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# Colt DCNet on Demand

## SDN service, implementation & pricing, on-net and off-net

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# 1. Do SDN and NFV enable fixed network access which gives alternative network operators more control over the network of the incumbent compared to current layer 2 wholesale access products (Ethernet bitstream or VULA)?
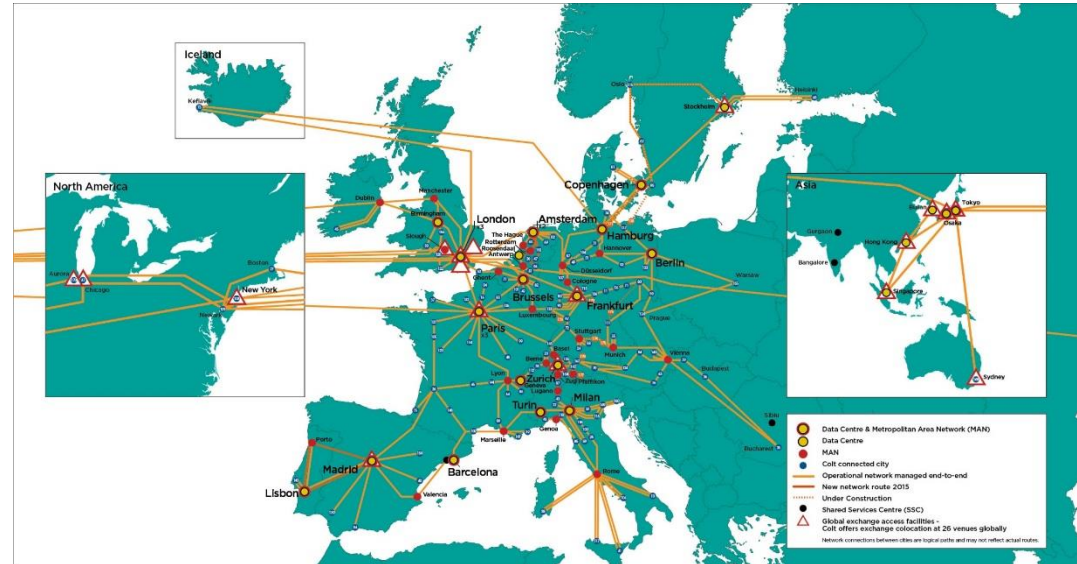
## *A. Is this possible in principle?*

Colt is an infrastructure player, making money on-net, i.e. where we can activate passive infrastructure

Off-net is necessary because scope of RFPs don't stop with our local loop & ULL

More control over third party networks through SDN & NFV is possible and welcome…

…but it is **not a substitute to access to passive infrastructure**

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| | | | | |
|---|---|---|---|---|
| **38k+** Km terrestrial long distance network | **205** Connected cities | **470+** Ethernet Network to Network interfaces | **22k+** Buildings directly connected | **29** Carrier neutral Colt managed data centres |
| **120k+** Km Subsea long-distance network | **520+** Connected third party data centres | | **2k+** Pre Approved On- Net buildings | **3** Continents |
| **28** Countries | **47** Metropolitan Area Networks (MANs) | **900+** ULL Central offices | **9k+** Km Metro fibre routes | **85+** Active Countries |

**1. Do SDN and NFV enable fixed network access which gives alternative network operators more control over the network of the incumbent compared to current layer 2 wholesale access products (Ethernet bitstream or VULA)?**

*B. Will SDN and NFV also be standardized in a way (including multi-tenant support) which will make such forms of network access possible based on SDN/NFV?*

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From proprietary bilateral exchanges between operators…

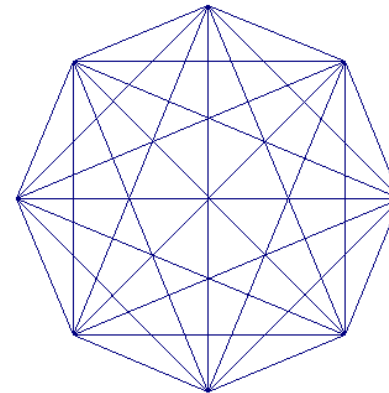Colt has enough funds to automate exchanges with one or two operators per country

Colt buys from and sells to 500+ operators

Specification-only standards are implemented in a piecemeal way by different players

