

INFINERA OTS SOFTWARE

PACNET INTRODUCES NETWORK VIRTUALIZATION TO THE OPTICAL LAYER WITH INFINERA'S OTS SOFTWARE

One of the key tenets of Software Defined Networking (SDN) is facilitating dynamic networks that are easily configured via application programming interfaces (APIs).

This technical brief explains how Pacnet deployed Infinera's Open Transport Switch (OTS) software within Pacnet Enabled Network (PEN) to extend their widely commercially available Network as a Service (NaaS) platform through to 100 Gb/s optical transport infrastructure using SDN principles. NaaS allows Pacnet's customers to use a self-service portal or Application Programming Interfaces (APIs) to deploy and reconfigure transport network bandwidth in minutes versus an industry average of two to four weeks.

Pacnet's initial deployment of PEN provided Layer 2 Ethernet virtual circuits with bandwidths up to 10 Gb/s. In 2014, the platform was extended to add Network Function Virtualization (NFV). Now with this new optical virtualization capability Pacnet has extended the PEN platform's NaaS model through to the transport layer by integrating it with Infinera's OTS software.

Pacnet's agile development methodology, along with Infinera's concise OTS API, allowed the Infinera transport technology to be integrated with the PEN platform in a three-month development cycle, compared to typical 12 to 18 month traditional telco service development efforts.

The converged packet-optical foundation of the PEN NaaS offering is Infinera's Intelligent Transport Network featuring the DTN-X platform, which is widely deployed by Pacnet. The DTN-X is a highly software controllable transport solution featuring a layer of abstraction called Bandwidth Virtualization, an intelligent multi-layer GMPLS control plane and a rich set of functions that can be manipulated via software. In typical deployments the DTN-X is controlled via Infinera's Digital Network Administrator (DNA) network management system. For this new service Pacnet has integrated PEN with Infinera's OTS software and deployed it across key routes of their pan-APAC network to offer

this new NaaS. OTS is a Web 2.0, lightweight virtual transport switch that runs on a Linux server and provides a high level of abstraction and virtualization of the Intelligent Transport Network for simple network programming. OTS is designed with a completely open framework so it can integrate with a customer's application, SDN controller, or orchestration software and does not require Infinera's DNA or an Infinera-specific controller to operate. Pacnet is leveraging the OTS Hybrid Control Mode, which allows OTS-enabled services to be deployed alongside existing production transport services managed by Infinera's network management system.

The PEN platform consists of multiple software modules that enable SDN orchestration of network elements from multiple vendors, abstraction of multi-layer network topologies, integration into back office operations support systems (OSS) and business support systems (BSS) and exposure of network bandwidth and control to end users through a public API and portal.

