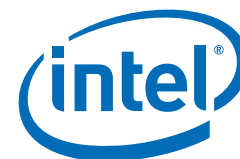


Product Brief

WiMAX Base Station
Proof of Concept

Embedded Computing



WiMAX Base Station Proof of Concept

Intel® multi-core processor-based platform runs application, control plane and data plane workloads

Many Different Components

Base station development managers find themselves coordinating multiple development efforts for application, control plane and data plane workloads comprising a diverse mix of hardware and software components. Within a family of base station products, there can be numerous different boards using a range of processing silicon, such as CPUs, DSPs, FGPA's and ASSPs, each requiring dedicated firmware and software. This system architecture approach invites inefficiencies with respect to component reuse, integration, inventory and ongoing compatibility, just to name a few areas.

Single-Processor Architecture Approach

The alternative is to use just one processor architecture for consolidating application, control plane and data plane workloads – all running on a single Intel® multi-core processor. Today, Intel® Architecture Processors are routinely used for applications and control plane processing because they are relatively easy to program and have the horsepower to run large compute and data-intensive programs. The revolutionary performance gains from multi-core processors are now being applied to data plane workloads, producing impressive results. In fact, it's possible to run all three workloads on a single Intel multi-core processor, as illustrated in Figure 1, and satisfy WiMAX equipment throughput requirements. Some of the benefits of a single-processor architecture approach are listed below.

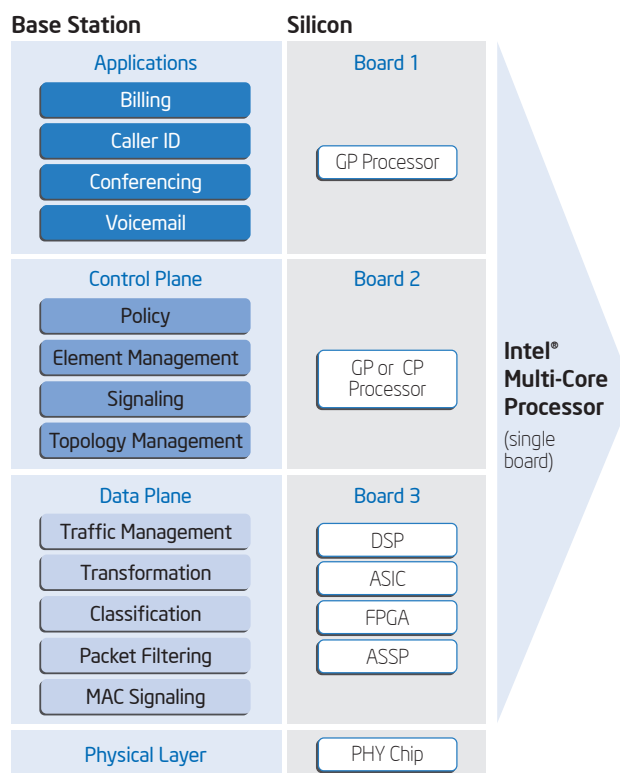


Figure 1. Base Station Functions Consolidated on Intel® Processor

| Feature | Benefit |
|--|------------------------------|
| One processor architecture reduces the number of DSPs, FGPA's and ASSPs | Reduces complexity |
| Fewer boards to build, integrate, inventory and maintain | Lowers cost |
| Intel® Architecture Processors cover top to bottom performance requirements | Increases software reuse |
| Intel Architecture Processors are truly software backwards compatible (current and future) | Protects software investment |

Data Plane Proof of Concept

The proof of concept will demonstrate the performance achievable running WiMAX application, control plane and data plane workloads on Multi-Core IA (MCIA). It will showcase the benefits of a single architecture running these workloads rather than having the workloads spread across multiple silicon chips with the inherent intra-silicone latency that a multi-architecture design has to deal with.

Product Overview

The Intel® WiMAX base station proof of concept is divided into data plane and control plane components, as shown in Figure 2. The data plane functionality establishes a datapath between a WiMAX 802.16 tower (air downlink) and an Access Service Network (ASN) gateway (network uplink). The software is designed in a pipeline fashion, taking full advantage of parallel processing capabilities of Intel® processors with multi-core technology.

The base station control protocol (BSCP) implements the MAC signaling stack and manages the underlying MAC convergence sublayer (CS) and MAC common part sublayer (CPS) functionality. The MAC CS transforms and maps external network data into MAC service data units (SDUs) received by the MAC CPS. The MAC CPS provides core MAC functionality, such as system access, bandwidth allocation, and connection establishment and maintenance.

Benefits for Developers

This Intel® proof of concept, supporting control plane and data plane workloads for a WiMAX base station, offers significant advantages for developers:

- **Industry-Leading Performance:** Technology innovation is delivered on a reliable and predictable timeline, based on an Intel development model that alternates the next generation of silicon technology as well as new processor microarchitecture year after year.

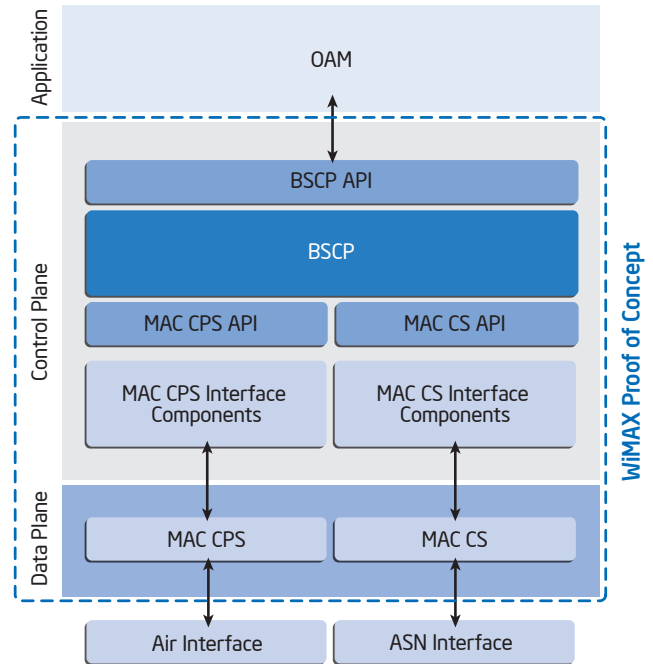


Figure 2. WiMAX Base Station Proof of Concept

- **Reduced Time-to-Market:** Greater component reuse, enabled by a smaller mix of system boards and components, streamlines software development because there's less code to write, integrate, validate and test.
- **One Processor Architecture:** Software developers only need to master one tool chain, which boosts efficiency, reduces training time and gives every programmer the opportunity to work on any system function.
- **Broad Range of Solutions:** Intel reference designs are supported and enriched by a strong ecosystem of hardware, software and tools providers, including members of the Intel® Embedded and Communications Alliance: www.intel.com/go/eca

For further information on Intel's WiMAX Base Station Proof of Concept, please visit: www.intel.com/netcomms/solutions/ip-services-wireless/index.htm. Please contact your Intel sales representative to access the reference software.