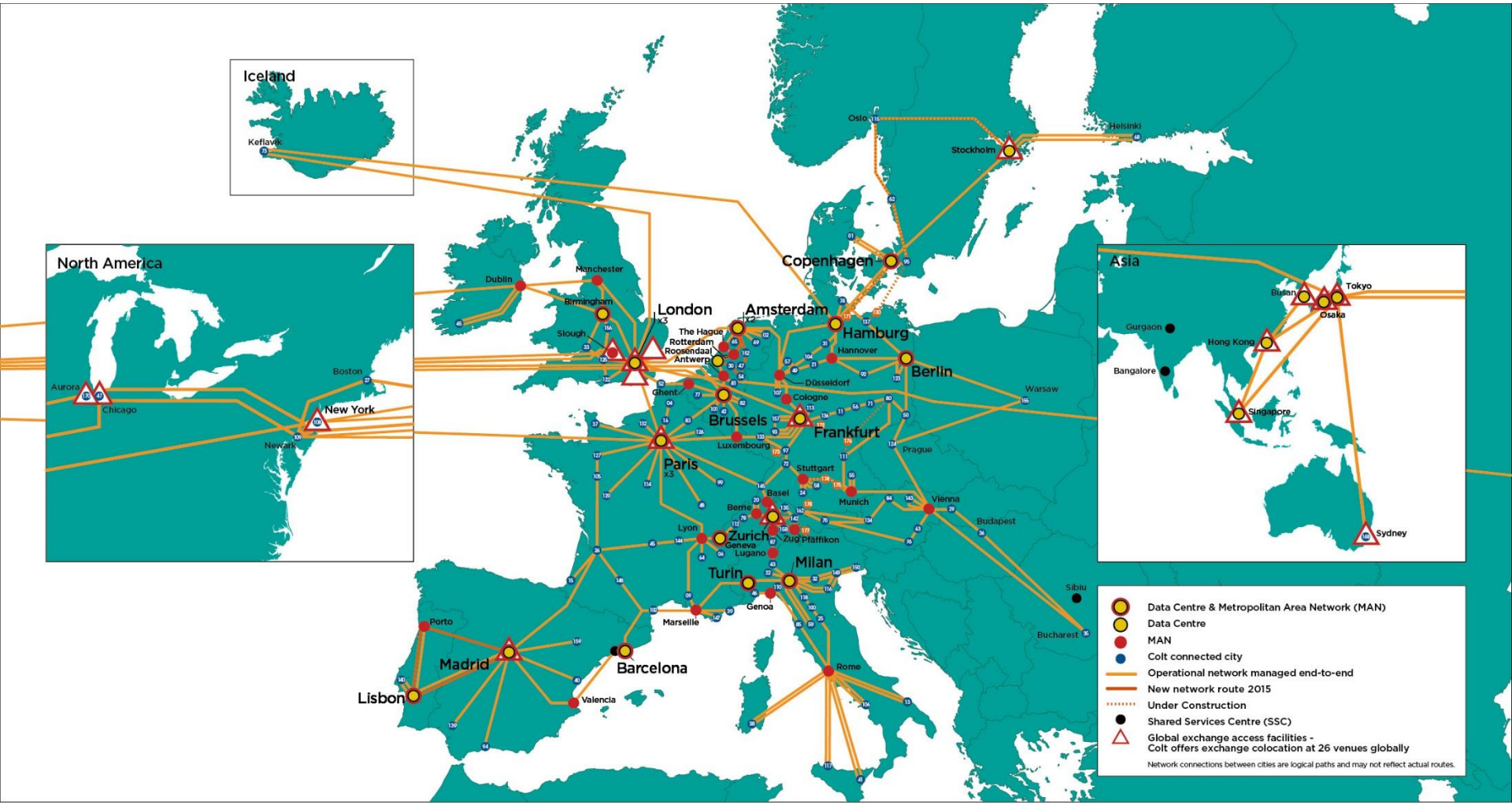
Colt Novitas: Bringing SDN & NFV in Production

Javier Benitez, Strategy & Architecture,
Javier.benitez@colt.net

Colt at a glance



SDN and NFV are transforming networks

The virtualisation of IT has transformed the consumption of compute and storage and is extending to the network, within and beyond the data centre.

From

Traditional networking

- Infrastructure driven
- Static
- Function-specific features
- Vendor-controlled releases

To

Virtualised networking

- Software driven
- Dynamic
- Policy-based applications and services
- Open platform with rapid release cycles

Colt's SDN/NFV Infrastructure Development – The Foundation

DC Fabric & Network Virtualisation

DC Fabric

- OpenFlow DC Fabric evaluation (2012, not mature enough)

DC Network virtualisation & Architecture:

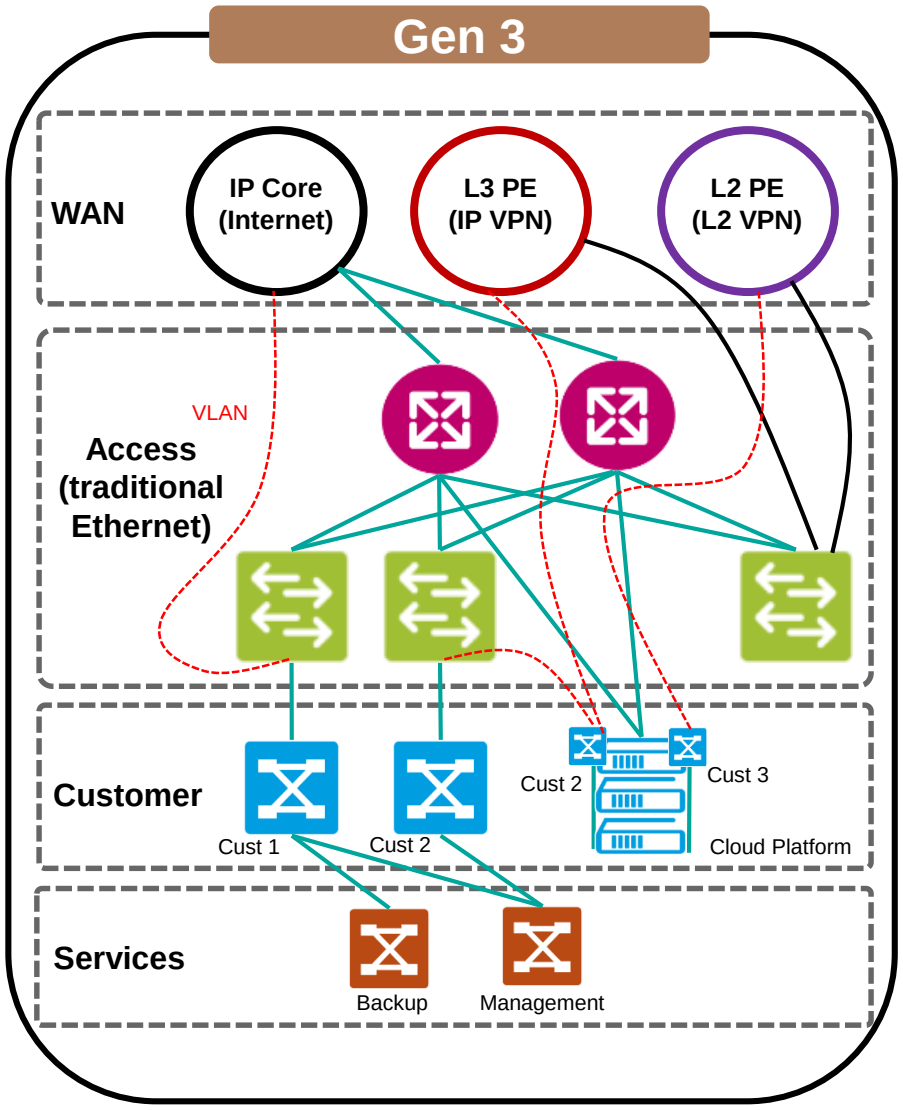
- SDN Overlay: L2-L4 DC Network Virtualisation & DC Architecture

