Data Center Day 2008
Data Center Transformed!

Accelerate   Consolidate   Virtualise   Automate

David Cairns
Principal Solutions Architect
BT Global Services
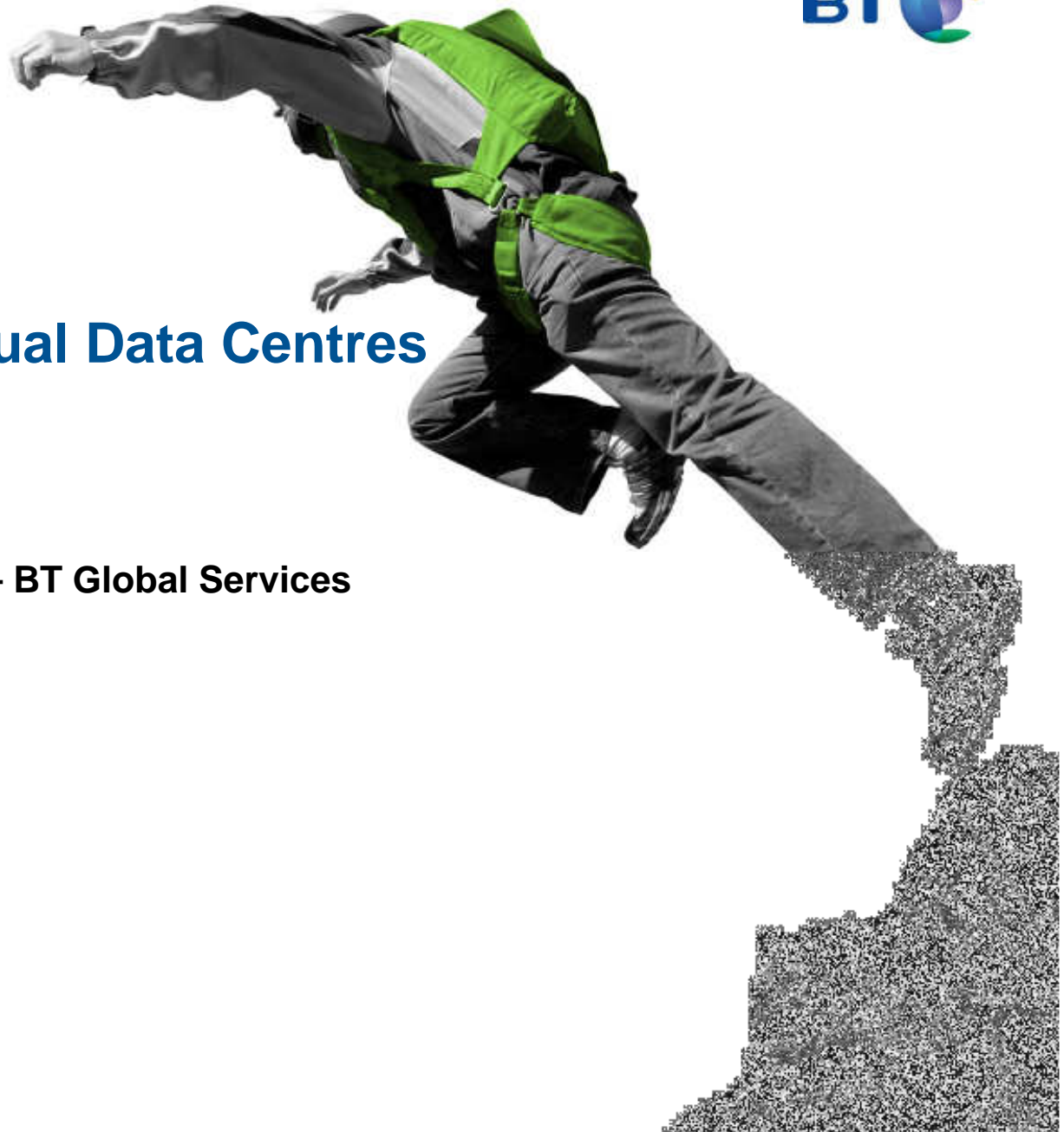
Next Generation Virtual Data Centres

