

LTE eNodeB Reference Design

Intel® multi-core processor-based platforms integrate the Aricent eNodeB Software Framework, comprising signal processing, data plane and control plane workloads

Supporting Diverse Workloads

Long Term Evolution (LTE) deployments will trial this year and begin to ramp next year. Equipment development managers are already busy evaluating different architectural approaches with respect to performance and cost. They are reviewing system partitioning options and deciding which software components and hardware architectures best meet equipment requirements. When running diverse workloads on a network element (e.g., LTE eNodeB equipment), there's a natural tendency to follow traditional methods and design in multiple hardware architectures. However, this approach can increase BOM cost and system validation complexity and lead to departmental silos that decrease resource allocation flexibility, leading to longer time-to-market and increased overall project cost.

A Single Architecture

Architects, mapping eNodeB workloads to different hardware architectures, could conceivably design a system consisting of a general-purpose processor, a network processor and multiple digital signal processors, as shown in Figure 1. An alternative is to consolidate all of the workloads on a single architecture – Intel® architecture. The extraordinary performance gains from multi-core technology support both deterministic data plane and signal processing and the programming flexibility needed to write feature-rich control plane functions. By consolidating these workloads, Telecom Equipment Manufacturers (TEMs) can reduce the silicon footprint, decrease power consumption

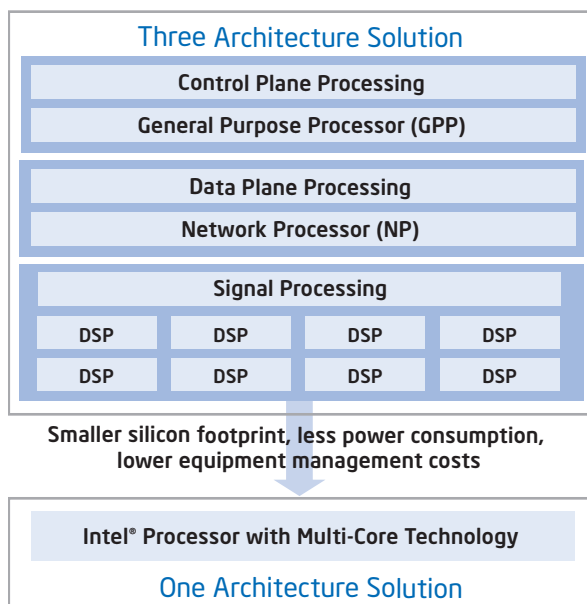


Figure 1. eNodeB functions consolidated on Intel® architecture

and lower end-customer maintenance costs associated with managing complex multi-architecture systems. With a single 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. Some of the benefits from consolidating workloads on Intel architecture are listed in Table 1.

Benefits

Consolidate signal processing, control and data plane on single architecture

Decrease validation effort because there's only one hardware architecture to test

Scale software across different network nodes and next-generation platforms

Choose from a wide array of Intel® silicon components

Leverage tools and support from a very large ecosystem

Results

Lowers complexity and minimizes latency between protocol layers

Reduces validation effort and shortens time-to-market

Protects development investments

Optimizes price-performances and provides scalable options

Enhances and streamlines the development environment

Table 1. Benefits from consolidating workloads on Intel® architecture

Product Overview

The Intel® LTE eNodeB reference design is a complete hardware and software solution that runs on the new Intel® 45nm and 32nm enhanced core microarchitecture with dual-core and quad-core technology. This solution provides a scalable performance path from a single-sector micro eNodeB to multiple-sector macro eNodeB with up to 4x4 multiple-input multiple-output (MIMO) on 20 MHz channels. With this reference design, developers can collect real-world performance data and create workload consolidation proof-points. For more information please contact your Intel sales representative.

“Intel’s semiconductor expertise combined with Aricent’s software solution creates an effective framework for network equipment developers designing highly integrated, optimized LTE solutions.”

– Rakesh Vij, AVP, Business Development, Aricent

eNodeB Reference Software Overview

Aricent LTE software, comprising the PHY, MAC, RLC, PDCP, RRC, SIAP, X2AP, GTPu and SCTP, is a key component for building LTE femtocells and pico and macro eNodeB basestations. The Aricent LTE eNodeB Framework (eNBF) integrates the Layer 1, 2 and 3 functionality into a packaged framework, accelerating and simplifying development of a carrier-deployable pico/femto eNodeB solution. To meet the stringent performance requirements of LTE, the software is integrated, pre-optimized and benchmarked for performance on multi-core processors, enabling equipment vendors to develop cost-effective, performance-tuned solutions. At the same time, the software is modular and scalable.

About Aricent

Aricent is a global innovation, technology and services company focused exclusively on communications. Aricent combines the leading innovation capabilities of frog design with unparalleled domain expertise in communications as a strategic supplier to the world’s foremost infrastructure, application and service providers. For more information, visit www.aricent.com.

Benefits for Developers

This Intel® reference design, supporting control plane, data plane and signal processing for an eNodeB network node, 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 next-generation silicon technology with new processor microarchitecture year after year.
- **Cost savings:** Workload consolidation simplifies hardware design, reduces system validation effort and lowers spares management costs at the platform level.
- **Enhanced data plane performance:** Intel 45nm and 32nm enhanced core microarchitecture incorporates new instructions and runs optimized performance libraries, like fast Fourier transform (FFT) functions for digital signal processing, enabling exceptional data plane performance.
- **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.

More Information

For further information on Intel’s eNodeB Reference Design, please visit www.intel.com/netcomms/solutions/ip-services-wireless/index.htm or contact your Intel sales representative.

Solution provided by:



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