Tier 1 Service Provider Blueprint
Agile Enterprise Edge Platform Based on uCPE

A modular enterprise platform for SD-WAN and edge applications, leveraging uCPE virtualization to increase ARPU and decrease OPEX and CAPEX.

Virtualization technologies, similar to cloud computing technologies, are changing how communication service providers deliver networking and edge services to enterprises. On-premises virtualization as part of a unified network fabric that connects users and offices to services for increased ARPU and decreased OPEX is transforming how communication service providers (CSPs) deliver managed services.

To manage the competition from OTT players and increase ARPU, CSPs are looking at efficient ways to add new, innovative services to their offerings. Providing only the communication infrastructure does not allow for differentiation, resulting in lower margins and a capital intense business harder to scale. Delivering managed services on-demand and adding new services to the portfolio provides the opportunities to increase ARPU, but it requires an agile service delivery model based on a likewise agile platform.

The universal CPE (uCPE) is a flexible service delivery platform able to provide and scale services on-demand. Virtualization on white-box uCPE removes the constraints imposed by single-function appliances and enables automated, centralized, self-service delivery. Virtualization on universal COTS hardware also allows for shorter service development cycles. CSPs that rapidly respond to new business needs have the opportunity to build an early presence with the customer, keep the customer longer, and expand the services portfolio and ARPU.

The Challenge

Architecting a uCPE-based platform for enterprise communications allows picking best-of-breed products. The CSP needs to make sure the platform delivers on these promises:

- An open architecture preventing vendor lock-in
- Service expansion enabled by easily replacing or adding functionality
- Lean, lower OPEX in all service delivery phases
- High quality of experience
- Highly available and reliable services supporting business critical functions
- Scalable and optimized to target enterprises of any size

The Solution

Systems integrator nCinga has created together with industry leading partners Advantech, Enea, Rift, and Sproute a modular turnkey platform for agile service delivery to small, medium, and large enterprises. Based on open interface standards, the integrated solution addresses the challenges above, providing CSPs with an agile and scalable uCPE platform.

The blueprint solution includes SD-WAN enterprise connectivity, managed virtualization, and end-to-end automation and orchestration, all verified for a range of COTS hardware specifically designed for uCPE use cases.

- **White box hardware - Advantech uCPE**
  Advantech uCPE white boxes have been specifically designed to optimize on-premises deployments for service providers. The product range brings scalable processing performance and network throughput to fit a wide range of enterprise use cases from small outlets to corporate headquarters offering flexible WAN connectivity options now also including 5G & Wi-Fi 6 configurations.

- **uCPE Virtualization - Enea Edge**
  Enea Edge is a virtualization and management platform for white-box uCPEs. Not based on OpenStack, it provides minimal footprint and maximum networking performance for SD-WAN and edge applications.

- **SD-WAN – SPAN (Sproute Networks)**
  Sproute SPAN is a cloud-hosted modern WAN service enabling dynamic, robust, and secure networks connecting sites, cloud environments, SaaS applications, and remote users. SPAN is purpose-built from scratch, with a view to melding the best ideas from web-scale architectures and networking protocol stacks. It is easily customizable to fit any enterprise's networking, IT, and IoT needs.

- **Service Orchestration – RIFT.ware**
  RIFT.ware is a carrier-grade high scaling orchestration and automation solution for deployment of multi-vendor NFV services across multiple clouds and virtual networks. Its innovative, model-driven approach makes it quick and easy