The only efficient way to automate inter-operator exchanges is to exchange through one hub used as an implementation standard
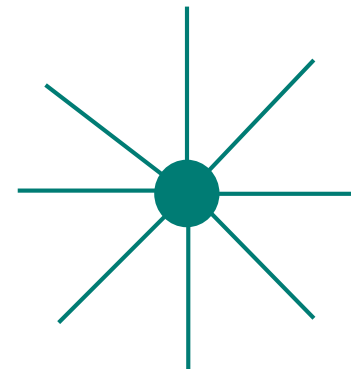
Colt proposes to extend the concept of the number portability platforms to SDN & NFV

$$\frac{N * (N-1)}{2}$$

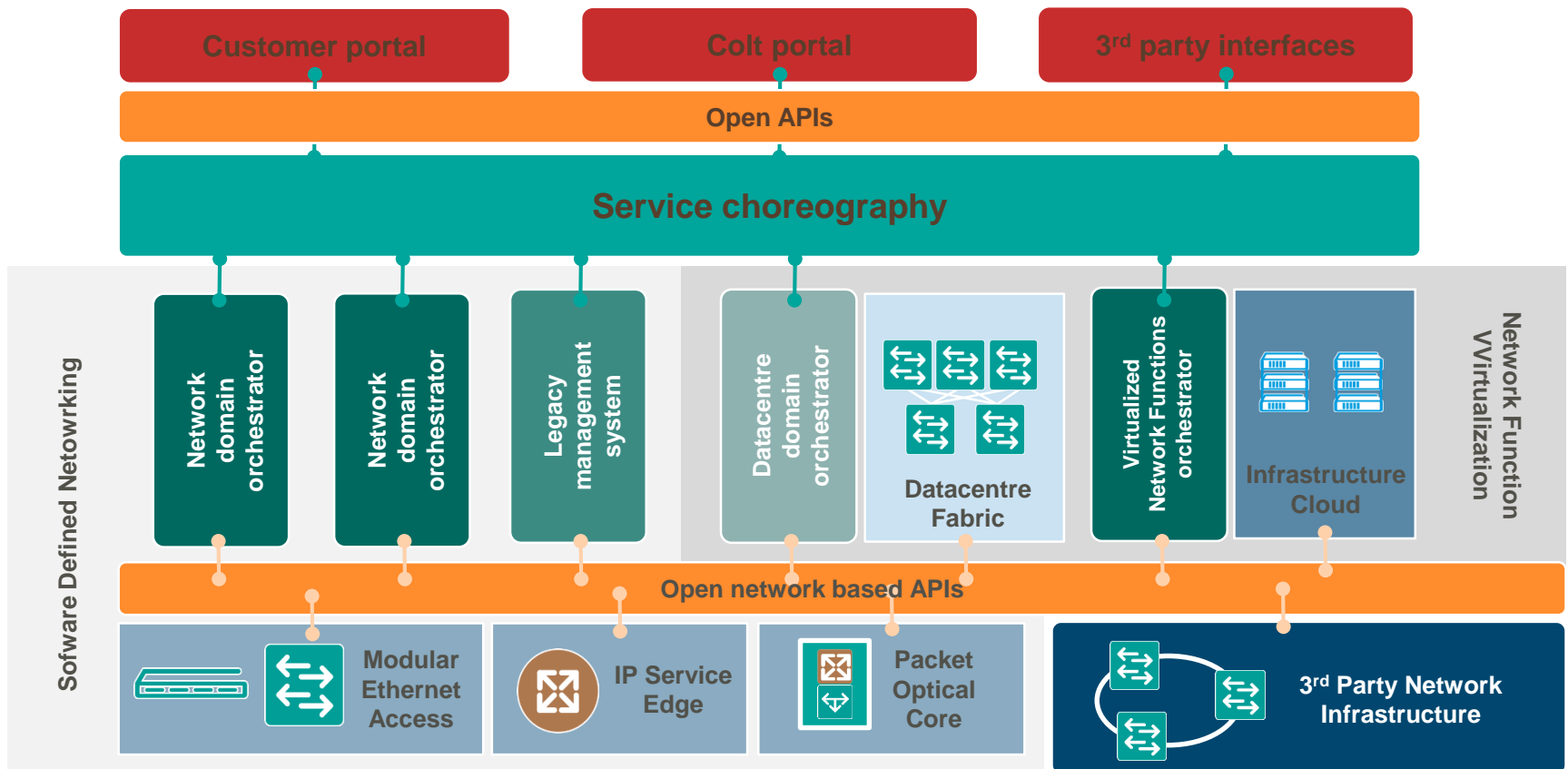… to one standard hub in Europe to exchange with all operators

$$N$$

# 1. Do SDN and NFV enable fixed network access which gives alternative network operators more control over the network of the incumbent compared to current layer 2 wholesale access products (Ethernet bitstream or VULA)?

