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Product Brief

Marvell® OCTEON Fusion® CNF105xx Family

4G/5G Macro Cell Baseband Processor

Overview

- Marvell is the industry leader in macrocell baseband processors for 5G Radio Access Networks (RAN)
- CNF105xx is the industry's first 5nm baseband solution for Radio Unit (RU) or Distributed Unit (DU) applications and is in volume production with leading tier 1 OEMs
- CNF105xx may be combined with other Marvell processors (OCTEON, ThunderX, Prestera) to provide network infrastructure OEMs with complete end-to-end RAN solutions
- Marvell is willing to engage with OEMs to design semi-custom CNF105xx variants, either by incorporating the OEM's IP blocks or by modifying the design for related PHY processing functions

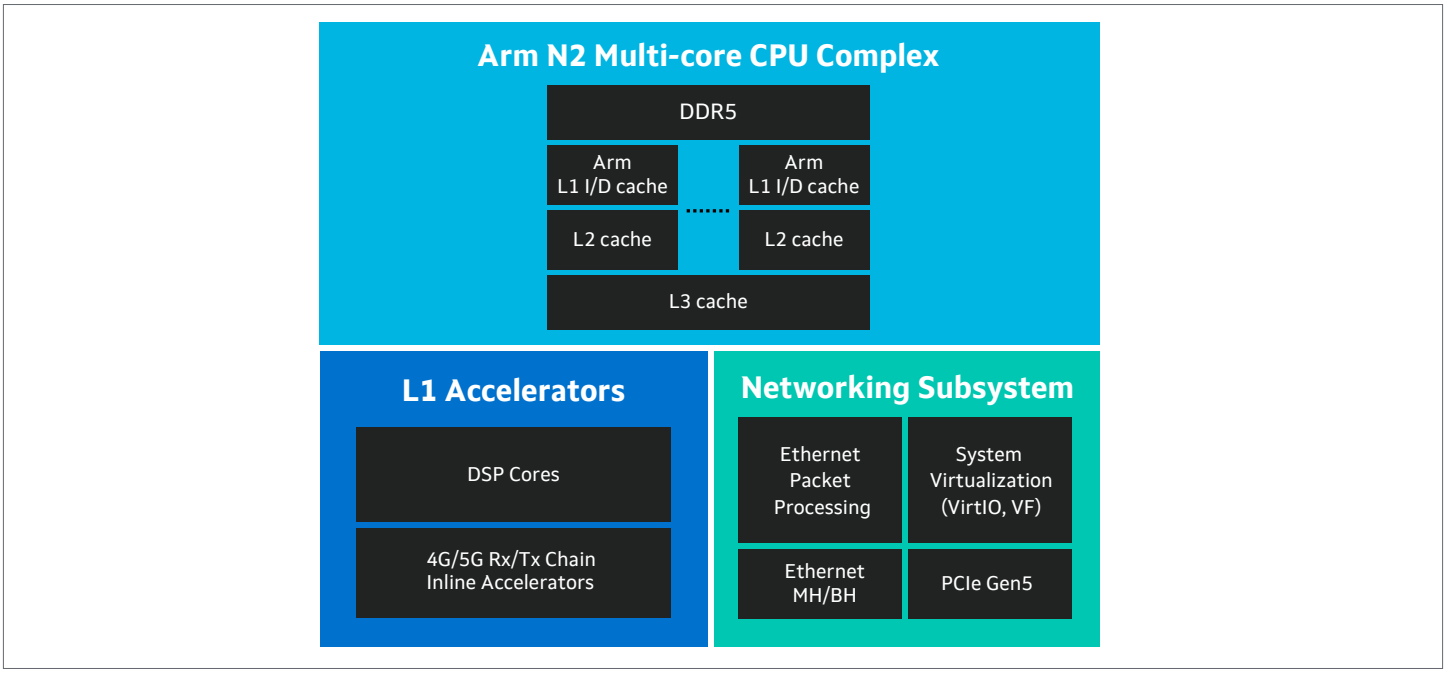
The OCTEON Fusion® CNF105xx family of 4G/5G baseband processors is targeted at top tier telecommunication equipment manufacturers. With a specific focus on efficiently running 5G and 4G layer 1 processing for very high throughput macro cell base stations and advanced features, including massive MIMO at wide-bandwidths, CNF105xx is the industry's leading merchant silicon for macro cells.

