



Executive Summary

Coriant has issued multiple announcements leading up to the 2018 Mobile World Congress: enhancements to its Hyperscale Carrier Architecture (HCA) and the launch of a new Multi-Sided Platform Partner Program. Subsequent releases have announced a software collaboration with Aricent and the debut of a 5G mobile solution with Affirmed Networks, a virtual packet core provider. Taken collectively, the announcements represent a broader transformation currently under way at the 35-year-old optical networking company.

Enhancements to Coriant's open, disaggregated, software-driven Hyperscale Carrier Architecture include a move into higher level NFV management and network orchestration (MANO), launch of a disaggregated IP/MPLS network operating system and the debut of disaggregated, application-optimized white-box packet platforms.

With the Multi-Sided Platform solution, Coriant is combining its products and life-cycle management know-how with best-of-breed vendors to deliver pre-integrated solutions that can enable differentiated services and accelerate time-to-revenue for service providers. The Multi-Sided Platform is debuting with initial vendor partners representing next-generation SDN/NFV access, video optimization, mobility, security, IoT, data center architectures and multi-access edge computing.

Service providers and innovative vendors seeking solution integration, global distribution, and flexible services should make time to discuss Coriant's Multi-Sided Platform ecosystem.

Key Findings

- Coriant is transforming into an open solution provider
- Coriant is launching the Vibe portfolio of disaggregated, COTS+ packet processing platforms with per-application hardware assist
- Coriant battle-hardened IP/MPLS software is launching as stand-alone NOS
- Coriant's Transcend™ Software Suite is moving beyond SDN control and into NFV MANO
- Coriant's Multi-Sided Platform Partner Program provides an ecosystem and solution-based approach to benefit SPs with
 - *Accelerated time to revenue*
 - *Reduced integration costs*
 - *Reduced risk*
 - *Increased flexibility*

CHANGING NETWORKS, CHALLENGE & OPPORTUNITY

Networks are transforming. Disaggregation at multiple networking levels is having a profound effect on products and solutions. The Optical DCI market is just one example where disaggregated, small form factor (SFF) appliances like the 1RU Coriant Groove G30™ are increasingly being utilized over chassis-based solutions to interconnect data centers. Although Optical DCI represents over 17% of the High Speed Optical networking market and grew at 25% y-y in 2017, the Optical DCI SFF appliance segment is growing at a blistering 94% y-y¹.

With network function virtualization (NFV), whole classes of software functions are also becoming virtualized, containerized and disaggregated from other software components and the underlying hardware. Two of the early NFV use-cases are the virtual evolved packet core (vEPC) of the mobile network and virtual customer premises equipment (vCPE) for enterprise and business services delivery. ACG estimates that NFV will be a \$16.7B market by 2021.

Although disaggregation is well under way, demand for bandwidth continues. The move to 5G mobile networks, the introduction of 4k video and the increasing use of virtual/augmented reality will all contribute to increasing bandwidth demands by mobile, residential and enterprise customers. Overall IP traffic is expected to achieve 24% CAGR through 2021². Global cloud IP traffic is expected to grow even faster at 30% CAGR through 2020³. ACG Research's own optical port tracker estimates that the number of 100G+ coherent DWDM ports deployed in 2017 exceeded 360,000 units or a 42% increase versus 2016⁴.

The combination of disaggregated networks, virtualized functions and growing bandwidth demands represents both a challenge and an opportunity for service providers. One of the biggest challenges is that with an increasingly modular network, the sheer number of components and variables can be overwhelming and increase the integration workload and risk while

decreasing deployment velocity. However, by partnering with a company with the right skills and experience, service providers have an opportunity to reduce their integration challenges and headaches while still achieving the benefits and competitive advantage of a mix-and-match, best-of-breed networking approach.