*B. Will SDN and NFV also be standardized in a way (including multi-tenant support) which will make such forms of network access possible based on SDN/NFV? (1/2)*

**Colt SDN Architecture**

# 1. Do SDN and NFV enable fixed network access which gives alternative network operators more control over the network of the incumbent compared to current layer 2 wholesale access products (Ethernet bitstream or VULA)?

*C. Will SDN and NFV also be offered by vendors (and/or open source) which will make such forms of network access possible based on SDN/NFV? (2/2)*

## System Architecture- Differentiation vs Standardisation
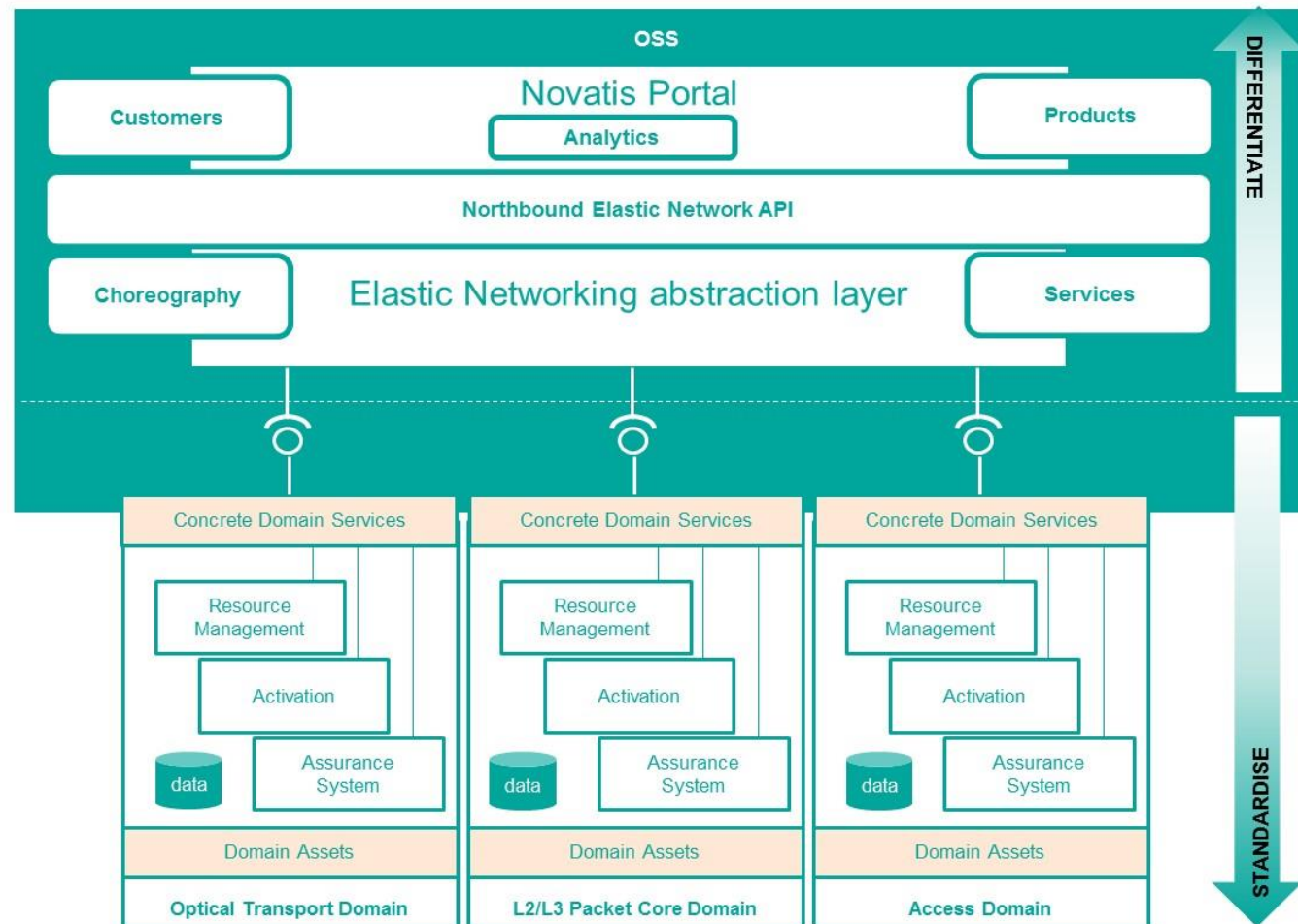
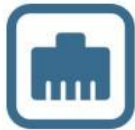# 2. Will SDN and NFV enable other new forms of network access or network sharing?

