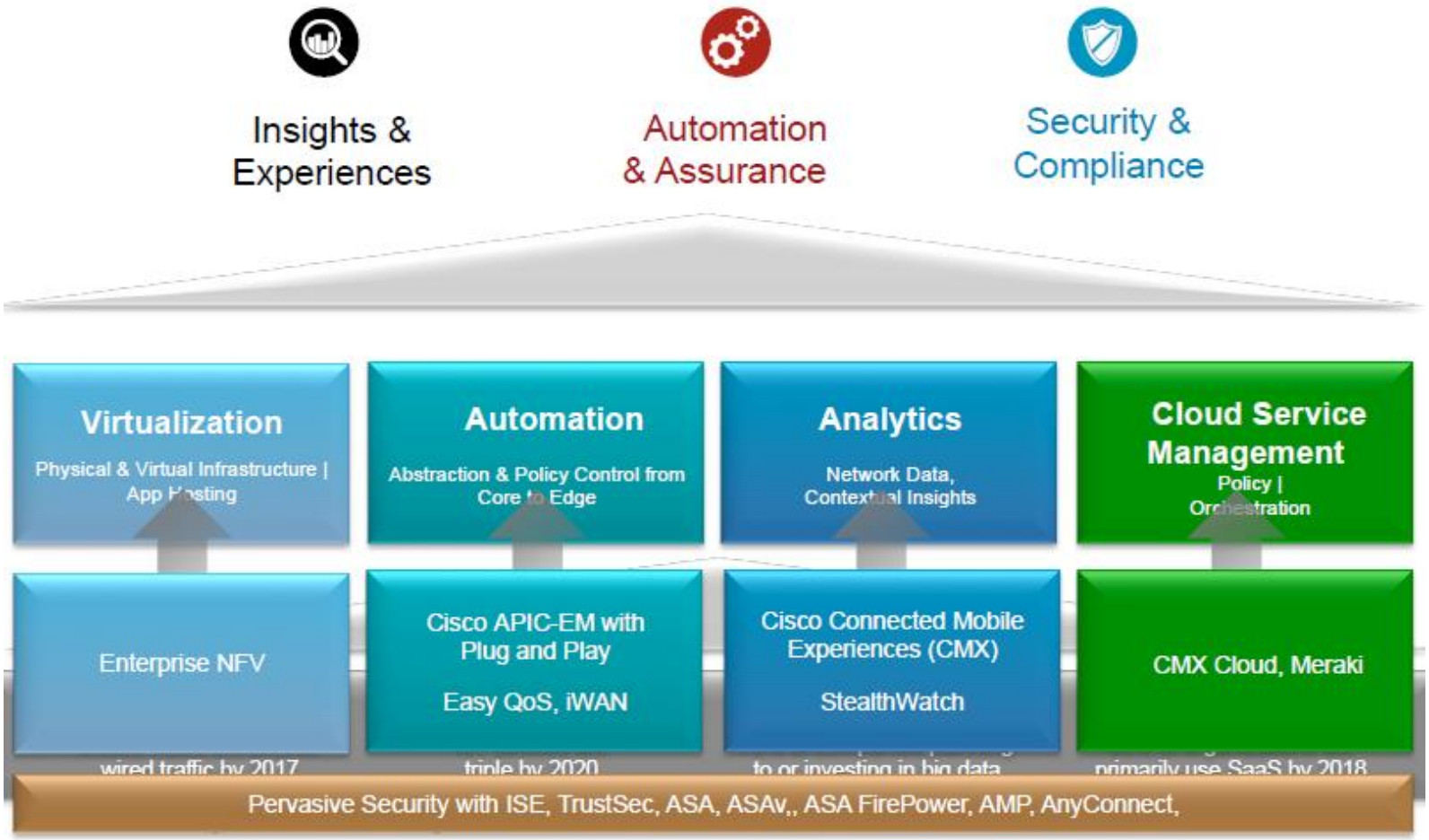
Архитектура цифровых сетей – Cisco DNA

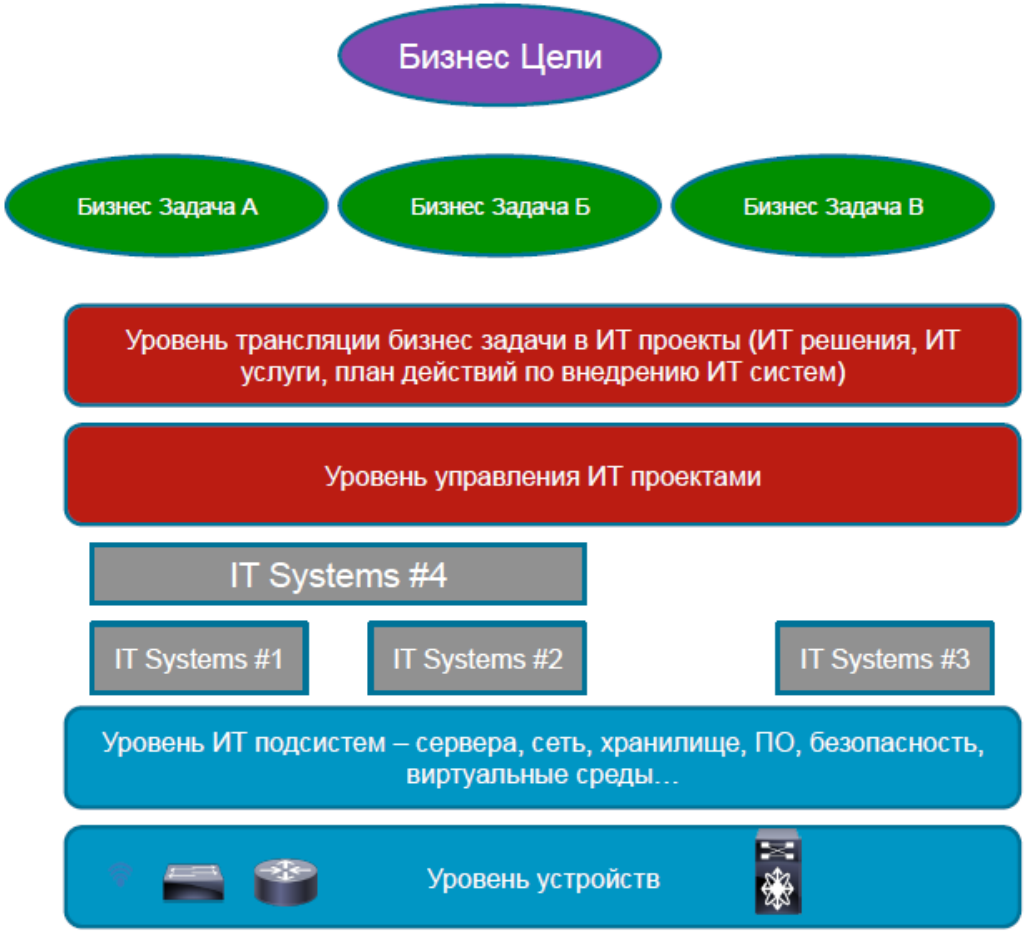
Евгений Лысенко
системный инженер
CCNP, CCDP, CCNP DC, CCNA Sec, CCNA Wireless

