



# The latest real-world uCPE deployments

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# Today's speakers



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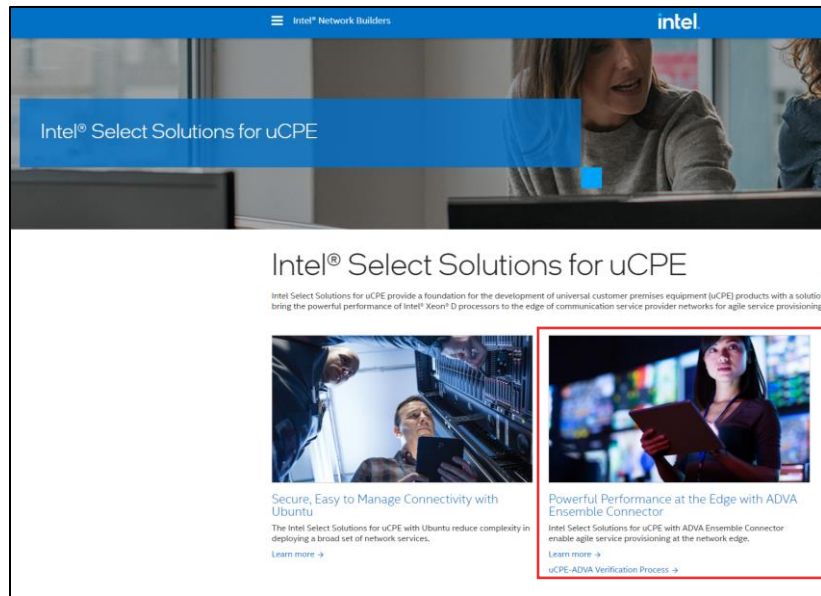
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# Thanks to our partner and sponsor Intel!

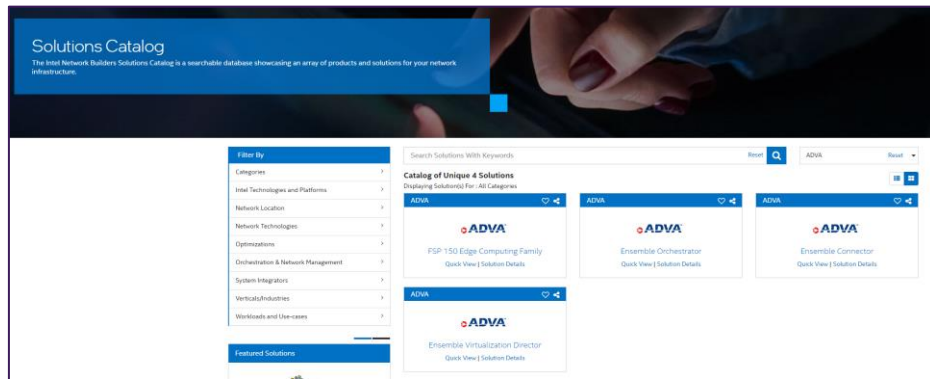
## ADVA presence on Intel Network Builders and Intel Select Solutions

### Intel Select Solutions for UCPE



### Four ADVA entries in solutions catalog:

- [Ensemble Connector](#)
- [Ensemble Orchestrator](#)
- [Ensemble Virtualization Director](#)
- [FSP 150 Edge Computing Family](#)








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Why look beyond router  
and SD-WAN appliances?

# Network appliances work ...

... but they don't address strategic drivers

-  Lower cost for platform and reduced inventory
-  Simpler operations through automation
-  Cloudification and software-centric approach
-  Vendor diversity and supply chain resilience
-  Innovation and revenue acceleration with faster delivery of new services

# NFV and uCPE can help!

Network functions virtualization (NFV) and universal customer premise equipment (uCPE) enable users to realize the benefits of the cloud by **replacing closed appliances** with their choice of **software** that can be **hosted anywhere** in the network on their **choice of open hardware**.



Bringing the power of the cloud to the telecom network - today!



