

Infinera Packet DCI

Leveraging Packet Disaggregation and SDN to Cost Effectively Scale Inter-Data Center Transport

With traffic between data centers growing at more than 30% per year, chassis-based systems will struggle to provide cost-effective and scalable solutions. Infinera Packet DCI leverages the technologies and principles of Infinera Hyperscale Carrier Architecture including programmable packet based on white boxes and a hardware-independent network operating system, leaf/spine horizontal scaling, and SDN with self-service customer portals to re-architect the inter-data center transport function. This approach can be used to address a wide range of use cases including data center fabric extension, inter-data center IP backbone, data center interconnect services, distributed internet exchange services, and cloud connect services.

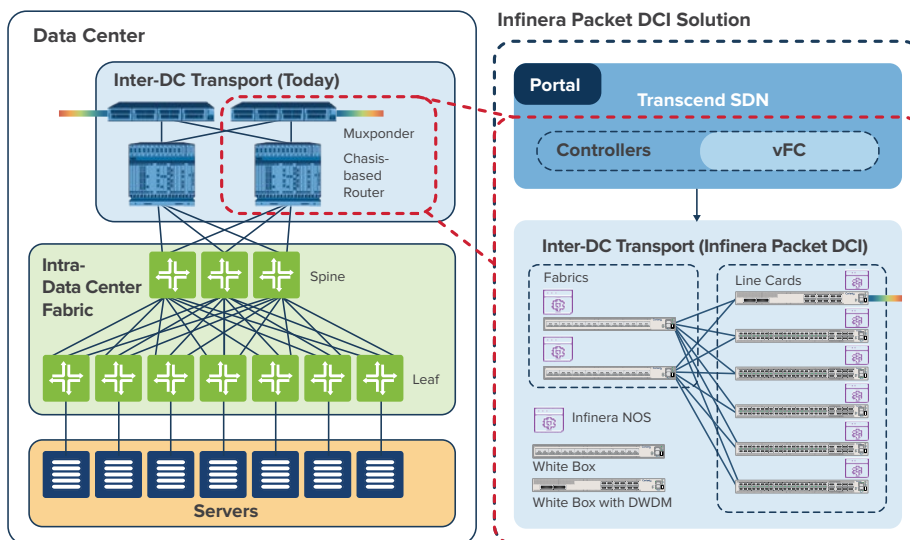


Figure 1 - Infinera Packet DCI Solution

DISAGGREGATE CHASSIS-BASED INTER-DATA CENTER SYSTEMS WITH WHITE BOXES AND SDN

While network operators have increasingly disaggregated the DWDM element of inter-data center transport by adopting open muxponders, such as the Infinera Groove G30 MUX, and open line systems, such as the Infinera Groove G30 OLS, the packet switching element of today's inter-data center transport typically consists of chassis-based routers. The Infinera Packet DCI solution disaggregates these chassis-based systems into white boxes running the Infinera Network Operating System (NOS), which replaces the fabrics and line cards with a leaf/spine architecture. The chassis controller function is provided by a Virtual Fabric Controller (vFC) within the Infinera Transcend Symphony SDN Controller.

BENEFITS OF THE INFINERA PACKET DCI SOLUTION

- **Accelerate** innovation by disaggregating inter-data center transport into best-in-breed functions that can be upgraded based on their own renewal cycle, and with the ability to quickly add new technologies and functions
- **Scale** inter-data center transport with the ability to quickly and cost effectively grow capacity by adding spine or leaf white boxes, and with support for the VXLAN protocol and the EVPN standard
- **Minimize** CapEx by reducing vendor lock-in, replacing chassis-based routers with disaggregated white box-based solutions, and collapsing packet switching and DWDM muxponder layers
- **Reduce** OpEx by leveraging SDN-enabled automation including a self-service portal for customers, and a virtual fabric controller that hides the complexity of multi-white box systems
- **Grow** revenues with on-demand data center interconnect, internet exchange, and cloud connect services

ADD CAPACITY QUICKLY AND COST EFFECTIVELY WITH HORIZONTAL SCALING

The leaf/spine architecture of the Infinera Packet DCI solution 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 line card capacity by adding or replacing leaf switches. As the controller is now a virtualized SDN function, it can also be easily scaled.

REDUCE OPERATIONAL COSTS AND GROW REVENUES WITH CUSTOMER SELF PROVISIONING

SDN plays a key role in the Infinera Packet DCI solution with Transcend Symphony providing the SDN controller function including the vFC and Infinera Transcend Maestro enabling end-to-end service activation. SDN-enabled automation can significantly lower operational costs with a portal also enabling new services and increased revenues based on customer self provisioning.

COLLAPSE LAYERS WITH OPTIONAL INTEGRATED DWDM OPTICS

While keeping the DWDM muxponder function separate from the packet switching can have advantages in terms of their different innovation cycles and the ability to select best-in-class suppliers for each function, integrating the muxponder and packet switching can have advantages in terms of reduced space and power, and fewer systems to manage and maintain. The Infinera Packet DCI solution supports both options with the Groove G30 MUX for when separate functions are preferred, and white boxes with integrated coherent DWDM interfaces for when integration is preferred.

EXTEND THE DATA CENTER FABRIC ACROSS SITES SEAMLESSLY

Infinera Packet DCI can provide an ideal solution for extending the data center fabric between geographically dispersed data centers. In addition to traditional Layer 2 and Layer 3 data center fabric options, Infinera Packet DCI can also support virtualized fabric options with support for both the VXLAN protocol and the EVPN standard.

BUILD AN IP BACKBONE LEVERAGING IP/MPLS OR SEGMENT ROUTING

In addition to extending the data center fabric across sites, the Infinera Packet DCI solution can also provide the IP backbone for inter-data center connectivity based on IP/MPLS or segment routing. The white boxes are loaded with a version of the Infinera NOS optimized for this application and originating from proven and scalable Infinera IP/MPLS software.

OFFER ON-DEMAND PACKET-BASED DATA CENTER INTERCONNECT SERVICES

Leveraging the white box switches with integrated muxponder functionality, the Infinera Packet DCI solution can enable Carrier Neutral Providers (CNPs) and Communications Service Providers (CSPs) to offer cost-effective and on-demand connectivity between customer servers in different data centers. In addition to decreased space and power, the statistical gain of packet switching can reduce the required optical capacity by between 50% and 75%, lowering CapEx and extending the life of fiber assets.

DEPLOY SCALABLE DISTRIBUTED INTERNET EXCHANGE SERVICES

The Infinera Packet DCI solution provides an ideal platform for Internet Exchange Providers (IXPs) and CNPs to provide distributed internet exchange services based on VPLS, EVPN-MPLS, or EVPN-VXLAN. Exchange members can easily monitor their current traffic utilization and trends based on historic utilization via the customer portal.

DELIVER PORTAL-BASED CLOUD CONNECT SERVICES

The Infinera Packet DCI solution also provides an ideal platform for services connecting customer servers to cloud service providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform. Leveraging BGP, these customer servers could be in the same data center, a remote data center, or a customer premises connected to the data center over a CSP's network.