IT.Integrator

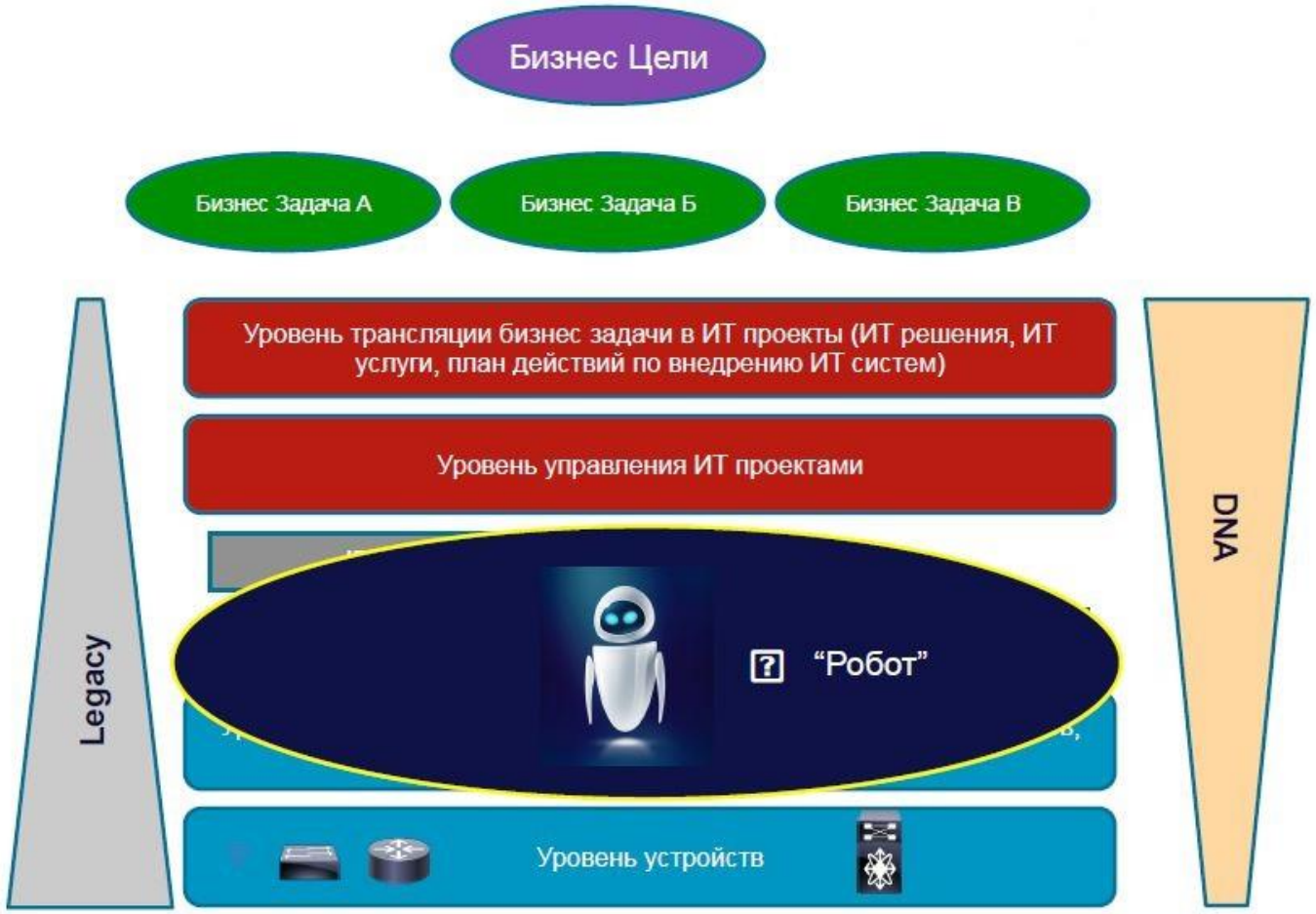
Решения, лежащие в основе архитектуры



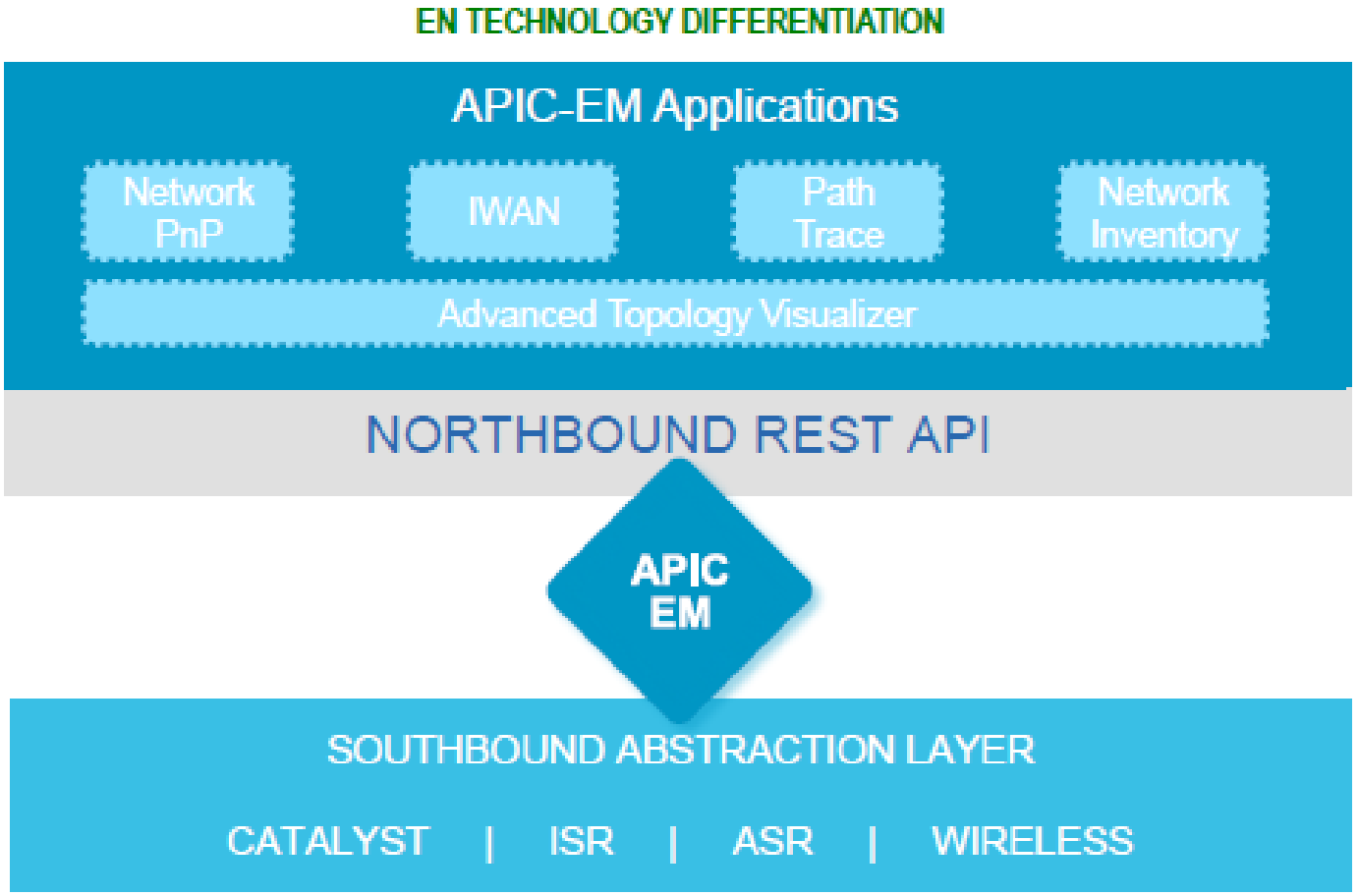
«Стандартная модель взаимодействия Бизнеса и ИТ»