CORIAN HYPERSCAL CARRIER ARCHITECTURE

The Coriant HCA is an open, automated, and software-driven approach to networking and service innovation. The architecture relies upon network modeling (most notably YANG) and abstraction with application programming interfaces to enable disaggregated elements and functions to be coordinated and programmatically controlled and managed. By utilizing open and consistent modeling and abstraction, individual hardware and software functions can be altered or replaced without the need to rewrite whole management and control functions as with prior vertically integrated and proprietary solutions. Recent HCA enhancements have been announced in three key areas: launch of a Coriant IP/MPLS network operating system (C-NOS), launch of a new series of Coriant Vibe™ programmable packet platforms and expansion of the Coriant Transcend™ Network Control and Orchestration Software Suite, which includes MANO and a virtual pod controller (VPC) that manages a stack of disaggregated functions and elements and enables service chaining.

CORIAN NETWORK OPERATING SYSTEM

Leveraging 20 years of IP/MPLS mobile backhaul and transport experience, Coriant has abstracted and virtualized its deployment-hardened IP/MPLS routing and control software. The Coriant NOS (C-NOS) is designed to operate on any commercial-off-the-shelf (COTS) compute platform as well as the application-enhanced Coriant Vibe™ hardware platforms. The underlying hardware environment can consist of X.86, ARM and Broadcom as well as customized network processing units NPUs from specialty packet processing vendors. C-NOS is another tool for service providers to enable them to instantiate a Layer-3 IP/MPLS routing instance when and where they need it on a diverse set of hardware and virtualized environments.

¹ Q4-2017 ACG Research Optical DCI Report.

² 2017 Cisco Visual Networking Index.

³ 2016 Cisco Global Cloud Index.

⁴ Q4-2017 ACG Research Optical Network Report.

CORIAN VIBE™ PROGRAMMABLE PACKET PLATFORM

Although embracing the use of COTS hardware, Coriant acknowledges that there are times when the required performance of certain applications can only be achieved with the appropriate underlying hardware. That is the driver behind the Coriant Vibe™ series of programmable products. Examples include Nx100G data plane performance in routing applications as well as low-latency performance (for example, < 1 or 1-10 msec) for multi-access edge computing applications like augmented reality or autonomous vehicle operation. The Coriant Vibe™ family of COTS+ platforms include hardware accelerators, custom compute engines and advanced synchronization and timing capabilities to meet the stringent requirements of advanced applications that might not be achievable with general purpose COTS hardware.

CORIAN TRANSCEND™ SOFTWARE SUITE

The Coriant Transcend™ Software Suite is a critical part of Coriant’s architecture as it facilitates a mix-and-match approach to solution creation with components coming from Coriant, Multi-Sided Platform partners and directly from service providers.

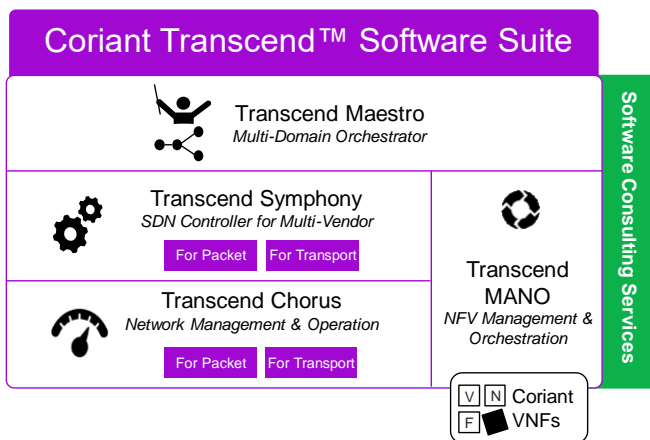


Figure 1: Coriant Transcend™ Software Suite

The Coriant Transcend™ Software Suite began multiple years ago as a multi-layer, multi-domain SDN controller for dynamically directing Coriant and third-party networking platforms. With the announced HCA enhancements, Coriant is collaborating with Aricent to extend the Transcend suite to take on a richer and higher-level set of NFV functions, including ETSI MANO. The Coriant Transcend™ Software Suite can interact with an Open Stack and/or VMWare virtual

infrastructure management software layer to instantiate, terminate and manage virtual network functions (VNFs). The MANO software is also designed to interact with higher-level service orchestration like Linux Foundation’s open-source ONAP project. By leveraging Aricent’s multi-year investment and experience in MANO software, Coriant accelerates its entry into higher-level NFV software functionality while enhancing service provider confidence in the solution.

