Enterprise Network Compute System (ENCS)

Cisco vBranch Architecture
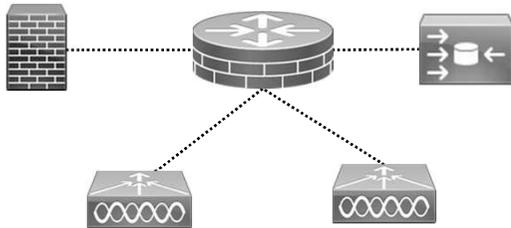
Per Jensen, per@cisco.com

Sept 2017

Agenda: Tech Update september-2017

1. ENCS update + demo v/Per

2. Viptela update + demo v/Dr Søren
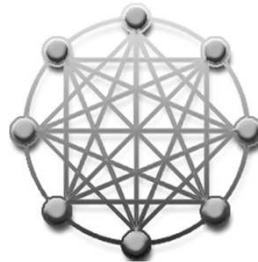
The Current Enterprise Branch Landscape

Multiple Devices
Routers, Appliances, Servers

Difficult to Manage
Device integration and operation

Costly to Operate
Upgrades, refresh cycles, site visits

Horseman of the branch apocalypse

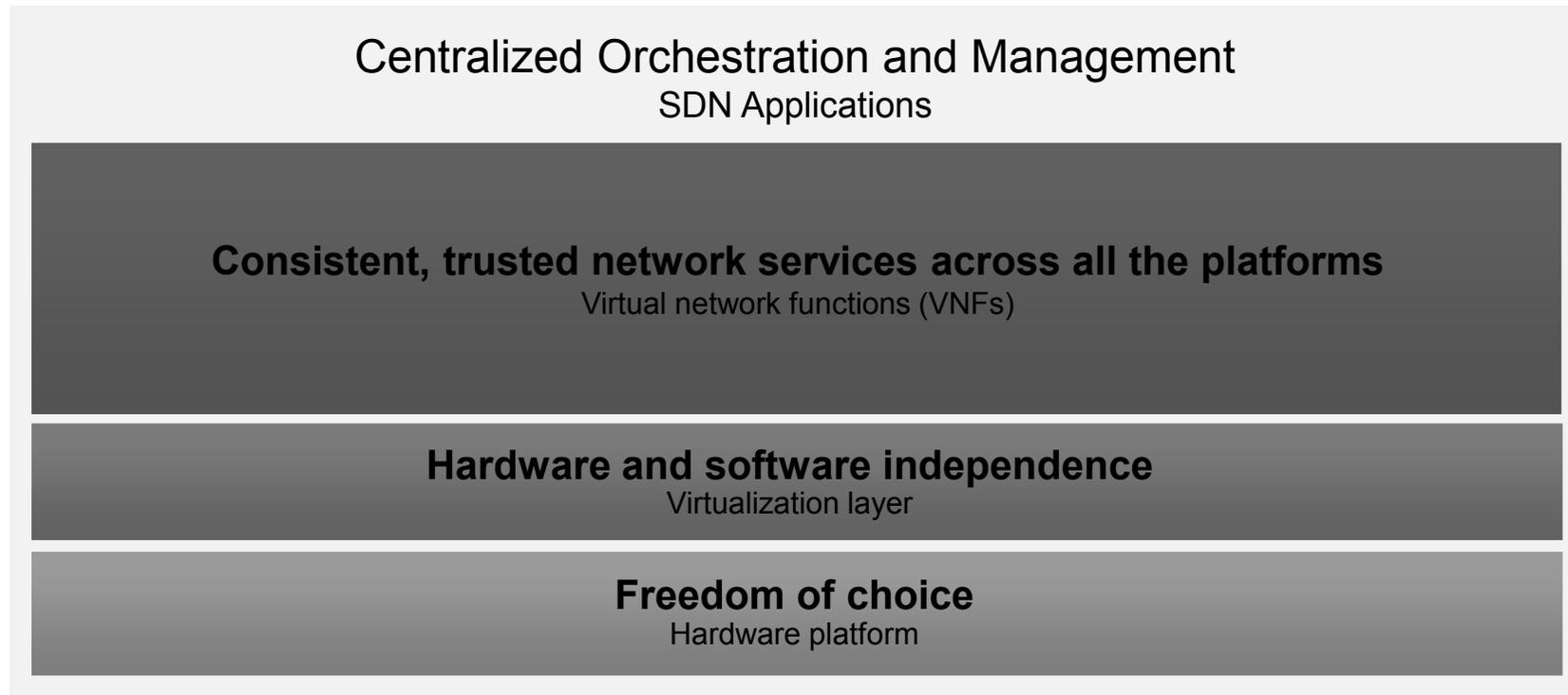# What Enterprise NFV Can Do For You

Quickly roll out new services and locations

Gives you flexible deployment options

Simplify day to day operations

Simple and easy to design, provision, manage the trusted services that are critical to your business

What Is Enterprise NFV?

