



Vodafone keynote

**How smart networks
are changing the
corporate WAN**

Peter Terry Brown

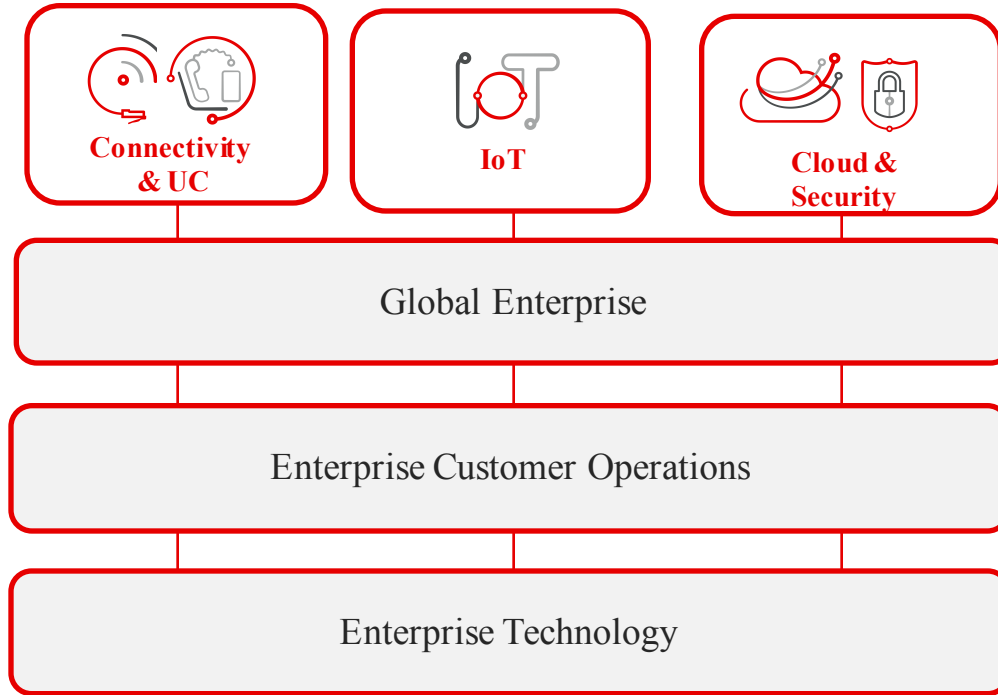
Director of Connectivity & UC

WAN SUMMIT

17 October 2017



About Vodafone Enterprise



Our vision:

To be the undisputed **total communications** leader for enterprises



Our mission:

To help businesses **succeed** in a **digital world**



About Vodafone Enterprise Network Services



SD-WAN
Cloud Connect



SDN

NFV

Virtual CPE

READYNETWORK



Extensive Fixed and Mobile Network

Vodafone Ready Network is a new portfolio of dynamic, **on-demand software defined network** products for digital business

T1 Global Voice carrier

1M+ KM Fibre Assets

Assets

80 cable systems



75 country MPLS

182 total country reach

17 local markets

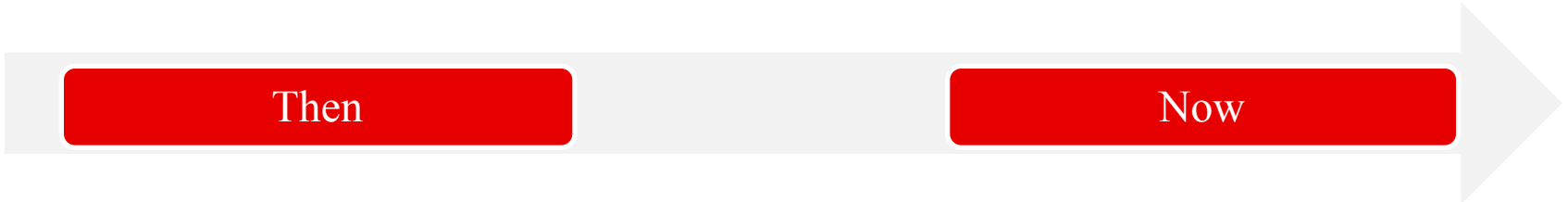


4G WAN in **13** countries

Top 5 Global ISP



Remember how we used to consume music?



