

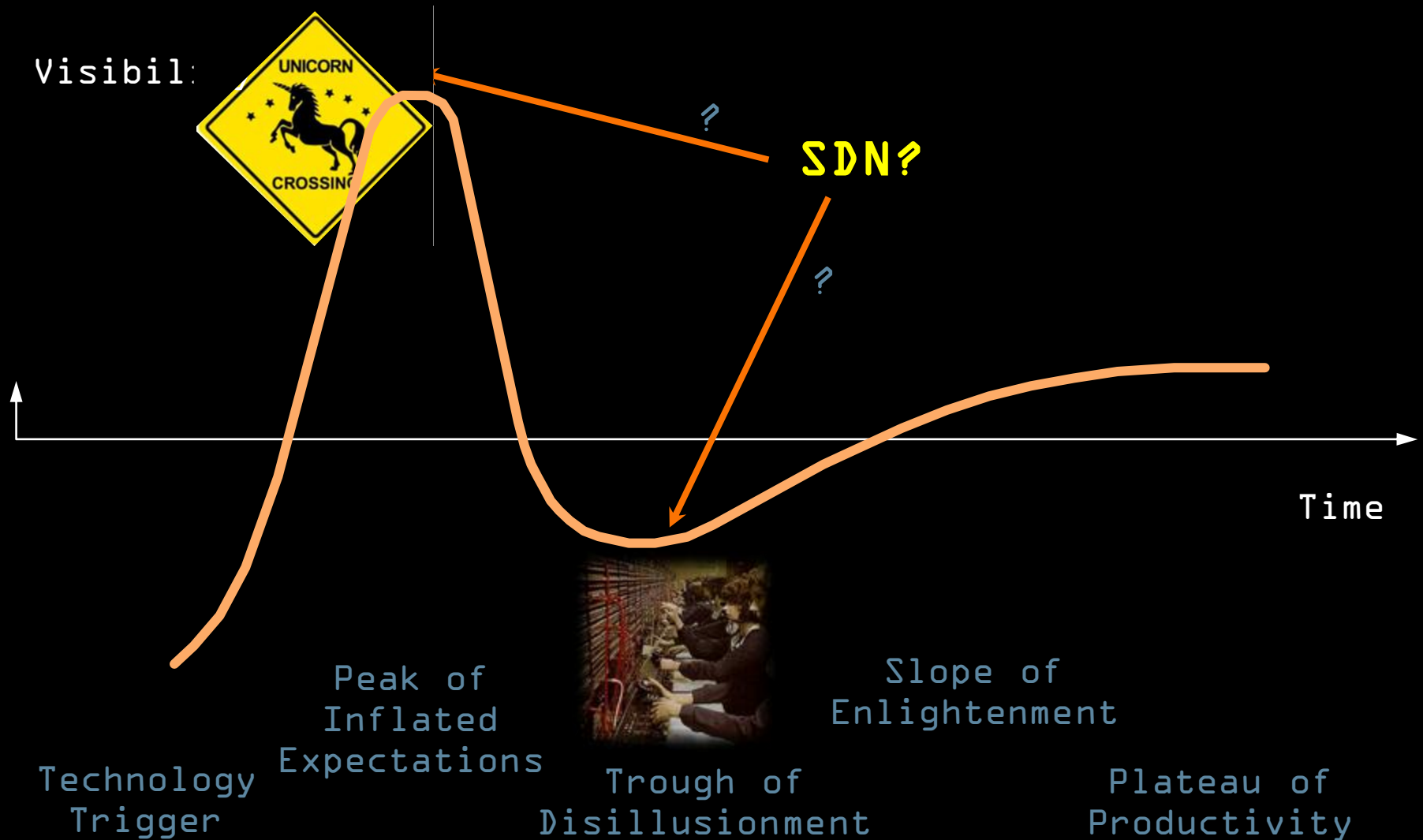
SDN AND CLOUD



WHEN (BUZZ)WORDS COLLIDE

Glenn Dasmalchi
Global Enterprise CTO

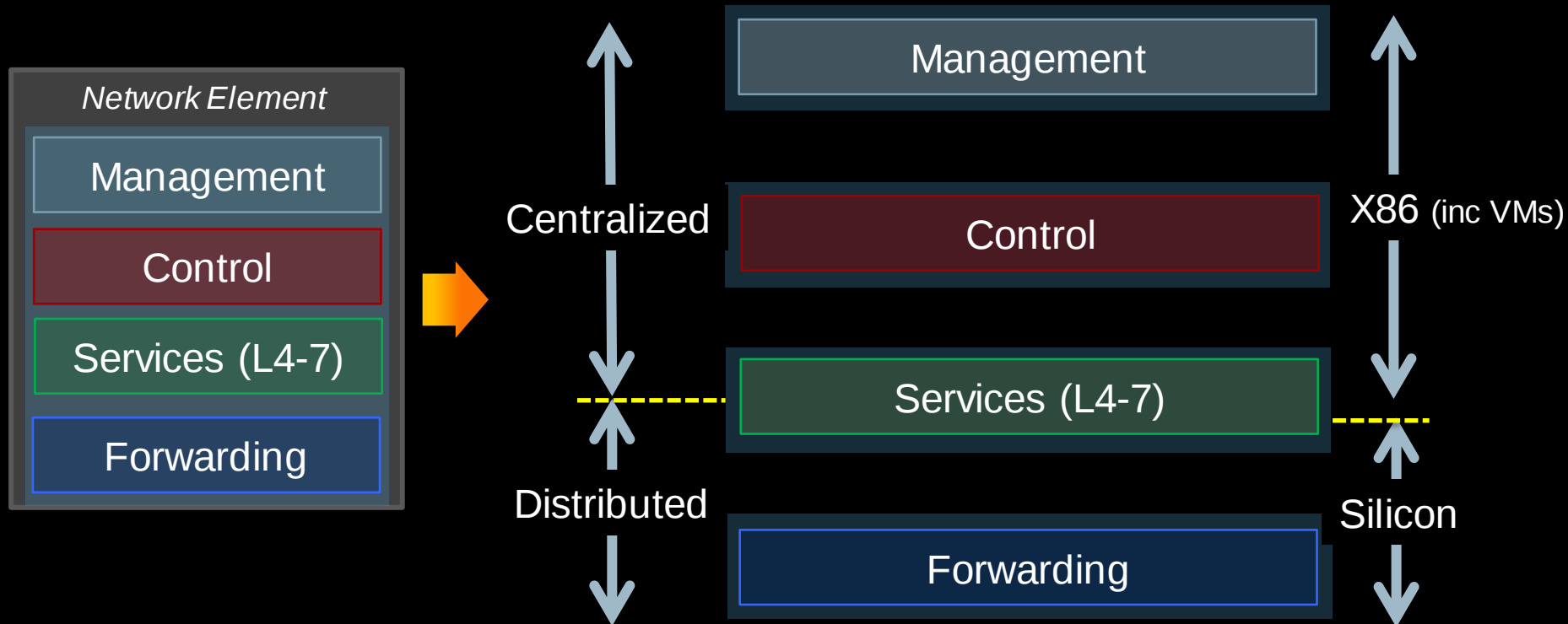
GARTNER HYPE CYCLE



SDN IN A NUTSHELL

- Disaggregating the 4 Primary Network Functions, which enables:
 - Choice of optimal processing platform for each function
 - Ability to *centralize* functions

End Result is Better Network Efficiency and Agility



SDN IMPLEMENTATIONS

Original Focus

Granular Control of
Individual Network Elements

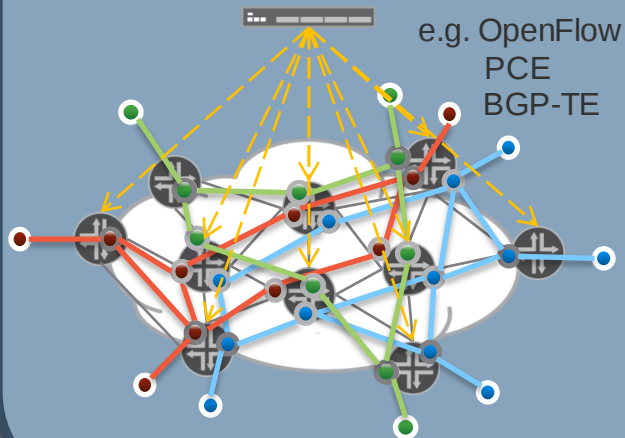


Current Focus

Control of Overlays over an IP
Data Center “Transport”