Centralized Orchestration and Management
SDN Applications

Consistent, trusted network services across all the platforms
Virtual network functions (VNFs)

Hardware and software independence
Virtualization layer

Freedom of choice
Hardware platform

Introducing Cisco Enterprise NFV
Network Services in Minutes, on Any Platform

Digital Network Architecture
Virtualization

Cisco Enterprise Service Automation (ESA) on APIC-EM
Network Services Orchestrator (NSO)

**Virtual Router
(ISRv)**

**Virtual Firewall
(ASAv)**

**Virtual WAN
Optimization
(vWAAS)**

**Virtual Wireless
LAN Controller
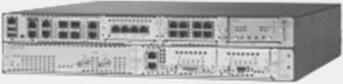(vWLC)**

Third-Party VNFs

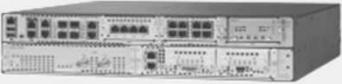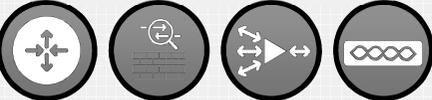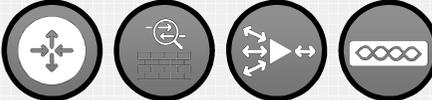**Network Functions Virtualization Infrastructure Software (NFVIS)**

**Cisco 4000 Series ISR +
UCS® E-Series**

**Enterprise Network Compute
System
(ENCS)**

**Cisco® UCS
C-Series**

Freedom of Choice
Cisco Intelligent Branch

Traditional	Enterprise NFV		
Physical Router	**Physical Router Virtual Services**	**Virtual Router Virtual Services**	**Virtual Router Virtual Services**
Cisco® 4000 Series ISR	4000 Series ISR + UCS® E-Series	Enterprise Network Compute System (ENCS)	UCS C-Series
Centralized services Fixed integrated services Conservative	Upgradable hardware Deterministic routing performance	Elastic routing and services Router / Server Hybrid	Elastic routing and services Performance Early adopter

Cisco ONE™ Access to Ongoing Innovation   License Portability   Investment Protection

ENCS 5400 Series

ENCS 5400 Series - Chassis Options

ENCS5406
6-Core

ENCS5408
8-Core

ENCS5412
12-Core

	ENCS5406	ENCS5408	ENCS5412
CPU	6-core, 1.9GHz	8-core, 2.0GHz	12-core, 1.5GHz
PoE	No	200W	200W
Capacity Guidance	ISRv + 2 VNFs	ISRv + 3 VNFs	ISRv + 5 VNFs

ENCS 5400 Series - Bezel
New Industrial Design

First platform with new Cisco design language
Intended to create a common look across Cisco products

Rounded Corners

Status Indicators using
Universal Icons

LED Backlit Logo

Aluminum Bezel with
Round Vents

Raised Bezel Edge

ENCS 5400 Series

Integrated
Power Supply

16 - 64 GB
DRAM

6, 8, or 12-Core
Intel Xeon-D

Dedicated Board
Management Controller

Optional Hardware
RAID Controller

Internal
M.2 Storage

8 Integrated LAN Ports
with Optional POE

USB 3.0
Storage

Network Interface Module
for LTE & legacy WAN

2 HDD or SSD
RAID 0 & 1

Hardware Acceleration for
VM Traffic

2 Onboard Gigabit
Ethernet ports
with SFP

Optional Hardware
Crypto Module

ENCS 5400 Major Components

Options

		HW RAID Controller*			
	M.2 SATA (Motherboard slot) 64, 100, 200, 400 GB	2.5" Disk Drives 1 & 2 TB SATA 1.2 TB & 1.8 TB SAS* 480 & 960 GB SSD	LTE NIM	HW Crypto Module*	PoE Power Supply (8 & 12 core chassis only)
RAM Upgrade Up to 64 GB					