Модель при применении DNA архитектуры

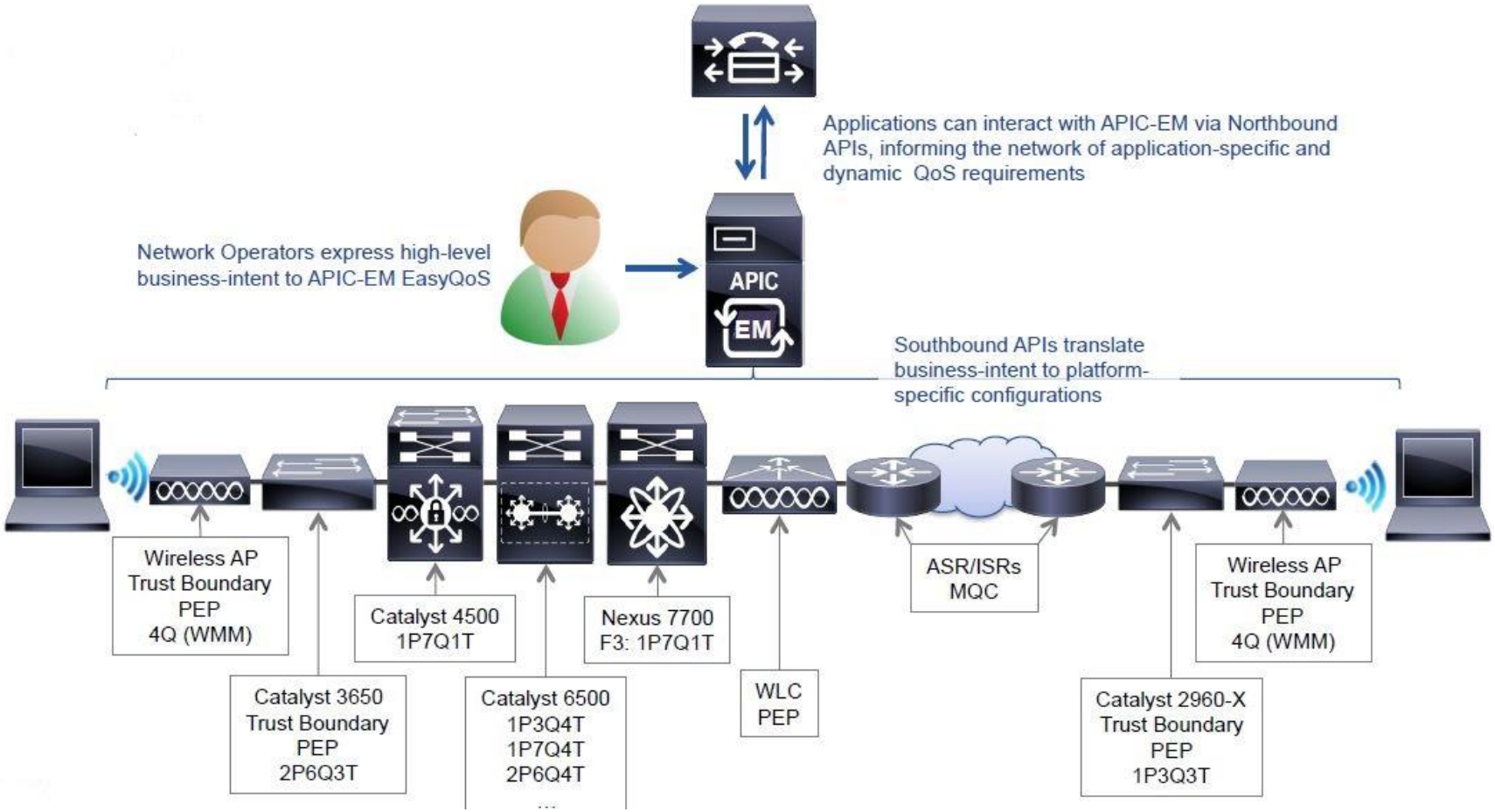


Архитектура платформы APIC-EM



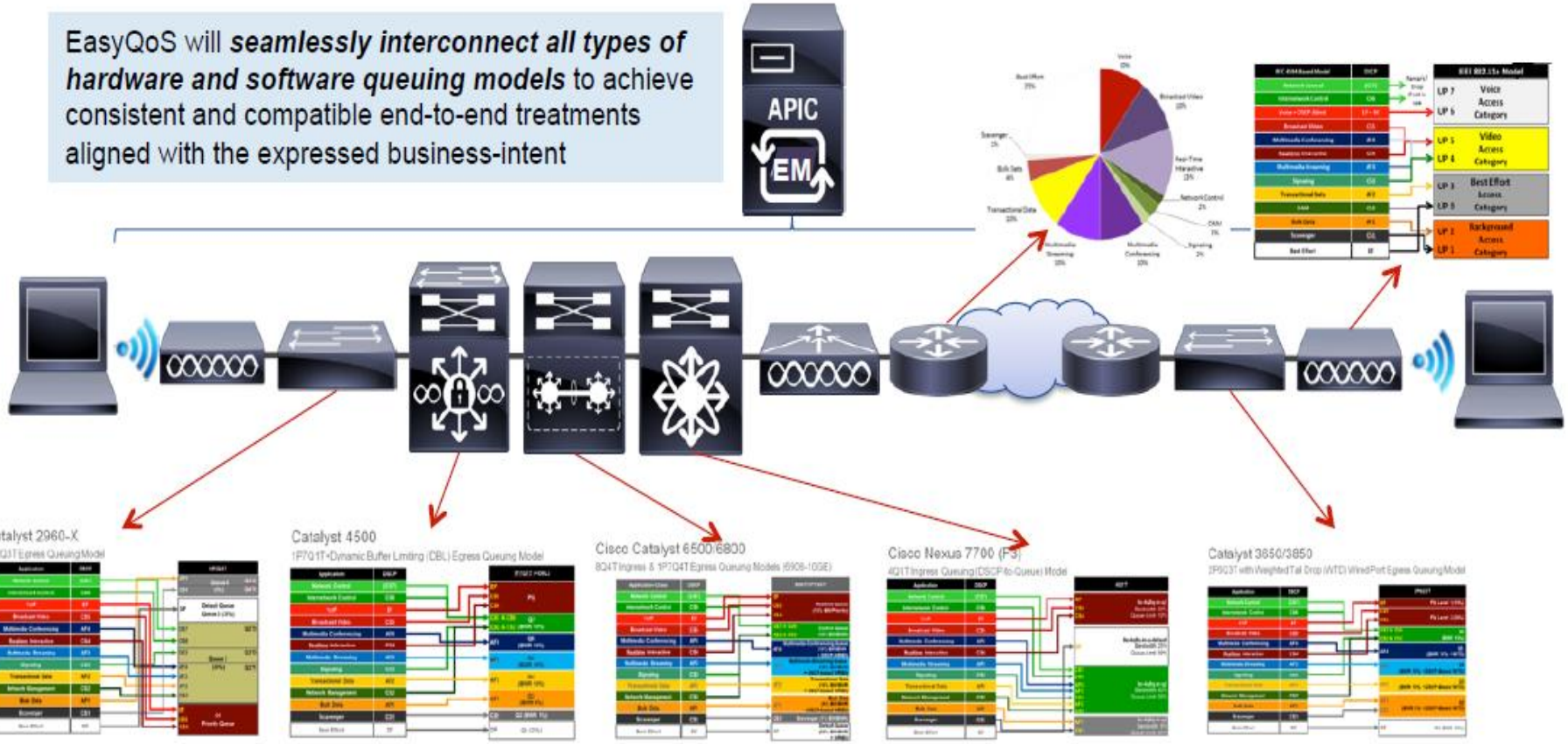
Автоматизация – основа для аналитики и самоорганизуемой инфраструктуры

APIC-EM App: EasyQoS

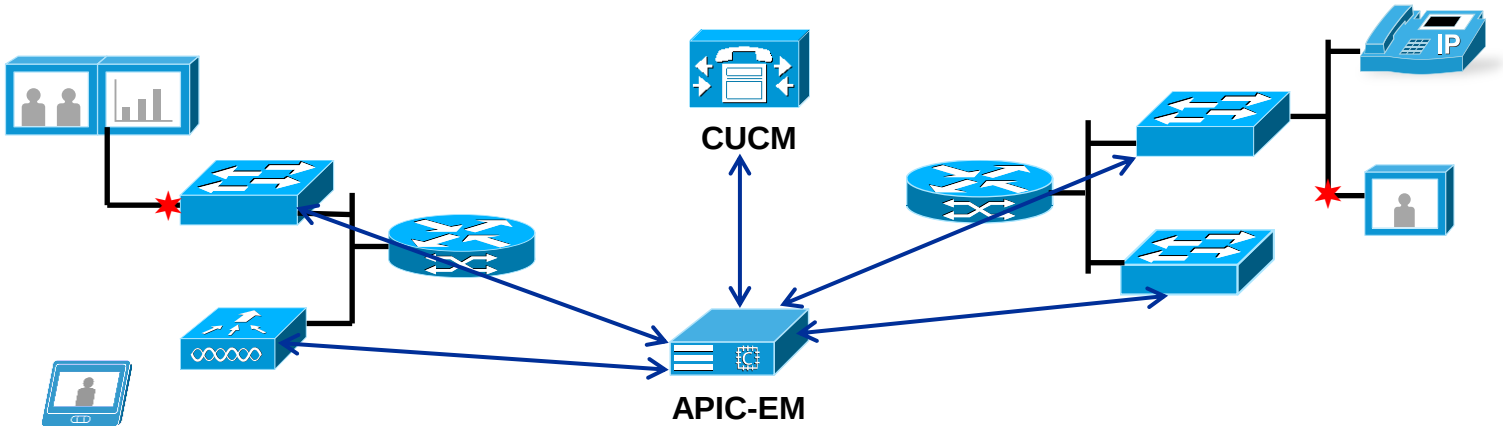


APIC-EM App: EasyQoS

EasyQoS will ***seamlessly interconnect all types of hardware and software queuing models*** to achieve consistent and compatible end-to-end treatments aligned with the expressed business-intent