Single device



Multiple devices



Higher quality
More capacity



On-demand



Business communications are evolving at a rapid pace

Driving the need for smart networks

Increasing network challenges:



Security risks



User Experience



Data explosion

Cloud

Robotics

AI

Mobility

IoT

Digitisation



Introducing new Software Defined Network technologies

Enterprise benefits: lower cost, increased business agility, a network ready for cloud and digital



Software Defined Network (SDN)



Network Functions Virtualisation (NFV)

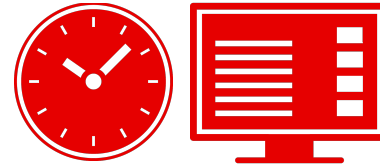
Enabling



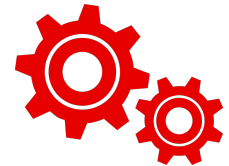
Virtual Customer Premise Equipment (vCPE)



Software Defined WAN (SD-WAN)



On-demand services



Automated Service Delivery

In 10 years, 75% of the MPLS IP-VPNs will migrate to Software Defined Networks



A black and white photograph of two men in a meeting. The man in the foreground is wearing glasses and a plaid shirt, looking at a laptop screen. The man in the background is holding a white coffee cup. A large red speech bubble is superimposed over the image, containing the text 'Smart networks changing the corporate WAN'.

**Smart networks changing
the corporate WAN**

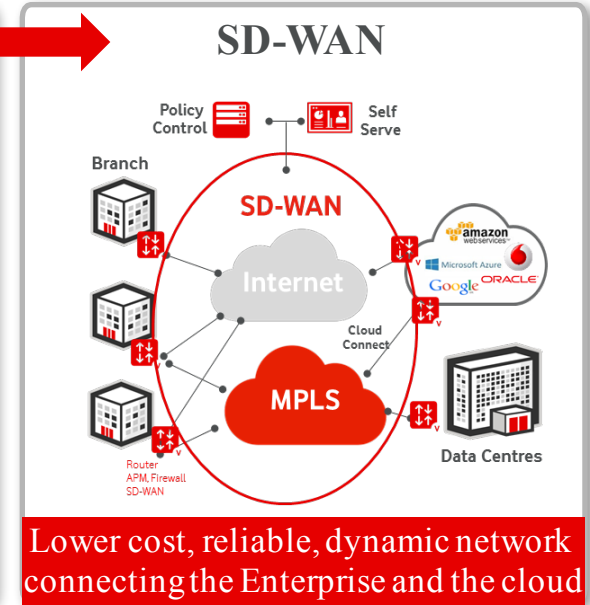
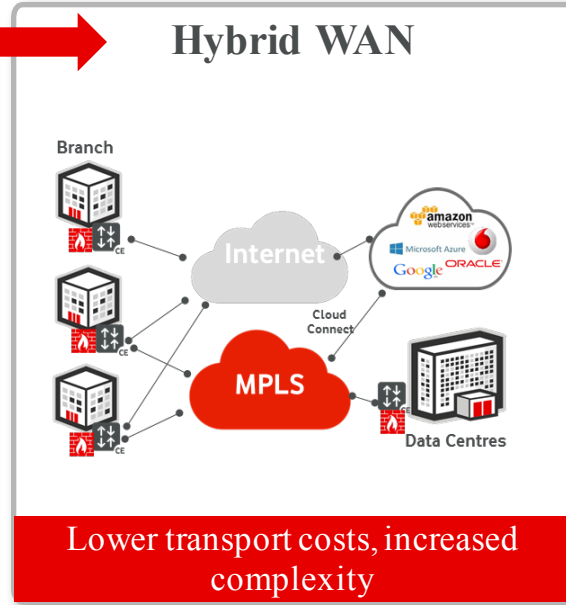
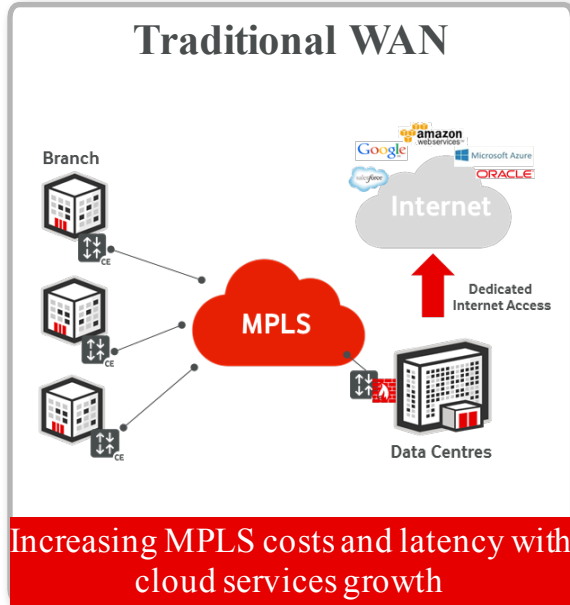
Use cases