Chassis

6-core Intel (16 GB RAM, 64 GB M.2 SATA)	8-core Intel (16 GB RAM, 64 GB M.2 SATA)	12-core Intel (16 GB RAM, 64 GB M.2 SATA)
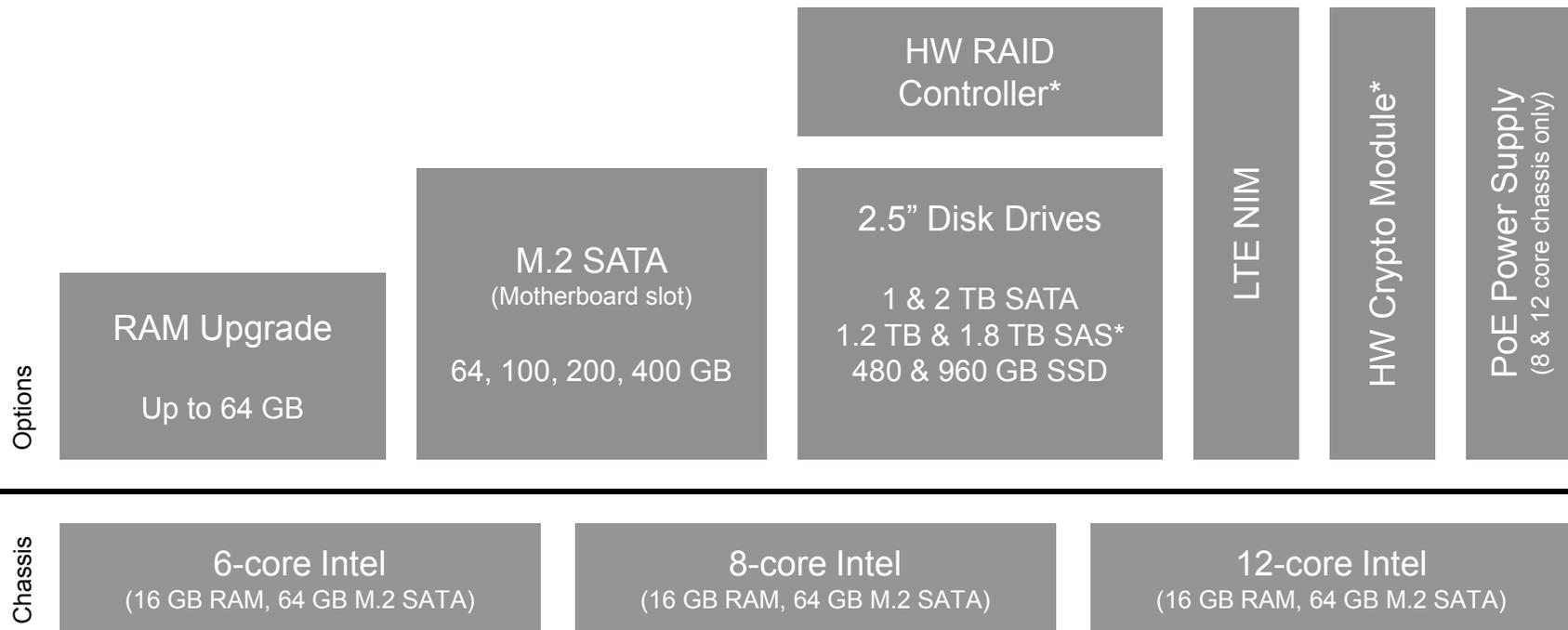
* Roadmap

Hardware Features

ENCS 5400 CPU Allocation Planning