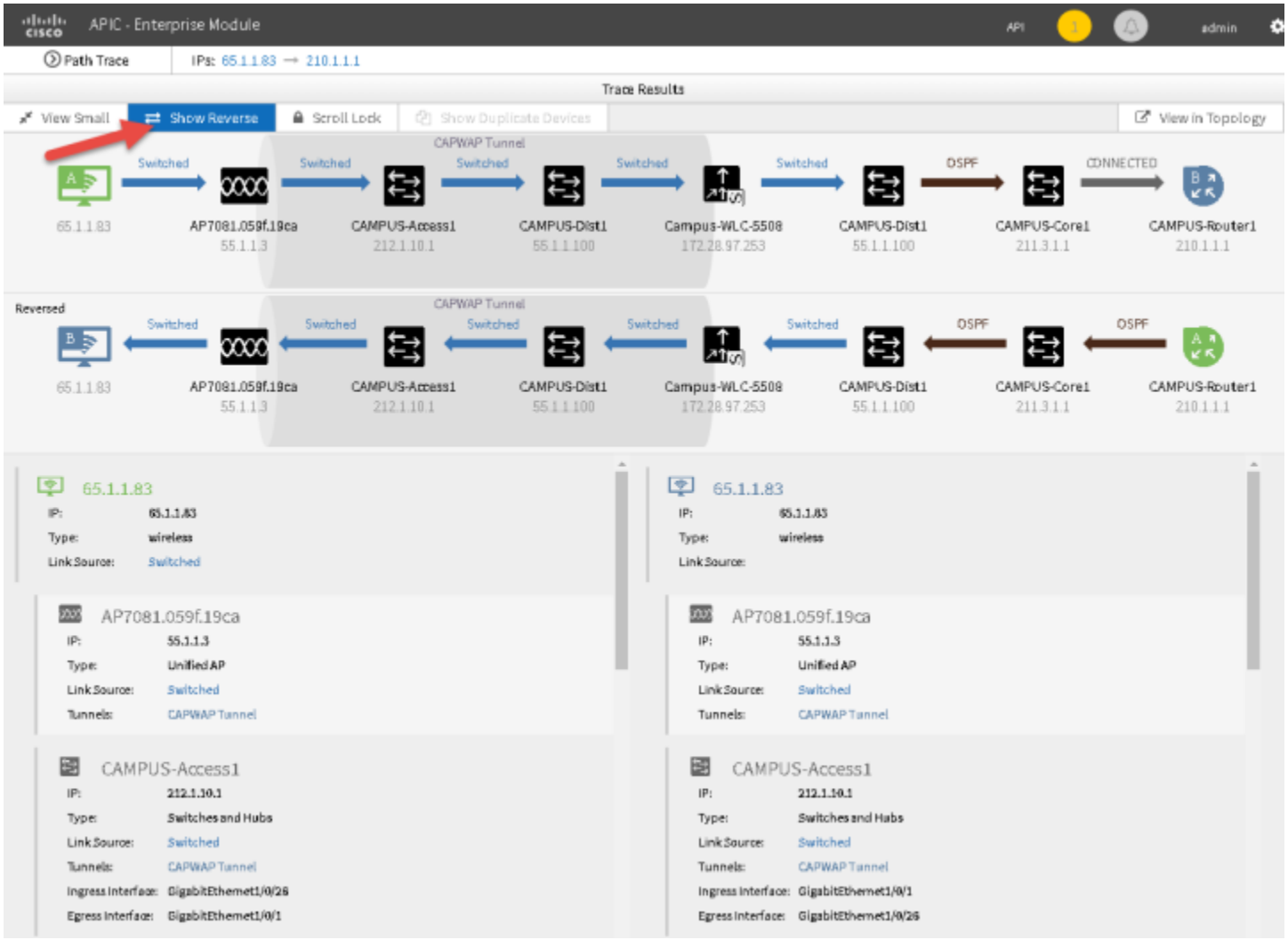


QoS Marking Via APIC-EM

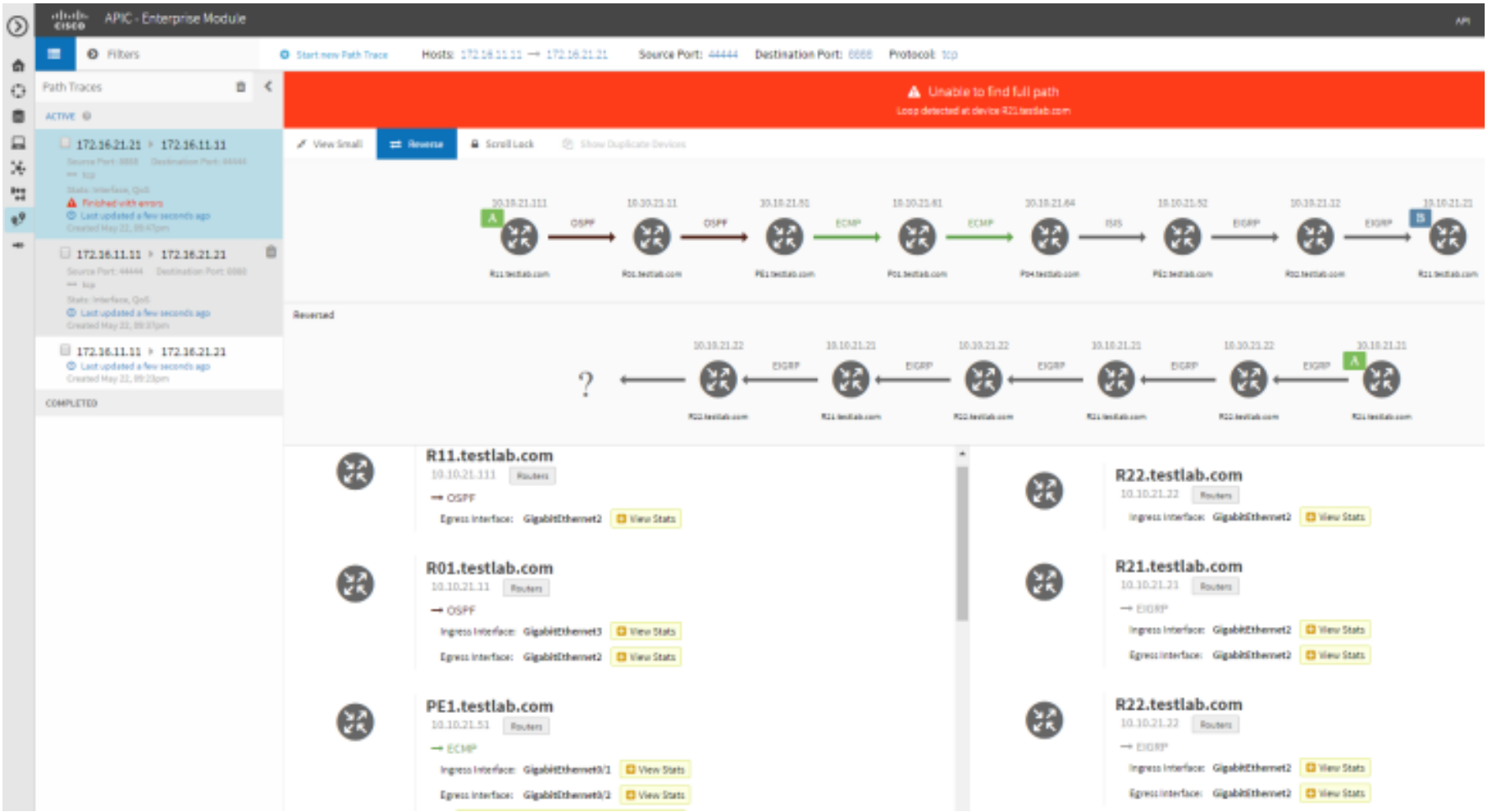


1. Endpoints signal call setup to CUCM
2. CUCM extracts media addresses from call signaling
3. CUCM requests QoS setting policy on flows from APIC EM
4. APIC EM instructs switch to apply DSCP according to policy

