Swiss Networking Day 2015

Next Generation in Data Center, Networks and Internet of Things

ARISTA

Reinventing Data Center Networking

Connecting the Cloud

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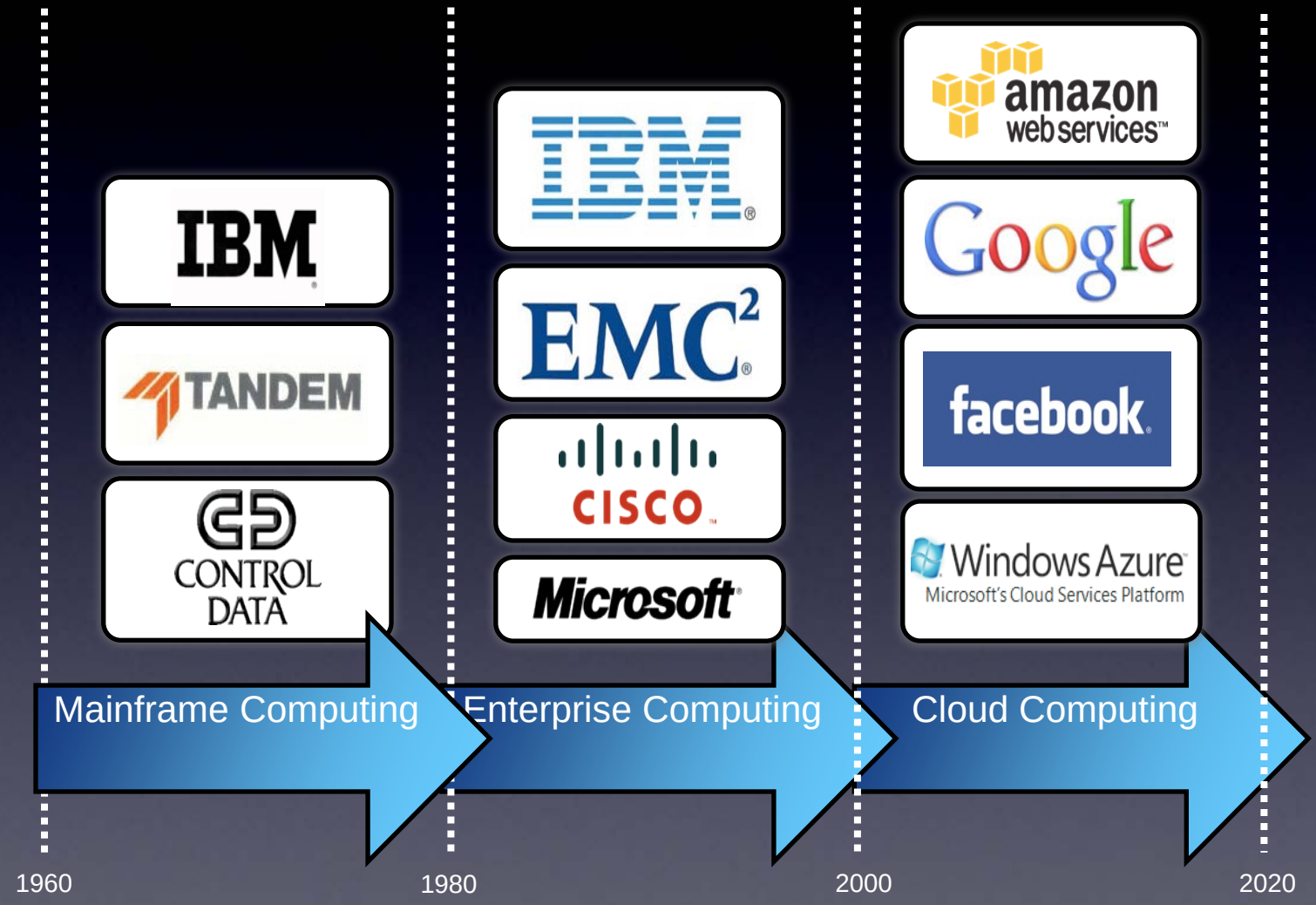
Corporate Overview

- Launched Arista and management team in Oct 2008
- Experienced Management and World Class Engineering Team
- 3000+ customers (> 3 Million x 10G Ports)
  - 8 of 10 biggest clouds worldwide are built on Arista
  - 7 of 10 biggest financials worldwide built on Arista
  - 9,3% market share in DC networking in Q4/14
- Award Winning Products & Differentiators
- Game changing software architecture (EOS)
- Vertical focus on Cloud, Web-scale, HPC, Big Data and Financial Services

Cloud computing is a major disruption born from internet, (not enterprise), companies



2013 Versus 2014 Data Center Magic Quadrant

HIGHLIGHTS:

1) Arista takes the #1 spot as “Visionary” for DC Switching Companies.
2) Arista was the only company to organically move both up and to the right.
3) Arista takes the #3 spot in Ability to Execute.
4) Arista is the market leader in 40GbE port shipments (with a 28.8% share).
5) Arista should be considered for all data center network opportunities in North America and Western Europe.

Source: Gartner (February 2013 and April 2014)

Customers' Challenges Addressed via SDN

Research

Experimental OpenFlow components for production networks

Network "Slicing"

Web 2.0

Customize with programmatic APIs to provide deep insight into network traffic

Network Flow Management & Visibility

Cloud/Service Providers

1. Automated provisioning & programmable Overlay - mixed virtual & physical topologies
2. VM aware network – Seamless workload & VM mobility

Scalability Multi-Tenancy

Enterprise

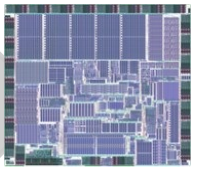
1. Run their own private cloud internally
2. Cost management
3. Automation for faster business responsiveness

Application Virtualization & Applications Agility

The Cloud Disruption

Infrastructure

- Simple building blocks
- Open networking standards
- Mega-scale

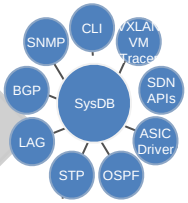


Merchant Silicon

Universal Cloud Network

Operations

- Automate, Automate, Automate
- Always-On Infrastructure
- Control through programmability



Modular & Resilient

Open & Programmable

Business

- Driving costs down with volume
- Disaggregated offerings
- New consumption models