NFVIS	ISRv	ASAv	vWAAS	Linux VM	Windows VM

Cores	1	2	3	4	5	6	7	8	9	10	11	12

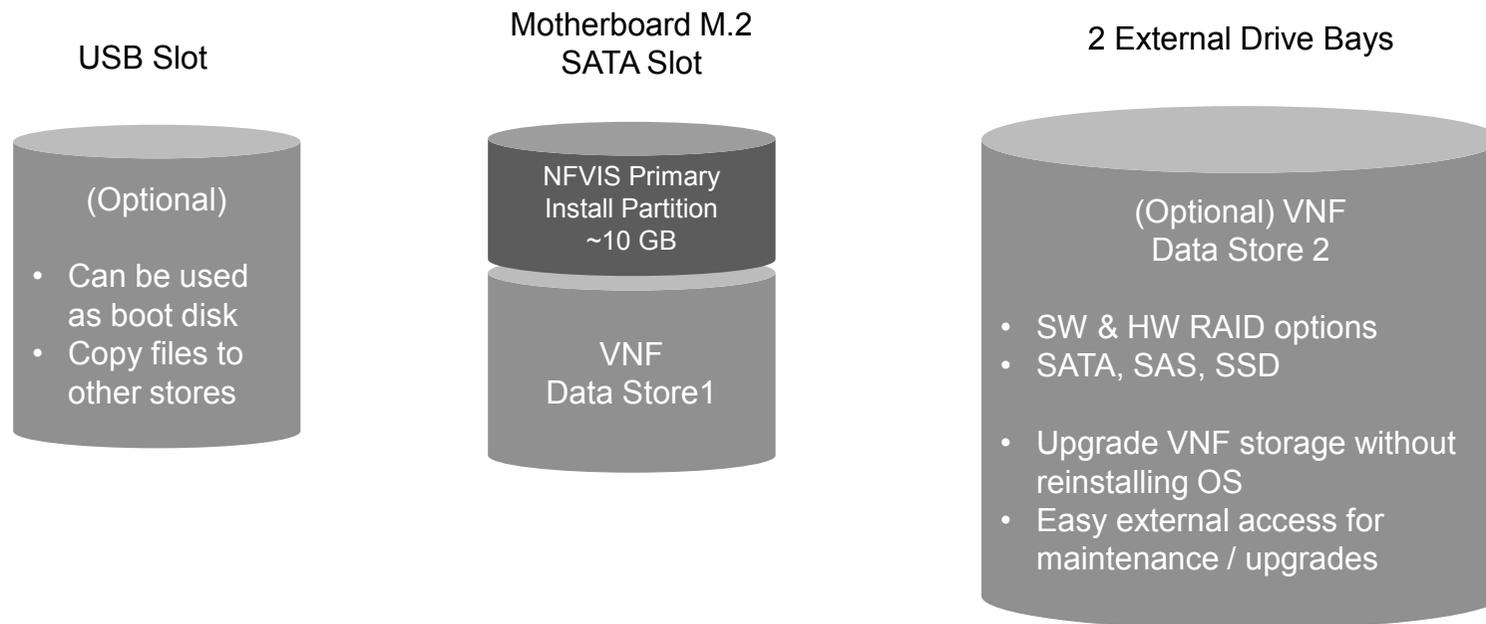**12-core CPU**
(Hyper-threading enabled)
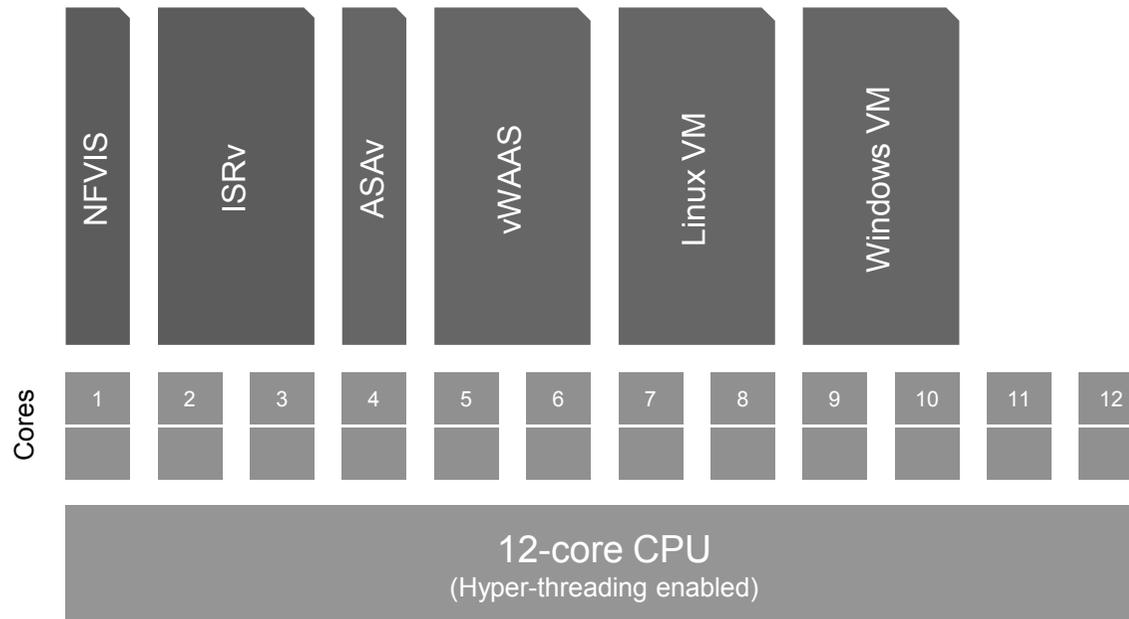
- 1 core = 1 vCPU = 1 physical core

