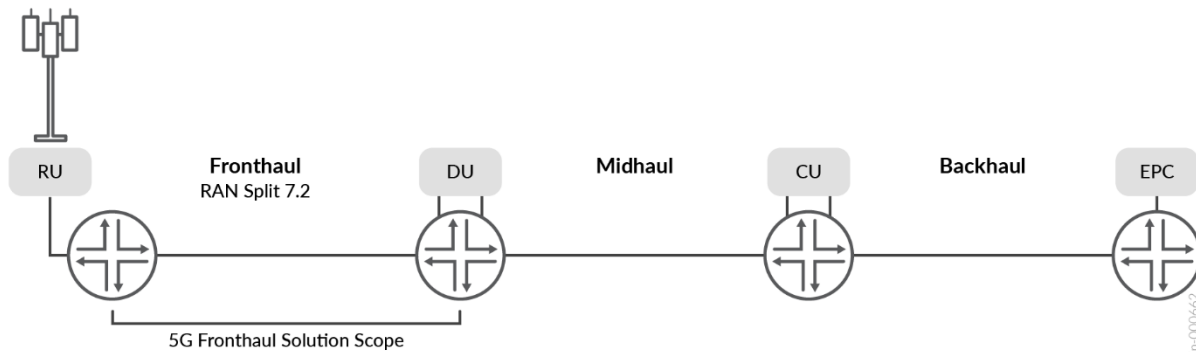


Juniper® Validated Design

JVD Solution Overview: 5G Mobile xHaul with Seamless MPLS 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 MBH 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 and implementation details for the 5G mobile xHaul network using seamless segment routing with Juniper Network's next-generation ACX7000 series, with special focus on the Fronthaul segment and insertion of the latest member of the ACX7000 series – ACX7024 a Universal Cloud Metro Router in the 5G/4G Cell Site Router (CSR) role.

We conducted thorough analysis of both functional and performance aspects and found that the ACX7100-32C/48L and ACX7509 are excellent choices for access and aggregation purposes. Both the ACX7100 and ACX7509 are particularly well-suited for the Hub Site Router (HSR) or Lean Edge segments, as they provide the necessary scale, bandwidth, feature velocity, and performance capabilities. While the ACX7100 surpasses the requirements for access nodes, it's also an ideal option for 400G Fronthaul or Metro Access deployments. The solution validation shows strong avoidance that ACX7024 is a reliable choice for a 5G CSR, offering an enhanced feature-set and improved performance compared to previous ACX platforms in most situations.

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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