# ADVA implementation of uCPE

## VNFs

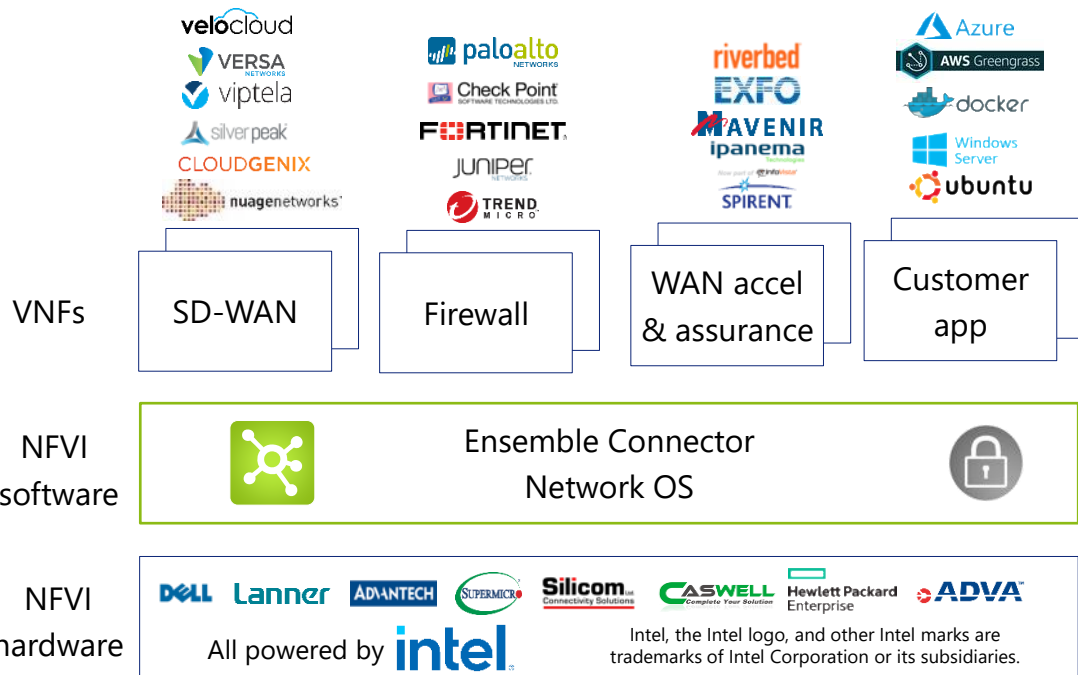
- Industry's largest library of VNFs
- Easy to onboard new VNFs
- Support for customer applications

## NFVI software

- Network OS convergence layer
- Platform for edge cloud
- Provides security, encryption and management of virtualized services

## NFVI hardware

- Industry's largest set of options
- Includes operator-chosen vendors



Choice of platforms and choice of apps on the platform



# Real world use cases

## How CSPs are using uCPE – NOW!



# Four real world use cases



A

- **Alpha:** North American CSP providing managed services
- **Key point:** hosting of applications at customer edge

B

- **Bravo:** APAC CSP providing Machine Learning (ML) services
- **Key point:** deployment of uCPE host with GPU for demanding ML application

C

- **Charlie:** North American CSP providing managed services
- **Key point:** Cloudless deployment with LTE-equipped uCPE for wireless access

D

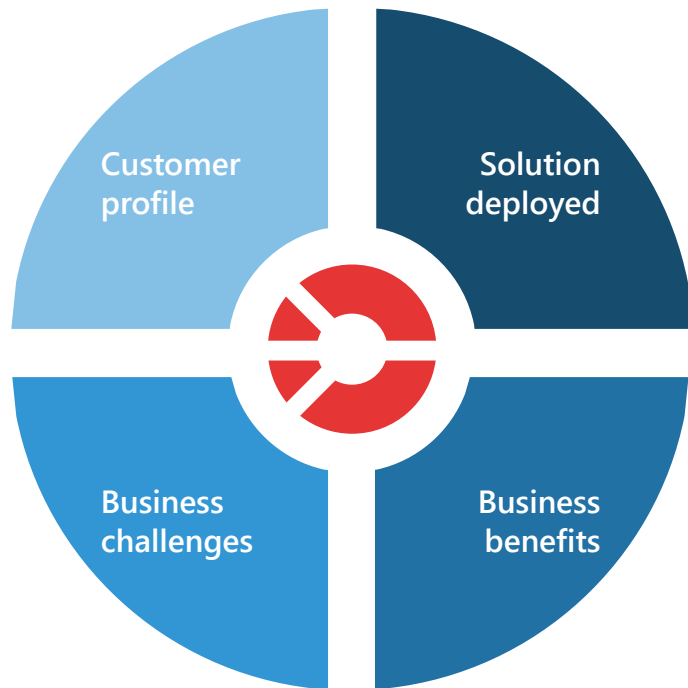
- **Delta:** global CSP providing managed services
- **Key point:** Reduction of inventory in depots