- 1-core allocation for NFVIS to cover OS, Hypervisor & vSwitch functions

- 2-core minimum allocation for ISRv

- Multiple VNF profiles target specific performance

- Cisco VNFs will be pinned to respective cores for performance.

ENCS 5400 RAM Allocation Planning

	16 GB	16 GB	16 GB	16 GB

Base Case

NFVIS | ISRv | vWAAS | ASAv | Linux VM | Windows VM

High Case

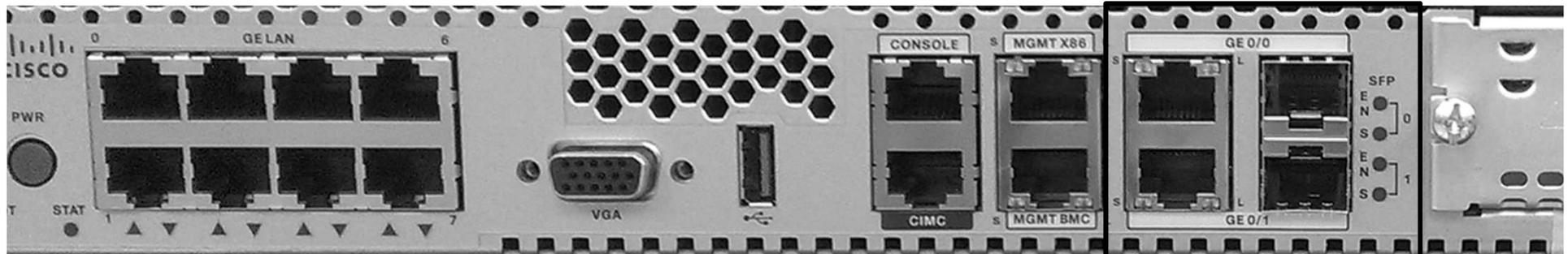NFVIS | ISRv | vWAAS | ASAv | Linux VM | Linux VM | Linux VM | Linux VM | Win VM | Win VM | Win VM | Win VM
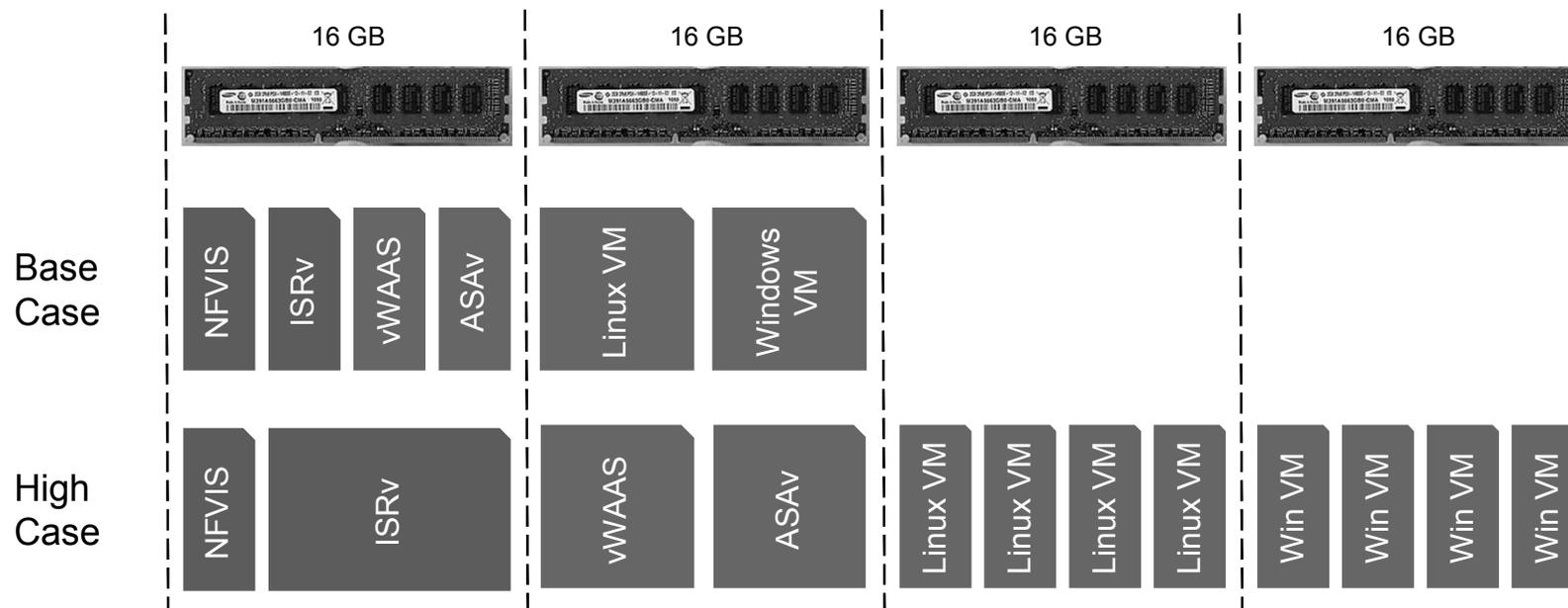
- Refer to VNF Datasheet for specific guidance. RAM over-subscription is not recommend for production environments.

ENCS 5400 Storage Summary

USB Slot

(Optional)

- Can be used as boot disk
- Copy files to other stores

Motherboard M.2 SATA Slot

NFVIS Primary Install Partition ~10 GB

VNF Data Store1

2 External Drive Bays

(Optional) VNF Data Store 2

- SW & HW RAID options
- SATA, SAS, SSD

- Upgrade VNF storage without reinstalling OS
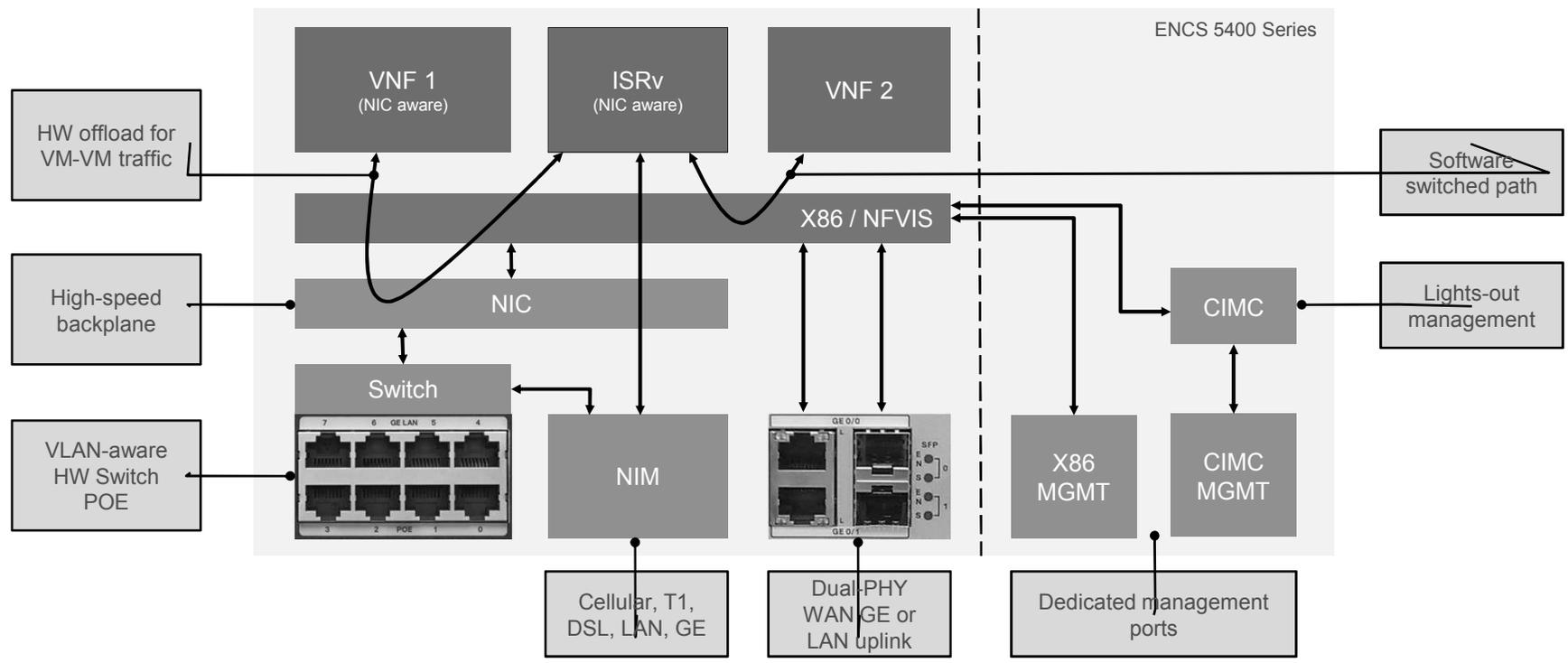- Easy external access for maintenance / upgrades