EOS
vEOS

Customer Driven Flexibility

Cloud Scale Economics

Arista's Software Defined Cloud Networking Solution

Cloud Stack

Joint Solution

Analytics Tools

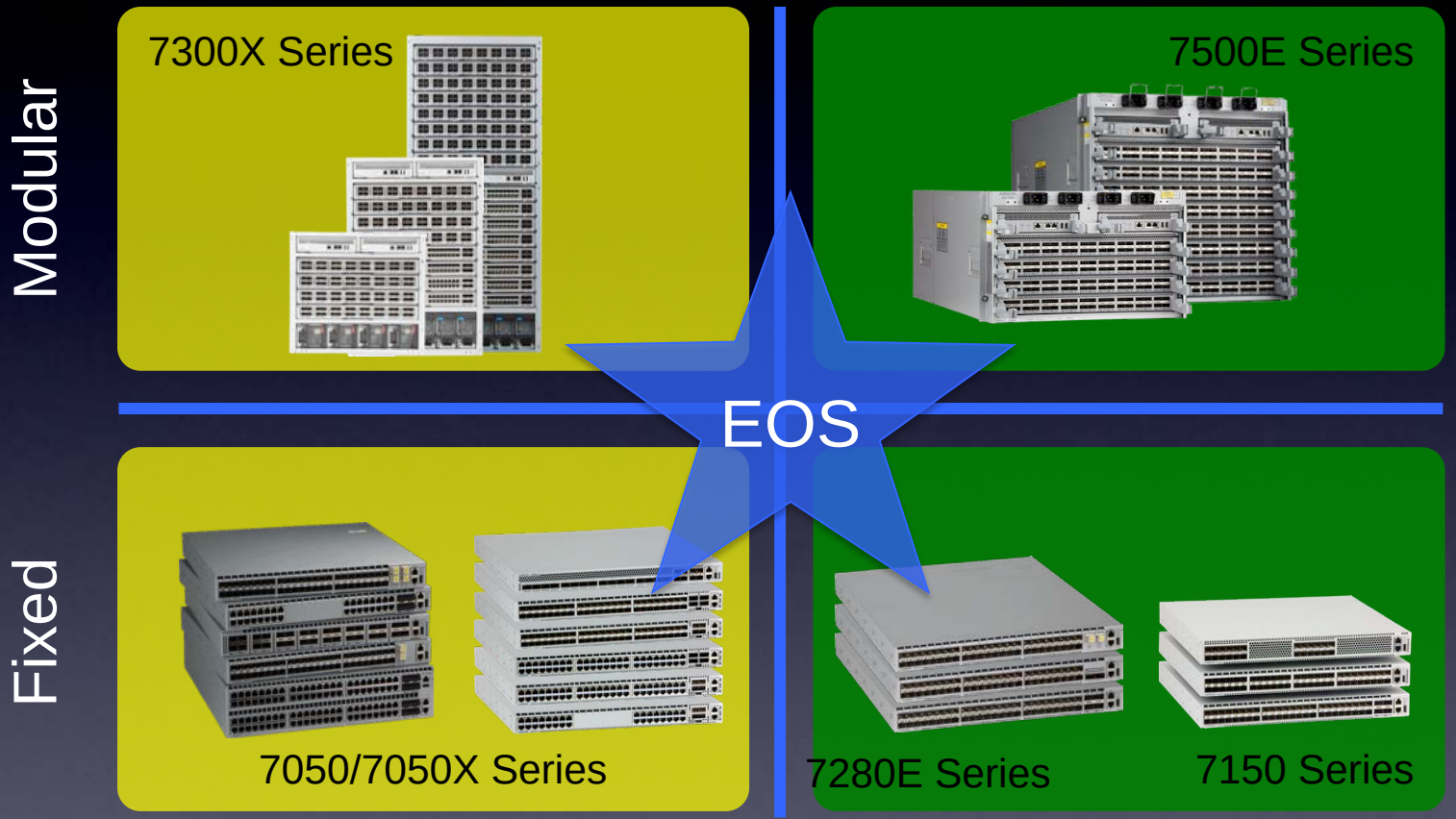
Visibility Tools

Auto Provisioning Tools

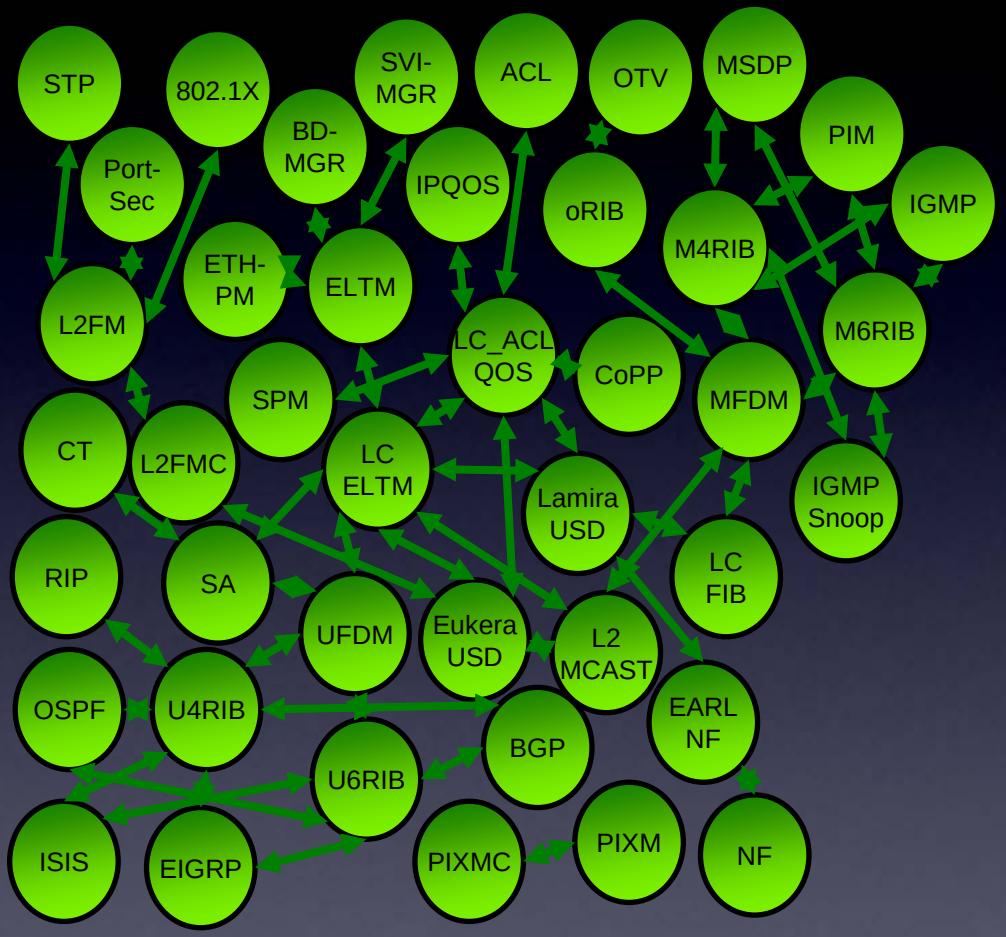
Arista EOS APIs

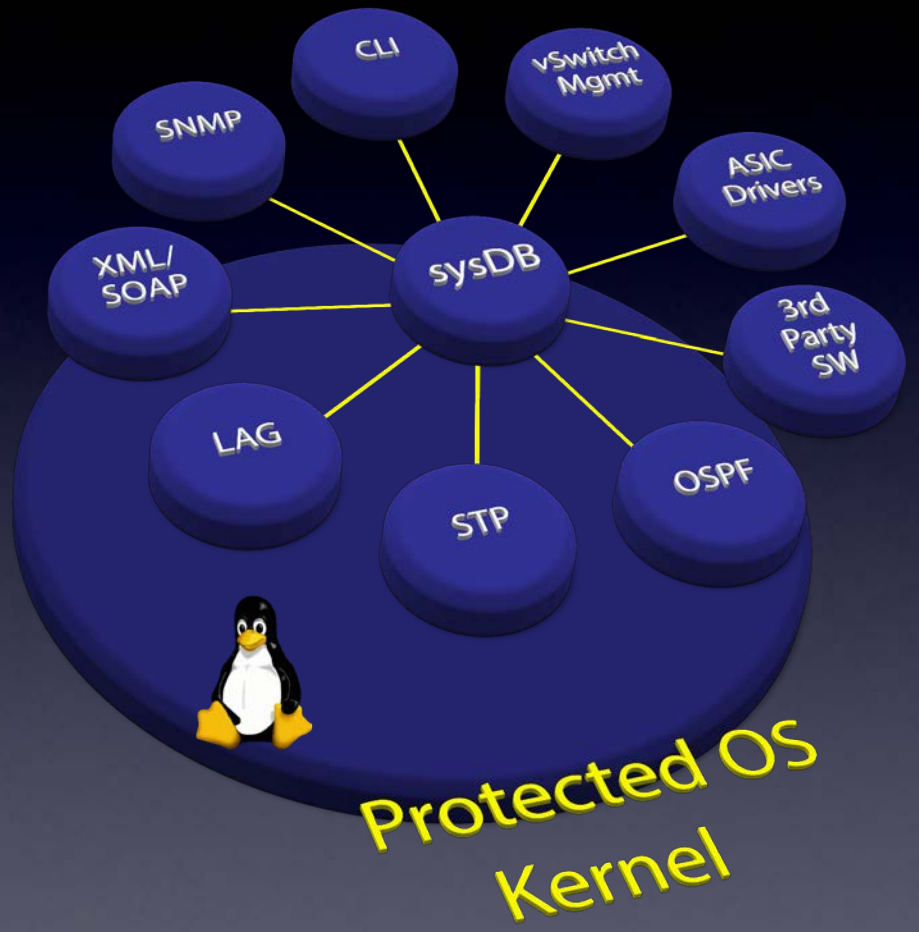
Arista Universal Cloud Network

Arista believes in choice without complexity



Wellknown OS vs. Arista EOS Modular Software designs





Wellknown software architecture

Complex to code, debug, test and troubleshoot

(Modular spaghetti)