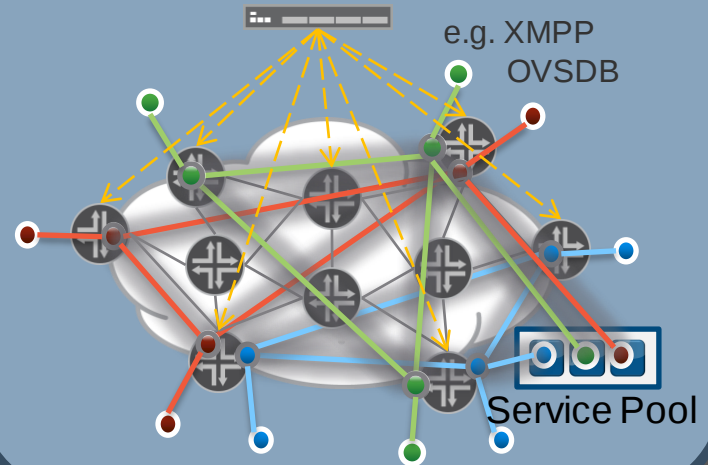
Centralized Node-by-Node

SDN Controller

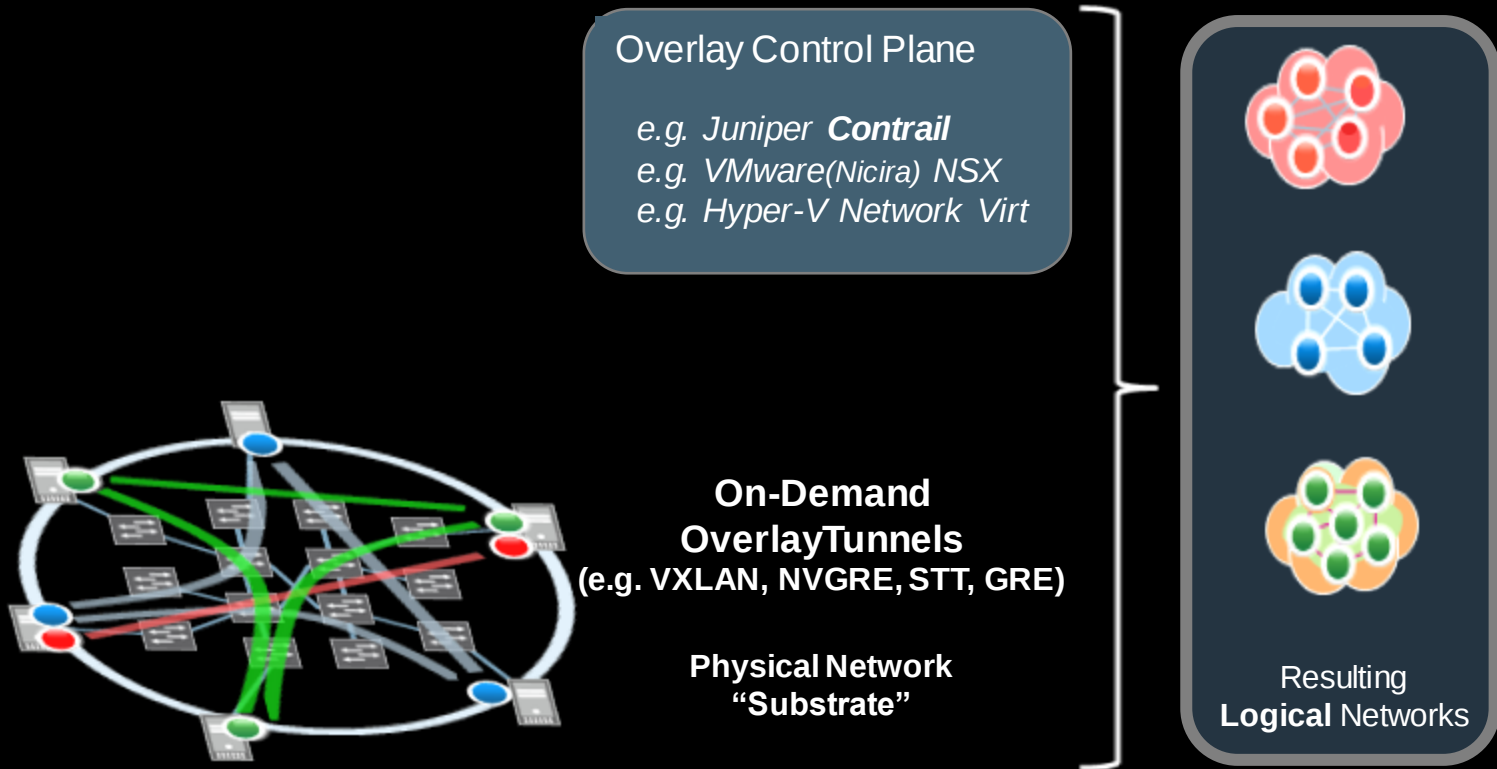


Centralized Edge Overlay a.k.a. “Network Virtualization”

SDN Controller



EDGE OVERLAY NETWORK VIRTUALIZATION FOR MULTIPLE TENANTS ON SHARED INFRASTRUCTURE



INTEGRATING WITH THE IaaS CLOUD “STACK”

----- IaaS (i.e. compute and object storage services) -----

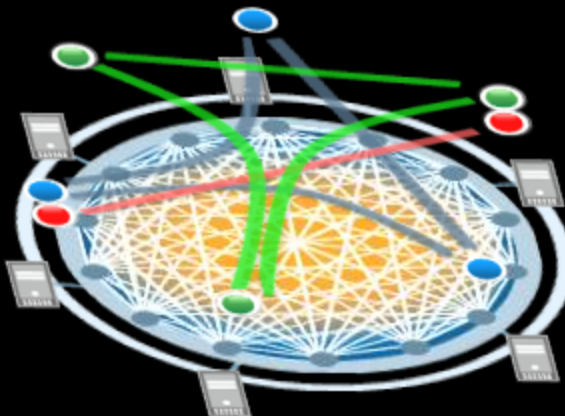
OpenStack Cloud Controller (Orchestration)

Quantum (Network-as-a-Service)

Plug-in

Overlay Control Plane

e.g. Juniper **Contrail**
e.g. Nicira (VMware) **NSX**
e.g. Hyper-V Network Virtualization