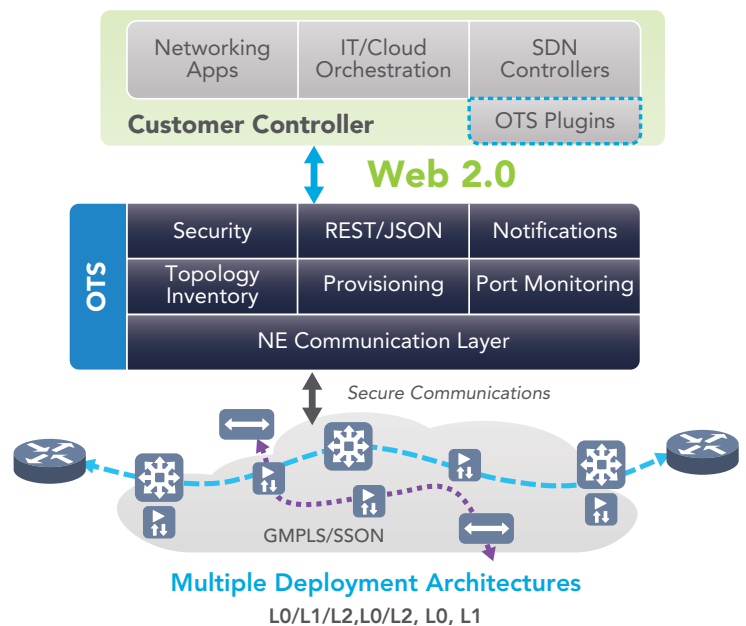


Figure 1: Open Transport Switch

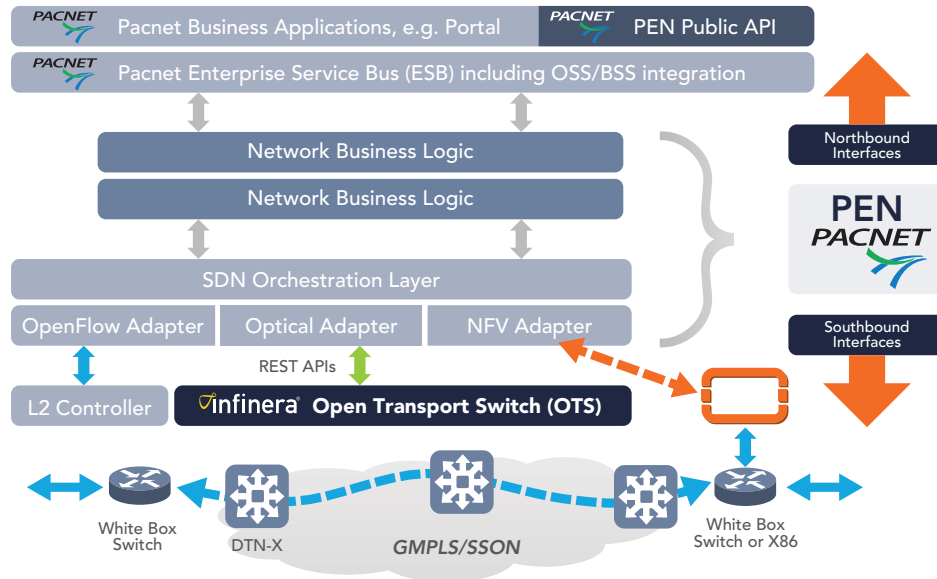


Figure 2: Pacnet Enabled Network Block Diagram

PEN SDN Orchestration Layer: Provides orchestration logic including SDN control with southbound APIs and protocols to control the forwarding path of L0-L3 network elements and L3-L7 virtualized network functions (VNF).

PEN Network Technical and Business Logic: Gives a view of network topologies and logic to map network business requirements to network technical implementation.

PEN Enterprise Resource Bus: Connects the Network Technical and Business Logic Software layer to Pacnet back office infrastructure including OSS such as monitoring and back office support systems.

PEN Public APIs: These are APIs that allow applications to directly request network services without human intervention.

PEN Portal: A user portal that allows users to request and provision NaaS-based transport services in 10 or 100 Gb/s increments between two end points, for which they get real time pricing quotes based on the duration of service requested.

With the extension of NaaS to the virtualized optical transport layer, there are number of key benefits to Pacnet, their customers and the industry:

- PEN customers or their applications can dynamically deploy transport bandwidth to satisfy customer desire for increased control and pay-for-use model. Customers not only have control of the bandwidth but also duration of service, latency and quality of service, and they pay for what they use without the need for lengthy and inflexible contracts.
- This new model makes better use of previously underutilized network assets and possibly creates new markets as applications begin to exploit the dynamic control of the network.
- This deployment shows the industry one possible way to extend SDN to the wide area networks from lab-based demos and interoperability tests to real world revenue deployments.
- This deployment shows the value of Infinera’s open approach to SDN and of a lightweight OTS abstraction layer that can integrate into any application, controller, or orchestration software layer.
- Pacnet is able to deploy this new SDN NaaS along with their traditionally managed transport services using the OTS Hybrid Control mode.
- Pacnet is able to make solid steps towards multi-layer network control now having both Layer 1 and Layer 2 SDN controlled NaaS services.

Global Headquarters
140 Caspian Court
Sunnyvale, CA 94089
USA
Tel: 1 408 572 5200
Fax: 1 408 572 5454
www.infinera.com

US Sales Contacts
sales-am@infinera.com

Asia and Pacific Rim
Infinera Asia Limited
8th floor
Samsung Hub
3 Church Street
Singapore 049483
Tel: +65 6408 3320
sales-apac@infinera.com

Europe, Middle East,
Africa
Infinera Limited
125 Finsbury Pavement
London EC2A 1NQ,
United Kingdom
Tel: +44 207 065 1340
sales-emea@infinera.com

Customer Service and
Technical Support
North America
Tel: 877 INF 5288
Outside North America
Tel: 1 408 572 5288
techsupport@infinera.com

