vE-CPE: Implementation & Test Strategies

December 20, 2016

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Today’s Presenters

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**Jim Hodges**
Senior Analyst, Heavy Reading
Agenda

- Introduction
- vE-CPE Deployment Drivers
- vE-CPE Architecture Options
  - SD-WAN Implementation Strategies
- Remote Evaluation Services for vE-CPE
- Conclusions
- Q&A
Enterprise Cloud Drivers

Please rank the importance of the following factors in migrating to enterprise cloud services. (1 = most important) (n=53)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service agility and application flexibility</td>
<td>159</td>
</tr>
<tr>
<td>Reduced capital expenses (capex)</td>
<td>152</td>
</tr>
<tr>
<td>Reduced operating expenses (opex)</td>
<td>142</td>
</tr>
<tr>
<td>Enhanced security capabilities</td>
<td>136</td>
</tr>
<tr>
<td>Greater revenue generation opportunities</td>
<td>92</td>
</tr>
</tbody>
</table>

Source: Heavy Reading Enterprise Survey – September 2016

Key Finding: Enterprises are migrating to the cloud for the same reasons as network operators; service agility, as well as capex and opex reduction.
Enterprise Cloud Readiness

What is your organization's plan regarding the use of cloud services for application service delivery? (n=53)

We plan to start using cloud services for application service delivery within the next 12 months - 40%

We already are using cloud services for application service delivery - 36%

We will eventually use cloud services for application service delivery - 21%

We have no plans to use cloud services for application service delivery - 4%

Source: Heavy Reading Enterprise Survey – September 2016

Key Finding: A little more than a third of enterprises (36%) are already using some form of cloud services. 40% of the other enterprises aren’t far behind. Only 4% of the respondents have no plans to implement.
Enterprise Cloud Readiness

How much of an impact will cloud services have on your organization’s application strategy? (n=53)

A moderate impact -- we will migrate many of our applications to the cloud

A major impact -- we will migrate most or all of our applications to the cloud

A minor impact -- we will migrate a limited number of our applications to the cloud

Little or no impact -- we will keep most or all of our applications off the cloud

Key Finding: Similarly, more than a third (36%) are planning to migrate most or all their applications to the cloud. 40% expect to migrate “many” applications. 23% anticipate only a limited number of applications will be migrated.

Source: Heavy Reading Enterprise Survey – September 2016
vE-CPE Deployment Drivers

Why is vE-CPE a top ranked enterprise use case?

Business Drivers

• Addresses the top drivers – agility, opex and capex reduction
• Flexible implementation options
• New business models – Cloud Managed Services vs. Managed Services
• New business models – SaaS, SECaaS, FWaaS, SD-WAN
• New business segments - IoT vs vE-CPE vs white box connected car.
• Opens up the ecosystem

Technical Drivers

• Alters CPE performance metrics – scale and software integration
• vE-CPE is just another VNF
• Secure the Cloud, secure the Enterprise
• Aligns with the spirit of open platform NFVi.
**vE-CPE Architecture Options**

**Legacy CPE Solution**
Branch Offices with expensive complex appliances

**Virtualized Enterprise CPE solution**
Customer Premises VNF Model

Remote Office
All-in-one integration

Small & Medium Office:
Integration with Existing Infrastructure
White box and Cloud Model

Cloud-centric Deployments: Slim CPE
Branch Security and XaaS Gateway
Universal CPE Architecture Requirements

- Needs to be Industry-standard COTS x86 server platform for SOHO/SME installations
- Tested and Certified by key SW vendors for vE-CPE & SD-WAN roll-out
- Optimized for volume deployment + global logistics and forward replacement services
- Prefer Integrated offload for enhanced security
- Flexible LAN / WAN connectivity
- Optional LTE connectivity for deployment flexibility
- Integrated LAN switch and optional WiFi support
- Full range of branding options
Universal Architectures for vE-CPE

- Wireless Options 4G/LTE
- Agility and TCO
- Zero Touch Provisioning
- Performance & Scalability
- Secure connections without penalties
- Ethernet Connectivity to the WAN
- Rich LAN connectivity
- Reliability & Availability
- WiFi Integration
- Physical Security

Physical Platform Needs
SD-WAN & SD-Security: The New Enterprise VPN

- Unified Secure VPN Across Multiple Public & Private WANs
  - Dynamic Application & SLA-Aware Traffic Steering
  - Flexible Internet Breakout (Centralized and/or Distributed)
  - Pervasive Network, Application & Security Visibility
  - Automated Network & Security Services Provisioning
Audience Poll #1

To what extent have you decided on a particular vE-CPE implementation option.