David Cairns

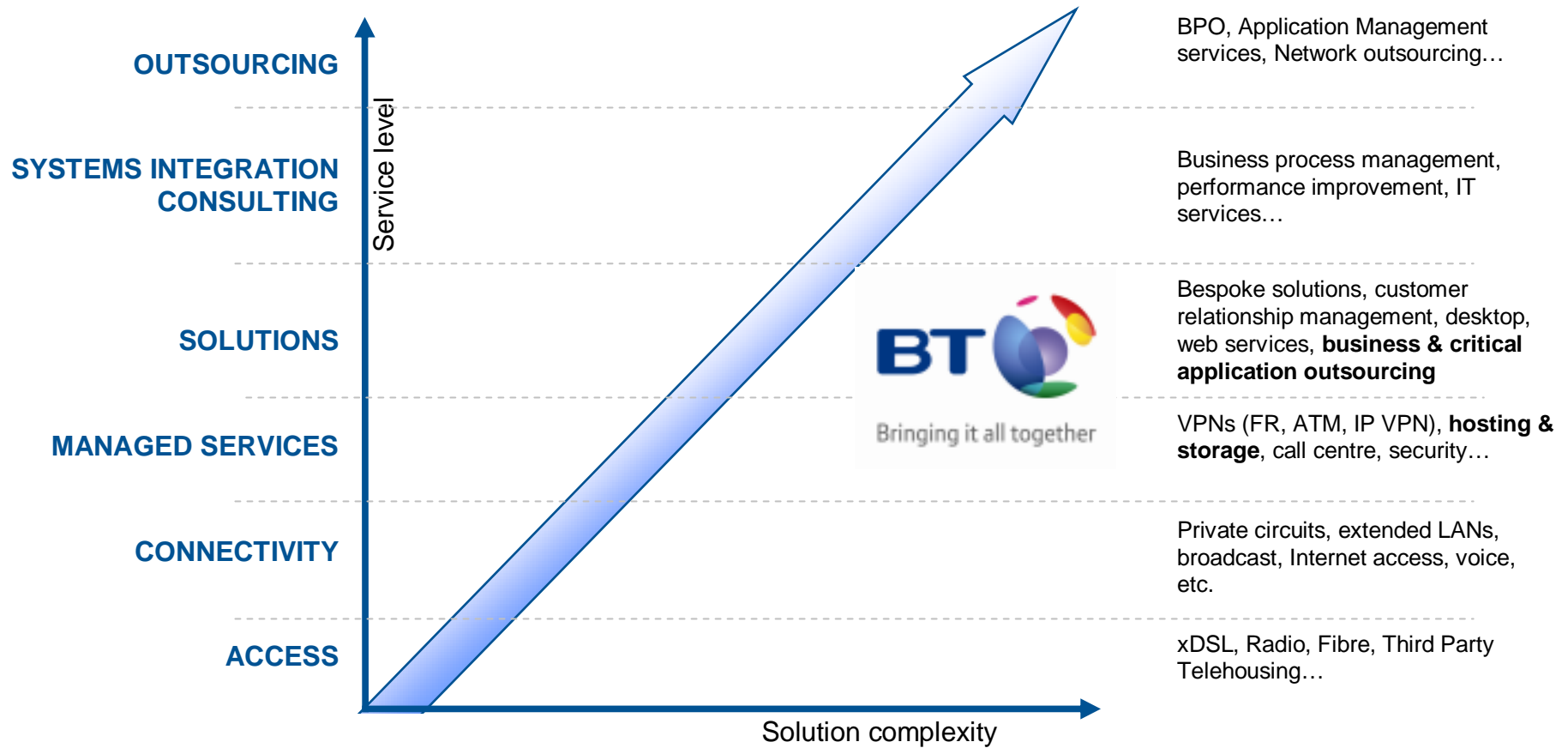**Principal Solutions Architect – BT Global Services**

Singapore

BT Group

- **BT Group** employs over 100 000 people worldwide, with revenue close to **30 billion euros** (£19.5bn)

- **BT Global Services** delivers solutions and services to major corporations

- Its core market features the world's 10 000 largest multi-site enterprises

- With nearly **13 billion euros** (£8.63bn), BTGS represents **over 40% of BT's revenue**, with annual growth of > 10%, employing 30 000 people in 50 countries and delivering services in over 170 countries.