CNF105xx baseband processors are optimized for both traditional all-in-one base station designs as well as virtualized RAN (vRAN) and ORAN-defined split architecture base stations. An OCTEON Fusion CNF105xx distributed unit (DU) combined with a complementary OCTEON CN10xxx network processor central unit (CU) provides a compelling price/performance advantage over competing solutions. In addition, CNF105xx baseband processors support both mid-band (sub-7GHz) and mmWave radio frequencies making them suitable for 5G deployments in any region worldwide.

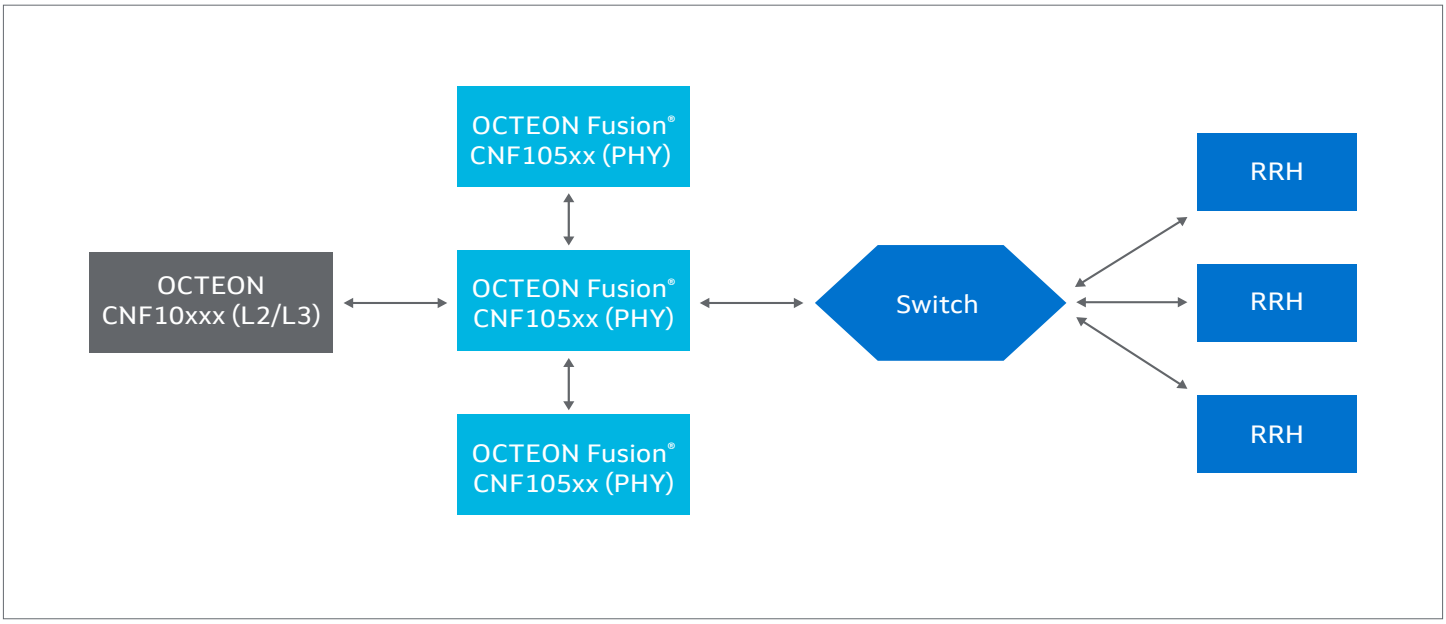
CNF105xx is a lower cost and lower power alternative to the FPGA-based solutions found in the 4G/5G infrastructure market. These fouth-generation OCTEON Fusion processors have been optimized for 5G PHY Layer performance while retaining sufficient programmability to support future enhancements to the 3GPP 5G Advanced specification.

The OCTEON 10 Fusion baseband processor also provides flexible L1 implementation, with hardware and software reuse across the RU (Radio Unit) and DU (Distributed Unit) to facilitate evolving L1 splits among operators worldwide over the coming years.