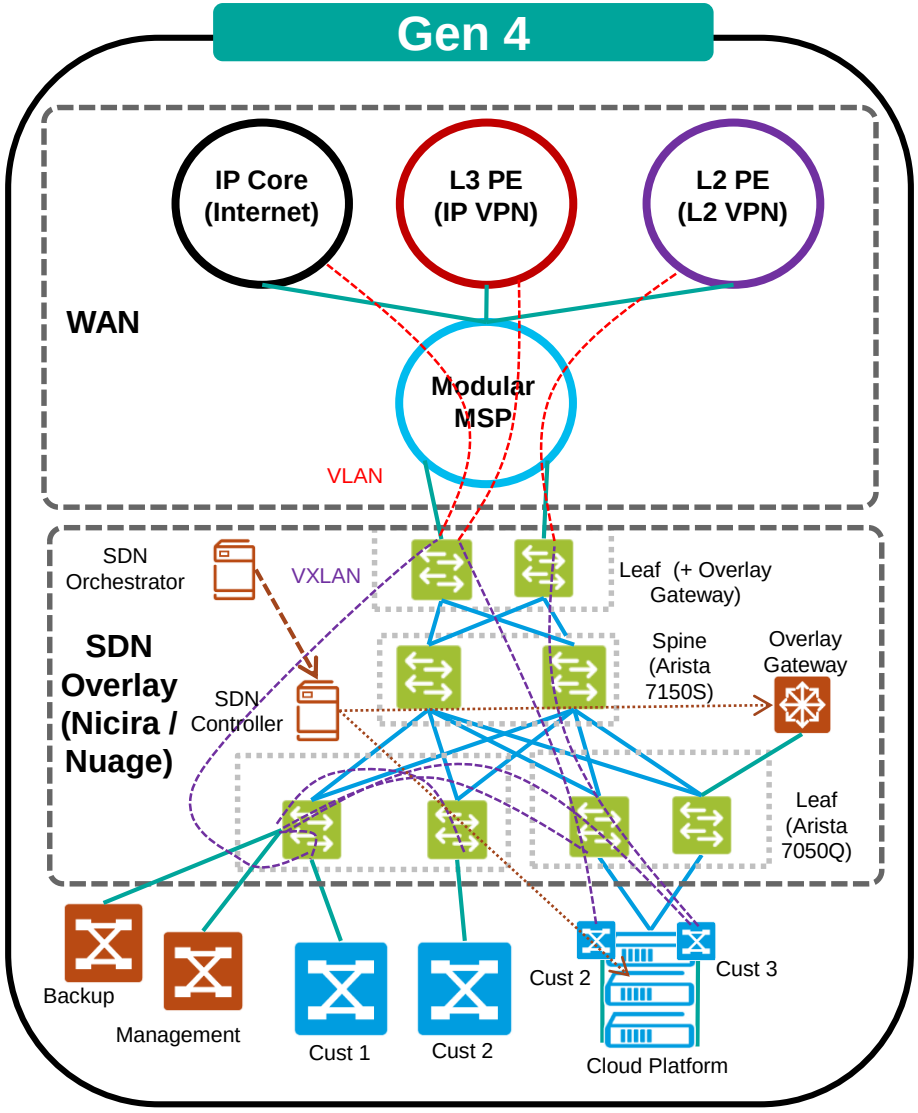
Live Feb'14

Network Functions Virtualisation (NFV)

WAN SDN

Colt DC – Gen 3 vs Gen 4





Colt's SDN/NFV Infrastructure Development – The Foundation

DC Fabric & Network Virtualisation

DC Fabric

- OpenFlow DC Fabric evaluation (2012, not mature enough)

DC Network virtualisation & Architecture:

- SDN Overlay: L2-L4 DC Network Virtualisation & DC Architecture

Live Feb'14

Network Functions Virtualisation (NFV)

L3 CPE router virtualisation (pre-NFV, PE based)

- virtualisation of the L3 CPE functionality (Internet access / IPVPN)

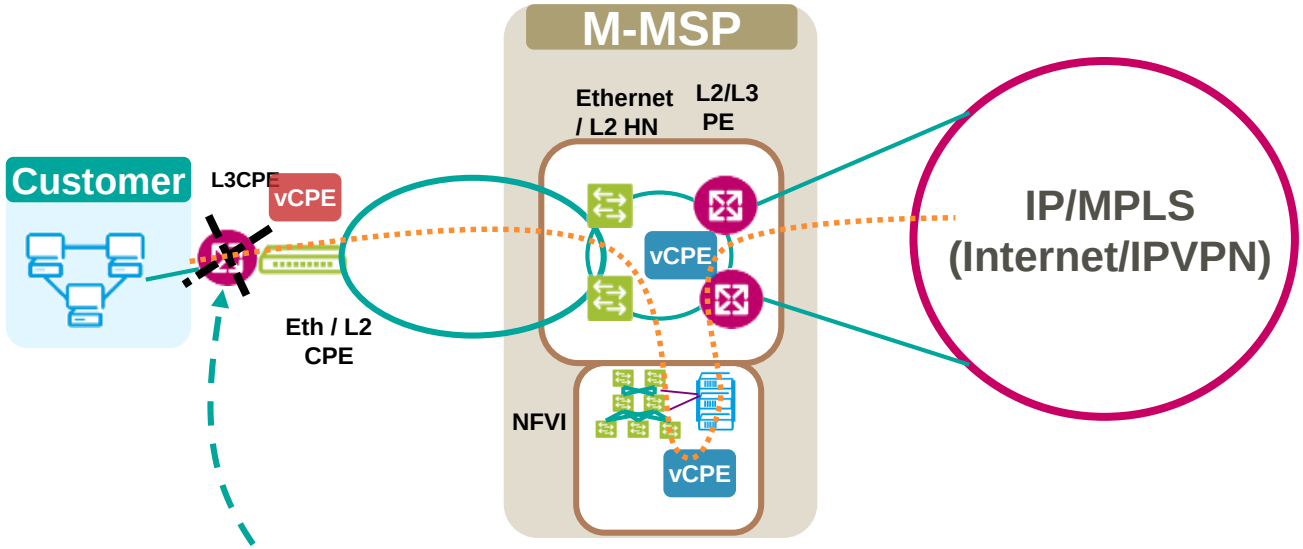
NFV: RFI & PoC in 2014, TAT completed mid 2015

- Use cases: vL3CPE / vDC Appliances (FW/LB) / vControl Plane (BGP RR)

Live Nov'12

WAN SDN

vCPE – First Colt Network Virtualization Experience



vCPE (Definition)

- Traditional Managed L3 services (Internet Access and IPVPN) delivered with dedicated L3 CPE router
- vL3CPE means removing the L3 CPE router and virtualizing the function in the network
- Initial vCPE location: PE router (launched Nov 2012)
- Evolution:
  - NFV based using NFVI deployed in Colt nodes
  - NFVI extended to customer premises (Distributed NFV)

vCPE - Benefits & Achievements

colt

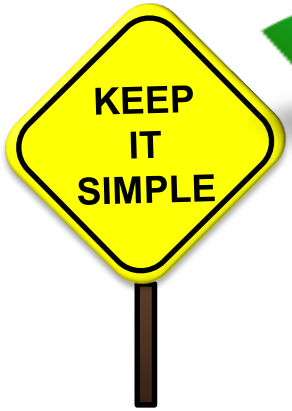
25%-50% unit cost reduction

Reduce Cost

Better Orchestration

Over 2000 vCPEs Delivered

Faster Service Delivery



More than 50% services delivered in vCPE currently

Simplified Product Management & Inventory

Challenges & Lessons learnt

Our enterprise customers will not like it !!

vCPE is complex !! QoS, NAT, security ??