- **A sound financial position**
    - 16 consecutive quarters of growth in earnings per share
    - 9 consecutive quarters of growth in revenue
    - 4 consecutive quarters of improvement in the EBITDA

- **A Global Network and ICT Service Provider**
- **60% of Fortune 500 companies rely on BT for Networked IT services**
- **BT Owns and manages 2nd largest US IP network**
- **~ $20 billion investment in data networks over next 2 years**

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BT Global Services coverage

OUTSOURCING — BPO, Application Management services, Network outsourcing…

SYSTEMS INTEGRATION CONSULTING — Business process management, performance improvement, IT services…

SOLUTIONS — Bespoke solutions, customer relationship management, desktop, web services, **business & critical application outsourcing**

MANAGED SERVICES — VPNs (FR, ATM, IP VPN), **hosting & storage**, call centre, security…

CONNECTIVITY — Private circuits, extended LANs, broadcast, Internet access, voice, etc.

ACCESS — xDSL, Radio, Fibre, Third Party Telehousing…

Service level

Solution complexity

BT Bringing it all together

Who am I?

- – Principal Solution Architect, BT Global Services
- – Degree at Edinburgh University in Comp Science
- – Worked in Hosting 12 years & 23 years in BT IT
- – Helped BT to turn a Hosting unit turning over £500k to become a ~ $100million per annum business.
- – Architect for **V**irtual **D**ata **C**entre
- – Solution Architect for Office of the Prime Minister