ENCS 5400 Dual-mode GE Ports

- 2 built-in GE ports for WAN or LAN uplink

- RJ45 Copper or SFP connectivity (10/100/1000 Mbps)

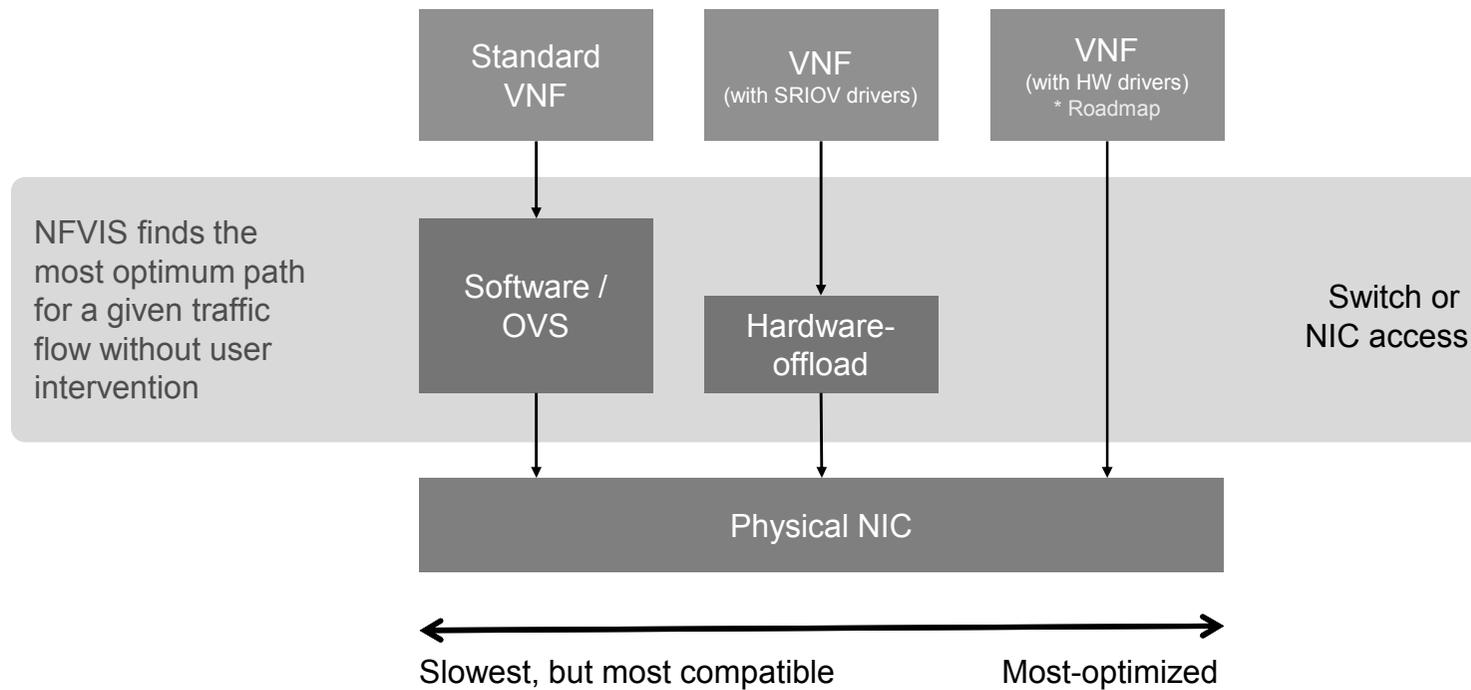- Auto-sensing mode. Usable in a active-standby configuration.