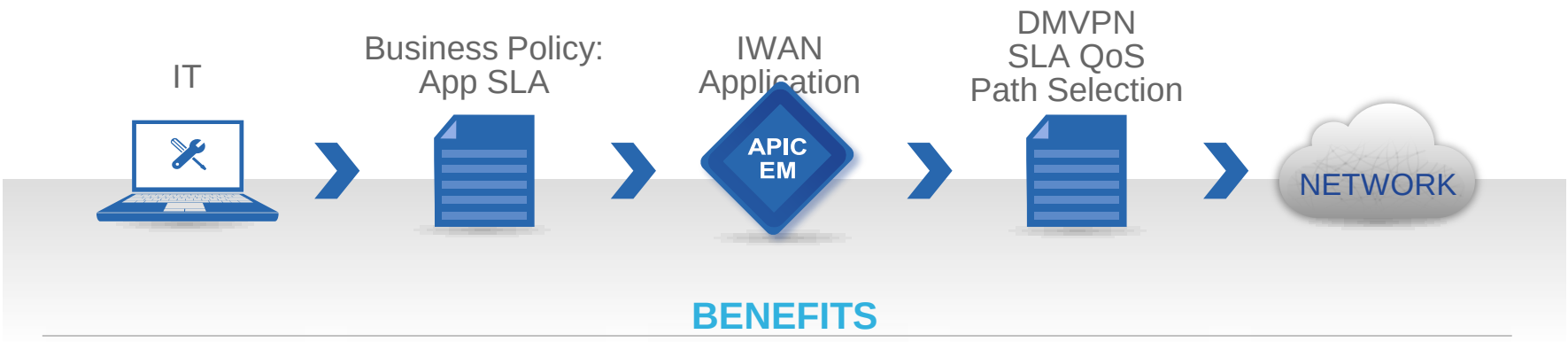
APIC-EM App: Path Trace – Application Flow Visibility



APIC-EM App: Path Trace – Easy Network Troubleshooting



APIC-EM App: IWAN



BENEFITS

- Simple Workflow
- Zero Touch Provisioning
- Network, Applications Monitoring
- Business Level Policies
- SDN Open Architecture

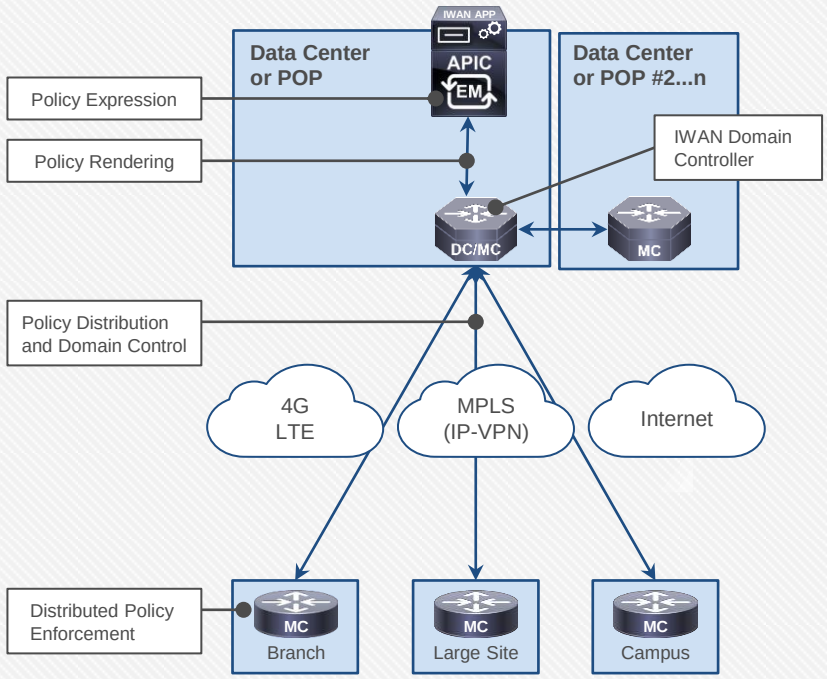
From Weeks to Minutes

Over 1000 CLI commands reduced to 10 GUI Clicks

Note: IWAN App Release 1 targets less than 500 sites, 2 links per Branch with ISR4000.

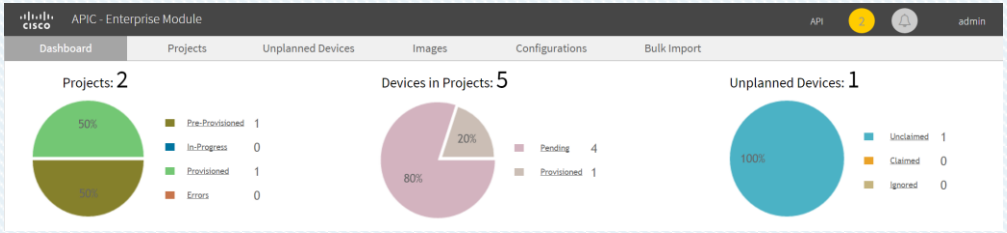
APIC-EM App: IWAN

- Cisco® APIC-EM centralized policy expression and distribution
- Distributed policy enforcement
- Automated application and topology discovery
- Application and network performance monitoring
- Adaptive path selection and QoS to sustain policy
- Performance analytics collected network-wide and reported centrally

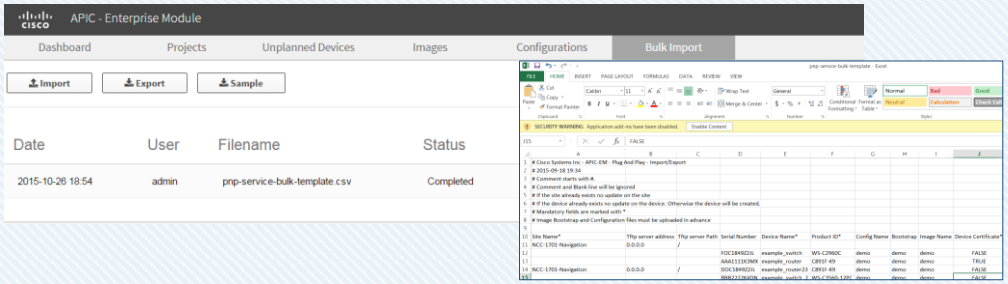


APIC-EM App: Plug and Play (PnP)

APIC-EM PnP Dashboard



APIC-EM Bulk Import/Export



APIC-EM PnP REST API Support

Device Repository and Database

Python

PnP REST API

APIC-EM API

Automation Framework (i.e. Python scripts, configuration generator, etc)

