

Virtual Baseband Unit (vBBU) Data Sheet



Virtual Baseband Unit

Multi-technology (2G, 3G, 4G, 5G)
Virtual Baseband Unit

Key Features

- Fully 3GPP-compliant “ALL-G” Software Platform
- Supporting OpenRAN split-architecture Options 6/7.2/8
- Versatile deployment options
- Cloud-native Application deployed on a COTS server

Key Benefits

- Software upgradable from 2G to 5G!
- 3rd Party RRH Interoperability
- Lower overall TCO

Parallel Wireless’ Virtual Baseband Units (vBBU) is the next step in OpenRAN evolution, which along with Parallel Wireless’ OpenRAN Controller, completely virtualizes the RAN segment, running on COTS x86 servers and integrating with COTS OpenRAN RRHs to completely disaggregate hardware and software, providing unparalleled TCO for operators.



Virtualized RAN functions deployed on the vBBU platform, reduce complexity and simplify network maintenance, consume optimal resources and reduce total cost of ownership for our customers. Leveraging the ever-growing capacity of COTS x86-based servers and a fully virtualized, hardware agnostic architecture, operators can use their own servers and radio-heads, integrated with Parallel Wireless’ vBBU software suite.

Parallel Wireless offers the world’s first “All-G” OpenRAN Virtualized Baseband Unit software suite to help Mobile Operators manage and grow their multi-vendor, “All-G” networks, while enjoying the benefits of lower TCO compared to legacy solutions.

The all new “All-G” vBBU builds upon Parallel Wireless’ proven unified software platform approach, able to run concurrently 2G/3G/4G/5G in accordance with OpenRAN and 3GPP functional traffic splits 6, 7.2 and 8 – depending on the connected radio-head and the required functionality.

The vBBU greatly reduces carriers’ OPEX and CAPEX by utilizing a COTS x86 server, enabling economies of scale to significantly improve hardware costs on the vBBU baseband server, while supporting simpler RRH designs. Coupled with Parallel Wireless’s fully software upgradable “All-G” design, the vBBU solution provides a unique and dramatically lucrative site-solution, with a very cost-effective entry point able to evolve with the carrier’ network via software upgrades.

Parallel Wireless’s 2G/3G/4G/5G unified software platform enables OpenRAN through complete decoupling of hardware and software functionality. This functional separation enables the Unified Software Platform to support all the different traffic splits between DUs and CUs based on available backhaul/fronthaul options. Different RAN element functionalities consolidate on the platform, reducing complexity and making overall network maintenance simpler and less resource intensive.

The vBBU is auto-configured and managed by Parallel Wireless’s All-G OpenRAN Controller, which makes the vBBU self-configurable and self-optimizing, and enables seamless handoffs/mobility between the vBBU and existing Macro network.

The vBBU can be deployed either with OpenRAN RRHs or be added to an existing CWS-deployed network, providing increased processing at the site and enabling enhanced features to a CWS network, such as Improved user count, Carrier-Aggregation, Distributed Dynamic ICIC, and more.

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vBBU Platform Capabilities at a Glance

Category	Capability
Architecture	<ul style="list-style-type: none"> Fully Containerized x86-based (optional hardware acceleration) OpenRAN Compliant DU and CU Functionality Traffic Splits 6 (over ETH), 7.2 (over eCPRI), 8 (over eCPRI)
Supported Technologies	<ul style="list-style-type: none"> 2G/3G/4G/5G – Any combination running concurrently
Utilized Accelerators	<ul style="list-style-type: none"> QAT, AES-NI, AVX512, DPDK
Platform Security	<ul style="list-style-type: none"> Carrier grade authentication and encryption using IKEv2 / IPsec Encryption: AES128-CBC, AES256-CBC Authentication: SHA-256 X.509 certificate-based authentication Integration with PKI infrastructure using CMPv2.
Network Management	<ul style="list-style-type: none"> TR-069 and Secure IPMI from Non-RT OpenRAN Controller

vBBU LTE Capabilities at a Glance

Category	Capability
3GPP Release	<ul style="list-style-type: none"> 3GPP Release-15 Compliant
Network Interfaces	<ul style="list-style-type: none"> S1, X2 (towards OpenRAN Controller)
User Count	<ul style="list-style-type: none"> 2000 RRC-Connected users per carrier
LTE Feature-set (Brief)	<ul style="list-style-type: none"> FDD, TDD – Band Agnostic VoLTE + Emergency call support Proportional Fairness Scheduling (PFS) Carrier Aggregation across RRHs MIMO2x2, MIMO4x4 MOCN, MORAN Network Sharing Location-based Services (E-CID, OTDOA) Public Warning System (PWS) support - ETWS, CMAS Up to DL 256QAM and UL 64QAM Admission Control Enhanced Distributed and Centralized SON EIA0/1/2, EEA0/1/2 (AES128, Snow3G)
Inter-RAT	<ul style="list-style-type: none"> CSFB to 2G, 3G SRVCC to 2G, 3G PS Handover to 2G, 3G

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vBBU UMTS Capabilities at a Glance

Category	Capability
3GPP Release	<ul style="list-style-type: none"> • 3GPP Release-13 Compliant
Network Interfaces	<ul style="list-style-type: none"> • Iuh (towards OpenRAN Controller)
User Count	<ul style="list-style-type: none"> • 64 Voice Calls per Carrier • 160 HSPA Users per Carrier
UMTS Feature-set (Brief)	<ul style="list-style-type: none"> • FDD Band Agnostic • CS – AMR, WB-AMR, CS Video • PS – R99, HSDPA (Up to Category 14), HSUPA (Up to Category 6) • Multi-RAB • Emergency Call Support • RANAP Location Reporting • Fast Dormancy • Admission Control • RTP Multiplexing • Access Control • UIA1/2, EEA0/1/2 (Kasumi, Snow3G)
Inter-RAT	<ul style="list-style-type: none"> • SRVCC from 4G • CS/PS/MRAB Handover to 2G

vBBU GSM Capabilities at a Glance

Category	Capability
3GPP Release	<ul style="list-style-type: none"> • 3GPP Release-12 Compliant
Network Interfaces	<ul style="list-style-type: none"> • Abis-like (towards OpenRAN Controller)
TRXs	<ul style="list-style-type: none"> • Up to 8 (RRH-dependent) per cell
GSM Feature-set (Brief)	<ul style="list-style-type: none"> • CS – AMR-HR, AMR-FR, EFR, VAMOS • PS – GPRS, EDGE • Emergency Call Support • Receive Diversity • Frequency Hopping • Dynamic Resource Allocation • DFCA • RTCP • A5/1, A5/3, A5/4 Ciphering
Inter-RAT	<ul style="list-style-type: none"> • SRVCC from 4G • CS/PS/MRAB Handover to 3G • Fast Return to 3G/4G

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