Arista EOS software architecture

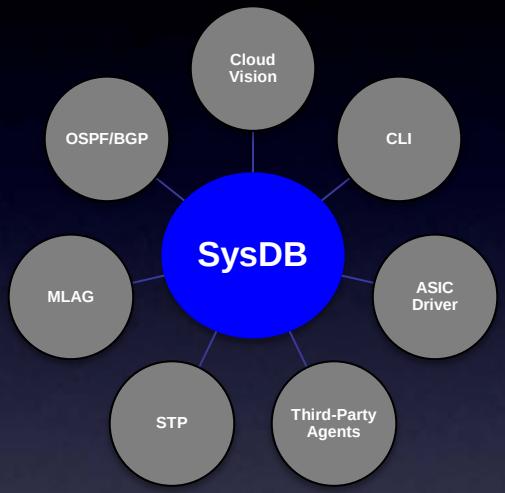
SysDB used for all state

SysDB used for all IPC

Arista EOS - Software for the SDCN

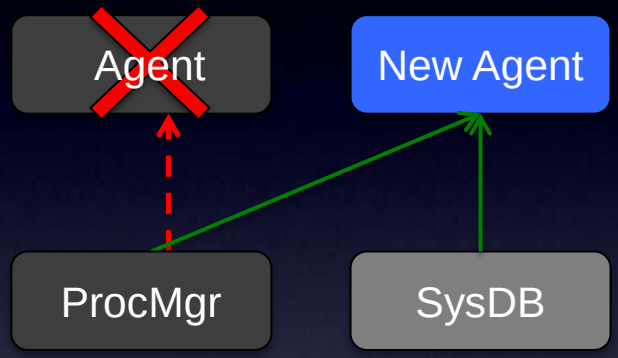
Proven Reliability

Modular



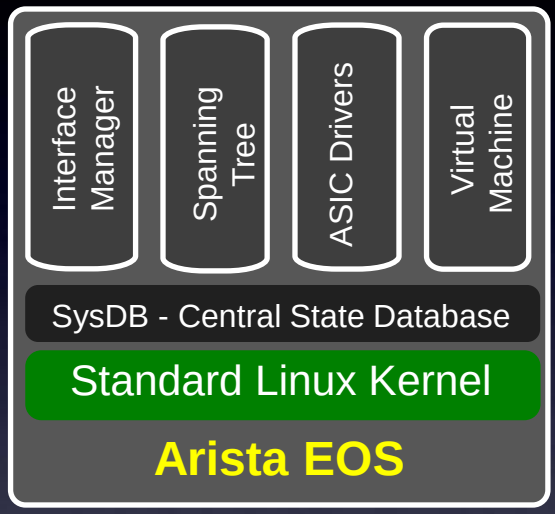
- Multi-process/threaded state sharing architecture
- Isolated
- Secure
- Reliable

Resilient



- Self Healing
- Stateful Fault Containment
- Stateful Fault Repair
- Highly Available
- Process-Level Upgrades

Programmable



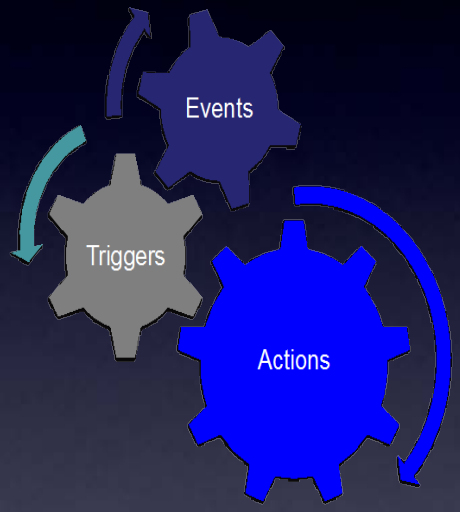
- One image all products
- Extensible architecture enables 3rd party applications
- Open
- Programmable

