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Coriant Disaggregated Router

Minimize Vendor Lock-in, Accelerate Innovation, and Scale Cost Effectively

In addition to today's challenges of strong traffic growth driven by internet video, cloud, and data center interconnect, tomorrow's networks will also have to cope with significant growth of latency-sensitive applications including augmented reality, the tactile internet, and autonomous driving, and with huge increases in IoT scale, driven primarily by the adoption of 5G. Routers have a key role to play in addressing these challenges, however, the closed, proprietary architecture of today's chassis-based routers results in vendor lock-in, slowed innovation, and high costs, with capacity typically limited by the chassis backplane and number of slots. A key component of the Coriant Hyperscale Carrier Architecture, the Coriant disaggregated router solution addresses these limitations while maintaining consistency with initiatives such as Central Office Re-Architected as a Data Center (CORD), Head End Re-Architected as a Data Center (HERD), and 5G Mobile Edge Computing (MEC).

DISAGGREGATING THE ROUTER WITH WHITE BOXES, A HARDWARE-INDEPENDENT NOS, VNFs, AND SDN

Through the Coriant approach to disaggregating the traditional chassis-based router, line cards become leaf white box switches while fabrics become spine white box switches. The chassis backplane is replaced by Ethernet-based interconnects, including either optical leveraging photonic innovation or electrical with Direct Attached Copper (DAC) cable assemblies. In addition to generic white boxes from partners, Coriant provides the option of its own carrier-class Coriant® Vibe white boxes with environmental hardening, enhanced synchronization, and high availability features.

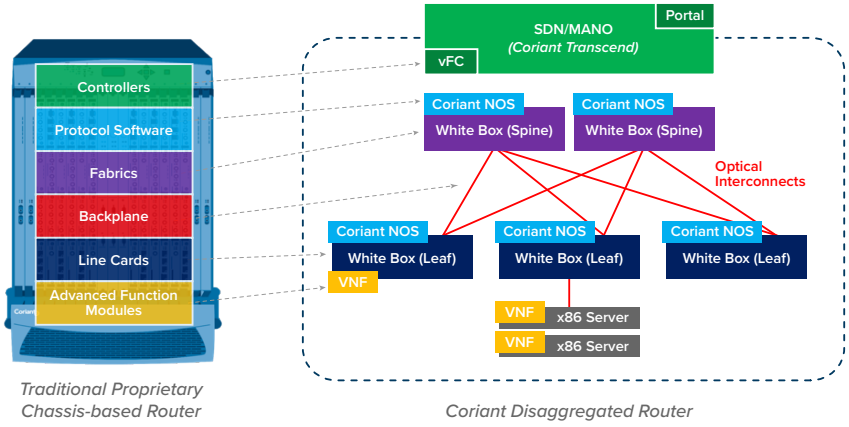

Figure 1 – Coriant Disaggregated Router

The router's protocol software is replaced by the hardware-independent Coriant NOS with support for IP/MPLS and segment routing derived from Coriant's proven and scalable IP/MPLS software as well as support for data center-oriented protocols such as VXLAN and EVPN. Additional services such as CGNAT, BNG, EPC, firewall, IPSec, and DPI that in the past may have required dedicated modules in the chassis or standalone devices can instead be supported with either Coriant or third-party Virtual Network Functions (VNFs) hosted on the white boxes or on standard x86 servers, as shown in Figure 1.

BENEFITS OF THE CORIANT DISAGGREGATED ROUTER

- **Accelerate** innovation by disaggregating routers into best-in-breed hardware and software functional blocks that can be upgraded based on their own renewal cycle
- **Minimize** CapEx by reducing vendor lock-in, replacing chassis-based routers with disaggregated white box-based solutions, and avoiding large upfront investments in the chassis, fabrics, and controllers
- **Reduce** OpEx by replacing proprietary CLI-based configuration with open SDN-enabled automation, and with a virtual fabric controller that hides the complexity of multi-node systems
- **Scale** cost effectively with a NOS built to support node stacking and leaf/spine horizontal scaling
- **Grow** revenues from latency-sensitive applications with the option to distribute VNFs to white boxes at the edge of the network
- **Address** both carrier IP use cases with IP/MPLS and segment routing support, and inter-data center use cases with EVPN and VXLAN support

The controller function of the traditional router moves to the SDN controller and in particular the virtual Fabric Controller (vFC) within the Coriant Transcend™ Symphony SDN controller, which hides the complexity of multi-node systems. The Transcend Solution also includes Coriant Transcend™ MANO for the management and orchestration of VNFs, and provides end-to-end automation including a portal for customer self-provisioning.