ENCS 5400 Internal Networking

Data Path

Control Path

ENCS 5400 Series

VNF 1 (NIC aware)

ISRv (NIC aware)

VNF 2

X86 / NFVIS

HW offload for VM-VM traffic

Software switched path

High-speed backplane

NIC

CIMC

Lights-out management

Switch

NIM

X86 MGMT

CIMC MGMT

VLAN-aware HW Switch POE

GE 0/0

GE 0/1

Cellular, T1, DSL, LAN, GE

Dual-PHY WAN GE or LAN uplink

Dedicated management ports

NFVIS Auto-selects Optimum Packet Path

NFVIS finds the most optimum path for a given traffic flow without user intervention

Standard VNF

VNF (with SRIOV drivers)

VNF (with HW drivers) * Roadmap

Software / OVS

Hardware-offload

Switch or NIC access

Physical NIC

Slowest, but most compatible ←→ Most-optimized

Cisco Server Management
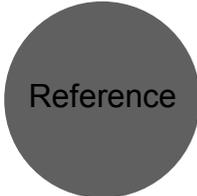
Cisco Integrated Management Controller

- Hardware-level out-of-band lights-out management
- CLI, GUI, XML API
- Same experience as UCS E-Series & C-Series

- Key functions:
  - HW configuration – e.g. RAID, Boot order, BIOS
  - Monitoring & troubleshooting. Failure alerts.
  - Platform power cycling
  - Virtual console & remote media mount
  - Disaster recovery

ENCS 5400

CIMC

CLI

LAN, WAN, console ports, and interfaces

Web GUI
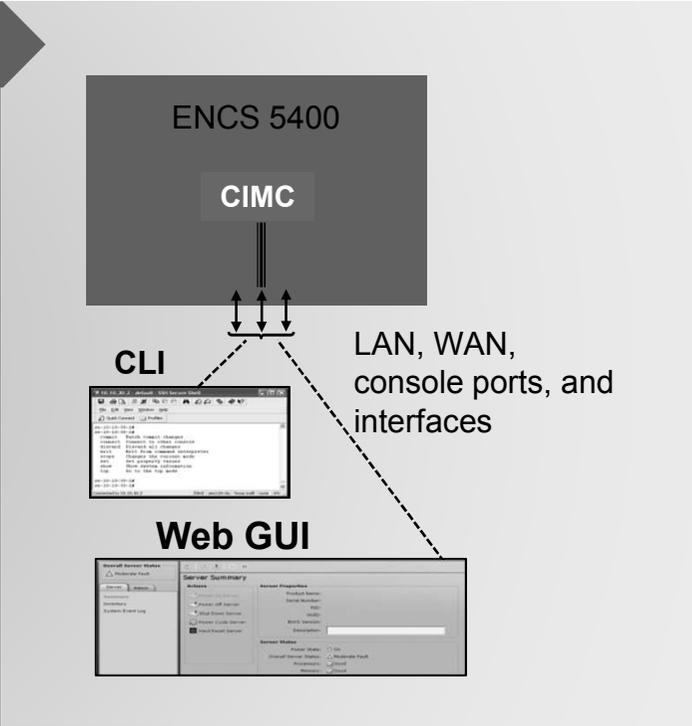
ENCS 5400 CIMC Access Modes
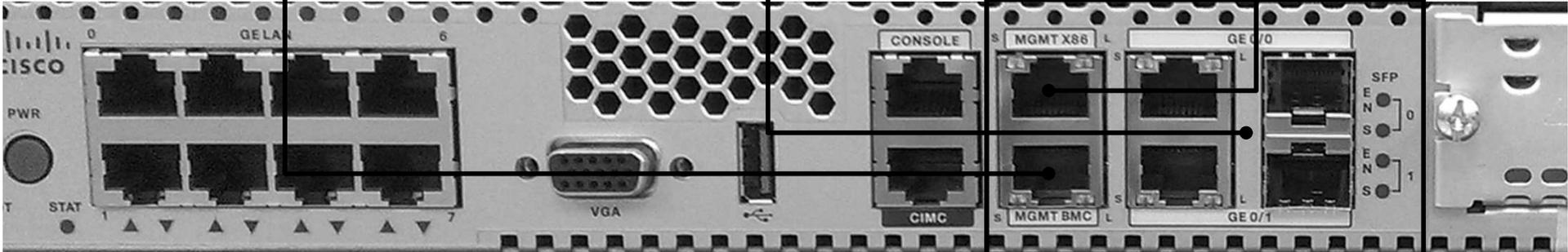
Option 1
Dedicated GE MGMT Port

Requires a dedicated physical connection to an external LAN switch.