Feature Rich

Arista EOS - Software for the SDCN

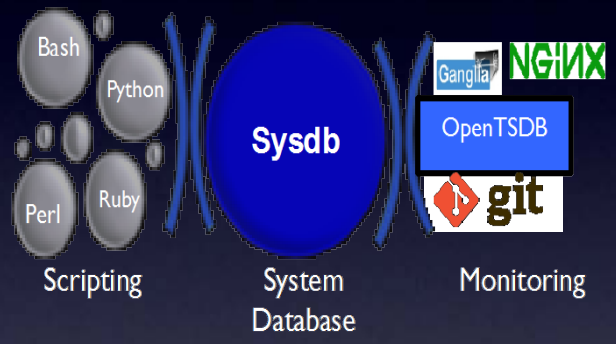
Customized events and actions

Advanced Event Monitor



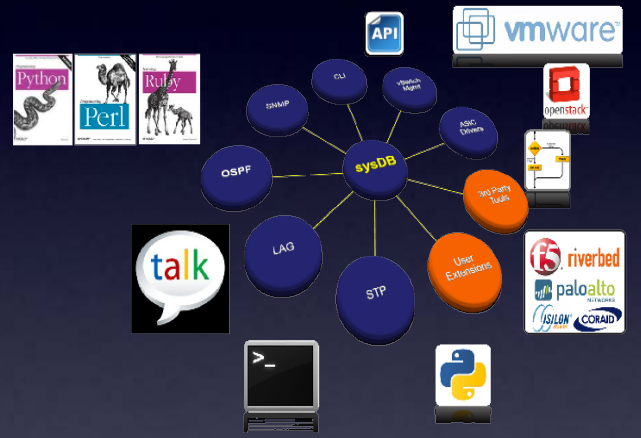
Monitor and react

Linux Tools



Linux Tools

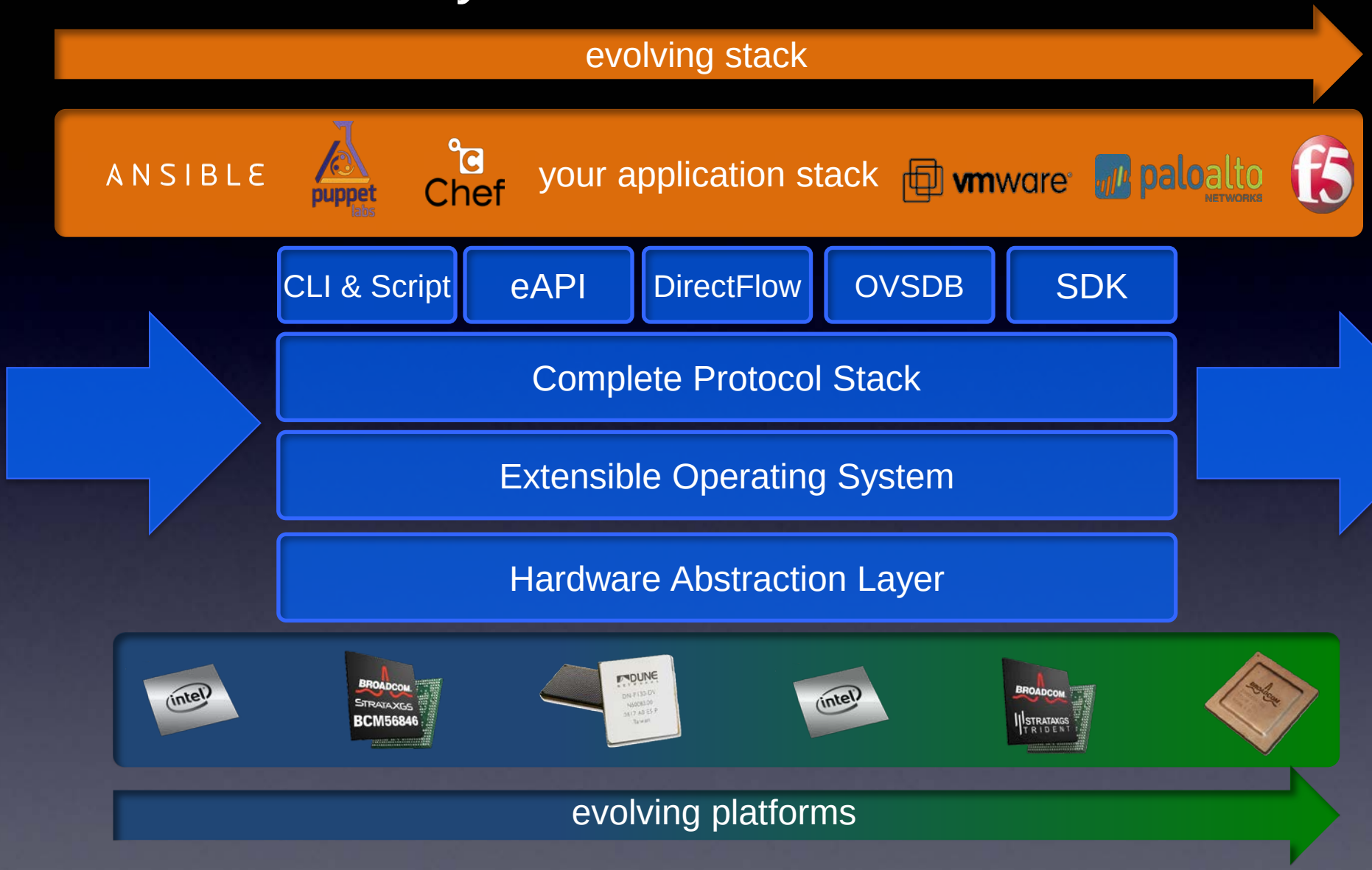
eAPI



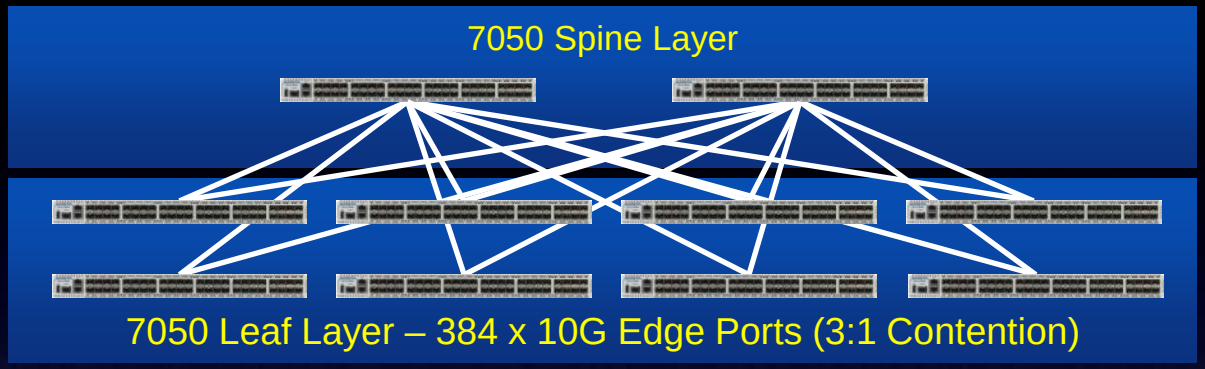
Easy integration

Programmability at every level

EOS is a key enabler of cloud environments

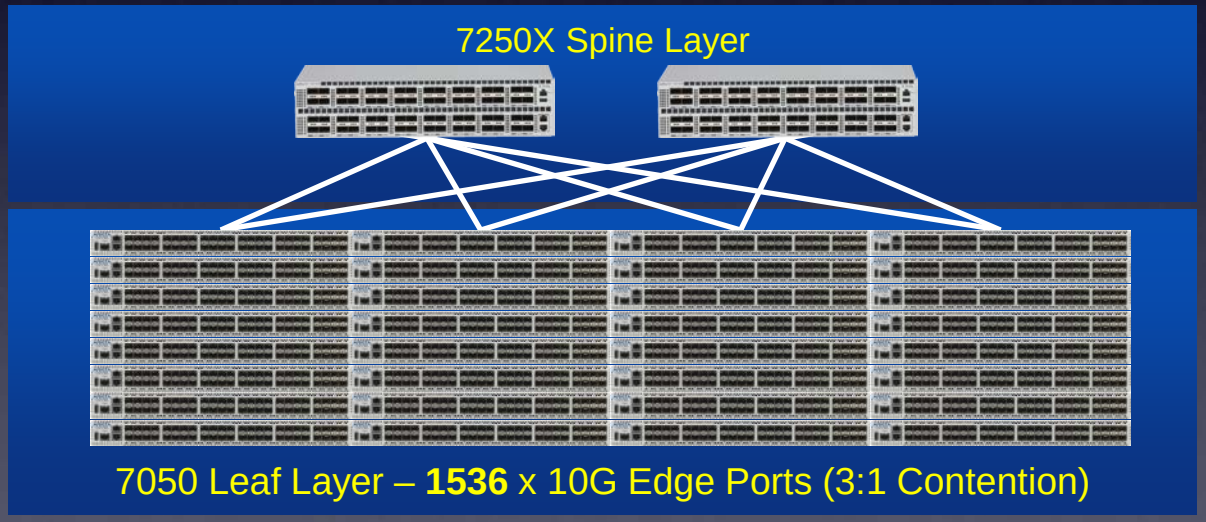


Standards based platform enables organic growth



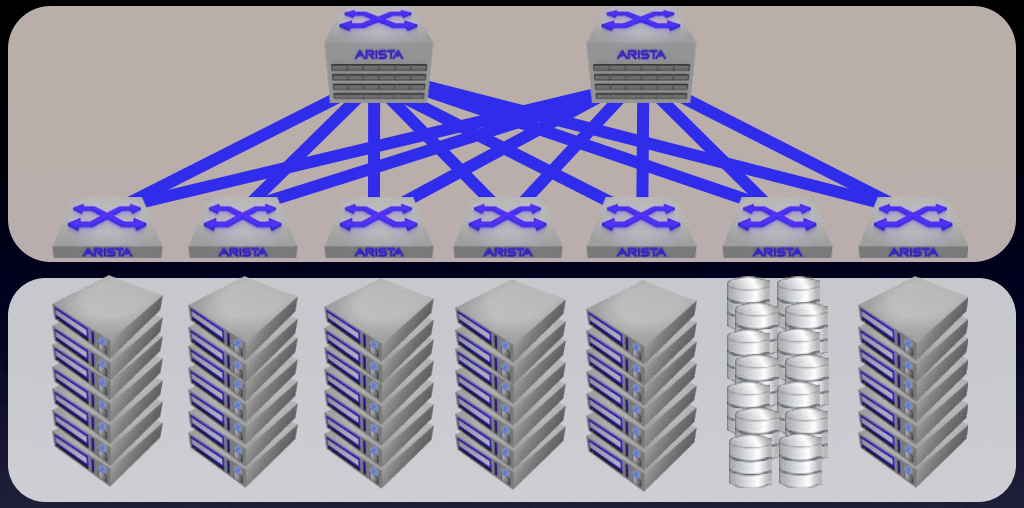
2012

2014



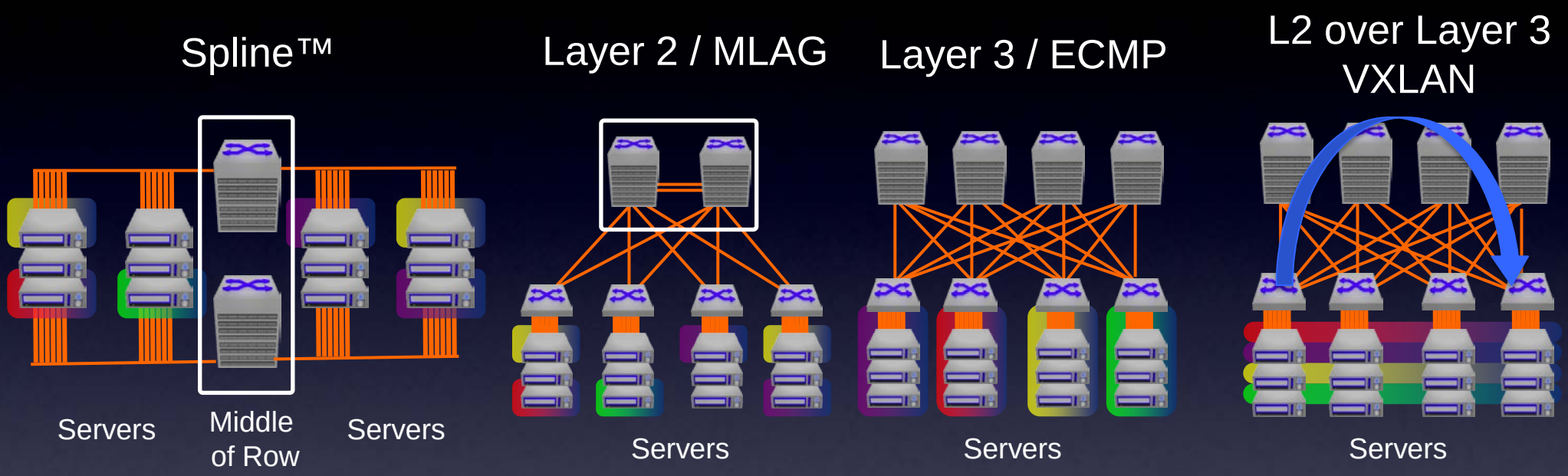

ARISTA
Building a Scalable Cloud Architecture

Cloud Network Requirements



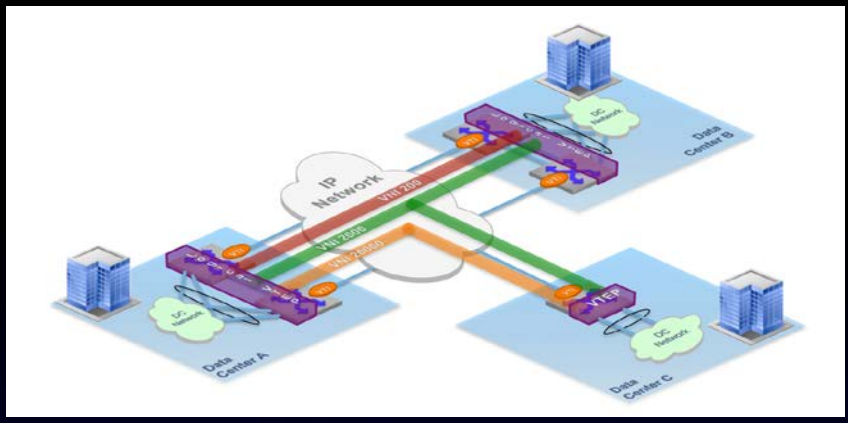
- Must be designed to be transparent to any workload - deterministic any to any connectivity
- Must be open standards based to avoid technology cul-de-sac
- Must be simple to design, capacity plan, scale and troubleshoot
- Must not rely on proprietary management tools/techniques
- Must enable continuous innovation and ‘pay as you grow’ scale

Arista Universal Cloud Network