A. We are committed to the customer premise based VNF model
B. We are committed to the white-box cloud hosted model
C. We will deploy both
D. We are still reviewing our options
SD-WAN Implementation Strategies
The Value of SD-WAN

Fundamentally Changing the Economics

Retain & Acquire Customers
Hybrid & SD-WAN

Lower Capex
Commodity Hardware

Lower Opex
Zero-touch Provisioning
& Software Agility

Generate New Revenue
Security & Apps

- Increase Profits

MPLS + Internet

- Keep the branch
- Eliminate risk of billions in lost revenue
- One 1000 branch customer = $15-20M in potential losses to competitors

- Move to white box appliances
- 70-80% savings in Capex

- Self-service, no truck rolls or specialized personnel required
- 50-60% savings in Opex
- One 1000 branch customer = $2.0M in savings over 3 years
- Instant deployment

- Branch security, application visibility & performance
- 100% + revenue upside potential per customer

LightReading WEBINAR
ADVANTECH Networks & Communications
VERSANETWORKS
Versa Solution: Open SD-WAN thru NFV

Versa OS
(service chaining, elasticity)

Routing  VPN  SD-WAN  Next-Gen FW  UTM

Versa FlexVNF

Versa Analytics

Versa Director

Open Hardware
Bare Metal, VMs, Containers

3rd Party VNFs

3rd Party PNFs

100% Multi-Tenant
Delivers economies of scale

Programmable
Agility through automation
# Value of Open SD-WAN Model

<table>
<thead>
<tr>
<th>Open SD-WAN</th>
<th>Proprietary SD-WAN appliances</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wider choice of models</strong></td>
<td><strong>Limited models</strong></td>
</tr>
<tr>
<td><strong>Benefit:</strong> optimize CPE per use case</td>
<td><strong>Issue:</strong> “3 sizes don’t fit all”</td>
</tr>
</tbody>
</table>

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<tr>
<th><strong>x86 for IP services</strong></th>
<th><strong>Hardware built for software</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benefit:</strong> run wide range of services</td>
<td><strong>Issue:</strong> can you add services to installed appliances?</td>
</tr>
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<tr>
<th><strong>Seamless upgrades</strong></th>
<th><strong>Difficult upgrades</strong></th>
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<tbody>
<tr>
<td><strong>Benefit:</strong> instant provisioning after upselling; no truck roll or replace</td>
<td><strong>Issue:</strong> capacity or service tier upgrade = new box?</td>
</tr>
</tbody>
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<tr>
<th><strong>Lower cost</strong></th>
<th><strong>Margin reqt’s = higher price</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Benefit:</strong> white boxes = lowest cost CPE; minimal vendor mark up</td>
<td><strong>Issue:</strong> Traditional appliance vendors require margins</td>
</tr>
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</table>
Versa Open SD-WAN Options