I can't design this service !!

Product

Enginee

resales

Our customers will want a discount !!

Se

De

I can't configure this service !! The process doesn't work.

Operations

I don't know how to troubleshoot this service !!

Our inventory tool cannot represent a virtual CPE …

Colt's SDN/NFV Infrastructure Development – The Foundation

DC Fabric & Network Virtualisation

DC Fabric

- OpenFlow DC Fabric evaluation (201 h)

DC Network virtualisation & Architec

- SDN Overlay: L2-L4 DC Network Virtualisa Architecture

GORE 8!!
6 Octubre 2011

Live Feb'14

Network Functions Virtualisation (NFV)

L3 CPE router virtualisation (pre-N

- virtualisation of the L3 CPE functio

NFV: RFI & PoC in 2014, TAT comp

- Use cases: vL3CPE / vDC Applian P RR)

Live Nov'12

WAN SDN

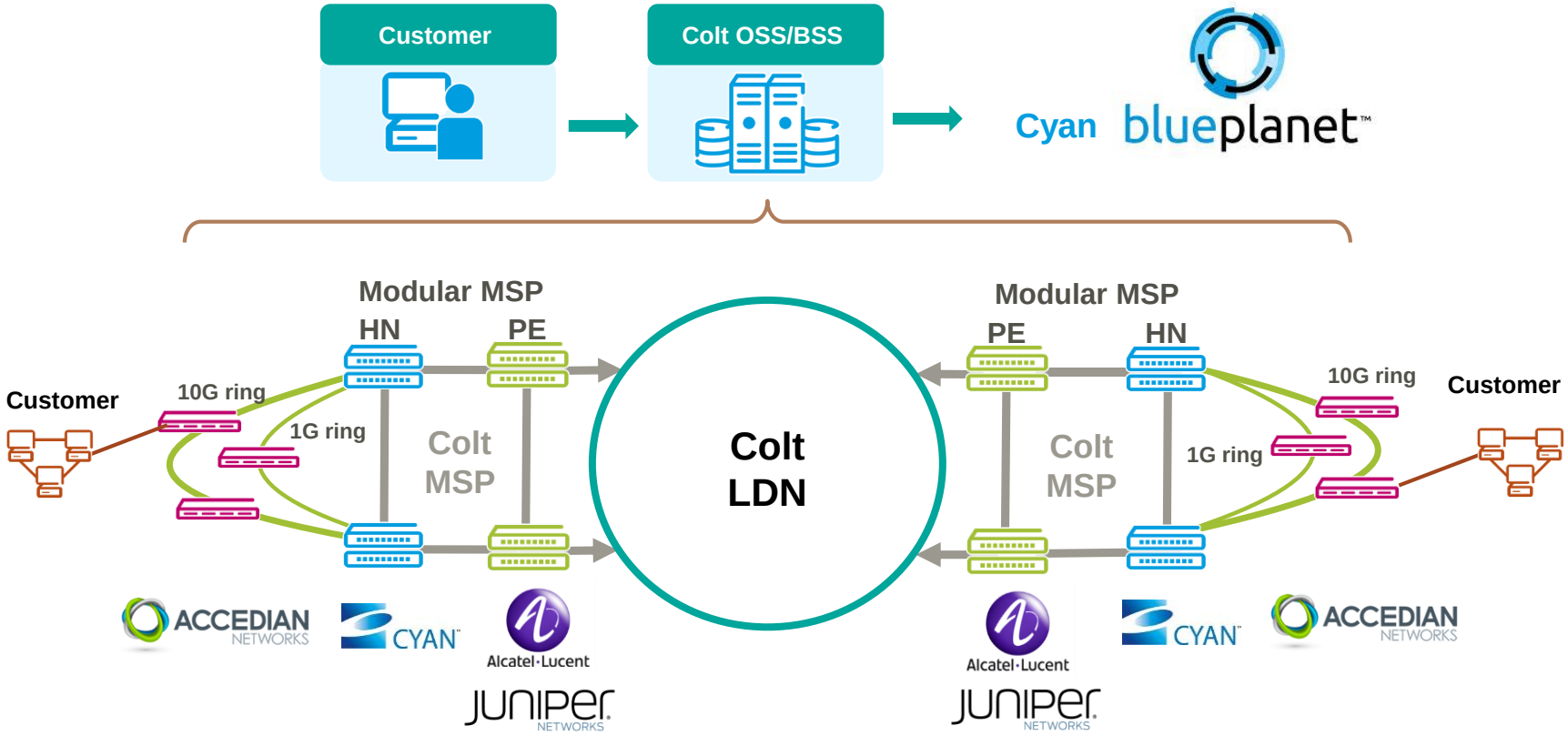
WAN SDN Network (Optical/Ethernet/IP):

- Modular MSP (Integrated L2/L3 WAN Network)
  - End to end WAN network abstraction & full automation in a multi-vendor, multi-layer environment
  - Flexible connectivity, i.e., ability to dynamically / on-demand change the connectivity attributes of the service (BW, QoS profile, etc).