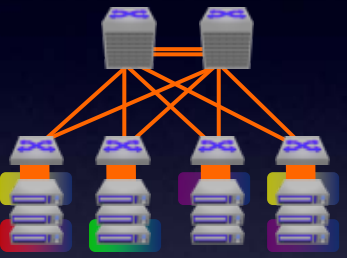


Server Scale: 100 to 1,000	**100 to 10,000**	**100 to 100,000+**	**100 to 100,000+**

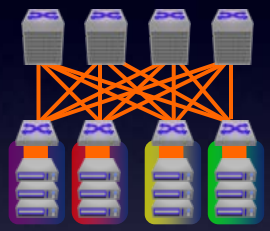
EOS & Evolution of Network Roles



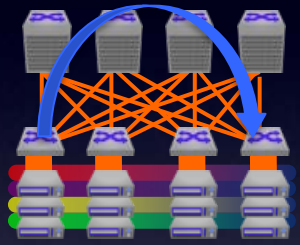
DC Interconnect (DCI)
with VxLAN



L2 MLAG

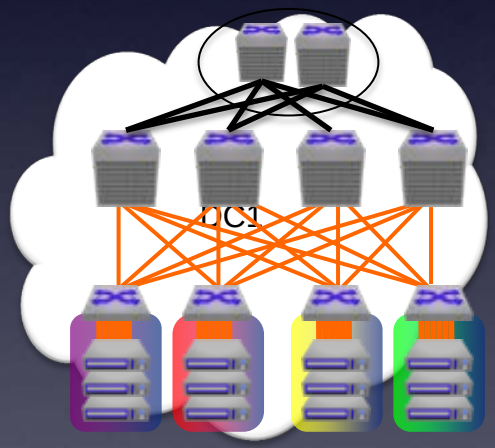


L3 ECMP



L2 Overlay - VxLAN

DC Leaf Spine
Universal Cloud Architecture – one architecture works for any type of DC

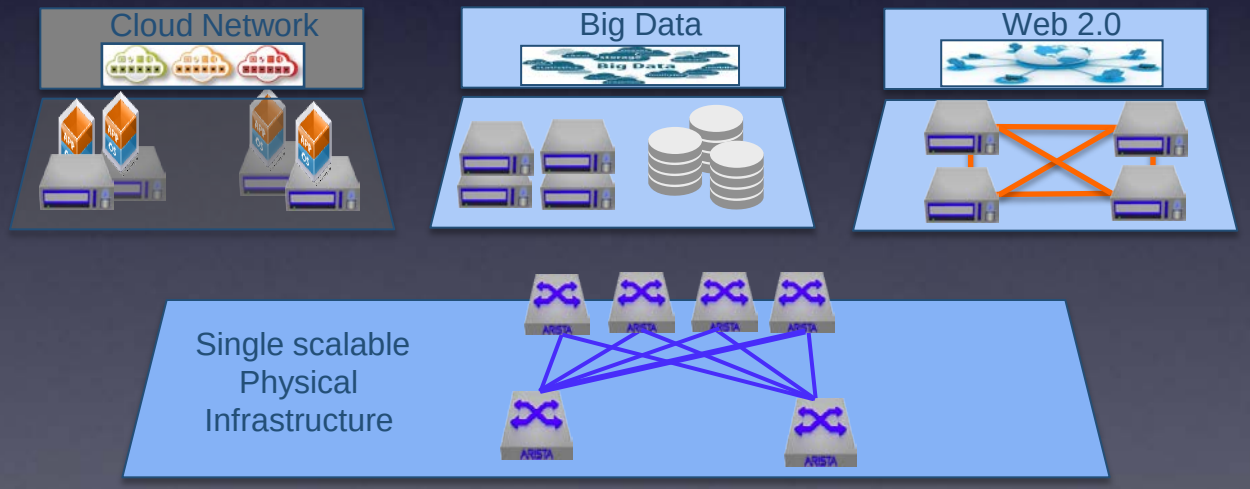


DC Edge Router & Peering
CDN, Caching, DC Backbone, Cloud

Arista Universal Cloud Network

To provide scale evolution is to decouple the virtualized network from the physical infrastructure

- Remove the scaling and architecture requirements from the physical infrastructure
- Architecture of the physical infrastructure not tied to the virtual infrastructure
- Building a physical transport infrastructure for bandwidth, port scale and operation
- Allowing the standardize of the the networking platform regardless of the application



Virtualized Solution

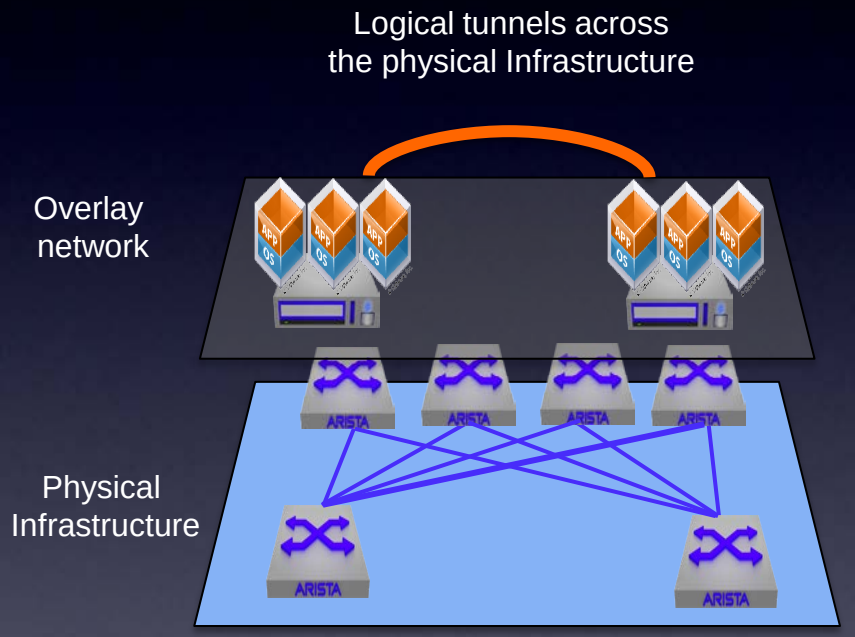
Virtualize the Network through an Overlay Network

