

Mercury Helps Tier 1 Telecom Supplier Develop Flexible, High-Bandwidth, Low-Latency, Wireless Test Bed

Leading-Edge LTE Technology on ATCA Standards-Based Platform

Situation

A leading supplier of mobile and fixed telecommunications services and equipment needed a flexible, high-performance platform to serve as the basis for developing leading-edge long-term-evolution (LTE) application software. Using pedestrian fabrics like Ethernet for the data plane was not an option. The application required full backplane connectivity at rates of up to 10 Gbps. The development focus was application code. The development team could not waste valuable time working around the oddities of a non-uniform communications fabric.

Critical Issues

While the primary purpose of the test-bed platform was to support algorithm development, the completed systems would also be needed to support field trials and customer demonstrations. The customer's development team was pushing the boundaries of available technology, necessitating use of pre-release and early-access silicon with all the associated difficulties. But, on the other hand, legacy issues constrained their selection of a digital signal processor (DSP). They also needed their RF subsystems tightly integrated with the base-station transceiver/user equipment (BTS/UE) test bed.

What Mercury Provided

Up front, Mercury performed comprehensive testing to ensure that AdvancedTCA® (ATCA) with RapidIO® fabric interconnect would be the right technology to achieve the high data rates required for the test bed platform. Because the LTE technology was so new, it was important to verify that ATCA was better than adequate to take on this leading-edge application.



Once the ATCA platform with RapidIO was proven and selected, Mercury provided design support services to ensure effective integration of the DSP resource into the system and assisted with AMC design issues. Mercury was effective in optimizing functionality and performance from pre-release processors until production-grade components became available. Mercury also licensed RapidIO endpoint IP and provided design support services to allow tight integration of the RF subsystems with the test bed. Close technical collaboration with the customer was instrumental in the successful completion of the development.

Capabilities

The ATCA solution that Mercury developed provided 10 Gbps over the backplane, while supporting control-plane and data-plane processing, tightly integrated with the customer's RF subsystems. This integrated solution included a 14-slot chassis, Ensemble™ BCC-101, BSW-101, and MPQ-101 modules, and Intel® blades.

Results

This wireless test bed solution provided the following benefits:

- Non-blocking backplane switch at 10 Gbps provided the high-performance interconnect.
- Support of pre-release silicon allowed the customer to proceed with development despite delays in processor availability.
- Scalability and robustness of the solution supported multiple DSPs and PowerQUICC™ processors, complete with Intel® hosts and hub/switch cards.
- Mercury's design services helped the customer with DSP integration and RapidIO IP for the custom antenna interface.

The capabilities of this platform led to a common development platform that the customer could use across a range of projects. With Mercury's help, second-generation products are now being incorporated, extending the useful life of the software developed in the initial project. The platform has now migrated to MicroTCA® to provide a more compact solution, a benefit available from the Ensemble product line, which spans ATCA and MicroTCA form factors.



**14-slot Ensemble chassis
with RapidIO backplane**



**Ensemble MPQ-101 AMC
with 1.3-GHz PowerQUICC III processor**

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