Option 2
Shared LAN On Motherboard

Uses the WAN GE Ports
Shares physical connection with other VNFs

Option 3 (Roadmap)
Through NFVIS MGMT Port

Shares the physical connection with NFVIS

ENCS 5400 Power Supply

- Single Integrated Power Supply Unit
  - 250W for regular PSU
  - 500W for POE PSU (ENCS5408 & ENCS5412 only)

- Universal POE on built-in LAN ports (Up to 60W)
  - Total limit of 200W

- Field-replaceable unit

Software
NFVIS & VNFs

Network Services from Cisco
Consistent software across physical and virtual

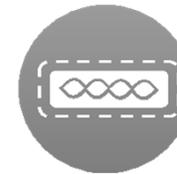| ISRv	ASAv/FTD [*]	vWAAS	vWLC
High Performance Rich Features	Full DC-class Featured Functionality	Application Optimization and Akamai Connect	Built for small and medium branches

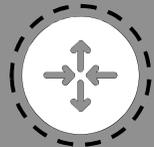| Windows Server	Linux	3rd Party
Active Directory, File Share, Server Applications	Custom Applications DNS/DHCP	Network Services Management & Monitoring

Product Positioning
ISRv vs CSR

Integrated Services Router - Virtual

Packaged for NFVIS

Branch-Specific Features

Branch-Specific Pricing

Look-and-feel of an ISR 4000

Not available separately

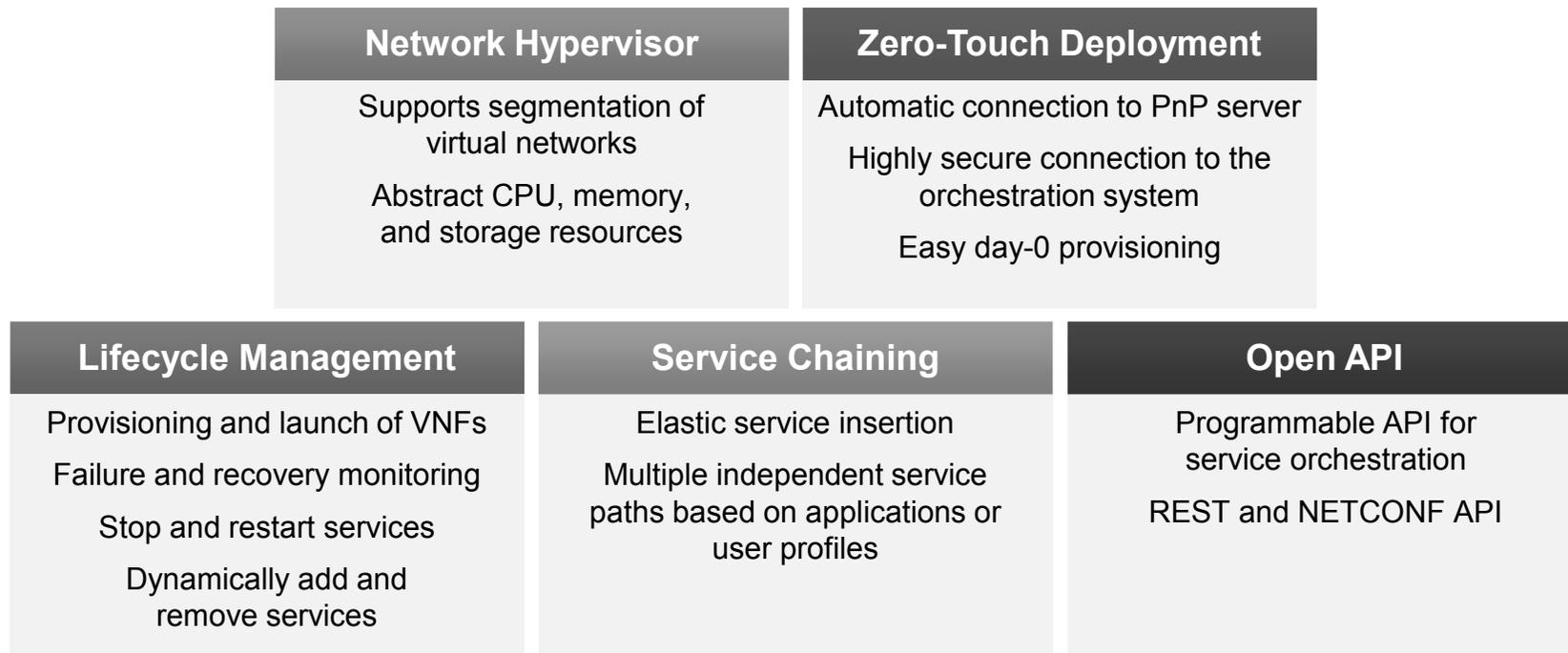**Cloud Services Router**

Cloud and VDC Deployments

Aggregation Use-Cases

Flexible Pricing & Packaging

Virtual ASR 1000 Series

Available on multiple platforms

Optimized for Network Services
Enterprise NFV Infrastructure Software (NFVIS)

Network Hypervisor

Supports segmentation of virtual networks

Abstract CPU, memory, and storage resources

Zero-Touch Deployment

Automatic connection to PnP server

Highly secure connection to the orchestration system

Easy day-0 provisioning

Lifecycle Management

Provisioning and launch of VNFs

Failure and recovery monitoring

Stop and restart services

Dynamically add and remove services

Service Chaining

Elastic service insertion

Multiple independent service paths based on applications or user profiles

Open API

Programmable API for service orchestration

REST and NETCONF API

Power in Software
NFVIS Software Stack