What is an Overlay Network

- Abstracts the virtualized environment form the physical topology
- Constructs L2 tunnels across the physical infrastructure
- Tunnels provide connectivity between physical and virtual end-points
- Provides solution to v-mobility over L3 networks

Physical Infrastructure

- Transparent to the overlay technology
- Allows the building of L3 infrastructure
- Physical provide the bandwidth and scale for the communication
- Minimize the operational and scale challenges from the IP Fabric Core



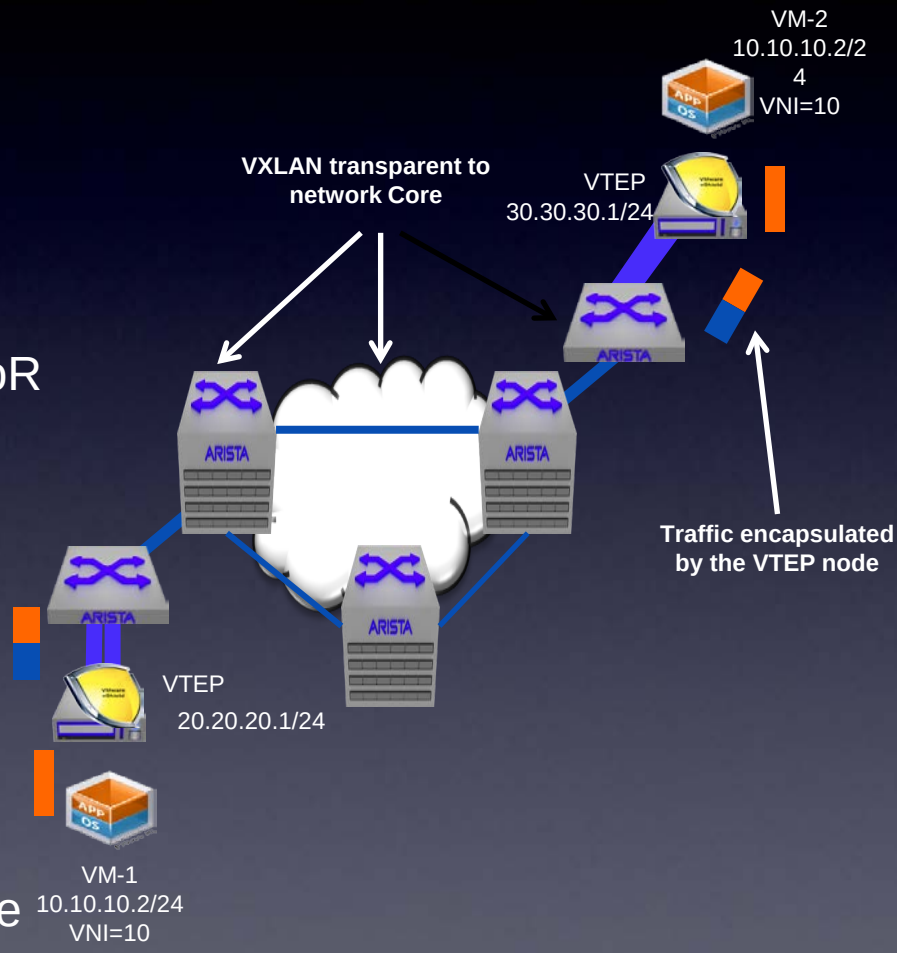
VXLAN - How does it work?

VXLAN creates logical L2 domains over standard layer 3 infrastructure

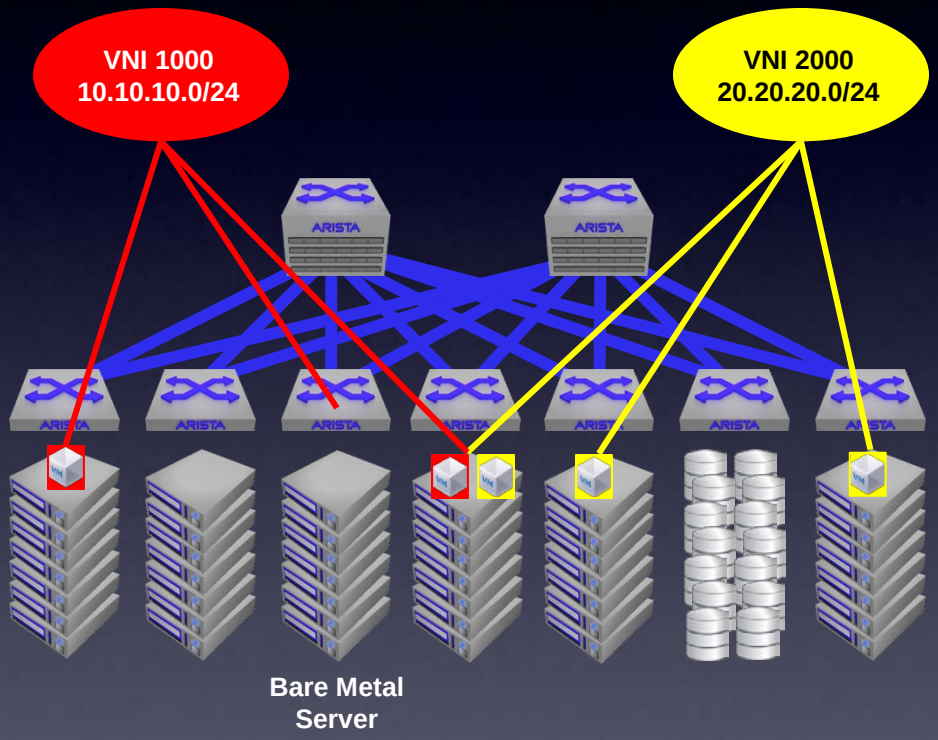
- VM traffic encapsulated inside a UDP/IP frame plus VNI identifier
- The VNI defines the layer 2 domain
- Encapsulation done by a VTEP node, VXLAN tunnel endpoint
- VTEP is a software or a physical switch at the ToR

Encapsulated frames are routed to the remote VTEP

- Remote VTEP strips the IP/UDP header
- Original frame forwards to the local VM
- Network core transparent, not aware of the VXLAN overlay.
- Only edge VTEP nodes need to be VXLAN aware