Live Nov'13

Colt Modular MSP - L2/L3 Integrated WAN Packet Network

Building on top of Colt Modular MSP: Circuits/Bw/QoS on demand



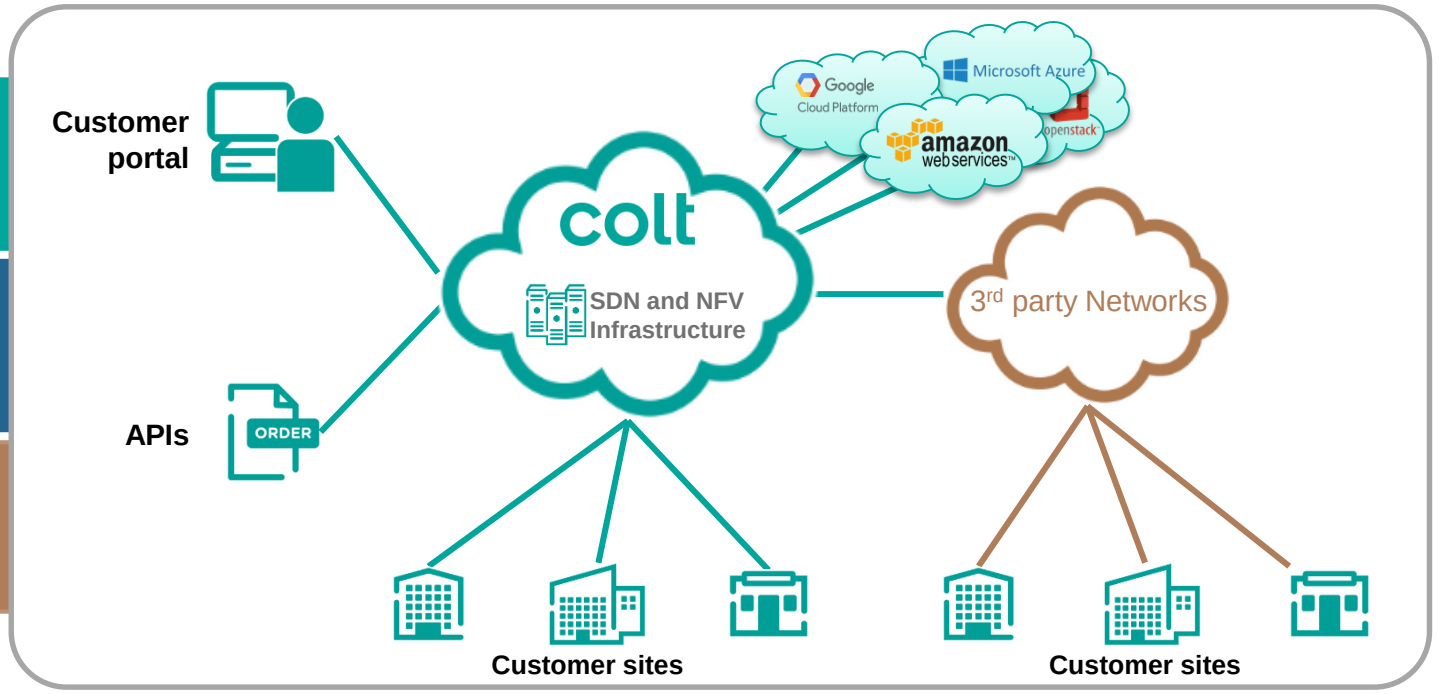
Colt Novitas Vision

Network services are self-provisioned, orchestrated and consumed in near real time through automation, and integrated with 3rd party networks

Elastic Bandwidth

Elastic Service

Elastic Topology



Available through portal and APIs

Self-provision

Near real-time

Support value added services

Interwork with other providers

Reduce costs

Reduce vendor dependency

Improve customer experience!

Novitas – Relying on SDN & NFV

Objective

- To leverage Software Defined Networking (SDN) and Network Function Virtualisation (NFV) technologies to drive business efficiencies and a better customer experience
- To benefit from the simplification, automation and dynamic service capabilities that these technologies enable
- To bring a set of disruptive network services to market

novitas

Latin

Etymology

From *novus* ("new; recent; unusual") + *-itās*.

Pronunciation

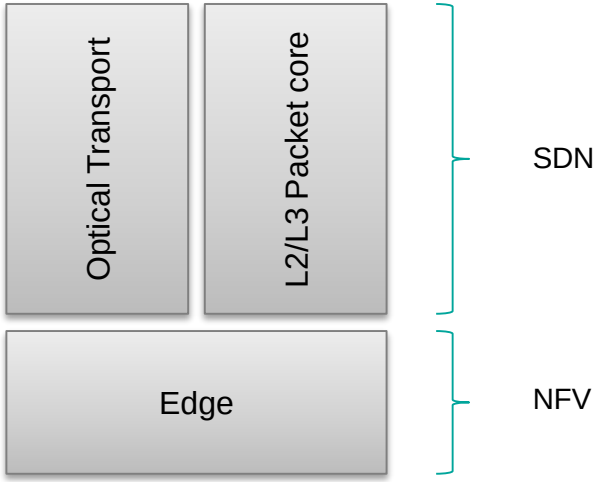
- (*Classical*) IPA(key): /'no.wi.ta:s/

Noun

novitās *f* (*genitive* **novitātis**); *third declension*

1. newness, novelty
2. rareness, strangeness
3. newness of rank
4. reformation

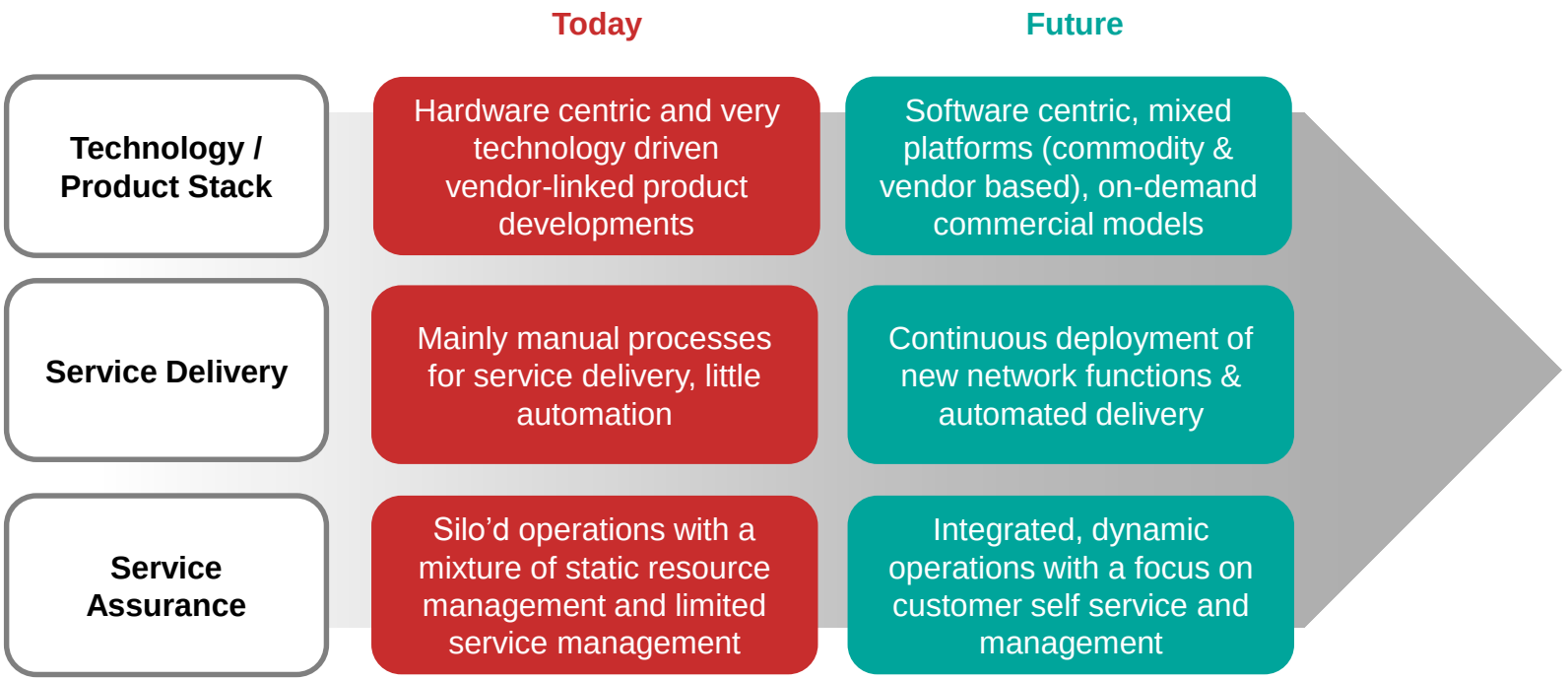
Elastic Bandwidth	Deliver programmable elastic links with variable bandwidth.
Elastic Topology	Deliver programmable flexible topologies based on overlay and underlay networks.
Elastic Service	Deliver virtualised off-net and on-net L2 and L3 edge services on top of basic connectivity.