Physical “Underlay”
Capabilities
Performance
Security

Compute

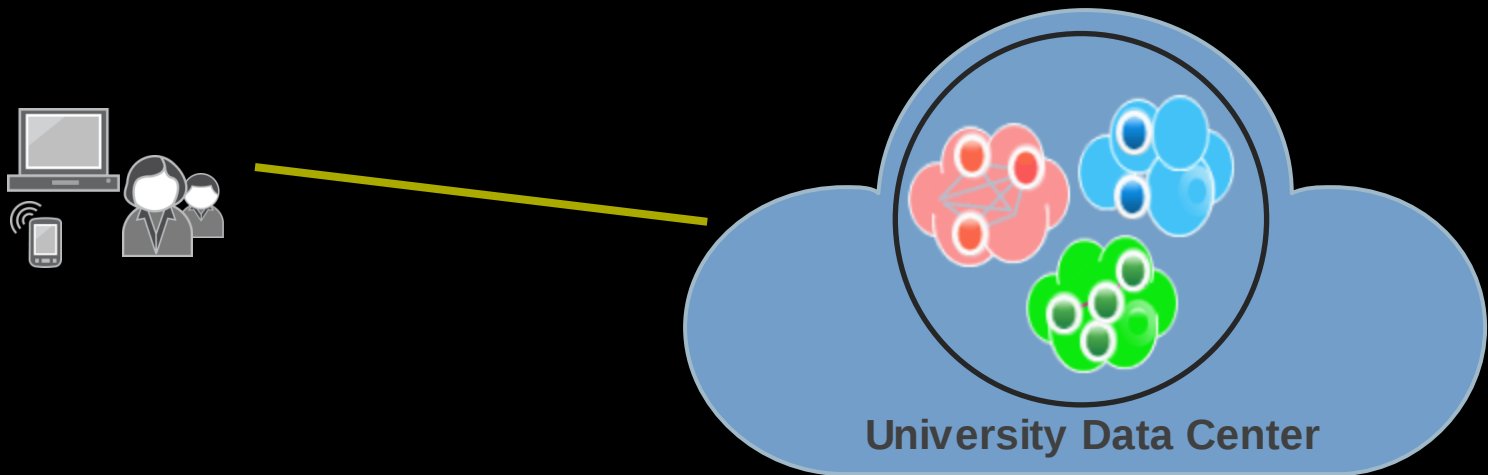


Storage

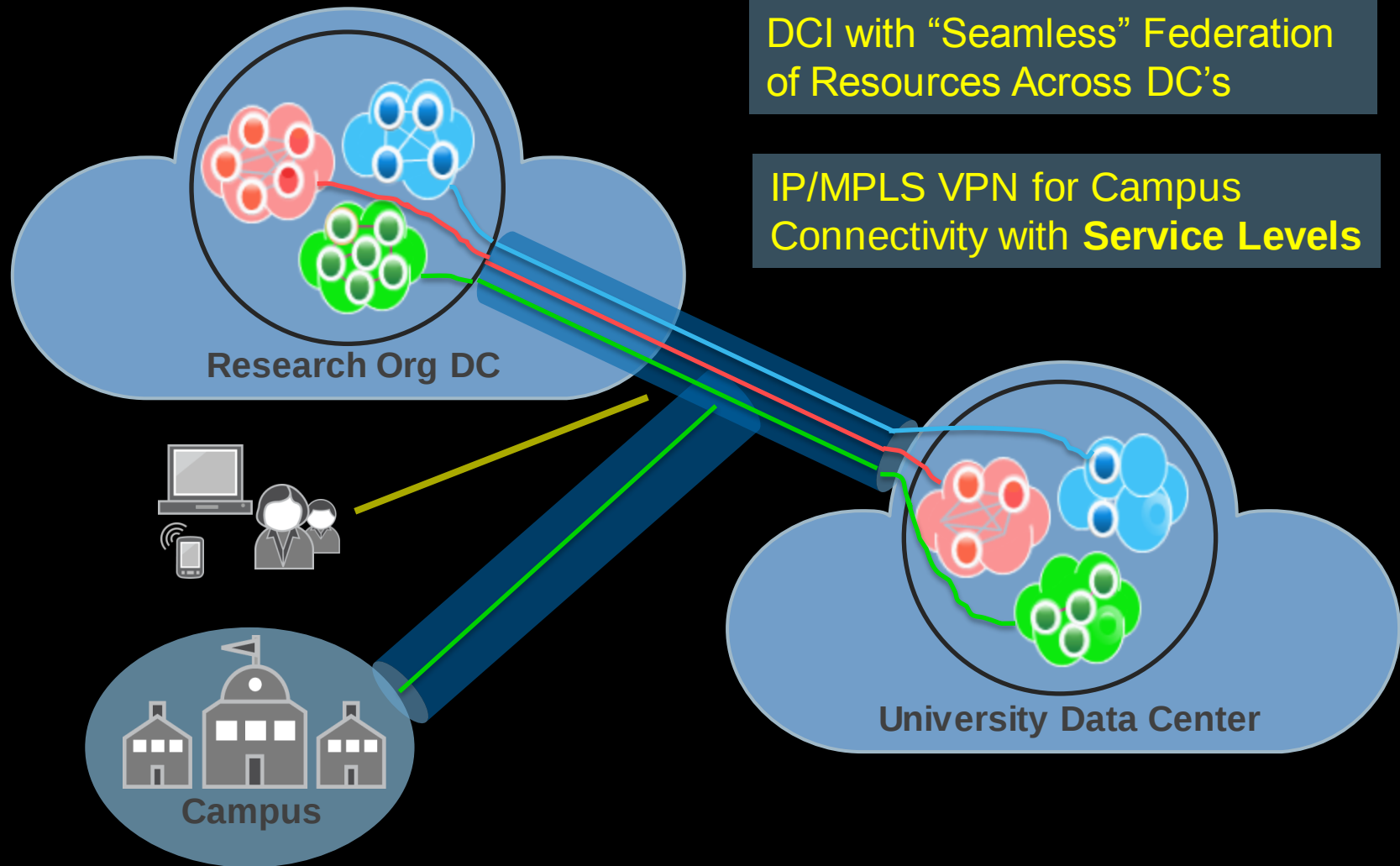