## A. If this is the case, please present them?

### Ethernet services
### DCNet on Demand

Provides customers with flexible, on-demand **Ethernet services** (on-net) across over 50 pre-wired data centres initially, with more to come soon.

With DCNet on Demand, customers will be able to…

1. Reserve / release ports

2. Create / delete a connection between user-reserved ports

3. Modify in real time 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 will initially support Point to Point services and will later support other modes.
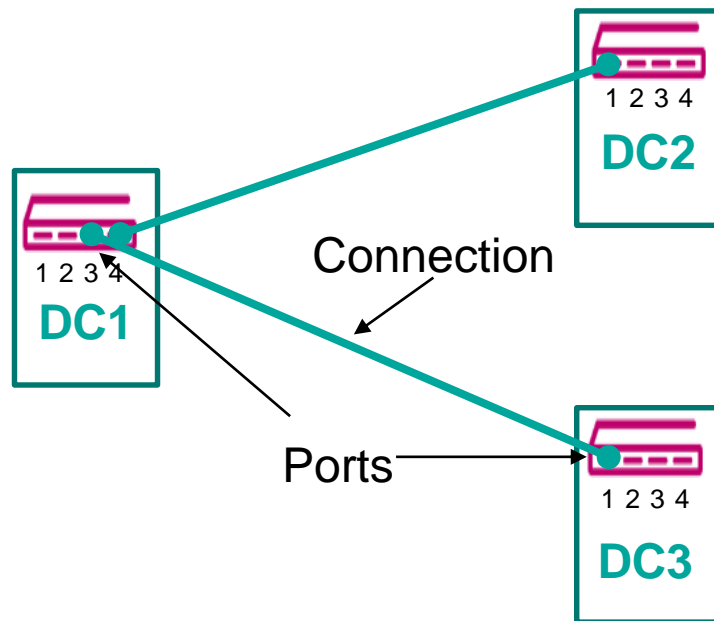
Offered as a PAYG service, ports and circuits will have a monthly recurring charge based on the capacity allocated and bandwidth consumed.

London — Colt Ethernet — Paris
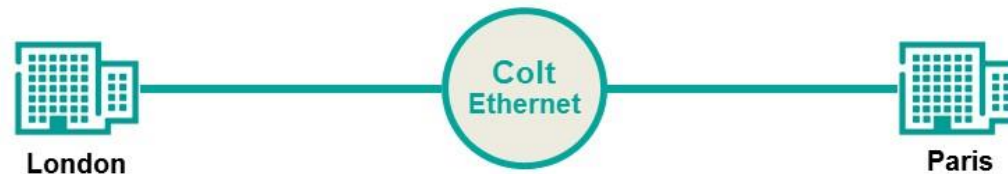
Bandwidth can be flexed between 0 and the maximum allocated capacity for the port, with the following port capacities supported: 10G, 4G (sub-rated), 1G, 400M (sub-rated), 100M.

## 2. Will SDN and NFV enable other new forms of network access or network sharing?

### B. Will SDN and NFV facilitate new services which enables end users to set-up data (Ethernet) connections dynamically on-demand similar to phone calls?

| Attribute | Properties |
|---|---|
| Ports | 1. Ports have an associated 'capacity'<br>   • 100Mbps, 1G/400M, 1G, 10G/4G, 10G<br>2. One off charge (NRC) levied for creation of the port<br>3. Minimum contract term for port = 3 months |
| Connections | 1. Connections have a 'variable' bandwidth associated with them<br>2. One off charge (NRC) levied for creation of the connection<br>3. Recurring charge based on the bandwidth ordered<br>4. Bandwidth can be changed ('flexed') up to maximum of port capacity<br>5. Minimum flex period = 1 hour<br>6. Connection bandwidth charged on an hourly basis<br>7. Minimum allowed bandwidth = 10Mbps<br>8. No minimum contract term |

DC2
1 2 3 4

DC1
1 2 3 4

Connection

Ports

DC3
1 2 3 4

# 2. Will SDN and NFV enable other new forms of network access or network sharing?

## B. Will SDN and NFV facilitate new services which enables end users to set-up data (Ethernet) connections dynamically on-demand similar to phone calls?