Overlay Network based on VXLAN



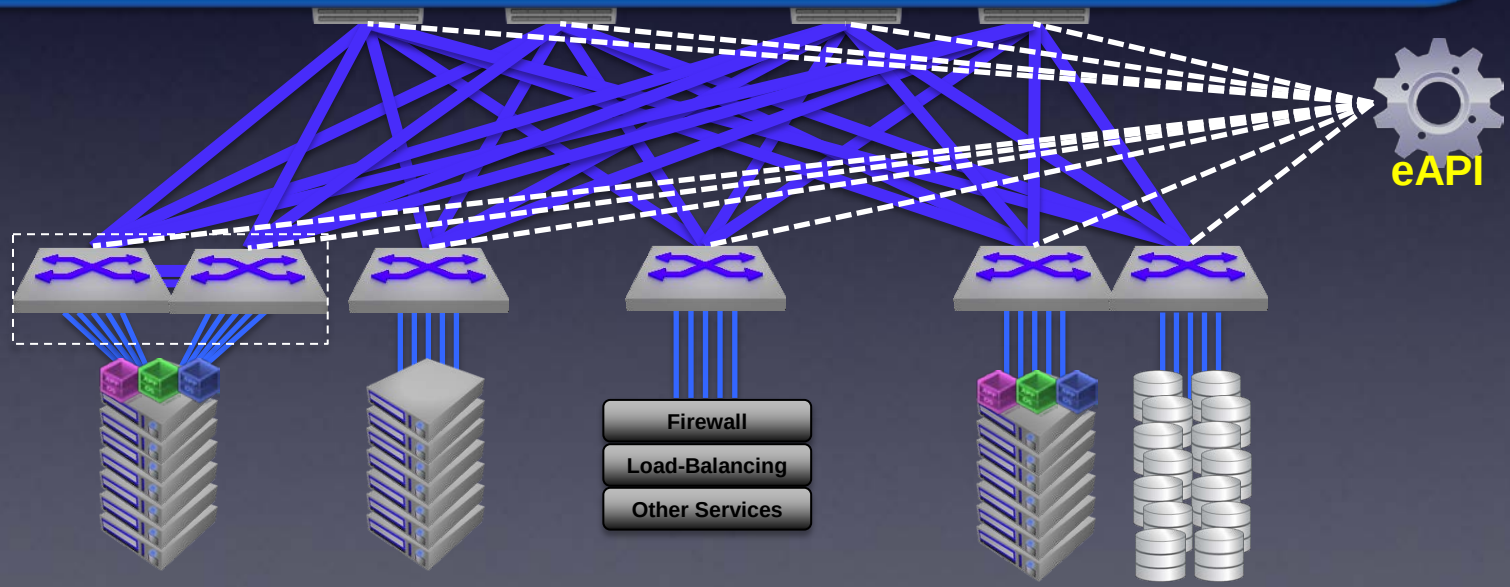
VXLAN is an extended version of regular bridging, it connects bridges through an L3 multi-point tunnel

- Provides a tunneling scheme to overlay Layer 2 networks across the Layer 3 IP fabric
- Transparent to the physical IP fabric
- Abstracts the Virtual connectivity from the physical IP infrastructure
- Vmotion across L3 boundaries
- Allows ECMP load-balancing across the network core which is VXLAN unaware
- 24-bit segment identifier = 16.7 million segments


ARISTA
EOS - Software for the
Software Defined Cloud Network

Arista EOS - eAPI

- Built around EOS CLI
- Uses JSON-RPC to communicate between application and EOS
- JSON-RPC provides industry standard, lightweight protocol to handle communications
- Messaging is achieved over HTTP/HTTPS as the transport
- Commands are sent using EOS standard CLI syntax
- All output is returned to application in standard JSON encoding messages



Arista EOS - eAPI

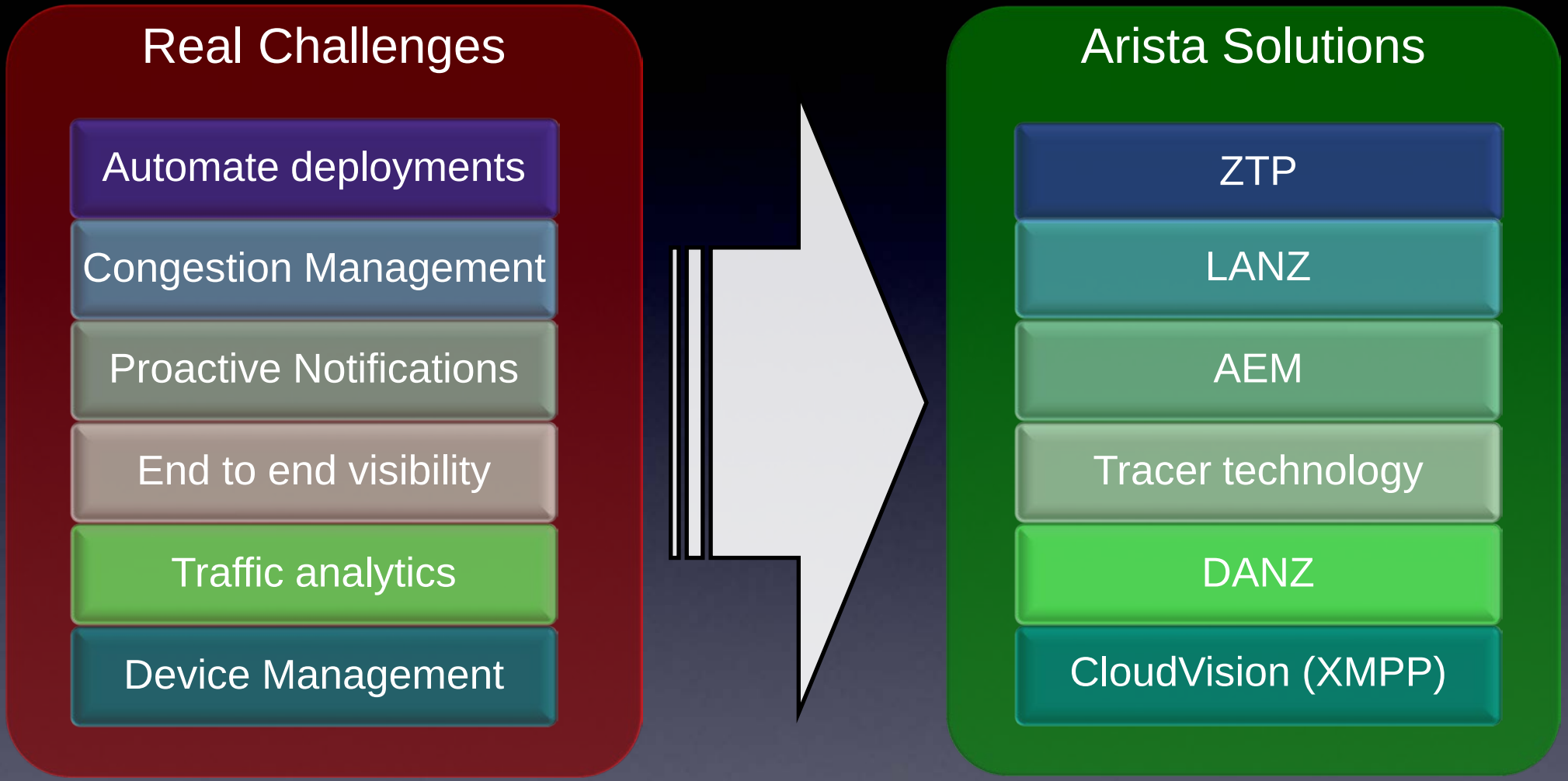
Request

```
{
  "jsonrpc": "2.0",
  "method": "runCli“,
  "params": {
    "cmds": [
        "show interface Ethernet3“,
    ],
  "format": "json" },
  "id": 1
}
```

Response

```
{
  "jsonrpc": "2.0”,
  "result": [
    { "Ethernet3" :
      {
        'bandwidth': 10000000,
        'description': '',
        'interfaceStatus': 'up',
        'mtu': 9212,
        'physicalAddr': '0000.4401.0001’
      }
    }
  ],
  “id”: 1
}
```

