

vCPE-OS

Open Carrier-Class Operating System for Network Edge Virtualization

- Linux-based, carrier-class operating system for disaggregated edge devices
- vCPE-OS consolidates an NFV Infrastructure, a vCPE optimized VIM and advanced routing
- Open standard Northbound Interfaces for management and orchestration
- Optimized for high-performance and low resource consumption

In the core of RAD's vCPE Toolbox stands vCPE-OS designed to run on any COTS white box server; it manifests disaggregation between hardware, operating system and network functions. It combines powerful networking capabilities with virtualization for hosting value-added virtual network function (VNF) applications from multiple vendors.

vCPE-OS enables a single box to serve as a networking edge, as well as a host for networking, security and IT applications, with the following benefits:

- Avoiding VNF vendor lock-in: vCPE-OS is suited to host value added services of any type per customers choice.
- Avoiding Orchestration lock-in: vCPE-OS integrates with any orchestration system based on NETCONF/YANG or CLI interface
- High performance, resource efficiency: vCPE-OS is a thin operating system, occupying a single x86 Core and less than 2 GB RAM memory. With ultimate resource efficiency, it provides top notch networking performance for its embedded routing functionality, as well as for hosted VNFs
- Zero touch provisioning: touchless installation and service provisioning without having technicians on site
- Secure operating system: offers hardening of Linux and KVM, data protection at rest, in transit and in processing, blocking of penetration and hacking attempts

MARKET SEGMENTS AND APPLICATIONS

With vCPE-OS, service providers can deploy a single common network OS on all hardware white boxes in use, each one suited to the specific requirements of the customer sites. The service provider gets to choose the preferred hardware within the x.86 family (avoiding vendor lock-in and optimizing performance vs. costs), desired applications for each customer, and a management/orchestration system. vCPE-OS is deployed in branch sites and in enterprise headquarter sites, on an array of

white boxes differing in interfaces, processing power and capacity for storing applications. Hosted applications vary between sites, where branches often deploy SD-WAN and SD-Branch, and headquarters also add on voice applications, such as IP-PBX.



INTEROPERABILITY

vCPE-OS has an open management platform and can be easily integrated with standards-based SDN controllers, orchestrators, and Operations/Business Support Systems (OSS/BSS) from major providers using NETCONF/YANG interface modeling, standard OpenStack-compatible REST API or SNMP.

ARCHITECTURE

vCPE-OS is built with a standard KVM hypervisor to host third-party VNFs. Common applications include: SD-WAN, Firewall and Session Border Controller (SBC).

vCPE-OS embedded routing functionality enables superior performance edge connectivity with value-add service chains.

vCPE Toolbox also includes:

- RAD's D-NFV Alliance, an ecosystem of network orchestration and pre-tested VNFs
- RADview management and domain orchestration with standard APIs
- White box and pCPE platforms with distributed and centralized virtualization capabilities

MANAGEMENT

vCPE-OS management suite includes NETCONF/YANG, OpenStack-compatible REST API, CLI, SNMP, Syslog, and alarms.

RADview Domain Orchestrator manages the VNF resources and network capabilities. It models and deploys VNF instances via service function chains.

RADview also provides NMS tools and a Performance Monitoring portal.



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SECURITY

vCPE-OS security features include:

- Integration with external user management servers like LDAP, TACACS+ and RADIUS
- Protection for local user management
- Secured interfaces with ACLs, SSL authentication, RSA and pre-shared keys
- Data protection with multiple secured protocols, such as SSH, SFTP, SCP, HTTPS, IPsec
- Critical data encryption
- Constant security updates for all OS layers

Specifications

HARDWARE REQUIREMENTS

CPU

64-bit Intel x86 processor with VT-x (virtualization technology)

Ports

At least one Ethernet port

At least one USB port

RAM

Minimum 4 GB memory for vCPE-OS and acceleration (DPDK)

Note: For certification of over a third-party white box, please contact your local RAD partner.

