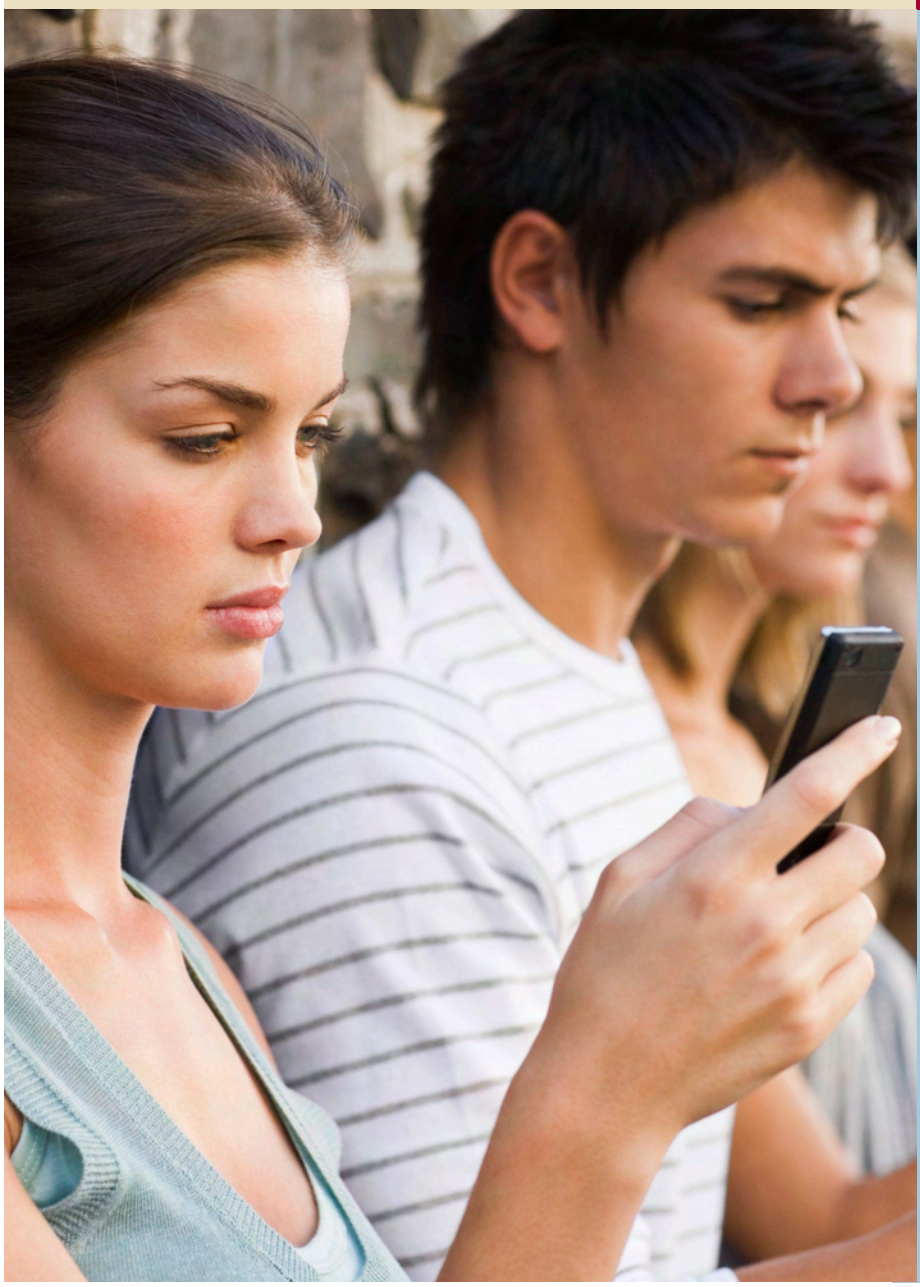
Customizing an ATCA-Based Femto Access Gateway Design

Case Study

radisys®



Industry/Market

Telecom equipment manufacturer.

The Challenge

A telecom equipment manufacturer (TEM) wanted to quickly develop a femto access gateway with minimal development costs.

The Business Environment

The rapidly growing usage of mobile devices worldwide is forcing mobile operators and enterprises to enhance and extend in-building wireless systems.

The Solution

The TEM selected standards-based ATCA architecture in order to leverage the ecosystem and pull a deployment-ready system together quickly.

The Benefits

The design used an optimized backplane and commercial off-the-shelf (COTS) blades plus wireless protocol software that would have cost millions of dollars and taken more than two years if developed internally.