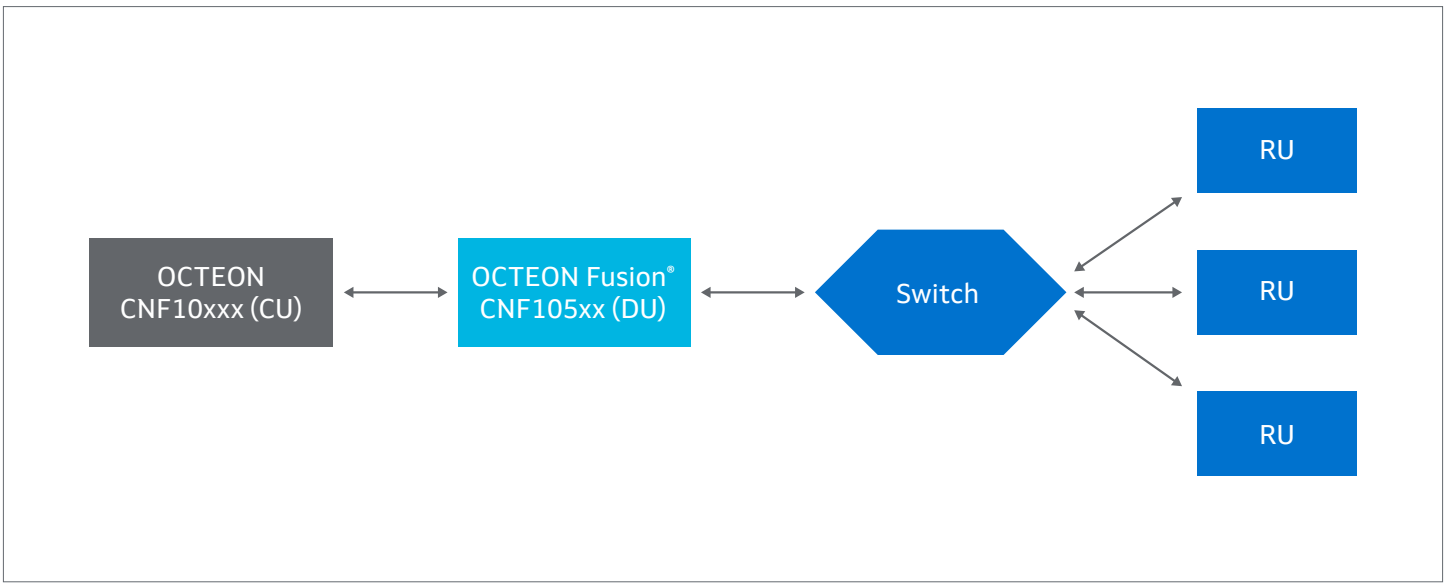
Block Diagram



4G/5G Macro Cell Example



5G Split RAN Example



Key Features

Features	Benefits
• Flexible baseband architecture	• Allows customers to configure cells/sectors/bandwidths as required for each deployment.
• Support for 4G and 5G	• Single baseband chip allows network operators to provide a cost-effective solution for legacy 4G and new 5G services. They can event choose to operate both protocols simultaneously, within the same base station enclosure.
• Support for a wide range of frequencies	• Allows base stations to operate in both mid-band and mmWave, the two primary cellular spectrums available around the globe.
• Unified PHY layer processor for all RAN architectures	• Provides options for all-in-one macro cells or vRAN/O-RAN DU configurations - both of which will be deployed over the coming decade. OEMs can support both use cases with the same silicon, enabling vRAN/O-RAN feature and performance parity with existing all-in-one 5G networks.
• Ethernet-based RF Interface	• Supports new high-throughput radio technologies which are needed to support 5G connectivity.
• Member of Marvell's OCTEON lineup of multi-core processors	• Integration with Marvell-supplied solutions eases RAN design and shortens time-to-market with integrated silicon and software solutions.
• Packed with Arm cores and DSPs compute capacity	• Supports beam weight calculations for massive MIMO radios.
• PCIe interfaces and pre-integration with cloud platforms	• Cloud-native architecture and software support for virtualised RAN (vRAN) deployments in private or public cloud environments.

Target Applications

- 4G/5G Macro Cell Base Stations – may run both protocols simultaneously
- 5G Distributed Unit (DU) for ORAN and vRAN Architecture Macro Cell Base Stations
- Massive MIMO Radio Unit (RU) for any and all ORAN Splits
- All-in-one Small Cells and mmWave Antenna Units
- Virtual RAN (vRAN) Acceleration Cards for cloud integration

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To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

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