A SIMPLE RESEARCH CLOUD

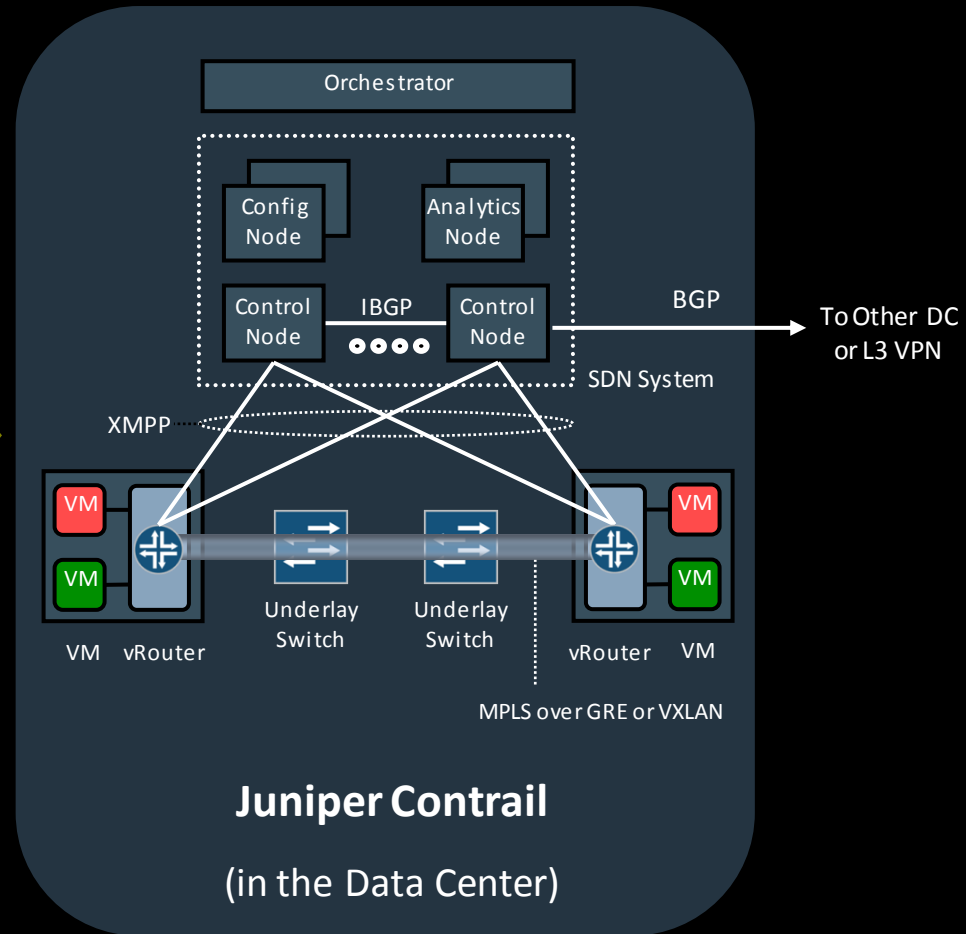
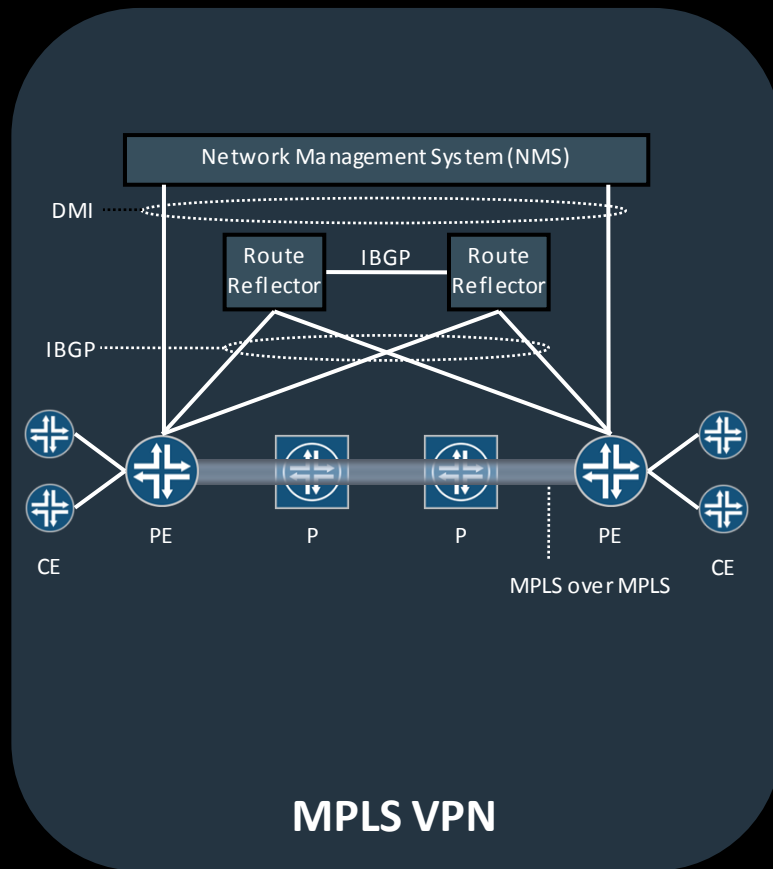
...BUT A LITTLE TOO SIMPLE