Principal Architecture of the Blueprint Solution
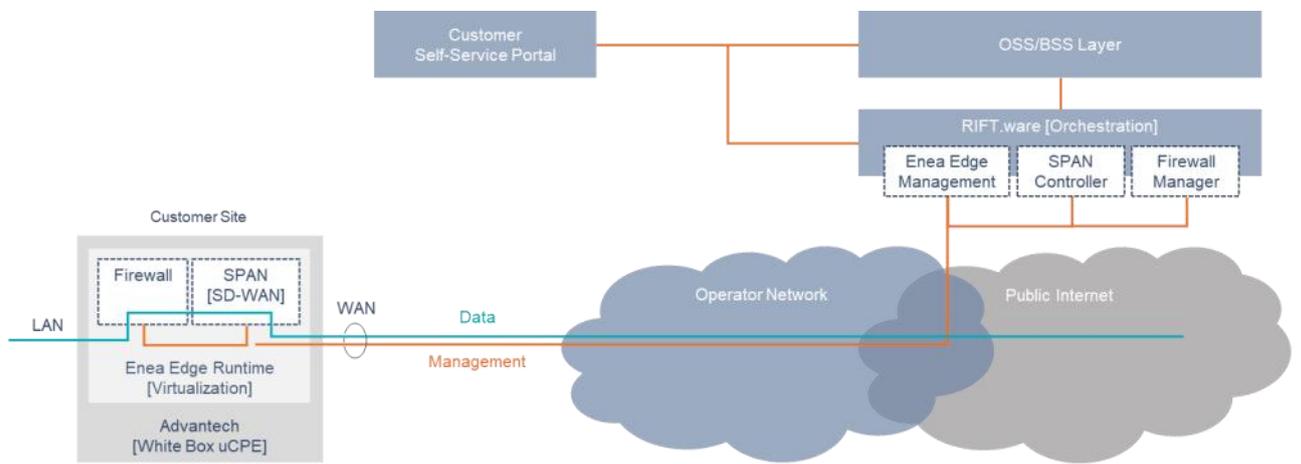
to integrate network functions and deploy services at large scale. RIFT.ware works with standard ETSI, TM Forum, and 3GPP interfaces as well as proprietary and legacy interfaces enabling easy migration from legacy deployments to standards-based uCPE virtualization.

▸ **Integration and support – nCinga**
nCinga integrates best-of-breed components into a modular turn-key solution with no vendor lock-in. This approach ensures availability of the best technology to build new services and enables service providers to customize services for their customers. Acting as a single point of contact to communication service providers for integration, support and maintenance, nCinga simplifies the service delivery.

Consolidation and scalability for lower CAPEX

Consolidating existing and new functions on the Advantech COTS hardware range can drastically reduce CAPEX by eliminating the need to procure application-specific hardware for each network or edge function. Furthermore, deploying white-box platforms allows for fully disaggregated models where service providers can optimize the use of hardware resources by replacing functions or expanding services leveraging the same existing infrastructure.

Advantech's range of white-box hardware verified with the blueprint solution spans the full range from cost-sensitive slim uCPEs to high performance edge cloud designs. Encryption acceleration is supported to provide secure branch connectivity without compromising VNF performance or increasing cost. The higher end platforms have been designed for high-availability networks with integrated failsafe redundancy and advanced remote management features that minimize costly downtime.

On the software side, both Enea Edge and SPAN have extremely low resource footprints, allowing CSPs to reserve resources for additional services, or to choose a smaller hardware device.

Agility and Open Standards for increased ARPU

The modular design of the blueprint solution in combination with the open standardized interfaces utilized between hardware, virtualization, SD-WAN, and orchestration minimizes vendor lock-in. CSPs can easily replace one component with

another providing the same function.

Even more importantly, they can adjust to specific customer requirements and create new services by adding new functionality to the solution without having to rely on a single vendor's roadmap or delivery schedule. Services can use components from various vendors, forming variations of the services adopting to different enterprise segments.

Lean operation for lower OPEX

A high degree of automation is necessary for lean management and low OPEX. RIFT.ware provides centralized management and end-to-end service orchestration and automation through a single pane of glass for model-based service deployment and management. RIFT.ware integrates with Enea Edge Management for VNF lifecycle and platform management, and with the SPAN backend for SD-WAN management. RIFT.ware can also integrate additional application management functions to accommodate expanded services offerings.

Using technologies such as secure zero touch provisioning automates and simplifies roll-outs to the point where it can be efficiently handled also by non-IT-professionals, a requirement to avoid costly customer-site visits.

RIFT's focus on open architectures and specifications enables RIFT.ware to easily connect to the CSP's self-service portal and OSS functions, making it possible for users to provision, view, and manage services without hands-on involvement from the CSP. Instantly accessing services in a simple and efficient manner improves the end user experience. It also enables the CSP to provide service evaluations without additional investments in hardware or time to manually provision services.

Conclusion

The blueprint presented in this solution brief is an already integrated and tested turnkey solution. It customizes easily thanks to the flexibility built into its architecture. Customized or "as is", it provides an open, flexible and agile solution for enterprise networking, keeping OPEX and CAPEX down, and satisfying constantly changing end user requirements for quality of experience.

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