# Alpha: North American CSP providing managed services

## Overview

- Tier 1 CSP based in North America and providing global services
- Residential, business and government customers
- Long-time user of NFV

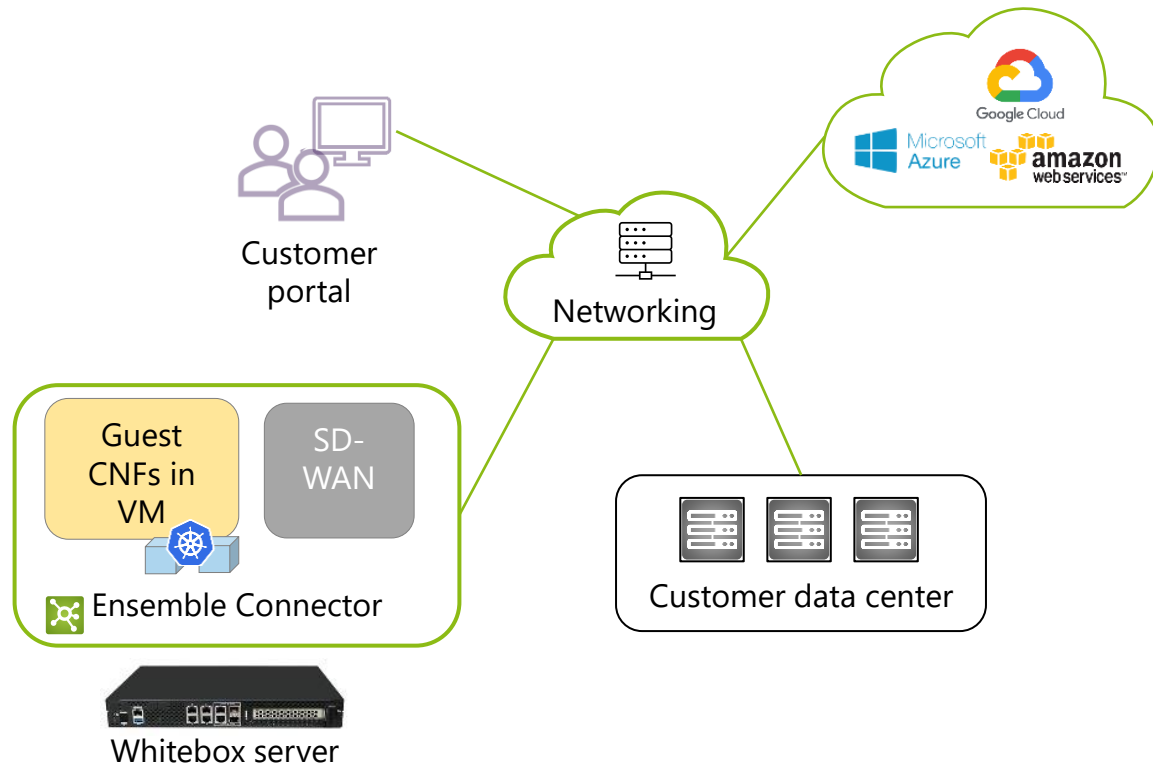
- Customers are asking for onsite hosting of workloads
- Need to support containerized applications using the isolation of VMs
- Need to combine with virtualized services on one platform