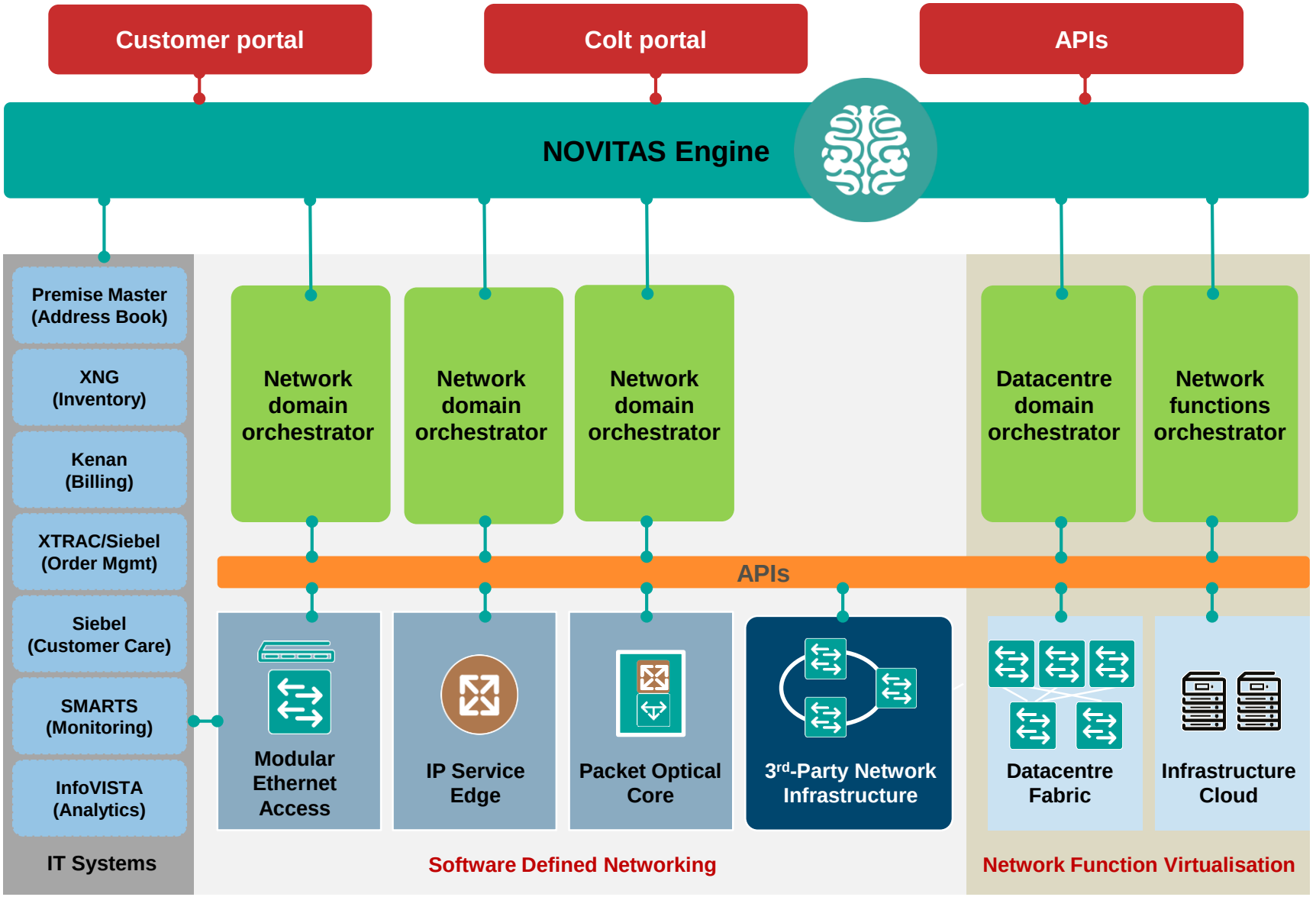
Colt Novitas is a major change programme

The transformation will impact all areas of the business and will require:

- New operating models
- New commercial models and go-to-market
- Long term product and technology alignment
- Investments in new skills, platforms and technologies

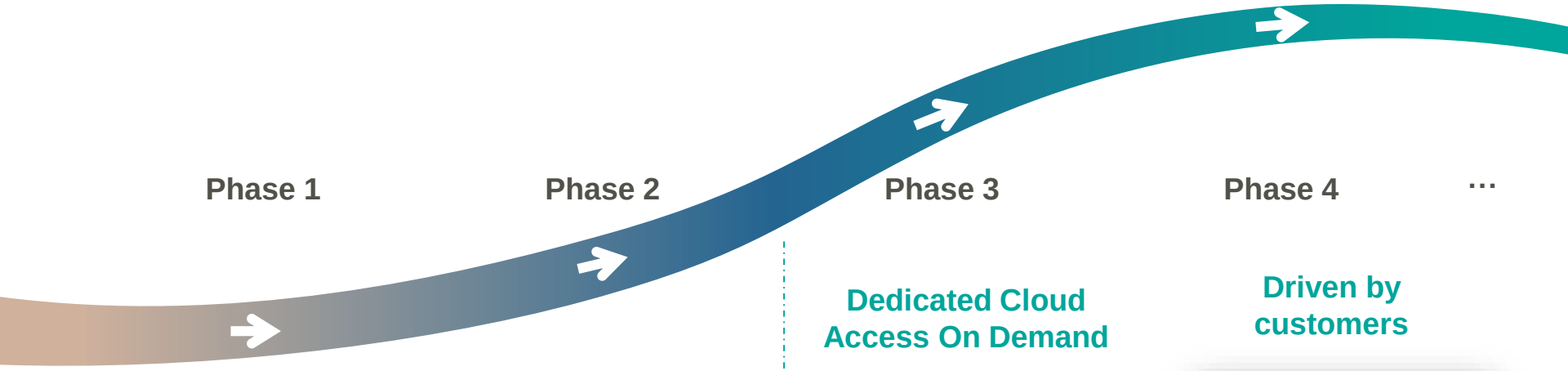


NOVITAS / Colt On Demand Architecture



Using Agile to build and evolve Colt Virtualization

Novitas is being developed with an Agile methodology based on 4 month “sprints”, first delivering a “Minimum Viable Product” and associated foundations and then continuously expanding features and reach.



Phase 1

DCNet On Demand

50+ Carrier Hotels

Phase 2

LANLink On Demand

5000+ Colt Connected Buildings

Phase 3

Dedicated Cloud Access On Demand

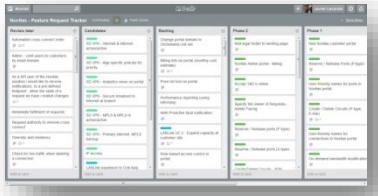
amazon web services™

DCNet On Demand

Software Defined VPN

Phase 4

Driven by customers



IP On Demand

…

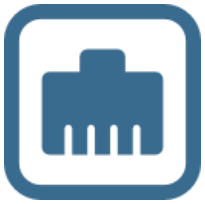
Ethernet Services On Demand (In Customer Controlled Introduction)

DCNet & LANLink On Demand

Flexible, on-demand **Point-to-Point Ethernet services (on-net)** on pre-wired data centres & retail sites enabling services with bandwidths between 100Mbps and 10Gbps.

