS/VPLS, PBB-TE, and IPv4/IPv6 routing

The Xelerator[®] X11 Reference Design Kit 4 is a Network Processor development platform for the X11 family of NPUs.

Introduction

The Xelerator[®] X11 Reference Design Kit 4 (RDK4) is a complete development platform for target development on the X11 Network Processor, using Xelerateds' Software Development Kit (SDK). RDK4 includes all hardware and software required for X11 forwarding and/or control plane design, integration and test, as well as full documentation and CAD files for the PBA design.

Early design of forwarding-plane applications significantly shortens time-to-market for system vendors. With the RDK, forwarding plane applications can be verified in hardware, and be ready for deployment at the time of design completion of the target boards. Furthermore, the risk of target board re-spin can be reduced by early implementation of critical parts of the data path.

A Platform for Design and Verification

Xelerated's verified full-featured forwarding applications, MEA, is available in source code to customers. It runs on both the reference board and in the clock-cycle accurate simulator included in the Xelerator SDK. This enables rapid development of forwarding-plane applications for the X11 NPU together with early verification and regression testing.

The applications include the following features:

- L2-L3 multicast forwarding including IEEE802.1Q, 802.1ad 802.1ah, IPv4/IPv6 and MPLS

- Edge bridge functionality for IEEE 802.1ad, 802.1ah, VPLS, PWE3, MPLS LER
- Connection OAM (IEEE 802.1ag)
- Metering, counting, MSTP, ACLs etc.

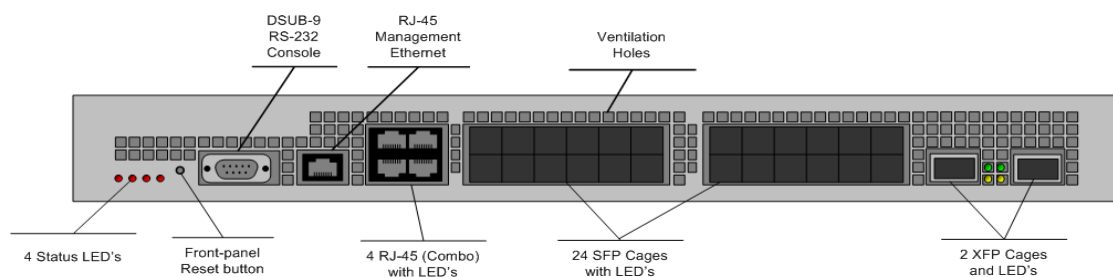
The RDK is also very suitable to use as a fast prototyping vehicle and for demonstrations or interoperability tests. This shortens the time from specification of new applications to running them at wire speed in demonstrations and also shortens time to integrate them into the final product.

The Reference Board has a modular design where the four electrical SPI-4.2 high-speed connectors can be used for attaching to other boards. Examples of this are Traffic Managers and Sonet/SDH Framers.

RDK4 is available with 24 SFP cages and four copper RJ45 ports. Four of the GE ports are combo copper/fiber, which gives a high degree of flexibility when connecting to other on-site networking equipment. The SFP cages can be equipped with 1000BASE-X fiber modules or with SGMII-attached multi-rate 100/1000BASE-X or triple-speed copper modules.

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.



RDK4 features two XFP cages for pluggable 10GE optical interfaces, 24 SFP slots for pluggable GE optical interfaces and four copper RJ45 for 10/100/1000BASE-T. Local management can be done over either Ethernet or serial console port.

Xelerated's Board Support Package (BSP) runs on the local PowerPC CPU. It enables simple configuration and boot of the system and also provides integration with the SDK enabling hardware debugging of forwarding plane applications.

The powerful local CPU runs an open development environment and includes an embedded Linux 2.6 distribution. This facilitates integration of customer-specific network control plane and management applications. For instance the customer's in-house control plane stack from a real router platform can be ported directly to the CPU of the RDK.

A Complete Package

The following is included in the X11 Reference Design Kit:

Reference Board

- Two Xelerator® X11 NPUs, each with connected to these lookup memories:
 - The NSE interface with a choice of either NetLogic NL8K or IDT 75K100 Search Engines, plus associated DDR SRAM for response data
 - Three Look Aside interfaces with 36Mbit DDR-SRAMs
 - One Look Aside interface with four 576Mbit RLDRAM
- Two internal electrical SPI-4.2 interfaces for X11 inter-connection, or for connecting to other boards.

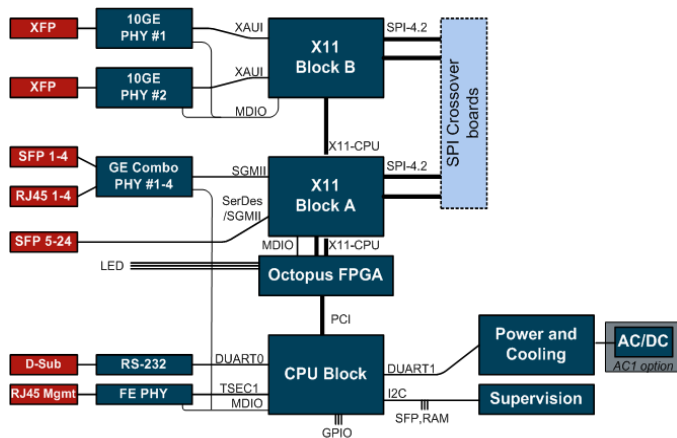
Board Support Package

- Configuration Command Line Interface (CLI) allowing access to all X11 resources
- Boot and Initialization Software
- Libraries to facilitate control plane communication with X11 and associated table memories

- Software module enabling debugging in hardware as well as providing an interface to the Xelerator® Software Development Kit (SDK) to import/export debug information

PBA Design Package

- Schematics, Bill of Materials, Assembly Drawings
- Gerber files describing the PCB layout
- FPGA images



RDk Block Diagram Each X11 Block includes Network Search Engine, SRAM and RLDRAM Look-aside memories. The CPU block includes a PowerQUICC III (PowerPC e500) processor with a removable CompactFlash storage card. The SPI connectors can be looped between the X11s using crossover boards.

