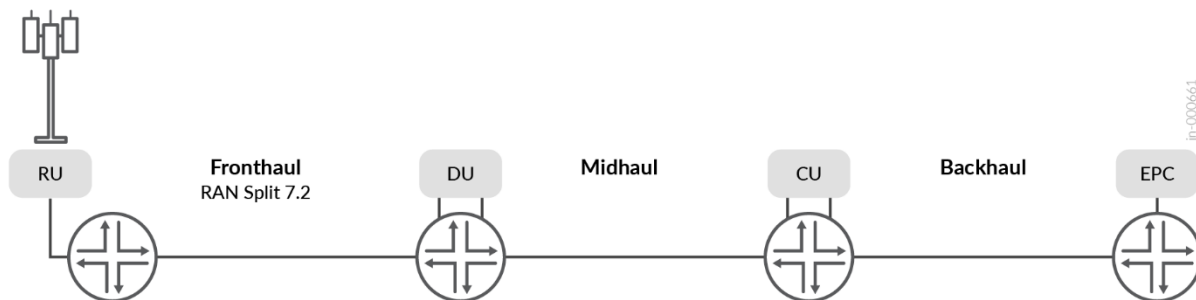


Juniper® Validated Design

JVD Solution Overview: 5G CSR xHaul Seamless Segment Routing

Executive Summary

The introduction of 5G radio access networks (RAN) dictates new requirements for the mobile backhaul (MBH) network infrastructure in terms of number nodes that constitutes the network, performance and feature richness and leads to growing network complexity. Juniper provides a solution for the end-to-end 5G xHaul network infrastructure, which is carefully designed to support both the traditional 4G mobile backhaul and the evolution into the 5G network infrastructure over the same physical network. This approach allows MSOs to make a smooth transition from 4G to 5G without disrupting their existing services. They can gradually introduce the necessary changes and upgrades to accommodate the new requirements of 5G networks.



Solution Overview

This solution provides design, reference architecture and implementation details for 5G xHaul network with seamless segment routing. The foundational technologies of the 5G xHaul JVD incorporate current and legacy VPN services over segment routing. Interdomain decoupling of transport and service layers is accomplished by leveraging Seamless SR with BGP-LU and Prefix-SID. The solution is geared towards innovative inter-domain network slicing concepts and suggests a practical implementation scenario using Flexible Algorithm and BGP Classful Transport (BGP-CT), which creates new layers of network abstraction and enables new capabilities to support end-to-end SLA requirements. A key focus of this solution is the ability to color-map individual overlay services, enabling granular support of 4G and 5G applications over xHaul infrastructure.

Juniper ACX, MX and PTX are used as main building blocks of the topology – ACX710 and ACX5448 Universal Metro Routers are used in the role of cell site Access Node and Pre-Aggregation routers; MX204 Universal Router is positioned as Aggregation nodes; MX10003 and MX480 Universal Routers perform Aggregation function; PTX1000 Router and MX10003 Universal Router are used as Core Routers and MX10003 Universal Router as a Services Aggregation Gateway router.

About JVD

Juniper Validated Design (JVD) is a cross-functional collaboration between Juniper Solution Architects and Test teams to develop coherent multidimensional solutions for domain-specific use cases. The JVD team is comprised of technical leaders in the industry with a wealth of experience supporting complex customer use cases. The scenarios selected for validation are based on industry standards to solve critical business needs with practical designs that are fully supported at publication.

Solution Architecture

A reference architecture is selected for validation after ongoing cadence with Juniper global theaters and deep analysis of customer use cases. The design concepts deployed are formulated around best practices, leveraging relevant technologies to deliver the solution scope. Key Performance Indicators (KPI) are identified as part of an extensive test plan that focuses on functionality, performance integrity, and service delivery.

Once the physical infrastructure required to support the validation is built, the design is sanity-checked and optimized. Our test teams conduct a series of rigorous validation to prove solution viability, capturing and recording results. Throughout the validation process, our engineers engage with software developers to quickly address any issues found. Unsupported features are excluded from the validation.

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