The virtual pod controller software enables multiple disaggregated devices and functions to be stitched together to provide a wholistic solution for service providers. The initial VPC focus will be on integration with pods defined by the Open Networking Foundation’s Central Office Rearchitected as a Data Center (CORD) reference architectures for mobile, residential and enterprise environments.

CORIAN MULTI-SIDED PARTNERSHIP PROGRAM

The Coriant Multi-Sided Platform open ecosystem builds upon Coriant’s 35 years of networking experience, deep customer relationships and global presence. The program has four key components: validation and system integration, sales enablement, co-selling and support and life-cycle management.


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Validation & System Integration
 Coriant orchestrates the ecosystem, provides installation and integration, commissioning.
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Sales Enablement
 Coriant with Partner will provide product definitions, CRM, sales training content, collateral, lead gen.
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Co-Selling
 Coriant collaborates with Service Provider sales channels, enterprise resellers, web-based and social campaigns.
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Support & Lifecycle Management
 Coriant provides Tier 1 VNF partner support, Partner provides tier 2-3, lifecycle management.

Figure 2: Coriant Multi-Sided Platform Ecosystem

To facilitate an ecosystem approach with extensive validation and system integration capabilities including VNF on-boarding and comprehensive life-cycle management, Coriant is in the process of creating a dedicated North American facility to serve as its main Multi-Sided Partner solution laboratory. The facility will house all Coriant’s and ecosystem partner’s physical

and virtual components as well as third-party software like ONAP service orchestration. The approach is flexible enough to enable service providers and partners to tailor services for their respective needs, but the approach is also comprehensive enough to enable end-to-end solution creation, support and life-cycle management from ideation through mass commercial deployment and post-deployment support.

INITIAL MULTI-SIDED PARTNERS

Coriant launched the Multi-Sided Platform Partner Program with six initial partners: ADTRAN, Bluechip Systems, Crunch Media Works, Engineered Fluids, Federated Wireless and nuPSYS. In a second phase of partner announcements, Coriant added Affirmed Networks, a virtual EPC supplier. The collection of companies covers next-generation SDN/NFV access, video optimization, mobility, security, IoT, data center architectures and multi-access edge computing.

BENEFITS FOR SERVICE PROVIDERS

Coriant's Hyperscale Carrier Architecture, enhancements to the Transcend Software Suite and the launch of the Multi-Sided Platform ecosystem position Coriant as a solution provider for open, disaggregated digital network transformation. Service providers can benefit from Coriant's expertise in four key ways:

- Accelerated time to revenue w. validated solutions
- Reduced integration costs leveraging Coriant's labs
- Reduced risk with Coriant front-ending partners
- Increased flexibility with tailored Coriant services

BENEFITS FOR PARTNERS

Hardware and software vendors can also benefit from Coriant's open approach. The company's global presence and support services can extend a vendor's reach beyond a single home market and make it easier to sell and service customers worldwide. By plugging into Coriant's Multi-Sided Platform ecosystem, best-of-breed category vendors can rapidly become part of a comprehensive solution. In addition, partner companies can leverage Coriant's professional services to provide support during and after deployment.

NEXT STEPS

We expect to see additional partner announcements from Coriant in the coming months. We also expect Coriant to impress upon service providers the importance of visiting its partner lab where Coriant can provide evidence of its commitment to succeeding with the Multi-Sided Platform ecosystem and establishing itself as a trusted partner in digital transformation.

CONCLUSION

As evidenced by enhancements to its Hyperscale Carrier Architecture, evolution of the Transcend Software Suite to include higher-level MANO functions and launch of the Multi-Sided Platform Partner Program, Coriant is transforming. Service providers looking for a partner to accelerate revenue, reduce integration costs, reduce risk and increase flexibility should talk to Coriant. Best-of-breed vendors looking to expand their footprint and become part of something bigger than themselves should also consider a discussion with Coriant.



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