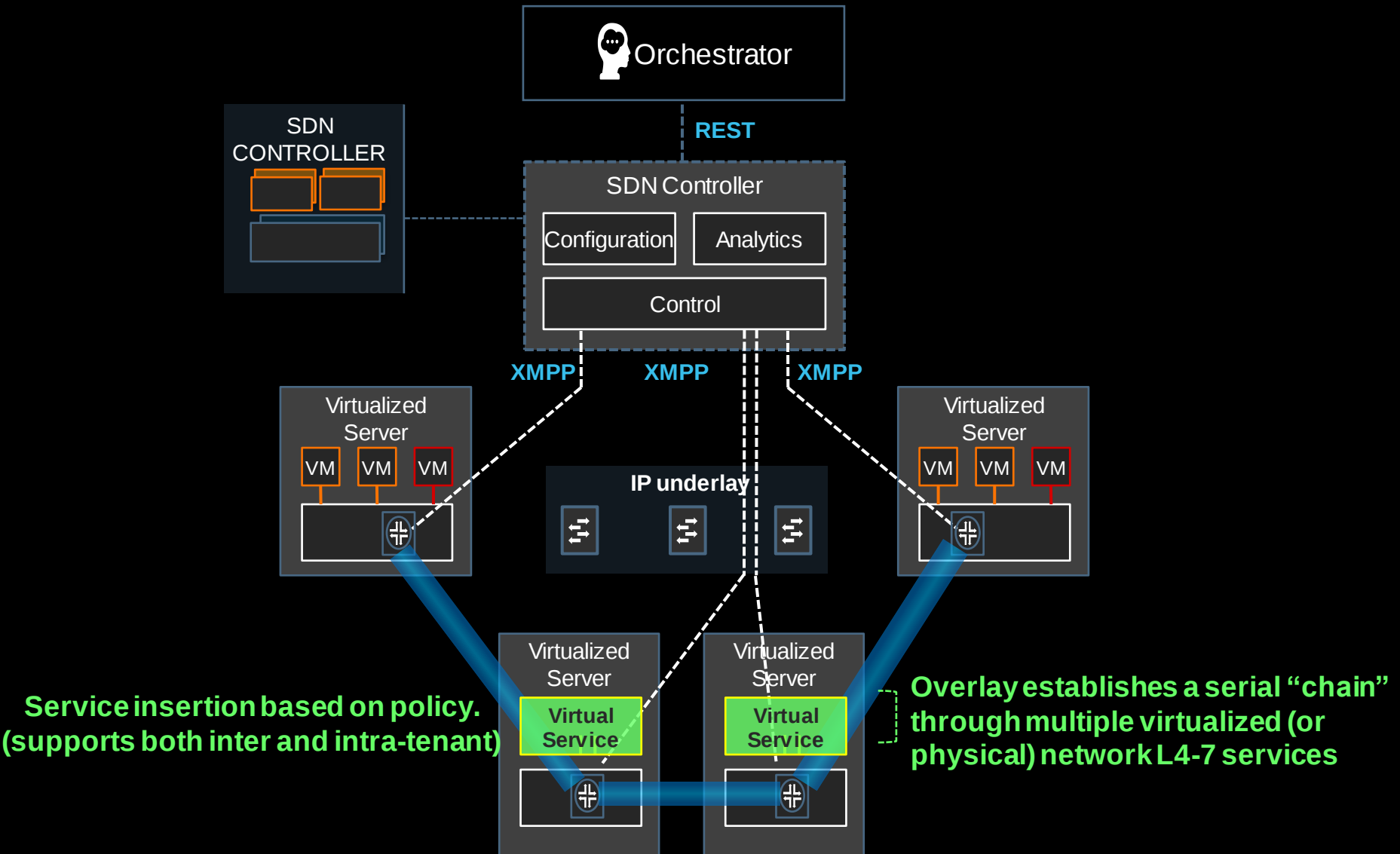
THE RESEARCH “HYBRID” CLOUD