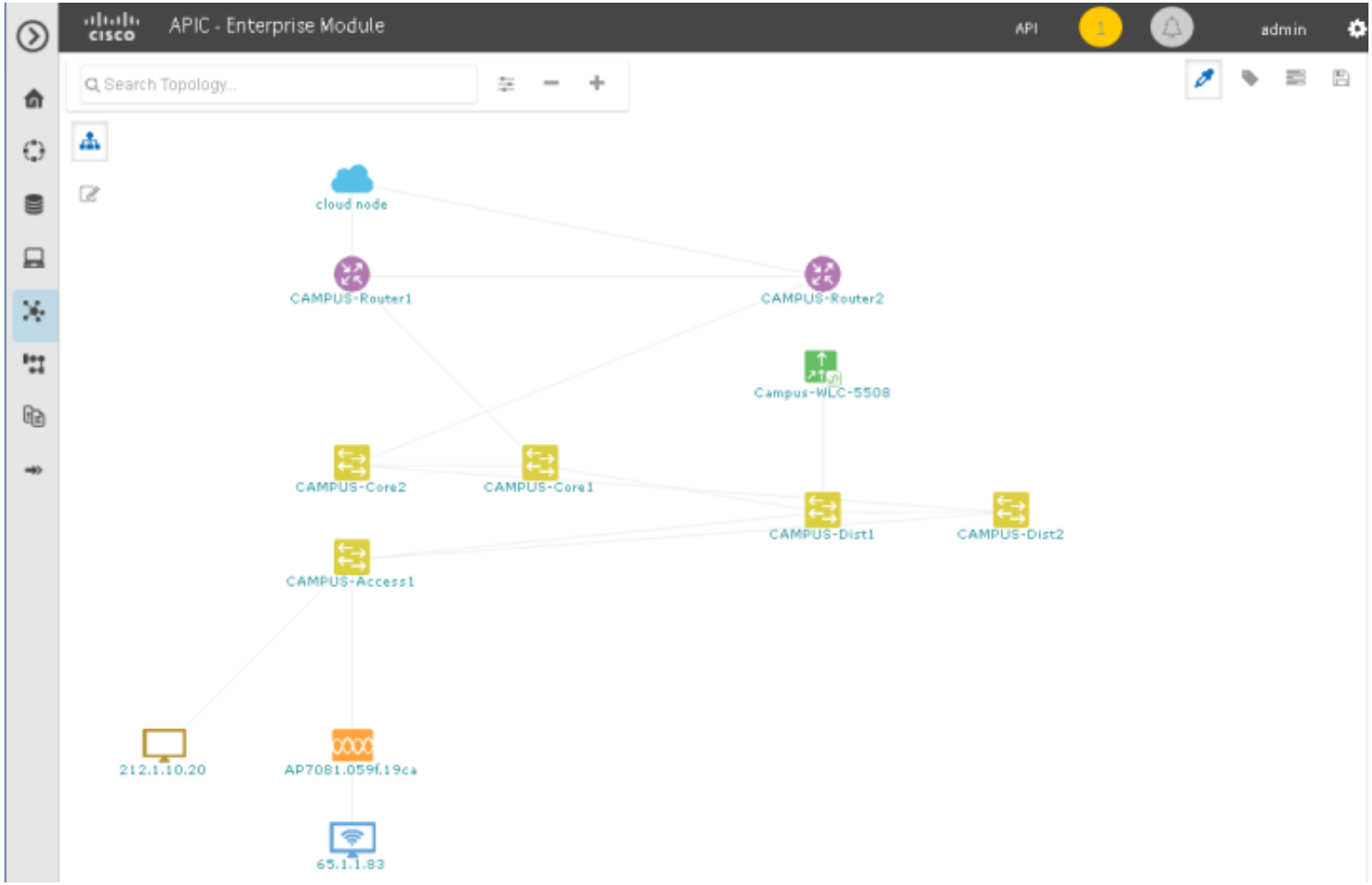
Customer's Existing Automation Frameworks

Switches (Catalyst)

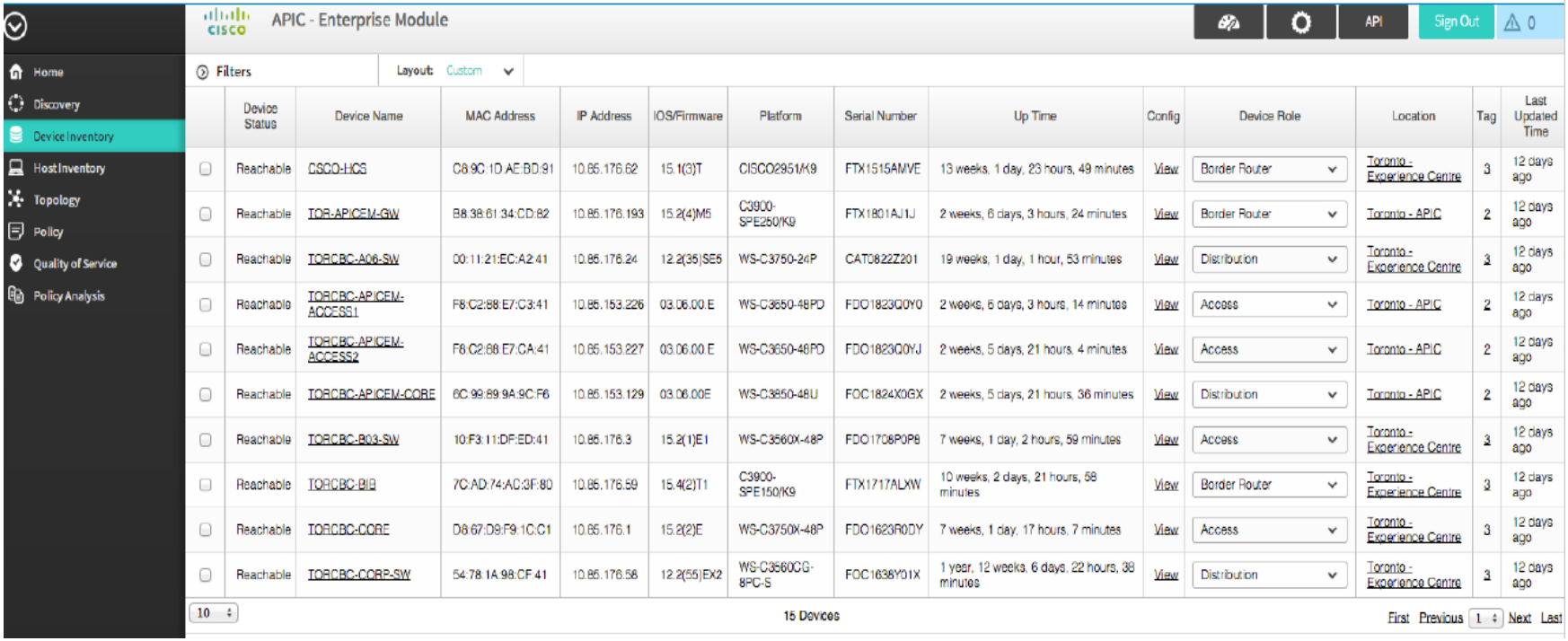
Routers (ISR/ASR)

Wireless AP

APIC-EM App:
Network topology Visualization



APIC-EM: Device Inventory



- CDP
- LLDP
- ICMP v2/v3

- SSH
- IP Tracking

APIC-EM: Поддержка устройств

LAN

Device Series	
Catalyst 2960-X/XR Series Switches	Catalyst 4500x Series Switches
Catalyst 2960-S Series Switches	Catalyst 4900 Series Switches
Catalyst 2960 Series Compact Switches	Catalyst 6500 Series Switches
Catalyst 3560 Series Compact Switches	Catalyst 6800 Series Switches
Catalyst 3650 Series Switches	Cisco Nexus 5000 Series Switches
Catalyst 3850 Series Switches	Cisco Nexus 7000 Series Switches
Catalyst 3750-X Series Switches	EtherSwitch Modules for Integrated Services Routers: SM-E22-16-P, SM-ES2-24-P, SM-D-ES2-48, SM-ES3-16-P, SM-ES3-24-P, SM-D-ES3-48-P
Catalyst 3560-X Series Switches	Industrial Ethernet 2000 Series Switches
Catalyst 4500 Series Switches	Industrial Ethernet 3000 Series Switches