WAN SUMMIT

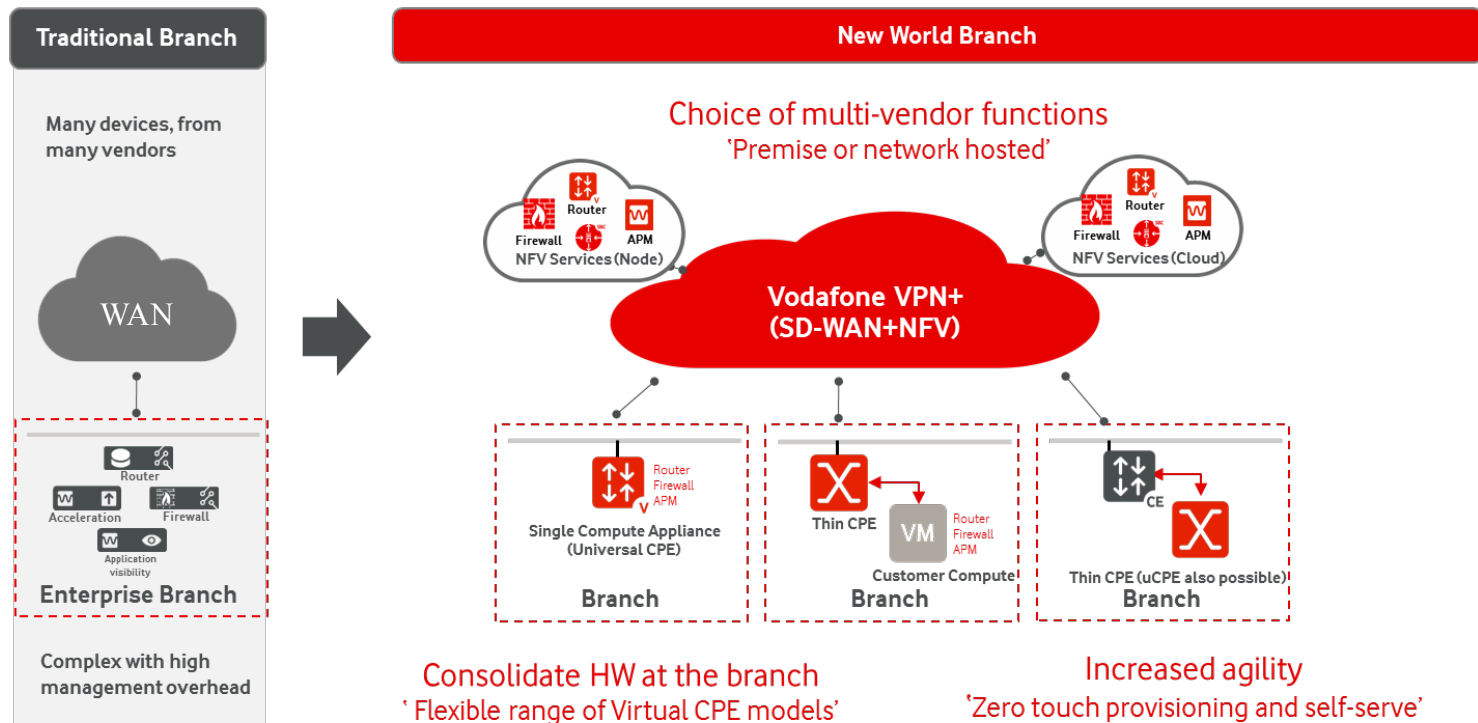
17 October 2017



Use case 1: Increasing cloud services adoption



Use case 2: Virtualisation of Branch networking equipment



Use case 3: **Visibility and better control of the network**

Self-serve via portal and/or APIs

Traditional Network



Bandwidth and Quality of Service

Limited Application Visibility

Fixed and Slow to Change



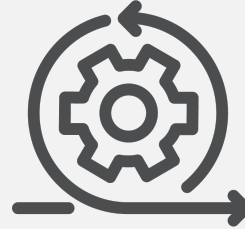
Application Visibility



Performance Management

- Real-time visibility of applications performance
- Set thresholds and alerts
- Pre-empt and prevent major issues

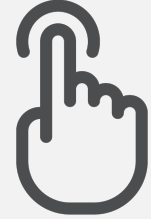
Application Policy Management



Centralised Policy Management

- Consistent user application experience
- Prioritise applications by business criticality
- Rapidly accommodate new applications

On-demand



Add, modify and control your services

- Order, connect and authenticate new sites (vCPE) in days
- Turn up new services instantly
- Configure settings e.g. bandwidth or firewall policies, in minutes



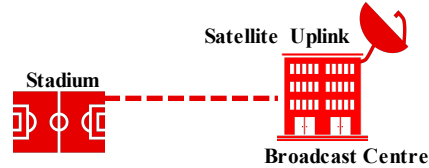
Use case 4: Big Data and bandwidth intensive real time applications

Medical Imaging



- Transfer of a full body MRI files of 300GByte takes ~ 4 minutes with a 10 Gbps connection

Media Broadcast



Business Continuity



Software Defined Networking (SDN)



- Software programmability of the network
- Dynamically configure new connections, services, speeds and setting
- On-demand; consumption based
- Emerging product, enhancing SD-WAN

Increased self-control and business agility

- **Optical High Ethernet** services provide the solution for these applications **and SDN** enables them to be activated on-demand
- In time, SDN will enhance SD-WAN services via on-demand control of underlay transport bandwidth and analytics driven service assurance



Key considerations for enterprises in their digital transition

1

Identify WAN impacting network projects:
Cloud, Digital ...

2

Network audits and application discovery

3

Plan your network strategy and transition

4

Self-serve, operational and commercial requirements

5

Deep dive providers' network products and wider portfolios



Vodafone Ready Network

Our enhanced fixed network capability with SDN and NFV

**Most extensive
SDN**



Best cost & end-to-end
SLAs over fixed and
mobile
(4G and future 5G)

**Enable your cloud
strategy**



Secure & reliable cloud
connectivity, every time

On-demand



Driven by business
policies and powered by
analytics

Innovate at speed



Future-ready
Multi-vendor
Network-as-a-Service for
total comms

Fast and Agile



More efficient network
with high levels of self-
control
Easy transition

A new portfolio of **on-demand networking products for the digital enterprise**
Combining Vodafone's extensive fixed and mobile networks with agility and efficiency of
SDN/NFV