- Ensemble Connector
  - Third-party MANO
  - Third-party whitebox
  - Kubernetes containers running in a virtual machine
- 
- Ability to provide sticky value-added services
  - Same platform (hardware, software, MANO) as for managed communication services

# Alpha: North American CSP providing managed services

## Details of application



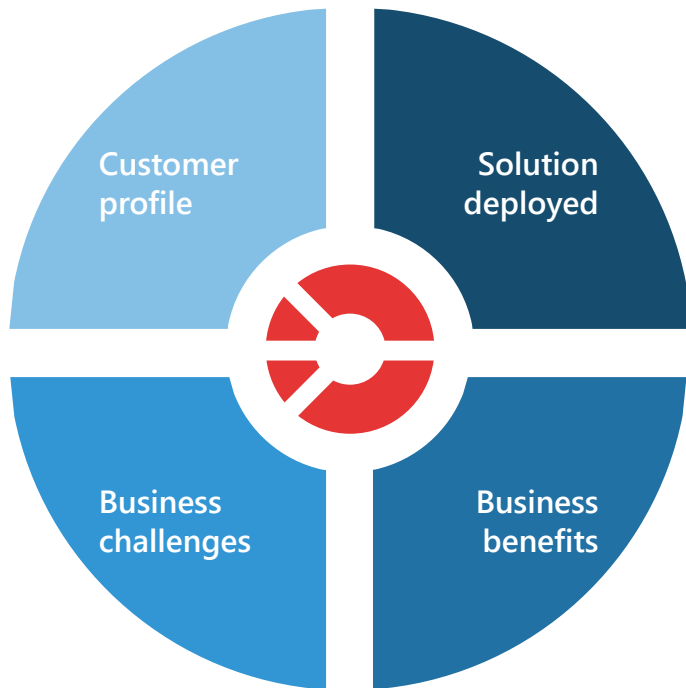
### Key aspects

- Whitebox server provides networking services and provides customer edge compute hosting
- Ability to host customer IT workloads across diverse environments
- Kubernetes deployment across clouds
- User experience from single customer portal

# Bravo: APAC CSP providing Machine Learning (ML) services

## Overview

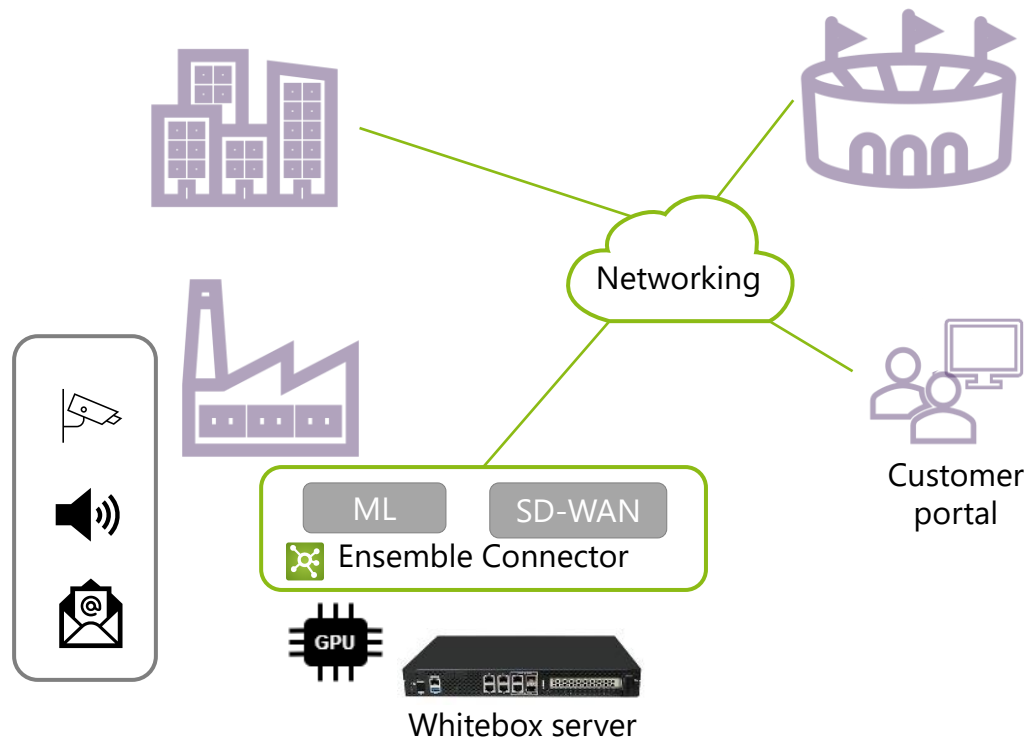
- Tier 1 CSP based in APAC and providing global technology services
- Business, government, residential customers
- Leader in data analytics services
- Delivering new generation of cloud-native, managed smart services
- Computationally dense applications on white box
- Business case depended on ability to leverage hardware synergies with network services
- Time to market demands