Customers are able to…

Login to portal and see services subscribed



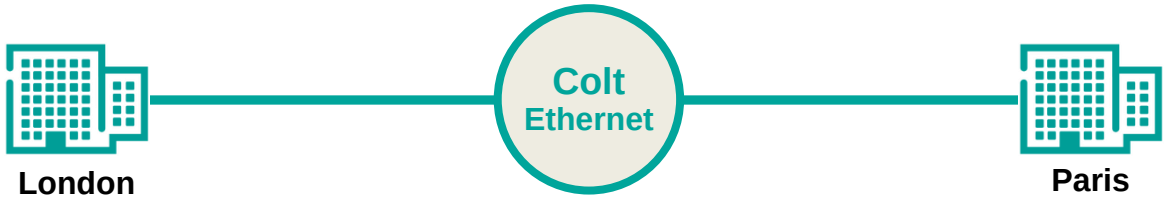
Reserve / release a port in the enabled site

Create / delete a connection between reserved ports

Modify the bandwidth of a connection

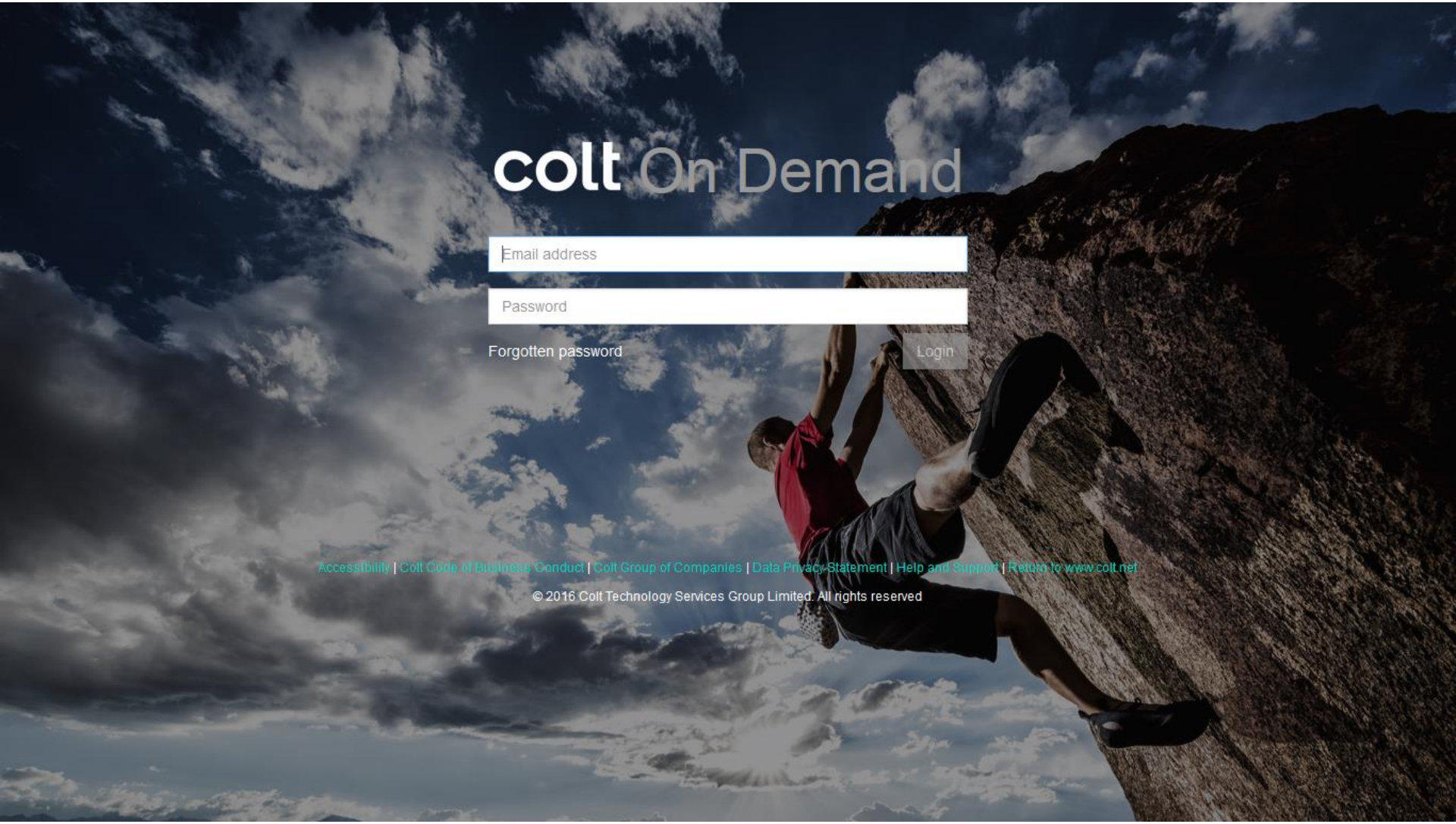
Available as a **component-based offering** rather than a pre-determined solution, customers can build any network topology in near real-time by reserving ports and creating connections. It initially supports Point to Point services and will later support other modes.

Offered as a PAYG service, circuits will have an hourly charge based on their bandwidth.