Vodafone keynote

**How smart networks
are changing the
corporate WAN**

Peter Terry Brown

Director of Unified
Communications & Connectivity

WAN SUMMIT

17 October 2017





Back up slides

WAN SUM  IT

17 October 2017



SD-WAN changes the financial profile and metrics of the WAN

SD-WAN versus MPLS IP-VPN

| Pricing Line Items | MPLS | VPN + |
|--|------|---------|
| Access | ✓ | ✓ |
| Port/ CIR | ✓ | ✓ |
| Flexible bandwidth on demand | ✗ | ✓ |
| QoS/ CoS | ✓ | Inbuilt |
| Router / CPE | ✓ | ✗ |
| Virtual CPE | ✗ | ✓ |
| SD-WAN licences, management and self-serve | ✗ | ✓ |
| Virtual network functions | ✗ | ✓ |



Access

MPLS access for critical applications, Internet for the rest.

\$/Mbps reduction

Increasing role for 4G



Port

Bandwidth on demand (SDN enabled)

Pay for peak bandwidth you need, when you need it



CPE Functions

Virtual CPE
Multi-vendor virtual functions

Lower cost CPE, operational costs, HW consolidation



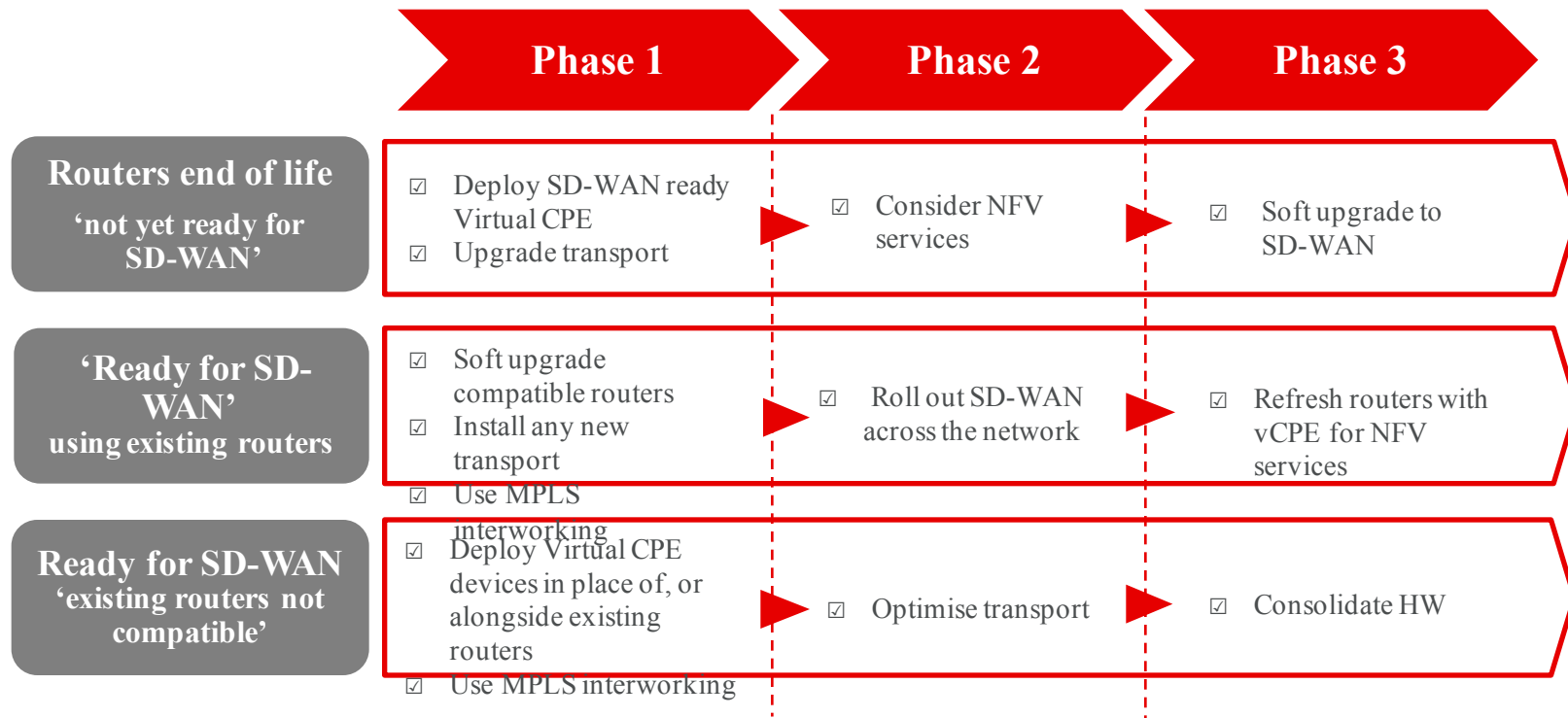
SD-WAN

SD-WAN licenses and management

Agility, reliability, security



Software Defined WAN | transition scenarios



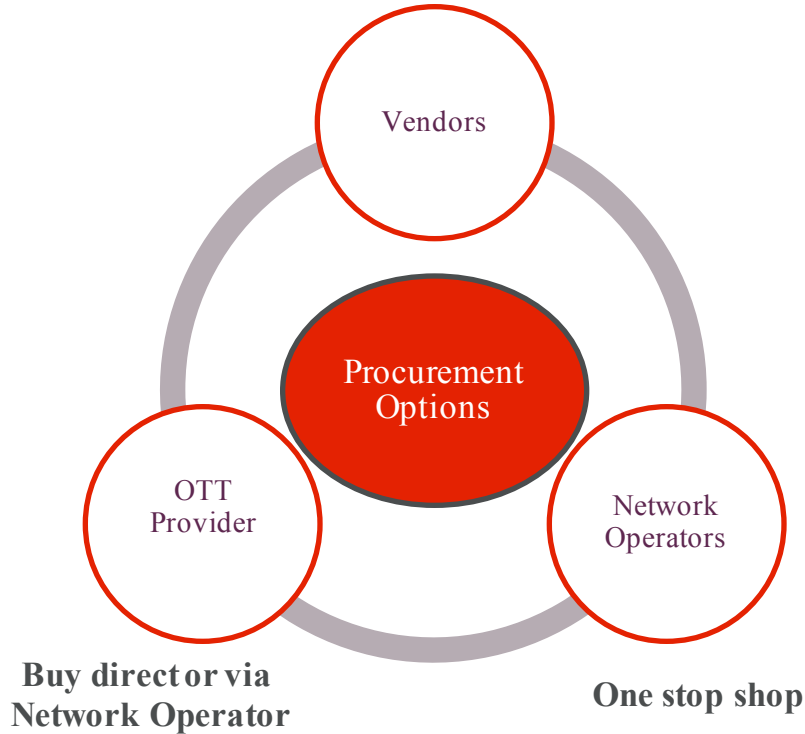
Considerations: re-use existing infrastructure, minimising truck rolls, future proofing, ROI