- Ensemble Connector
- ADVA SaaS MANO
- Third-party whitebox with GPU acceleration
- VNF using software developed in house to provide managed ML services
- Computational performance goals achieved
- Builds infrastructure for new smart services and new networking services
- Solution developed in very short time with minimal staff

# Bravo: APAC CSP providing Machine Learning (ML) services

## Details of application



### Key aspects

- Whitebox server provides networking services and hosts innovative managed ML services
- Enables service for smart factories, smart cities, smart sports, etc.
- Connector integrates ML application with hardware acceleration resources
- Computationally dense applications are handled at customer edge



# Charlie: North American CSP providing managed services

## Overview

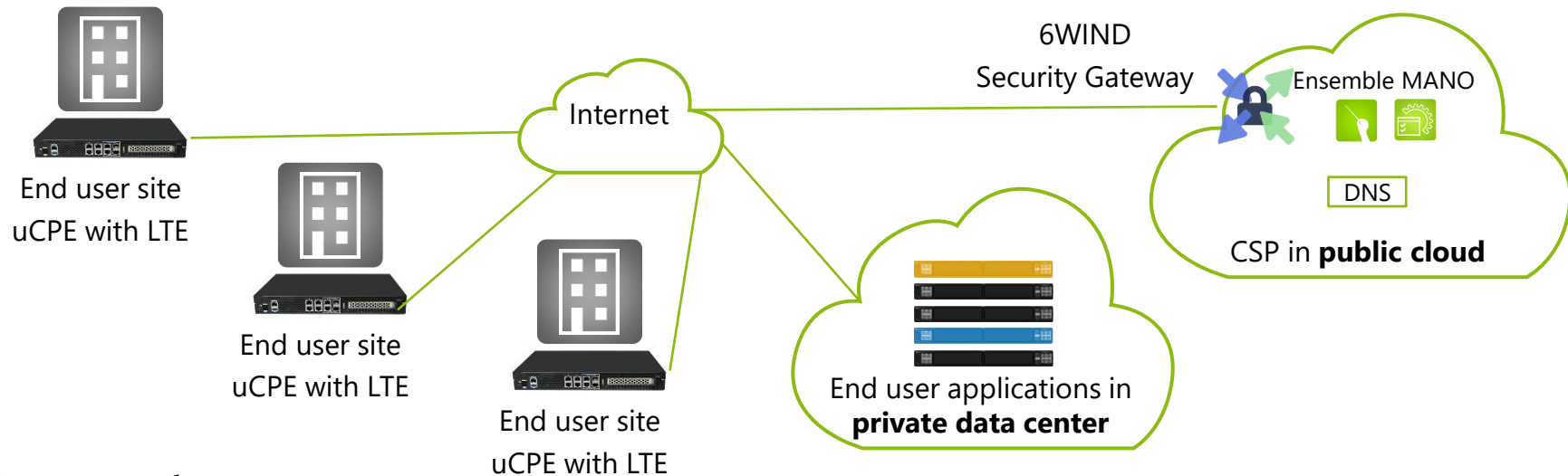
- Voice, data, internet, wireless, video and secure network options throughout the US and Canada
- Large enterprises and government agencies
- Wide variety of appliance-based solutions: SD-WAN, router, firewall
- **Wanted to use a virtualized solution to enable flexibility, without requiring visits to 15,000 sites to make any potential changes in the field.**
- **Cloudless model** to optime the footprint and cost of this approach was a key to making a successful business case



