



SUPERMICRO AND RAKUTEN SYMPHONY COMBINE TO OFFER MOBILE AS A SOFTWARE™ AND O-RAN DATA CENTER INSTALLATIONS

Supermicro and Rakuten Use Expertise to Offer a Complete O-RAN Solution for Mobile Operators

TABLE OF CONTENTS

- Solution Overview..... 1
- Open RAN 1
- Key Components..... 2
- Hardware Solution Features..... 3
- Summary 3
- Further Information 3



Solution Overview

Rakuten Symphony is a recognized leader in providing solutions for the mobile industry. By reimagining telecom, Rakuten Symphony makes it possible to launch and operate advanced mobile services in a fraction of the time and cost of conventional approaches, with no compromise to network quality or security.

Creating a new solution requires expertise in a number of domains. For example, understanding the networking, storage, and computing

requirements of a telecommunication (telco) offering requires enormous expertise. Leveraging Supermicro servers for core and Open RAN, Rakuten has industrialized a transformational, highly automated, cloud-native network solution based on their "Mobile as a Software™" paradigm. With Rakuten Symphony utilizing Supermicro servers, customers get a proven, modern, and tested solution for the most demanding telco operations. Supermicro provides commercial servers with pre-validated solutions for Open RAN that will fit into different network deployment environments. Supermicro is a leading editor in the O-RAN ALLIANCE's White Box Working Group, defining the industry's reference architectures.

Open RAN

Telco networks have, in the past, been closed and proprietary solutions. Whether the hardware or software was proprietary and closed, this system was not optimal. Individual components could not be replaced to use the latest technologies, which reduced performance over time and led to more expensive solutions. With Open RAN (Open Radio Access Network), the RAN

functionality is disaggregated using open standards. An O-RAN network enables service providers to use components from many vendors, encouraging innovations and lowering costs. In addition, by using industry-standard servers, Open RAN can quickly borrow innovations from other parts of the IT world and apply them to the wireless network edge, thus increasing RAN's performance and flexibility and bringing many applications from the cloud to the edge.