Hardware Purchase Options

Versa Certified Appliances
- Direct from Supplier
- Distributor-provided

Compatible Hardware
- Data Center Servers
- Grey Box Platforms

System Integration & Support
# Open SD-WAN Appliance Options

<table>
<thead>
<tr>
<th>Platform Series</th>
<th>Target Deployment</th>
<th>Aggregate Performance</th>
<th>Interfaces</th>
<th>Processor</th>
<th>3rd Party VNFs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versa 100 Series</td>
<td>Small Branch</td>
<td>V100: 250 Mbps V110: 500 Mbps</td>
<td>Fixed GE Cu WiFi &amp; LTE option</td>
<td>Atom SOC</td>
<td>No</td>
</tr>
<tr>
<td>Versa 500 Series</td>
<td>Medium Size Branch</td>
<td>V500: 250 Mbps V510: 500 Mbps V520: 1.5 Gbps</td>
<td>Fixed GE Cu</td>
<td>Atom SOC</td>
<td>No</td>
</tr>
<tr>
<td>Versa 800 Series</td>
<td>Large Branch, HQ</td>
<td>Up to 20 Gbps</td>
<td>Fixed + Modular</td>
<td>Xeon-D SOC</td>
<td>Yes</td>
</tr>
<tr>
<td>Versa 1000 Series</td>
<td>DC Edge</td>
<td>Up to 50 Gbps</td>
<td>Fixed + Modular</td>
<td>Xeon</td>
<td>Yes</td>
</tr>
<tr>
<td>Versa 2000 Series</td>
<td>DC Edge</td>
<td>Up to 100 Gbps</td>
<td>Fixed + Modular</td>
<td>Xeon</td>
<td>Yes</td>
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- Features activated during testing: IPv4 Routing / Forwarding, IPsec Encryption, Layer 7 Application based traffic steering, CGNAT, Nextgen Firewall (NGFW), QOS (Classification and Marking), SLA monitoring, internal service chaining, URL Filtering,
- Testing done with IMIX sized traffic that consists of 90% TCP and 10% UDP
- IPS, IDS and Antivirus are not included
Remote Evaluation Service (RES) for vE-CPE

Overview

Advantech's Remote Evaluation Service (RES) is designed to help you get ahead of the technology curve and rapidly evaluate performance of the latest silicon from leading manufacturers on hardware platforms from our Networks & Communications Group (NCG). You can load your software onto Advantech's RES platform to evaluate the performance of your software in an environment that closely matches the real-world environment in which it will be deployed.
• Available x86 networking and compute portfolio to match platform needs per location
• Continuously add gear to track market evolution and Intel tick-tock innovation:
  – density, scalability and performance sweet-spots for compute, storage and I/O
Benefits of Remote Evaluation Services

- **Let it be our headache: Remote lab with AE and R&D support**
  - No hassle setting up, troubleshooting and maintaining hardware
  - Save money and resources, especially on “new” intel platforms in pre-production stages without sacrificing time to market
  - Leverage Advantech network test equipment

- **Access to latest generation platforms**
  - Access the broadest range of networking platforms based on iA in the industry
  - Advantech is early access partner of Intel
  - Advantech will upgrade platforms once production silicon is released

- **Test performance for deployment at different sites/locations**
  - Validate platform performance using site specific requirements
  - Equipment available represents different deployment scenarios and locations in the network (access/edge/aggregation/core, etc.)

- **Use it throughout the entire S/W lifecycle**
  - Check how your software performs on different intel platforms
  - Perform optimization, tuning and profiling
vE-CPE Virtualization Testing Scenario

Potential cases for VNFAasS in the Enterprise

- AR - Enterprise Access Router / Enterprise CPE
- PE - Provider Edge Router
- FW - Enterprise Firewall
- NG-FW - Enterprise NG-FW
- WOC - Enterprise WAN optimization Controller

- DPI - Deep Packet Inspection (Appliance or a function)
- IPS - Intrusion Prevention System and other Security appliances
- Network Performance Monitoring
vE-CPE Test Setup in RES Labs

NFV Infrastructure

PoP/DC/Cloud Central Compute

CPE device Local functions

Test Agent Emulate Users

Site-to-Site traffic

Site-to-Public traffic

Branch1 Central Functions

Branch2 Central Functions

Branch3 Central Functions

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Audience Poll #2

What do you consider the greatest benefit of vE-CPE remote testing?
Please tick all that apply

A. Set-up and testing time is significantly reduced
B. Easier to support testing of third-party applications.
C. More flexible when changes to test plans are required
D. Better optimization of testing resources
E. Ability to test across a broad range of HW platforms and payloads.
Thank you for attending!

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