SD-WAN Procurement

Whilst standards mature, no two SD-WAN solutions are identical

Buy and build your own platform

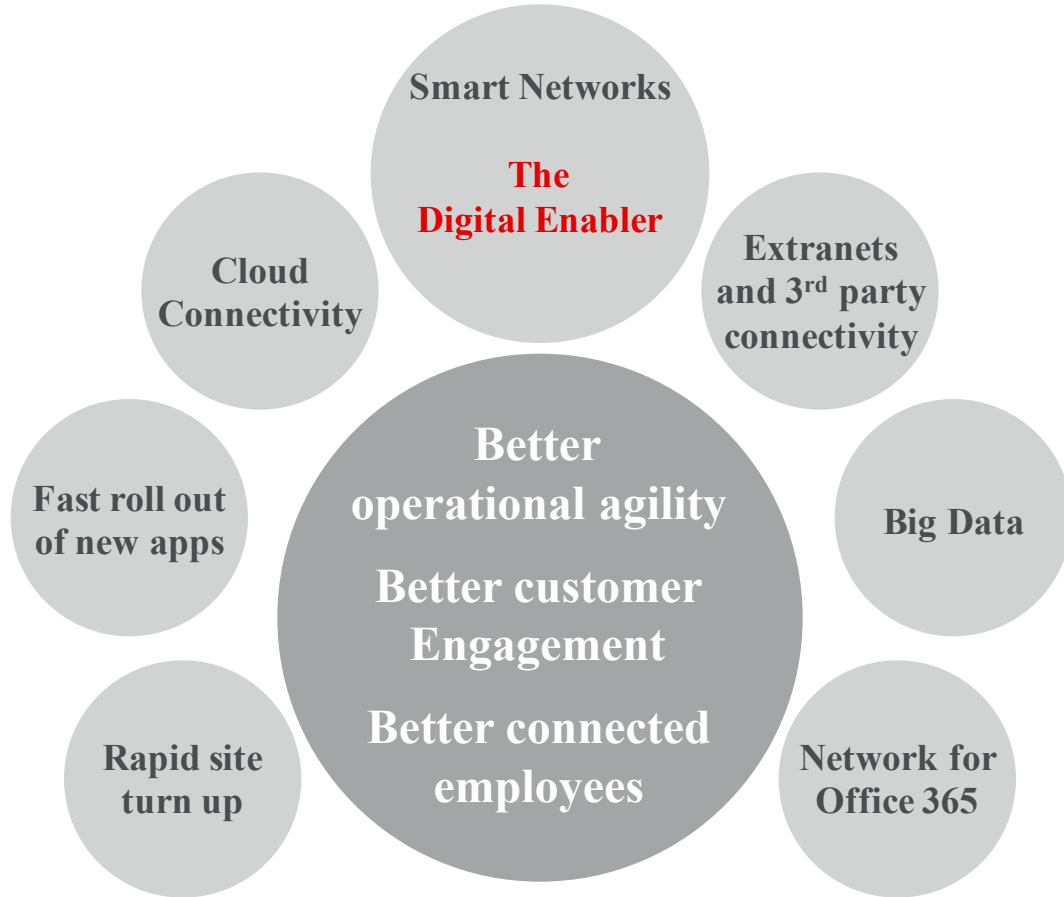


Considerations

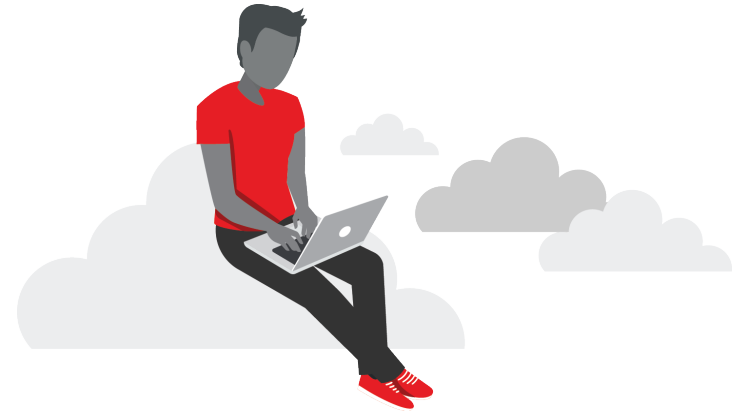
- In house skills and capabilities
- Single throat to choke
- Product functionality, service and commercial comparisons
- Interoperability
- Future proofing



Businesses are demanding smarter networks



In an increasingly Digital age



Capabilities that are enabled and future proofed with **SDN and NFV technologies**