Colt DCNet on Demand is positioned as a 'value add' service with a premium price over 'standard' Colt DCNet

'Like for like' price positioning: DCNet on Demand Connection Monthly Rental Charge = 1.2 x LANLink Monthly Rental Charge
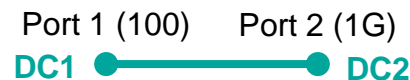
Example – 100Mbps Service

**DCNet on Demand**: 2 ports provisioned (ports 1 & 2) + 100Mbps connection between port 1 and port 2. Bandwidth fixed at 100Mbps for complete month, no 'flexing'

**DCNet:** LANLink P2P service configured between DC1 and DC2

**Charges:**



### Charges

**Recurring** ➡ **Connection (100Mbps) MRC** **=** **1.2 * LANLink 100Mbps MRC**

**Non-recurring** ➡ **NRC = Port 1 NRC + Port 2 NRC + Connection NRC** **NRC = LANLink NRC**

# 2. Will SDN and NFV enable other new forms of network access or network sharing?

## C. Will SDN and NFV enable network operators to offer Virtual Network Functions (VNF) as a service to other operators? Do you expect that this will happen? Which VNFs?



SDN NNI PoC with 3rd party operator

# 2. Will SDN and NFV enable other new forms of network access or network sharing?

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### Possible VNFs for a IP service

| | |
|---|---|
| **Bandwidth** | ▪ Flex bandwidth on demand in near real-time. |
| **U.B.B.** | ▪ Activate usage based billing, view consumption and modify settings. |
| **CoS** | ▪ Activate and manage class of service settings. |
| **A.P.M.** | ▪ Activate and manage network-based Application Performance services. |
| **Firewall** | ▪ Activate and manage a virtual firewall, including at customer premises. |
| **A.M.N.** | ▪ Modify notification settings and contact details. |
| **IP address** | ▪ Modify IP address settings. |
| **DHCP** | ▪ Modify DCHP settings. |
| **BGP / Dynamic routing** | ▪ Modify Border Gateway Protocol / dynamic routing settings. |
| **SNMP** | ▪ Modify SNMP settings. |
| **NAT** | ▪ Modify NAT settings. |
| **Router** | ▪ Activate and modify virtual router settings. |

## Requirement: secure API exchange

**3. Will SDN and NFV have an (further) impact on the current value chain? If this is the case, please present how SDN and NFV will alter the current value chain.**

Retail pricing has traditionally moved from dynamic (usage-based) to static pricing models (flat fee)

Traditionally, wholesale pricing has been theorised in the regulatory debate through static cost models and static regulatory accounting

With Colt DCNet on Demand, customers have to learn how to use flexibility and optimise their budget

Colt also has to learn about the impact of flexibility on revenues

The initial 20% 'flexibility premium' is meant as an experimental set-up, meant to be eventually adjusted once enough customer usage data has been collected

Each network operator will have to figure out their flexible pricing model through experiments not through static cost models

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**4. Will SDN and NFV have an impact on the relation between OTT and telecommunications service providers? If this is the case, please present how SDN and NFV will alter the role and possibilities of OTT and telecommunications service providers.**

SDN & NFV will happen between operators in a reciprocal & symmetric relationship depending on geographies

Eg Colt buys from incumbent in incumbent's country and sells to the same incumbent outside the incumbent's country

OTTs home ground will be the networking side of their data centres

SDN / NFV discussions between network operators and OTTs will be about reciprocal access to the other party's network infrastructure

The competitive situation of each reciprocal market will shape discussions

# 5. Do SDN and NFV have other regulatory implications?

Possible roadmap?

| 2014-2015 | Initial on-net commercial offerings |
| --- | --- |
| 2015-2016 | Initial inter-operator proofs of concepts |
| 2016-2017 | Initial inter-operator commercial offerings |