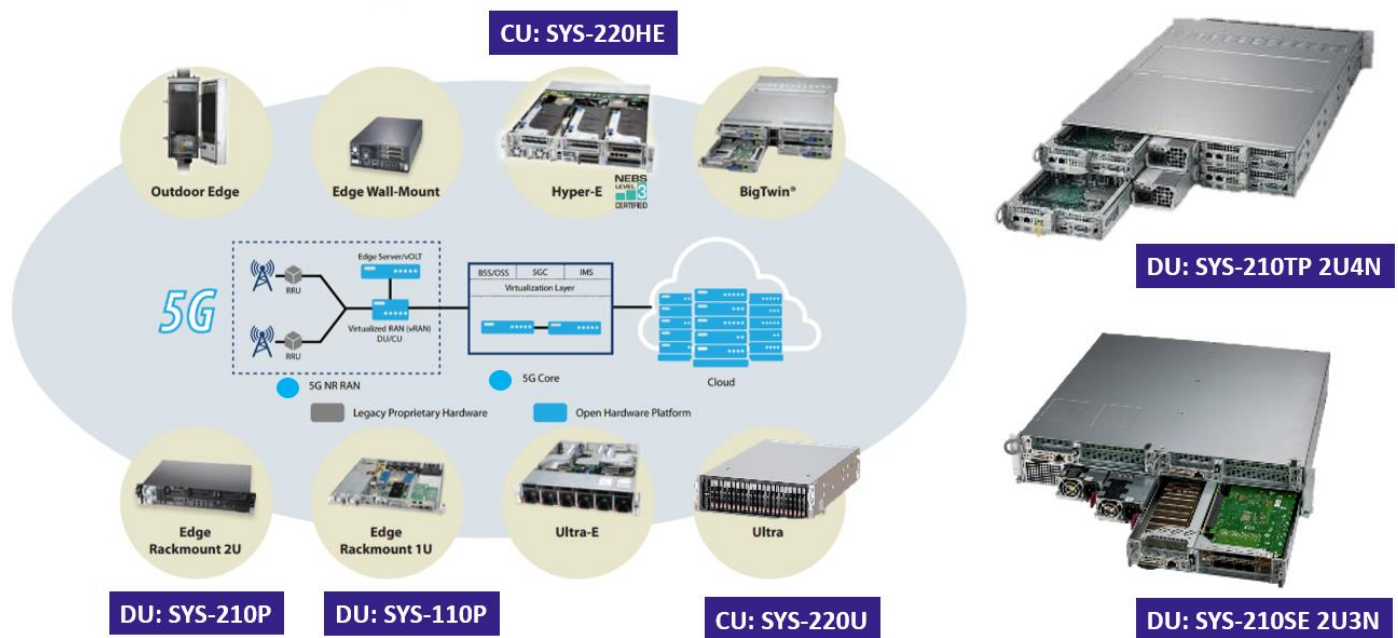
Key Components

An Open RAN solution for a telco environment consists of Distributed Units (DU) and Centralized Units (CU) for compute purposes. The DUs and CU perform different tasks and can be specified as different types of optimized servers.

- Distributed Unit – The Open Distributed Unit (O-DU) sits close to, or even at, the Radio Unit (RU), which broadcasts the mobile network signal and processes data transmission between the RU and the CU. Hardware used for the O-DU task often is commercial off-the-shelf (COTS) edge servers that can function as a baseband processing unit to handle high PHY layer, MAC, and RLC layer with network function virtualization (NFV) or Containers.
- Central Unit – The Open Centralized Unit (O-CU) sits between the core network and a series of Distributed Units. The Centralized Unit collects the relevant data from the Distributed Units and sends that data to the core data center.

The overall architecture of a 5G Telco network is described below. In RAN, the DU, CU, MEC/RIC, and edge servers are all based on white box servers. Based on the location of the deployments (Cell Site, Central Offices, Local Data Center) or the amount of traffic to be supported (# of Radio Units, # of Subscribers), Supermicro has a variety of servers to fit into different scenarios. We highlight some of the servers below as examples.

5G Telco Edge Server



Hardware Solution Features

Supermicro servers have been selected, tested, and available as CU or DU systems as a key component of the Rakuten Symphony solution.

- O-CU / SYS-220U-TNR: The powerful and flexible 2U Ultra system is deployed as a centralized unit, providing high compute performance with dual 3rd Gen Intel® Xeon® Scalable processors and 100 GbE connectivity. Default configuration: 2x Intel Ethernet Network Adapter E810 and 1x Intel Ethernet Network Adapter XXV710, Dual Intel Xeon Platinum 8358P w/ high flexibility and slot count, NUMA balanced architecture, full SW integration/management feature support.
- O-DU / SYS-210TP-HPTR: The 2U, 4-node SuperEdge system functions as a distributed unit in deployments where performance and low latency are essential. Each node can be configured with a 3rd Gen Intel Xeon Scalable processor and a range of add-on cards. Default configuration: Intel® Xeon® Gold 6338N with 32 cores, 1x ACC100, and 1x Intel Ethernet Network Adapter XXV710 single socket w/ high density, ultra-low latency in packet processing.
- O-DU / SYS-210P-FRDN6T: This ultra short-depth (299 mm / 17.2") system is able to deliver high-density performance in space-constrained areas as a distributed unit. Default configuration: Intel® Xeon® Gold 6338N with 32 cores, 1x ACC100 and 1x Intel® Ethernet Network Adapter XXV710, single socket short depth, ultra-low latency in packet processing.


Rakuten Symphony will start offering 4th Gen Intel Xeon Scalable processors-based products on the same footprint server listed above. To meet some of the Operator's deployment requirements, specific servers such as SYS-111E-FDWTR have gone through NEBs level 3 certification.

Summary

Supermicro and Rakuten together are creating a complete solution for O-RAN operators. With the combined state-of-the-art software, servers, and networking, new and highly performant RAN can be implemented in a fraction of the time compared to a piecemeal selection and integration effort.

Further Information

To learn more about Supermicro's X13 Products, please visit: www.supermicro.com/x13

- O-CU SYS-221H-TNR (<https://www.supermicro.com/en/products/system/Hyper/2U/SYS-221H-TNR?mlg=0>)
- O-CU SYS-221HE-FTNRD (<https://www.supermicro.com/en/products/system/iot/2u/sys-221he-ftnrd>)
- O-DU SYS-111E-FDWTR (<https://www.supermicro.com/en/products/system/iot/1u/sys-111e-fdwtr>) 
- O-DU SYS-211E-FRDN2T (<https://www.supermicro.com/en/products/system/iot/2u/sys-211e-frdn2t>)
- O-DU SYS-211SE-31D (<https://www.supermicro.com/en/products/system/iot/2u/sys-211e-31d>)