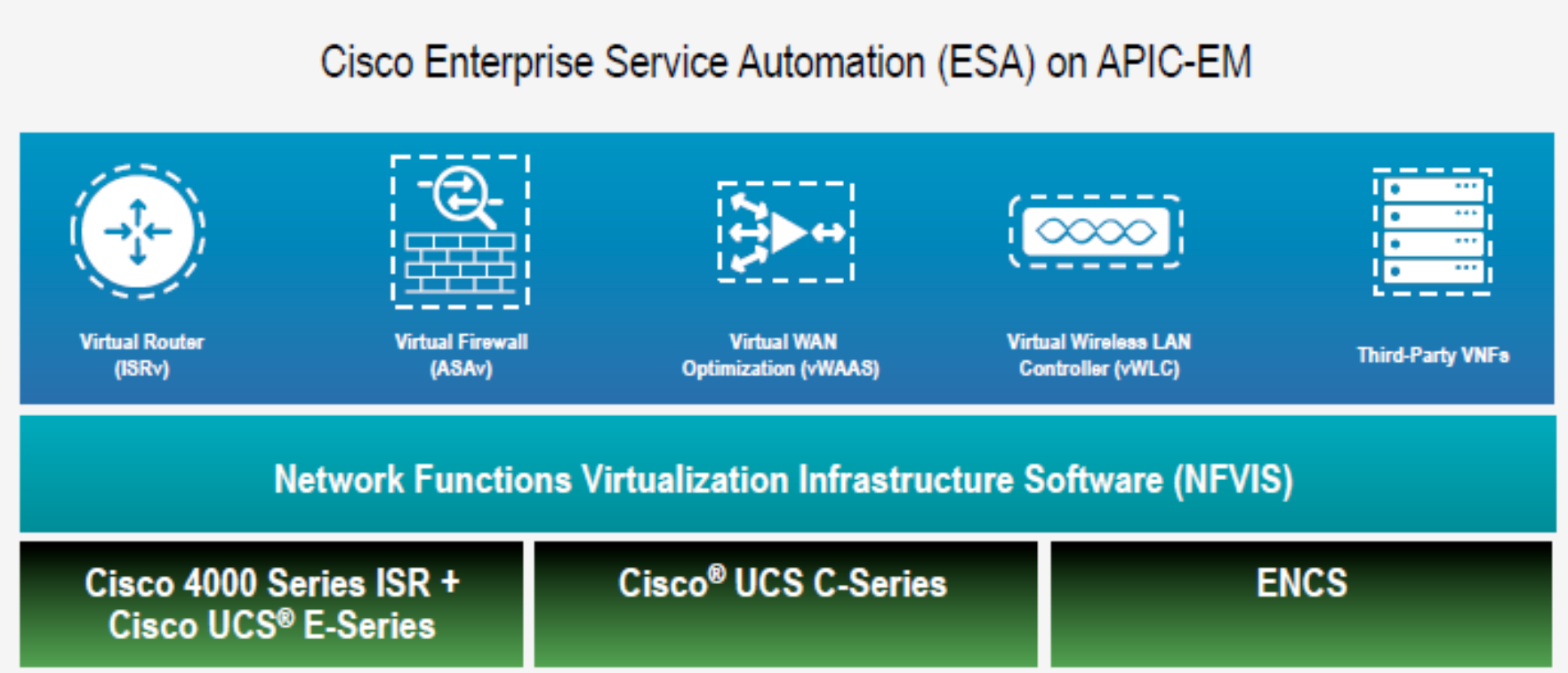
WAN

Device Series
4000 Series Integrated Services Routers
Integrated Services Routers Generation 2
ASR 1000 Series Aggregated Services Routers
ASR 9000 Series Aggregated Services Routers
Cisco Cloud Services Router 1000v

WLAN

Device Series
Wireless LAN Controllers (IOS XE & AireOS)

Enterprise NFV - Network Function Virtualization



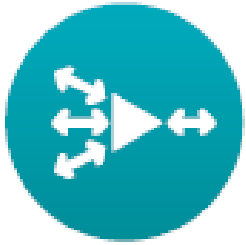
Сервисы от Cisco, функционально идентичные с аналогами в аппаратном исполнении

ISRv

- High Performance
- Rich Features
- End-to-end Support
- Proven Software

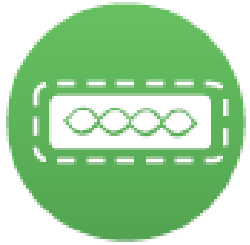
ASAv/FTD*

- Comprehensive Protection
- Full DC-class Featured Functionality
- Designed for NFV
- Cost-effective with NFV



vWAAS

- Application Optimization
- Superior Caching with Akamai Connect



vWLC

- Survivability & Scale
- Consistency across the Data Center and Switches
- Built for small and medium branches

Поддержка Windows 2012 и Linux Server

NFVIS

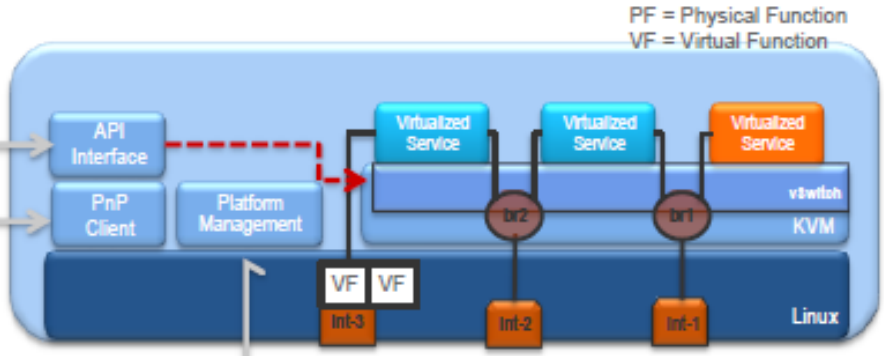
REST (HTTPS) and NETCONF (SSH)

- Register and deploy services
- Configure platform
- Gather monitoring statistics

PnP client for ZTD

Platform Management

- Controlling hardware specifics such as storage, memory, network interface connectivity
- Hardware performance such as SR-IOV



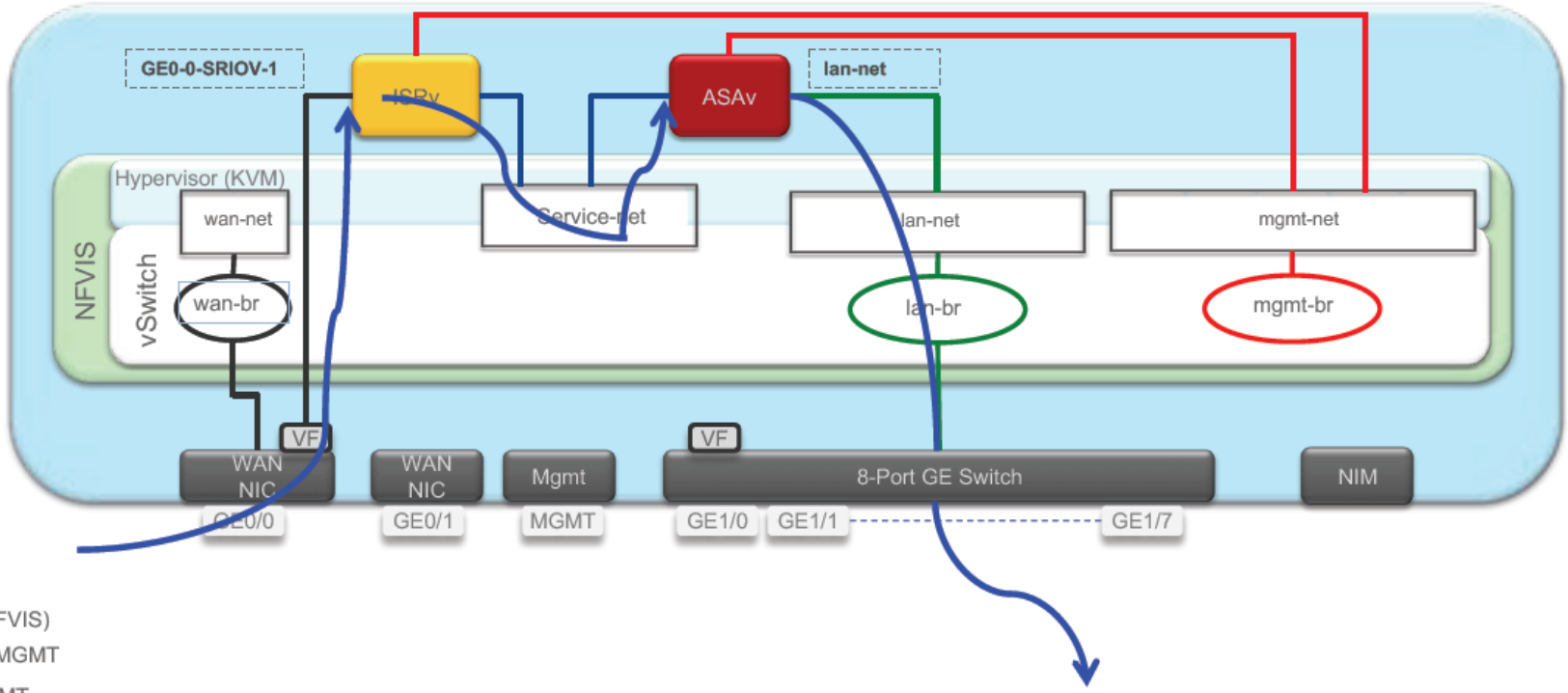
Network Function Virtualization Infrastructure Software

Варианты аппаратных платформ Cisco Intelligent Branch

Классический	Enterprise NFV		
Маршрутизатор	**Маршрутизатор и виртуализованные сервисы**	**Виртуализованный маршрутизатор и сервисы**	**Виртуализованный маршрутизатор и сервисы**
Cisco® 4000 Series ISR	4000 Series ISR + UCS® E-Series	Enterprise Network Compute System (ENCS)	UCS C-Series
Централизованные сервисы Фиксированные встроенные сервисы Классика	Обновляемое HW Предсказуемая производительность	Эластичность сервисов Гибридный вариант	Эластичность сервисов Производительность Первопроходцы