- SmartWAN with 6WIND Security Gateway
- Ensemble MANO deployed in cloud
- Third-party firewall and white box with LTE
- Solved the challenges for initial customer
- **Leverage the same model for all future customer projects.**
- Simplifies the operational process
- Open hardware and software to offer alternative services.
- Centralized changes across a large customer base

# Charlie: North American CSP providing managed services

## Details of application



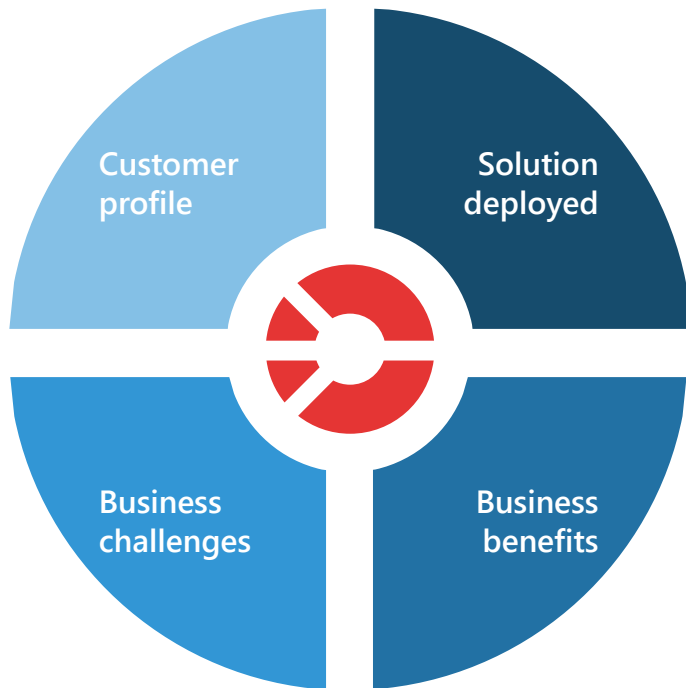
### Key aspects

- MANO cluster and the 6WIND Security Gateway operating in public cloud along with DNS
- Hybrid WAN access over internet and LTE
- Connector providing profiles for multiple wireless service providers for nationwide coverage

# Delta: global CSP providing managed services

## Overview

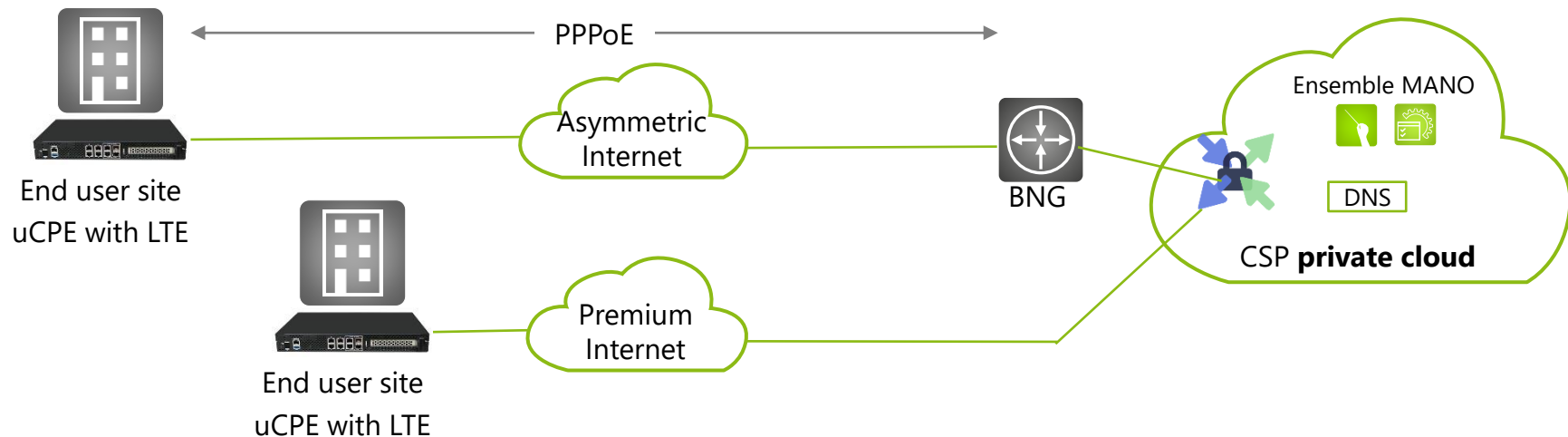
- Innovative solutions and services to 156.1 million subscribers in 16 countries across the Middle East, Asia and Africa
- 1Gbit/s services to enterprises and up to 10Gbit/s services to large enterprises and government sectors
- **Replace multiple hardware platforms and sizes with a single platform (see next slide)**
- Provide managed connectivity, SD-WAN & security applications at a **lower cost than competitors**
- Multiple underlays: LTE, symmetric Internet, asymmetric Internet with PPPOE