ACCELERATE INNOVATION WITH DISAGGREGATION, OPEN INTERFACES, AND A MODULAR NOS

Disaggregating the router into distinct hardware and software functional blocks enables each functional block to be upgraded based on its own innovation cycle, while leveraging the innovation capabilities of the ecosystem rather than more limited innovation capabilities of any single vendor. With SDN and open interfaces greatly simplifying the integration of new technologies into the IT/OSS environment, new innovations can be adopted more quickly and with lower cost and less disruption. Furthermore, Coriant's modular NOS and the migration of additional services from dedicated modules or devices to VNFs enables innovative new capabilities to be added quickly and cost effectively.

REDUCE CAPEX BY MINIMIZING VENDOR LOCK-IN AND BY AVOIDING HIGH UPFRONT INVESTMENTS

The high vendor lock-in of proprietary, closed routers and the small number of router vendors results in limited pricing pressure throughout their lifecycles. In addition to the CapEx benefits of accelerated innovation, the disaggregated router approach enables competitive pricing with greatly reduced barriers to adding or replacing vendors and a significant increase in the number of potential vendors. Rather than using costly proprietary hardware, the Coriant disaggregated router leverages generic white boxes based on off-the-shelf chipsets. And while chassis-based routers require a large upfront investment in the chassis and its backplane, fabrics, and controllers that may be significantly underutilized for much of their lifecycle, the Coriant disaggregated router provides the ability to scale incrementally with minimal wasted upfront investment.

MINIMIZE OPEX BY REPLACING PROPRIETARY CLI WITH OPEN, SDN-ENABLED AUTOMATION

Leveraging open interfaces with the flexibility to use controllers and orchestrators from parties other than the router vendor, the Coriant disaggregated router greatly simplifies the evolution from proprietary CLIs to SDN-enabled automation. In addition, the Transcend Software Suite provides a portal for customer self-service provisioning and the vFC, which hides the complexity of multi-node systems by virtualizing a network composed of multiple hardware elements into a single virtual fabric.

SCALE QUICKLY AND COST EFFECTIVELY WHILE ADDRESSING SYSTEMS OF ANY SIZE FROM ACCESS TO CORE

The Coriant disaggregated router can scale from the smallest access system with a single low capacity white box to the largest core systems. The Coriant NOS was specifically designed to support multi-node systems including node stacking and leaf/spine architectures. The leaf/spine architecture frees network operators from the constraints of chassis-based systems where capacity is limited by the backplane and number of slots, and by the interdependence of fabrics and line cards. This new architecture enables horizontal scaling with the ability to scale the fabric by adding or replacing spine switches, and to scale the line card capacity by adding or replacing leaf switches. For smaller systems, node stacking enables leaf switches to be stacked without spine switches, logically equivalent to a fabricless router.

AVOID COMPROMISE WITH CARRIER-CLASS WHITE BOX OPTIONS AND A PROVEN, SCALABLE NOS

The Coriant disaggregated router solution provides the option of using the Vibe series of carrier-grade white boxes. Building on a standard white box design, the Vibe white boxes offer temperature hardening, larger buffers, and packet synchronization features including 1588v2 and Synchronous Ethernet. High availability features include hot swappable, redundant fans and power supplies complementing the multi-node resiliency of node stacking and leaf/spine architectures enabled by the Coriant NOS, which is derived from Coriant's scalable and proven IP/MPLS software.

GROW REVENUES FROM LATENCY-SENSITIVE APPLICATIONS BY DISTRIBUTING VNFs TO THE NETWORK EDGE

With latency sensitive applications driving the push to locate compute resources closer to the network edge, the Coriant disaggregated router provides a flexible solution for VNF deployment with the option to host VNFs on the white boxes saving footprint and reducing power consumption at the network edge.

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