Arista EOS - Differentiated Solutions



Enabling progressive adoption of automation and orchestration

Evolution not Revolution

- Gradual shift/unification of skills base
  - Phase-out of legacy applications

manually configured

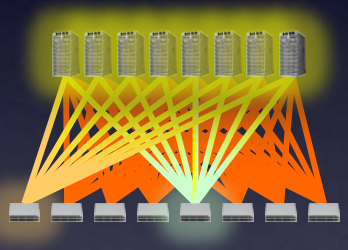
ad-hoc bash perl scripting

automated provisioning and monitoring

physical, virtual, cloud orchestration

Arista EOS - Infrastructure and Application Visibility

Arista's Tracers

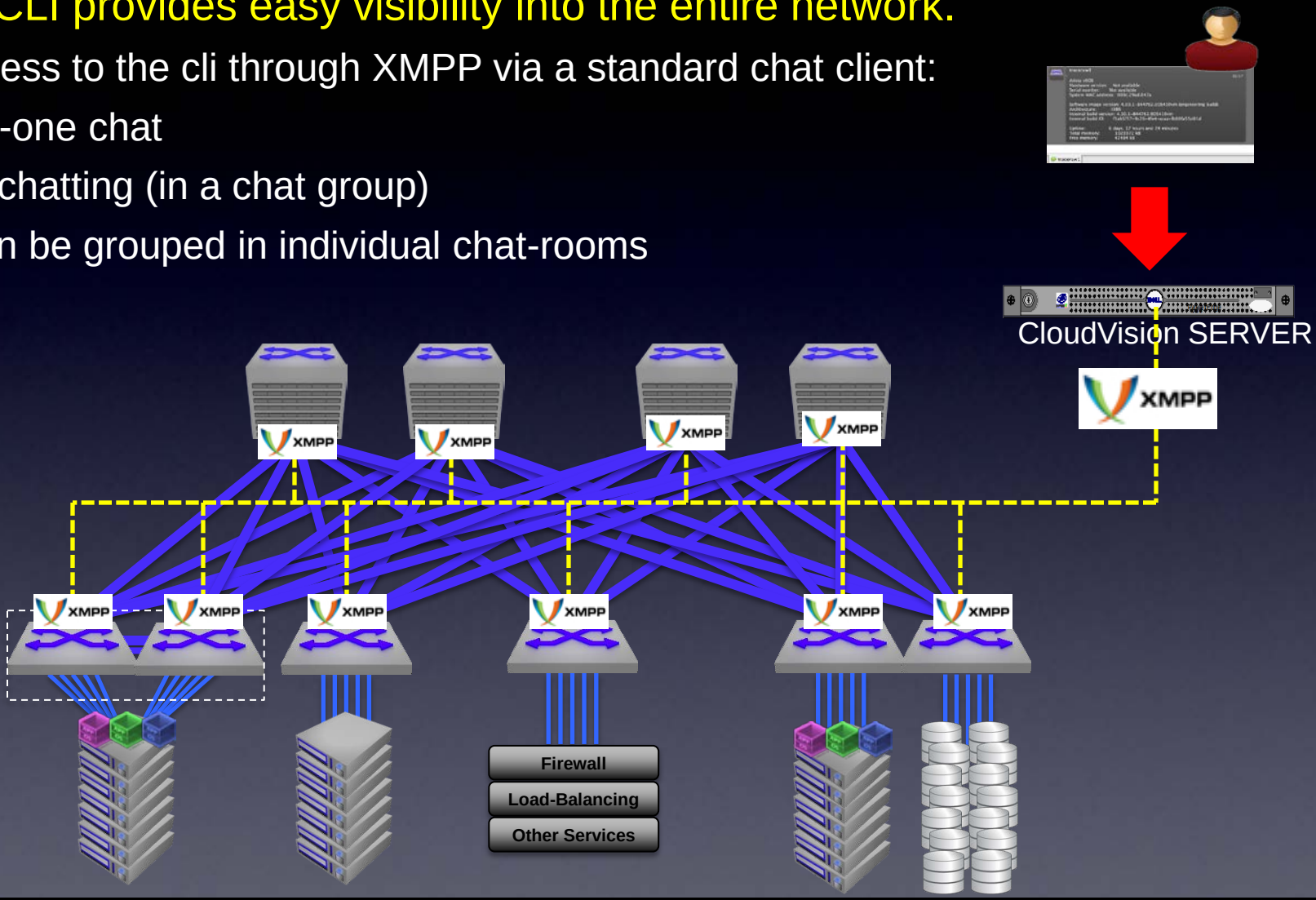
Physical		Virtual	Application
Health	Path	Virtual Machine	Map Reduce
			hadoop
Device level health checks	Active fault detection	Visibility & provisioning	Track & Monitor

Visibility reduces downtime and costs

CloudVision CLI - Centralized Management

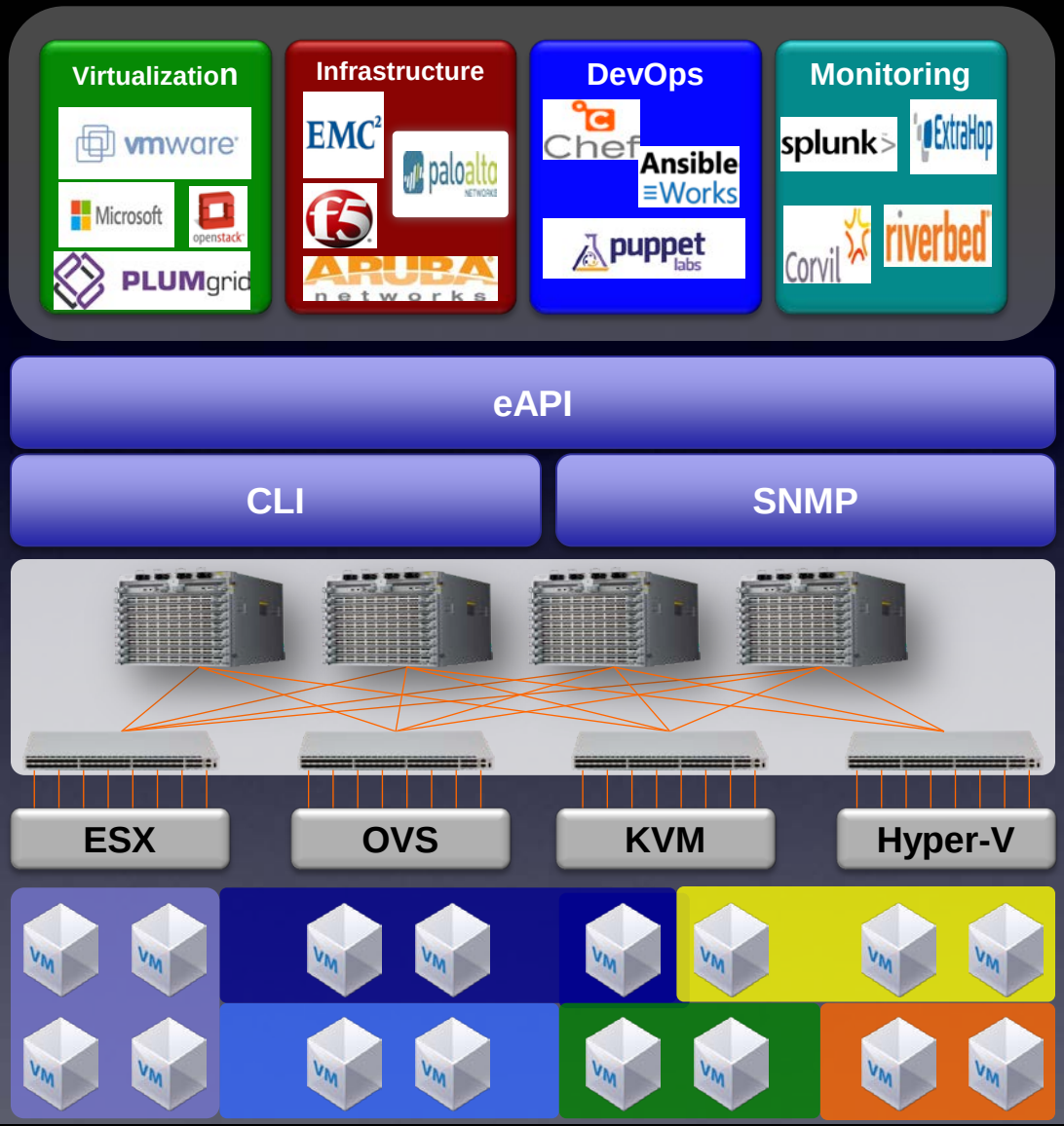
CloudVision CLI provides easy visibility into the entire network.

- Provides access to the cli through XMPP via a standard chat client:
  - in a one-to-one chat
  - multi-user chatting (in a chat group)
- Switches can be grouped in individual chat-rooms



Arista Networks - Built for the SDCN

- Virtualization Friendly
  Integrates with existing workflows
- Non-Blocking
  Zero Touch Provisioning
- Open API
  Traditional management
- Hypervisor agnostic
  No rip-n-replace
- One to one million
  virtual machines



ARISTA

Arbeiten Sie schon oder konfigurieren Sie noch?