ENCS 5400 Series

ENCS5400
ISRv and ASAv



- LAN Side (NFVIS)
- Out of band MGMT
- Optional MGMT
- Services Side (NFVIS)
- WAN Side (NFVIS)

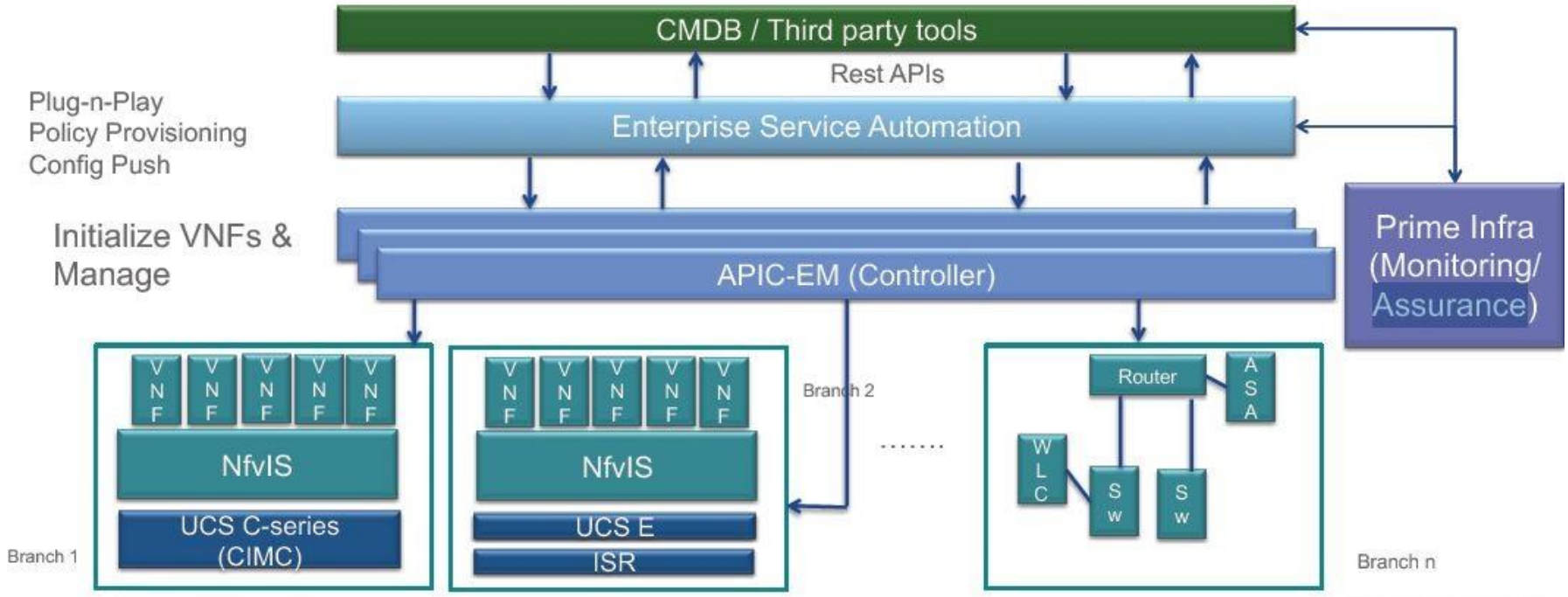
Автоматическая оркестрация, управление, применение политик Enterprise Service Automation (ESA)

- Стандартные шаблоны для разных типов филиалов
- Определение политик на основании приоритетов для бизнеса
- Пользовательские или предписывающие дизайны

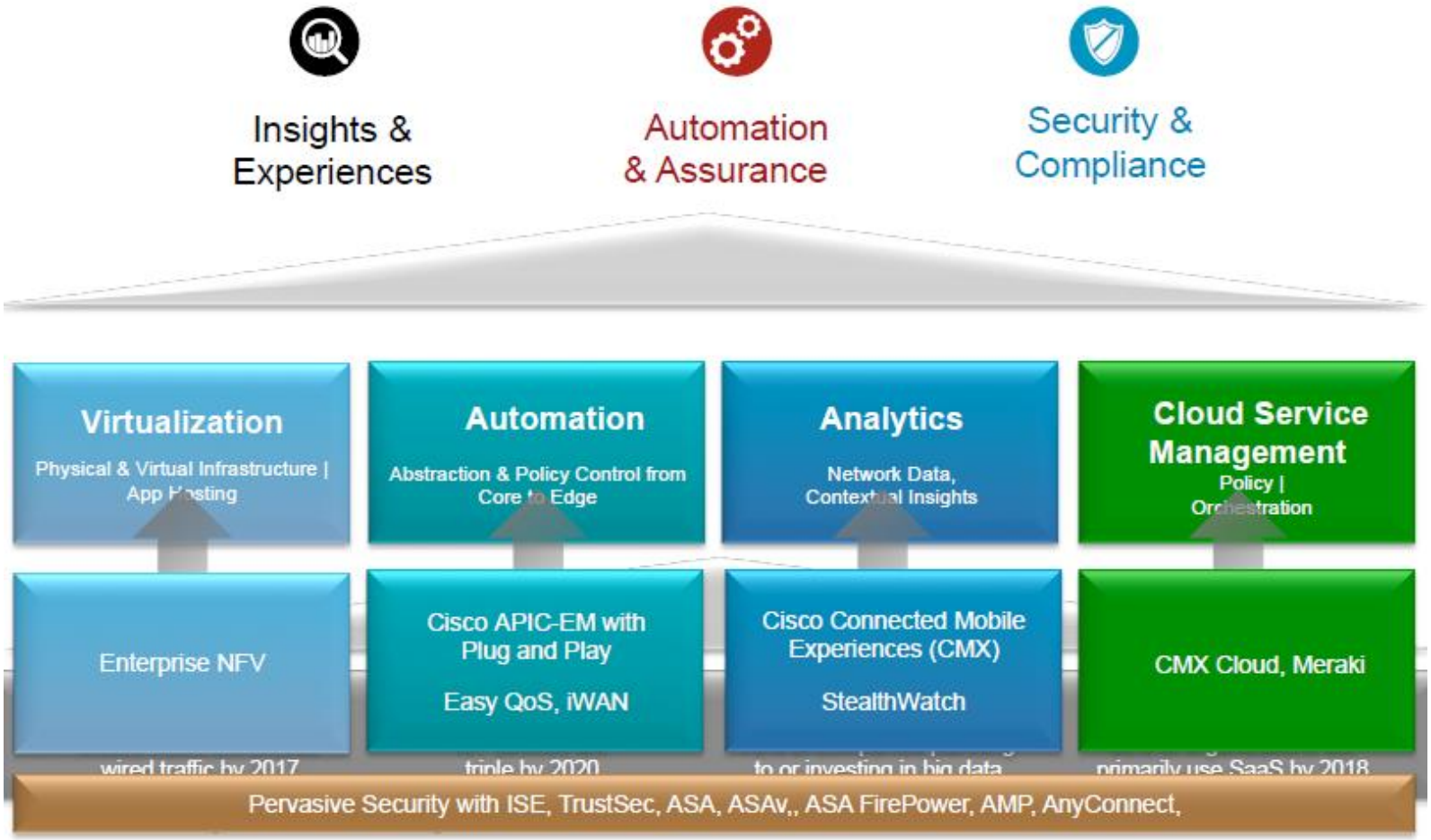
- Автоматическое развертывание
- Автоматическая оркестрация платформы и функций VNF
- Объединение сервисов и их лицензирование

- Мониторинг работоспособности
- Динамическое масштабирование сервисов по требованию
- Оперативное управление соглашениями об уровне обслуживания (SLA)

Enterprise NfV Automation



DNA - итоги


Insights & Experiences
Automation & Assurance
Security & Compliance
Virtualization
Physical & Virtual Infrastructure | App Hosting
Automation
Abstraction & Policy Control from Core to Edge
Analytics
Network Data, Contextual Insights
Cloud Service Management
Policy | Orchestration
Enterprise NFV
Cisco APIC-EM with Plug and Play
Easy QoS, iWAN
Cisco Connected Mobile Experiences (CMX)
StealthWatch
CMX Cloud, Meraki
Pervasive Security with ISE, TrustSec, ASA, ASAv,, ASA FirePower, AMP, AnyConnect,