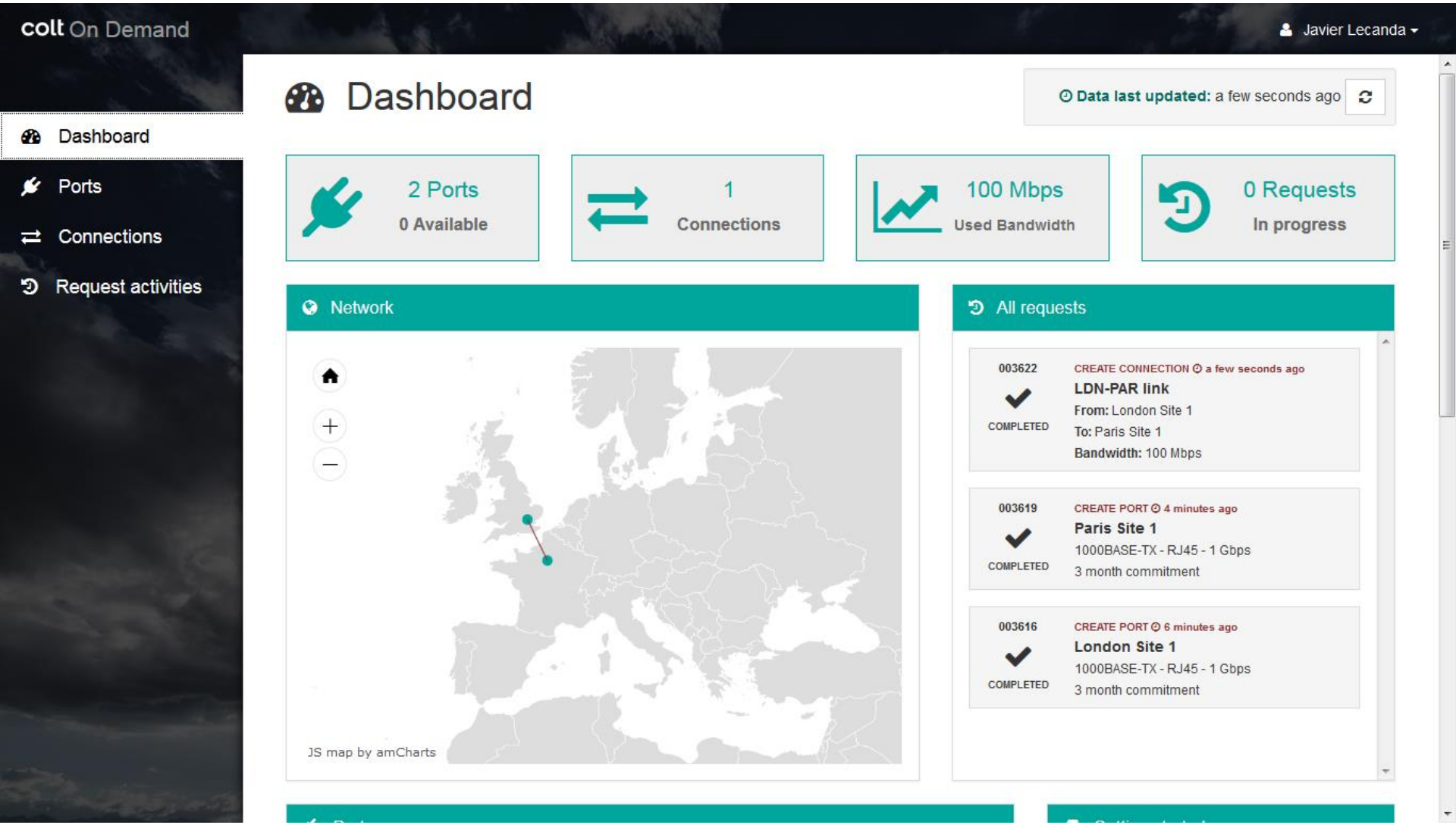


Bandwidth can be flexed between 10Mbps and the maximum allocated capacity for the port, with the following capacities supported: 10Gbps, 4Gbps (limited), 1Gbps, 400Mbps (limited) and 100Mbps.