NETWORKING

Layer-3 Forwarding – Static, BGP, OSPFv2

Multiple VRF

Policy Based Routing

Bridging (aware/unaware)

Dynamic IP

NAT and NAT Traversal

IPsec

GRE

VLAN tagging

Flexible binding of physical/logical ports to virtualization layer entities

Local switching

ACCELERATION

DPDK

SR-IOV

CELLULAR DRIVERS

LTE modem with PPP connection to hub

DIAGNOSTICS

Syslog

NETCONF notifications

MANAGEMENT

Authentication

5-level user authentication with TACACS+, RADIUS, LDAP (for virtualization only)

Console Port

Mini USB or serial (RS-232 or similar) port for management via CLI

USB port for installation from disk on key

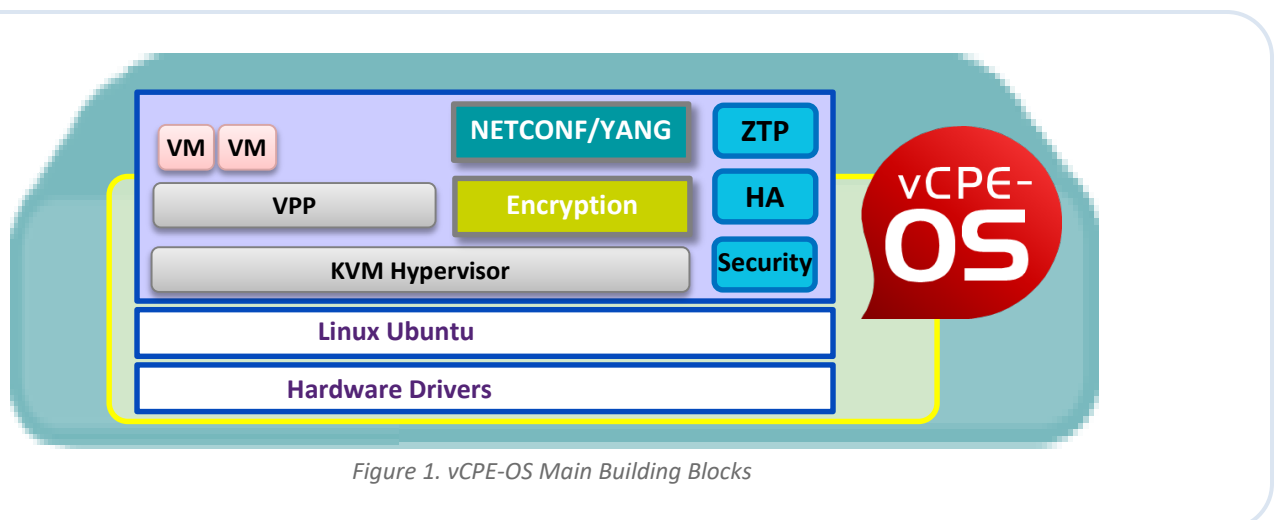


Figure 1. vCPE-OS Main Building Blocks

Management Options

CLI, SNMPv3, NETCONF

Remote management by SSH

SFTP Client

DHCP client

NTPv4

Access Lists for management and data traffic

Zero Touch

Performance Management

Ordering

RECOMMENDED CONFIGURATIONS

Licenses

VCPE-OS-LIC/[cores]

Annual license for a instance, based on the number of cores in the HW

VCPE-OS-LIC/[cores]/P

Perpetual license for a instance based on the number of cores in the HW

ANNUAL SERVICE COVERAGE

Note: The RADcare packages below are offered for a 12-month period. For longer periods, please contact RADcare Services.

RADCARE-D-NFV-BASIC-PLUS

8x5 SW support coverage plus maintenance and security patches

RADCARE-D-NFV-EXTENDED

24x7 SW support coverage plus maintenance and security patches

RADCARE-D-NFV-PREMIUM

24x7 SW support coverage plus maintenance, new feature releases and security patches

Professional Services

Remote installation and activation of vCPE-OS on ETX-2v

Onsite or remote vCPE-OS SW upgrade and activation

Onsite initial implementation (20 installations of vCPE-OS on ETX-2v, installation documentation and training session)

Full list of RAD services

SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options.

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