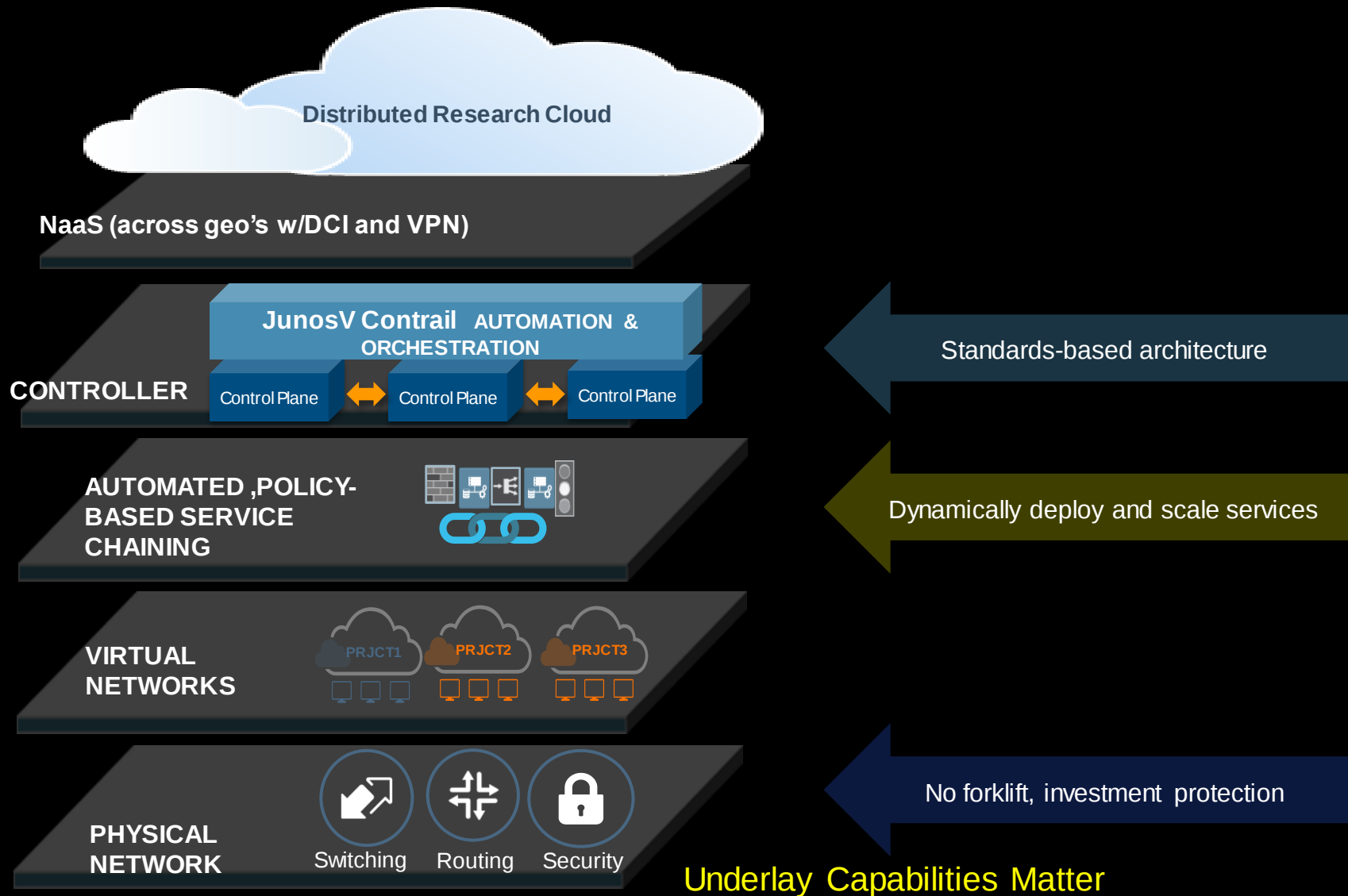
BUT WAIT, WE'VE SEEN THIS BEFORE...