Colt On Demand Portal - Login



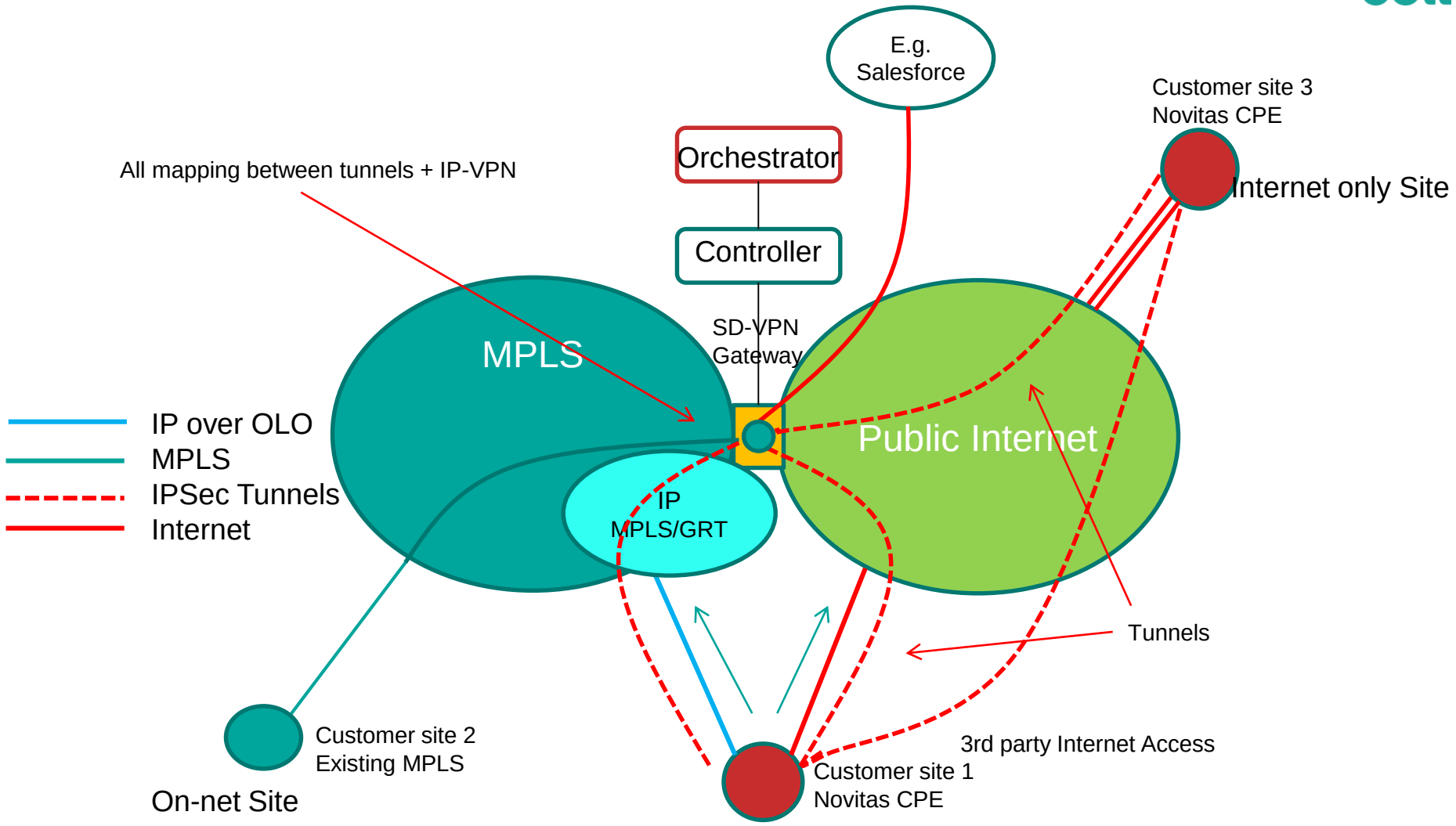
Colt On Demand Portal – Network Map



SD-VNP Product Requirements

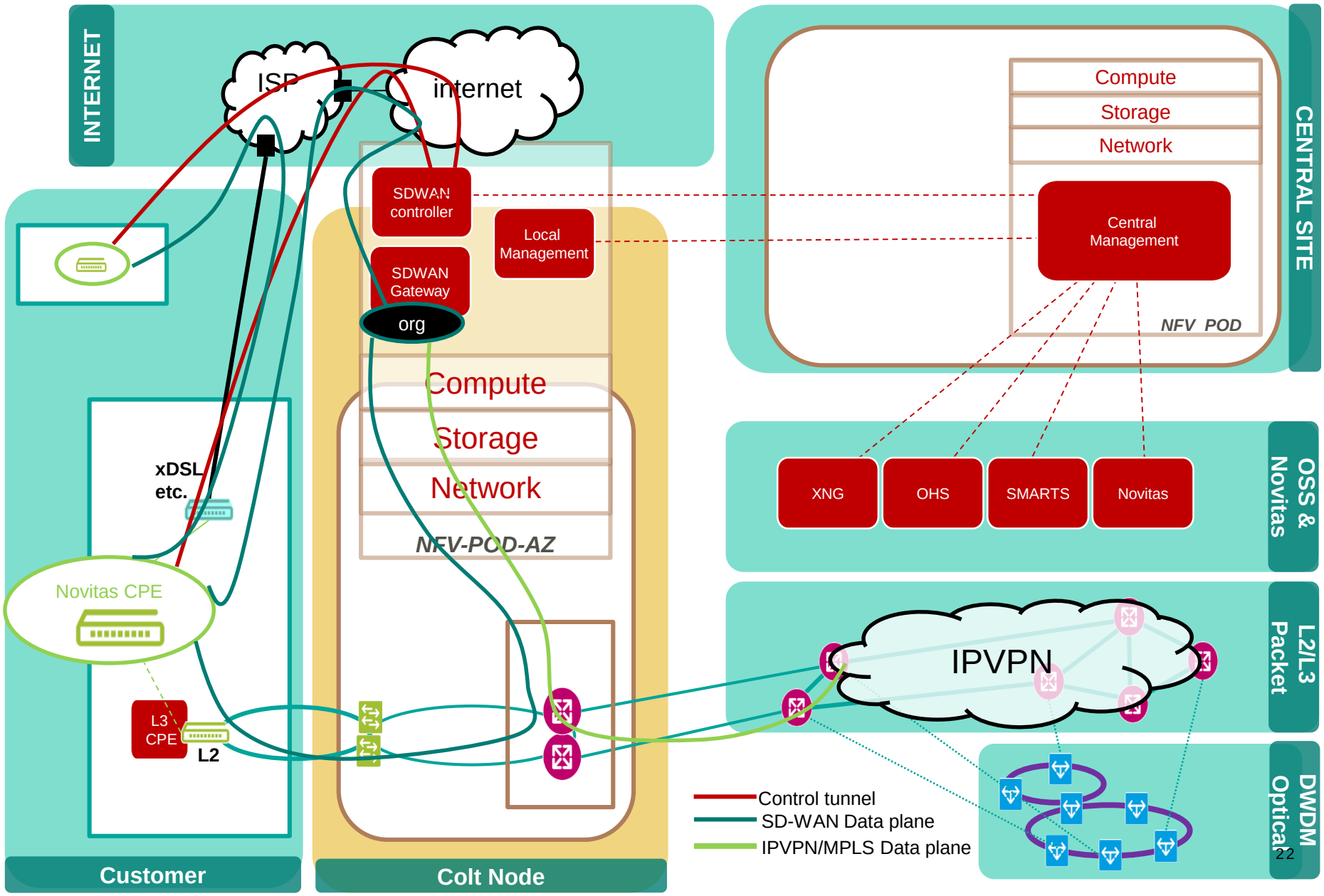
- Competitive low-cost 3rd party Internet Access
- Ability to automatically direct traffic along the best available path
- Provide visibility into the applications running across the network, app optimisation
- Provide customer with self-service capabilities:
  - Ability for the customer to change application / traffic mapping via a portal
  - Ability to change service parameters like CoS
- Allow for a direct break-out to public Internet at the branch site
- Customer self-install for IPSec-only sites

SD-VPN Use Case

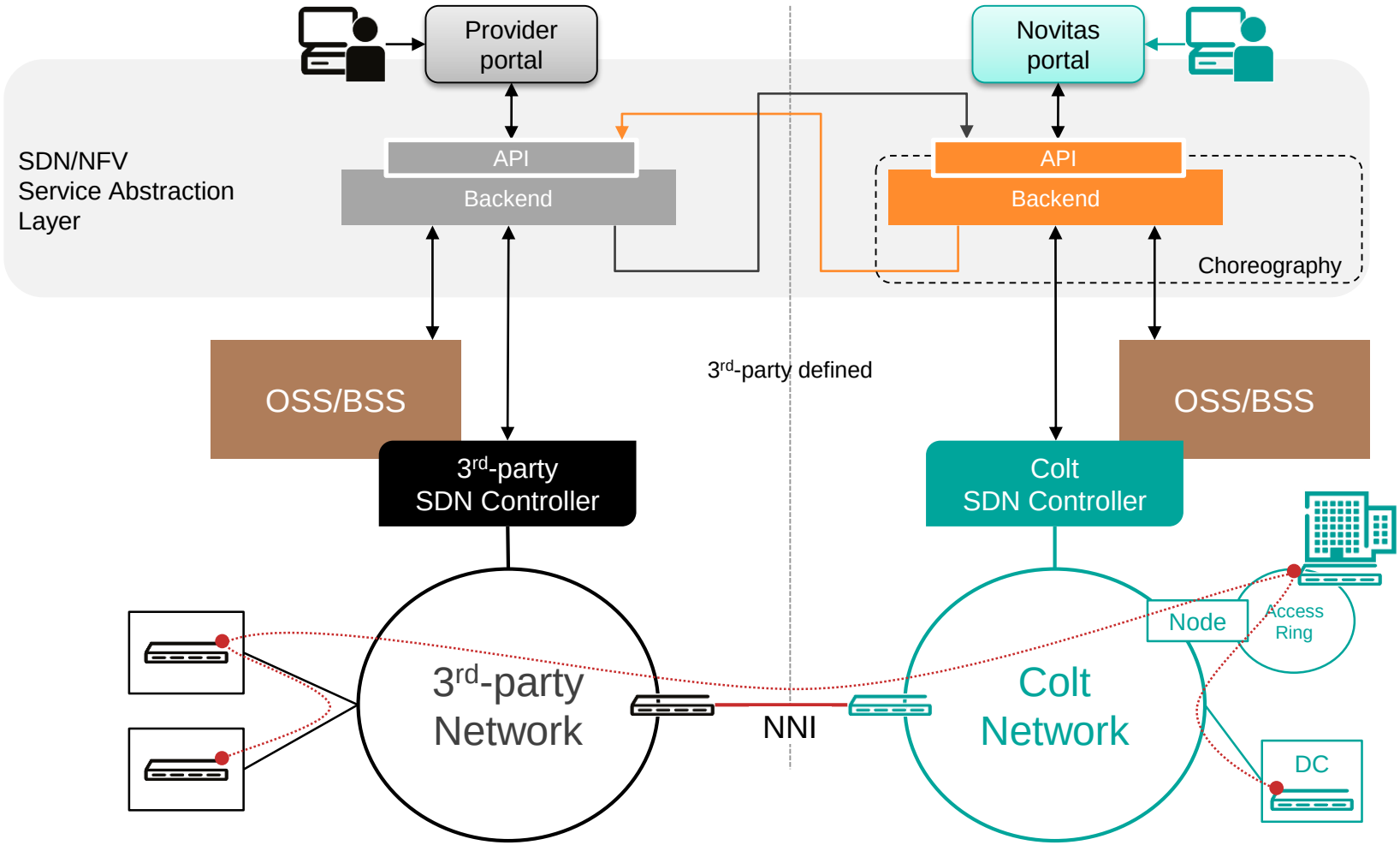


OLO[1-] Other Licensed operator

SD- VPN - Hybrid IPVPN (Novitas Phase -3)



SDN NNI Concept



For your time

Thank you

javier.benitez@colt.net