- SmartWAN vRouter with PPPoE using 6WIND technology
- Ensemble MANO in private cloud
- Third-party white boxes
- Select best-of-breed components at each layer, optimizing price and performance
- Wide variety of services on same physical platform, enabling lucrative upselling opportunities
- **Eliminate more costly appliances and VNFs in many use cases**
- **Future services based on open standards**

# Delta: global CSP providing managed services

## Overview of application



## Key aspects

- ZTP with PPPoE authentication and encapsulation
- Hybrid WAN access over internet and LTE
- Connector providing profiles for multiple wireless service providers for global coverage

# Delta: the problem with appliance proliferation

Lots and lots and lots of boxes!

- Customers may demand certain brands of devices for SD-WAN, firewall, router, VoIP
- And they need different sizes for different locations e.g. SOHO, hub, HQ, data center
- Stringent SLAs mean **lots of inventory** in **numerous depot locations**

Appliance approach:  
**39 types** of appliances must be stocked at **every depot**

uCPE approach:  
**3 server types**  
**per depot**

	SD-WAN					Firewall			Router			VoIP		uCPE
Vendor	A	B	C	D	E	D	E	F	G	H	I	J	K	L
Small	1	4	7	10	13	16	19	22	25	28	31	34	37	1
Medium	2	5	8	11	14	17	20	23	26	29	32	35	38	2
Large	3	6	9	12	15	18	21	24	27	30	33	36	39	3