Customer Profile

The TEM is a leading provider of wireless solutions, specializing in backhaul and in-building systems.

Exploding mobile usage is creating unprecedented pressure on network operators and enterprises that are anxious to find ways to maintain high levels of wireless service. The increased traffic on mobile networks is exacerbating congestion, and more people are using their mobile devices within buildings, where there are often coverage issues. Providing some relief, femto networks—short range wireless networks deployed in buildings—provide better radio reception indoors and can offload mobile access networks by diverting traffic to the Internet.

Hoping to capitalize on the growing demand for femto technology, a leading supplier of backhaul and in-building wireless systems wanted to quickly develop a cost-effective, high-capacity femto access gateway. Intent on keeping development costs low, the TEM preferred to use a standards-based architecture offering a wide choice of vendors for commercial off-the-shelf (COTS) hardware and software components, with the advantage of competitive pricing and interoperability.

The TEM selected ATCA architecture and Radisys blades and modules. The design employed five technologies (e.g., packet processing, switch, SBC), and since the TEM didn't have to develop five specialized blades, about $2M-$4M was saved on each. In the same way, software components, such as the femtocell gateway protocol software, were acquired. Still, the TEM decided to customize one key component, the backplane. Given the target market segment did not require a fully redundant, carrier-grade product, it was possible to modify the backplane to deliver 50 percent more capacity in the same chassis at nearly the same cost.

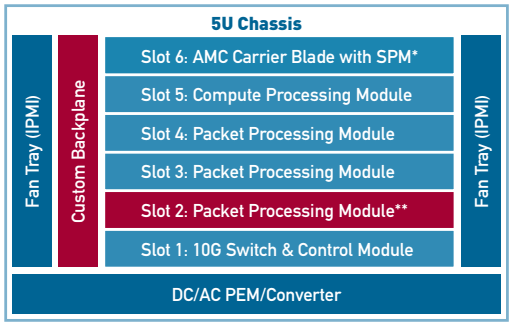
> *Facing incredible competition, TEMs look for ways to create a market advantage, which may involve some customization to a standards-based solution. This is where Radisys' extensive telecom and ATCA experience plays a key role in maintaining the integrity of the system.*
>
> **Curtis Miller** Product Marketing Manager at Radisys Corporation

Customizing an ATCA Platform

The 6U femto access gateway was architected using standard Radisys components, which are in slots 1-6 shown in figure on next page. A typical ATCA-based system employs redundancy, meaning the chassis contains multiple switching and packet processing blades that provide backup in the event of a component failure. However, the TEM departed from a fully standards-based ATCA system by specifying a custom backplane that substituted a packet processing blade in slot 2 for the redundant switch blade. With this change, the system could serve 50 percent more mobile users because the number of blades supporting ports increased from two to three.

Addressing Issues From Customization

The gating factor in the gateway design was completing the custom backplane and addressing the subsequent integration and validation implications. Fortunately, the design used readily-available standard Radisys components, and Radisys engineers were able to reconfigure the switch to work in non-redundant mode, thus software development could start almost immediately. In the meantime, the custom backplane was defined and developed in parallel. After the custom backplane was finished, various issues arose early on during integration, like the compute processing module not booting and the switch module not performing as expected. Following integration, the custom backplane and standard ATCA components had to be thoroughly tested together and validated as a complete system.



*Shelf Peripheral Module (SPM)
**Slot 2 Normally Used for a Redundant Switch Module

6U Femto Access Gateway

Navigating Through Uncharted Waters

Whenever TEMs decide to customize components in an ATCA-based system, it's important to plan for additional testing and validation, as well as unanticipated challenges. Clearly, suppliers with extensive telecom and ATCA experience are a big asset when working through challenges presented by designs that deviate from standard ATCA practices, as discovered during the TEM's femto access gateway project. Radisys engineers helped resolve all system issues and provided modified testing validation schemes that comprehended the lack of a redundant switch. With hundreds of years of combined experience, Radisys engineers coming from different disciplines can track down and fix unexpected interactions among hardware, drivers, operating systems and middleware. Radisys has a proven track record of helping customers architect, integrate and validate their ATCA designs, and enabling them to deliver highly-reliable products faster.

radisys.

Corporate Headquarters
5435 NE Dawson Creek Drive
Hillsboro, OR 97124 USA
503-615-1100 | Fax 503-615-1121
Toll-Free: 800-950-0044
www.radisys.com | info@radisys.com

intel Embedded Alliance Premier