

Customer

A global provider of communications software, IP, and optical networking solutions engaged AimValley to provide Design Services to develop FPGAs and software on next-generation DS3 and OC48 line cards on their Packet Optical systems.



Customer Objectives

For this project the customer identified and chose AimValley to leverage our expertise in DS3, SONET/SDH and TDM over Packet to replace obsolete devices on their line cards. The expectation was to deliver FPGA designs that would offer 4x the number of ports and channels, while maintaining feature parity with their current solutions.

AimValley Solution

AimValley delivered designs that included:

- > Multiple OC3/OC12/OC48 ports and DS3 line interfaces, mappers, framers, converted via CEP / SAToP into packet streams into dual 10GE backplane.
- > Software development to create the associated PCIe driver complete with the API.
- > Line and Equipment Protection function, Fault and Performance Monitoring, and Sync reference.

Key Technologies

- > High-density TDM over Packet in FPGA
- > DS3 line interfaces, framing and M13 multiplexer
- > Multi-rate SONET/ SDH framer
- > Flexible TDM cross-connect
- > High-speed interface to data buffer in DDR4 RAM
- > Software driver with function based API

Design Briefs

- > [AimValley Product Development Process](#)
- > [TDM over Packet solutions](#)
- > [ASIC Quality – FPGA Flexibility](#)
- > [“Spend Much Less”](#)

Results and Added Value

✓ Efficient

AimValley's previous experience and IP cores for TDM circuit emulation, DS3 and SONET/SDH, reduced the time to develop the solution, lowered costs, with confidence that this solution would perform well.



Partnership

AimValley engineers worked with customer's R&D team to define and deliver API integration in customer host software and to create and deliver the FPGA designs in close co-operation with the overall hardware/system design teams.

★ Successful

This program delivered the solutions in rapid succession with multiple releases to add additional features. We worked with the customer to select future-proof FPGAs that allow for additional functionality in later phases of their project.



Innovation

The solutions replaced multiple obsolete ASICs with a single [AMD](#) FPGA which reduced cost, size and power requirements. Several IP cores were rearchitected and optimized for the latest FPGA technology to support higher clock rates enabling quadrupled port and channel density.