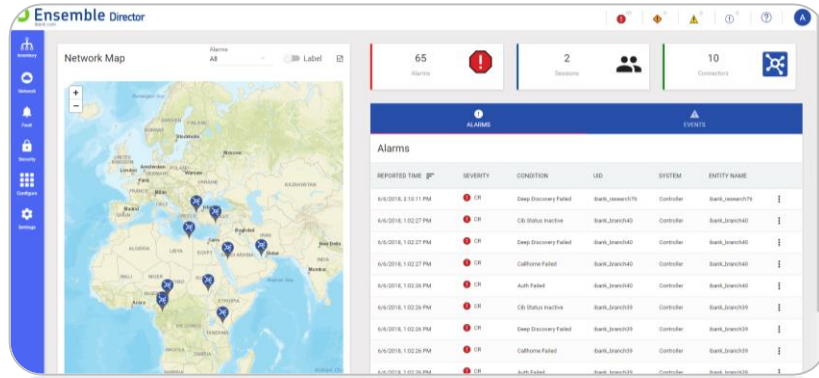


# MANO as a service

## Accelerating uCPE deployment

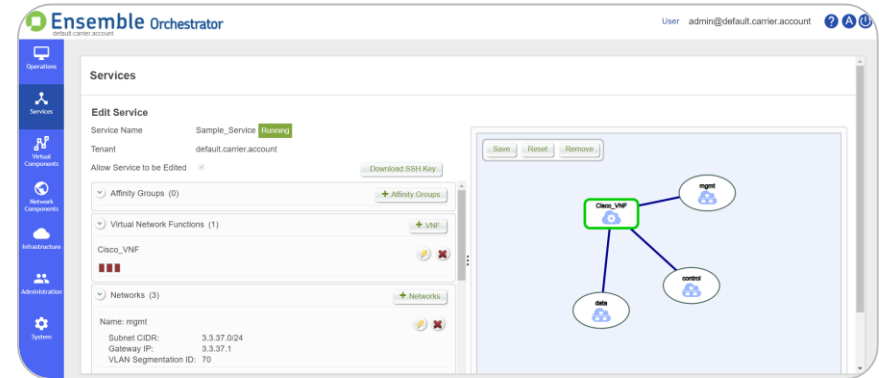
# Ensemble management and orchestration (MANO)

## Ensemble Virtualization Director and Ensemble Orchestrator



### Ensemble Virtualization Director

Provides a single pane of glass view for managing NFV operations. Supports end-to-end ZTP, secure cloud topology designer, and third-party orchestrators

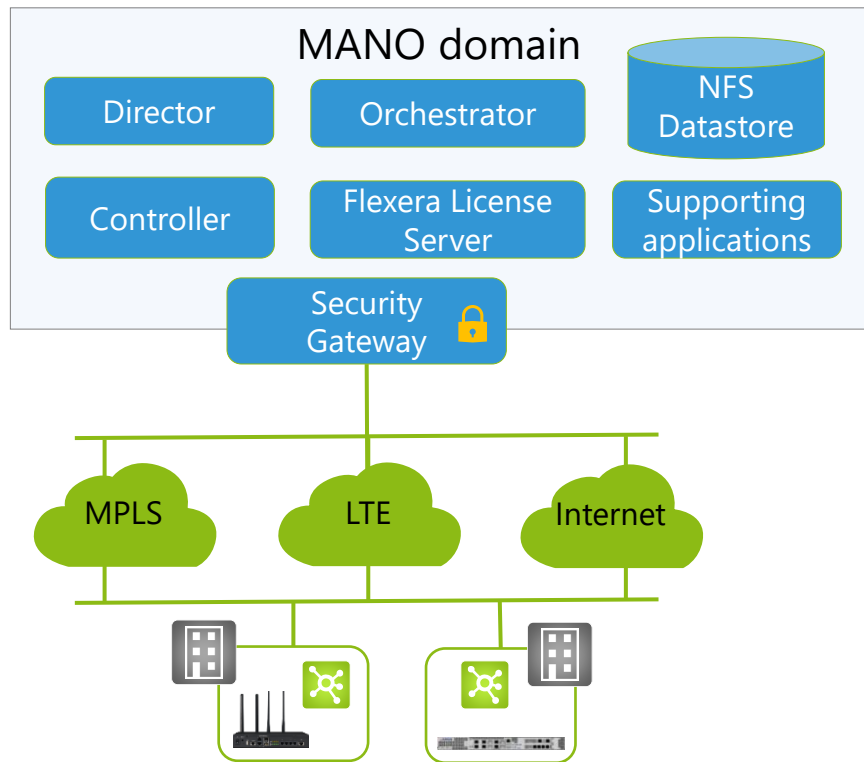


### Ensemble Orchestrator

Versatile NFV Orchestration platform to instantiate VNF services and to manage VNF lifecycle

Putting the M in MANO!

# Hosted SaaS MANO overview



## Features and benefits

- Ensemble MANO is a multi-tiered IT management application
- Customers can leverage ADVA's hosted SaaS MANO to access critical management tools while limiting up-front investment in resources, personnel, and training
  - Allows customers to focus investment on their core business
  - Simplifies service deployment resulting in faster time to revenue
- SaaS MANO supports standalone instances with AWS uptime SLA



## Summary, takeaways, Q&A

# Summary and takeaways



Service providers are deploying uCPE today to deliver innovative services



An open architecture enables best of breed and future-proof deployments



A wide variety of hardware platforms enables a balance between price and performance



Cost may be the initial driver, but upsell and innovation are the long-term benefits



Look for partners with experience





# Q&A



# Thank you

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