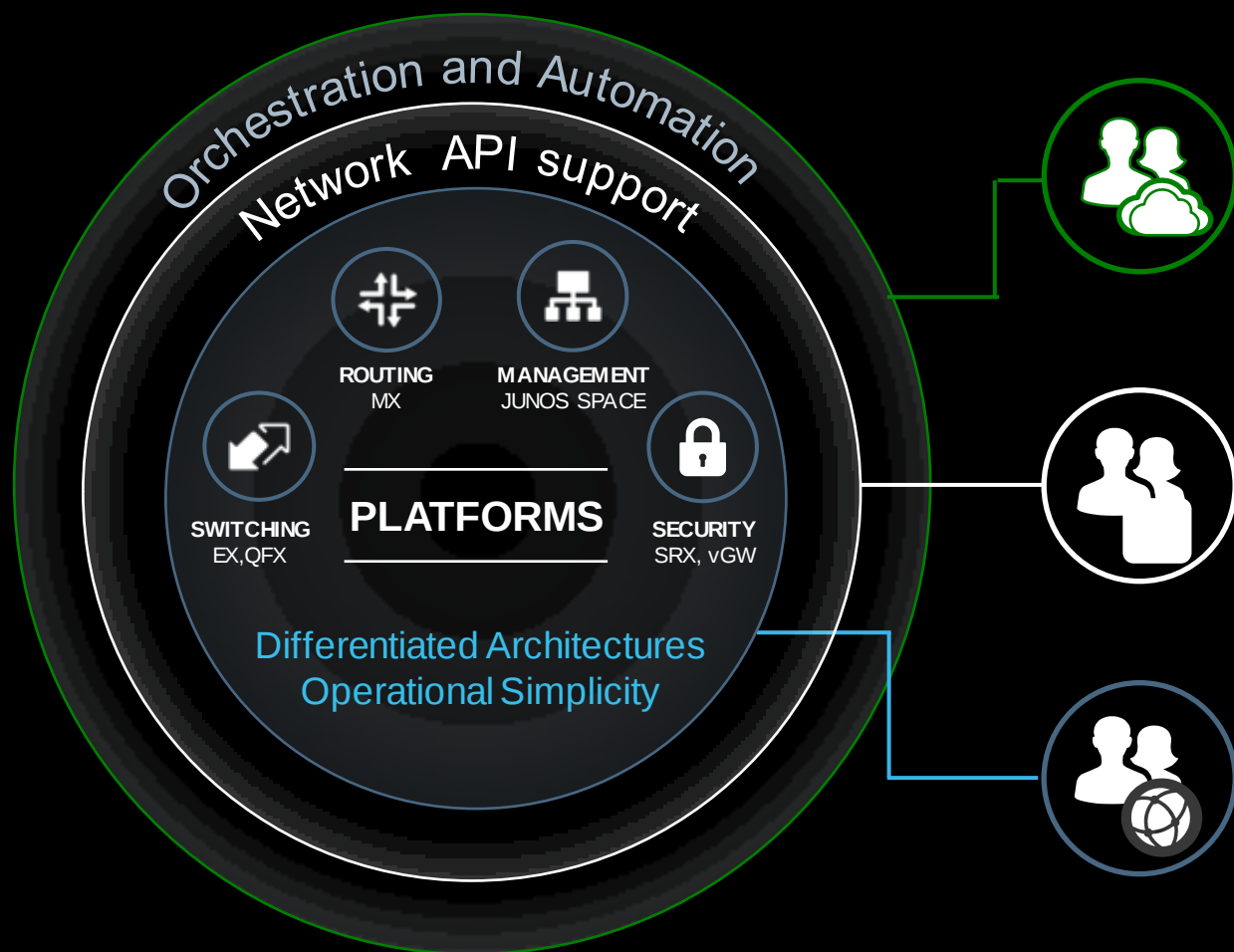
JUNOSV CONTRAIL SERVICE CHAINING



VIRTUAL NETWORKS TO MINIMIZE COMPLEXITY



JUNIPER AND SDN



Orchestration & Automation

- Contrail
- VMware
- OpenStack
- Puppet

Network API Support

- BGP
- OpenFlow
- VMware vCenter Director APIs

Platforms

- Comprehensive Portfolio
- Only 1-Tier fabric
- High Performance Security

SDN and Cloud



...more like



Thank You



JUNIPER'S SDN STRATEGY: 6-4-1

6 – General Principles



Separate



Centralize



Use the cloud



Common Platform



Standard



Apply Broadly

4 – Juniper Steps



Centralize Management



Extract Services



Centralize Controller



Optimize the Hardware

1 – Licensing Model

JUNIPER SOFTWARE ADVANTAGE

Full Use/Elastic

Transferable

Software
Lifetime Assurance

STANDARDS

Overall architecture

- IETF **NVO3** WG
- ETSI **NFV** ISG

Overlay control plane protocols:

- XMPP: **RFC 6120**, **draft-marques-l3vpn-end-system**
- BGP L3VPN: **RFC 4364**
- BGP EVPN: **draft-ietf-l2vpn-evpn**
- NetConf: **RFC 6241**
- Multicast: **draft-marques-l3vpn-mcast-edge**

Underlay control plane protocols: Existing layer-2 or layer-3 protocols

Overlay data plane encapsulation:

- MPLS over GRE: **RFC 4797**
- VXLAN (encapsulation only): **draft-mahalingam-dutt-dcops-vxlan**