Virtual Data Centre

The virtual data centre offers an integrated set of flexible and virtual hosting environments to enable you to rationalise your existing IT estate into an agile, efficient and cost effective infrastructure
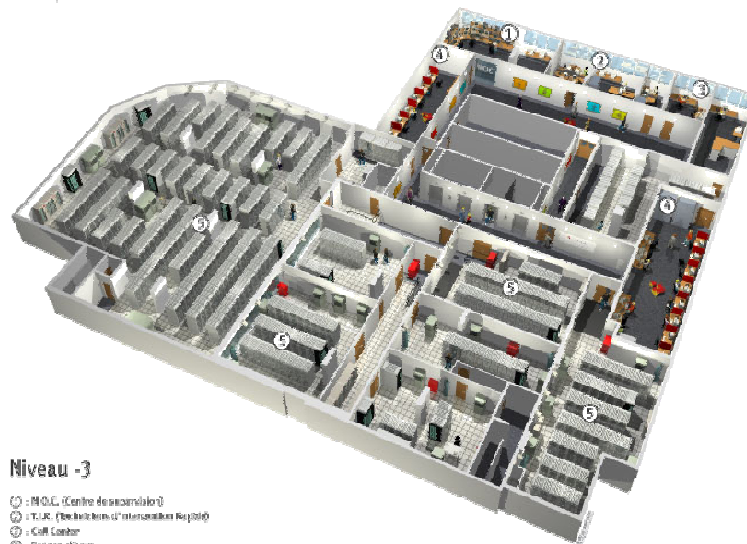
Niveau -3
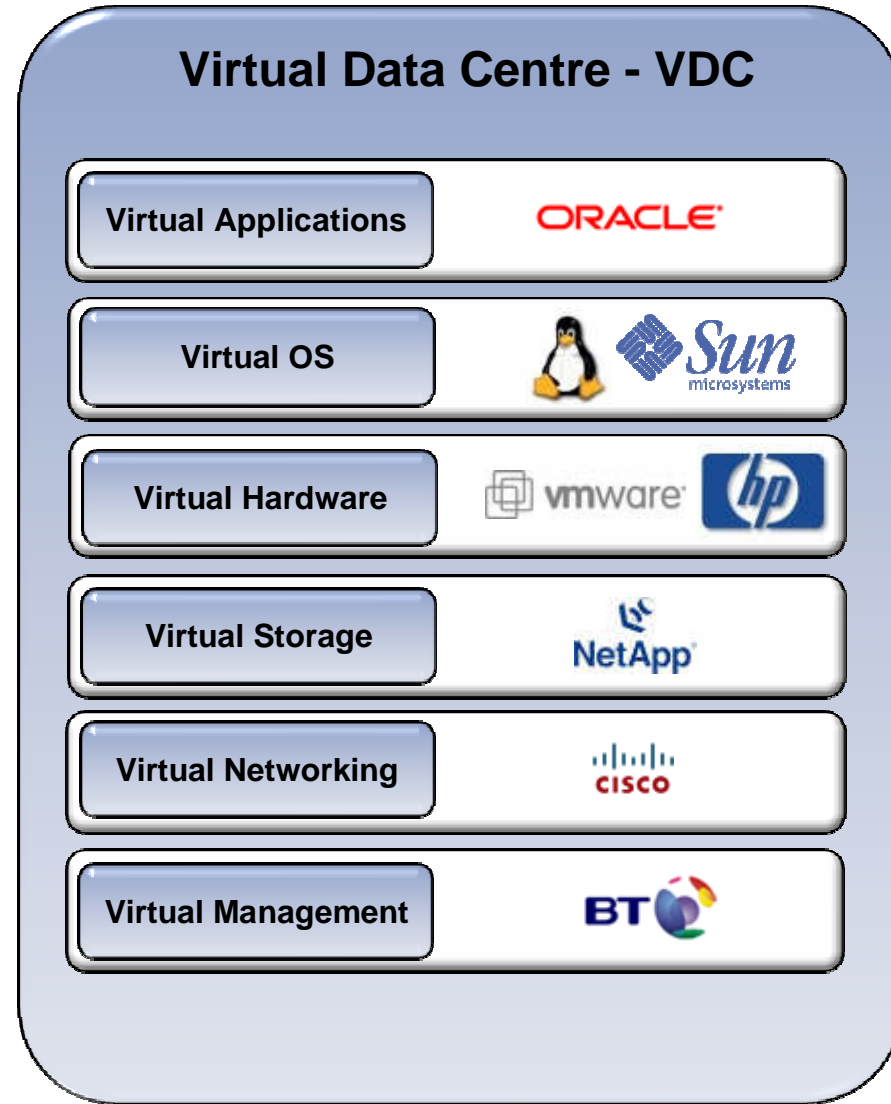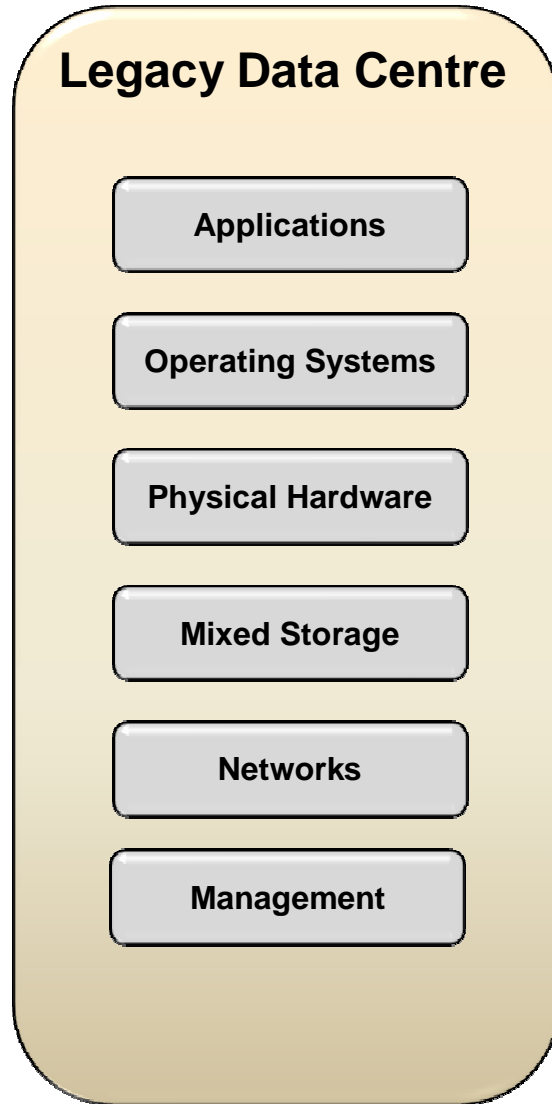
BT Data Centre Services

Virtualisation Perspective

> Virtualisation created a complete change of culture inside BT

> Personally been working with Virtualisation for 22 years

> My Work PC is Virtual served from the VDC

> BT partners with CISCO to provide our enterprise class virtualisation solution

> HP , SUN, VMware & NetApp alliances offer the enabling technology of our consolidation portfolio

> Enabler for the SaaS Vision

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BT's Internal Matrix Architecture

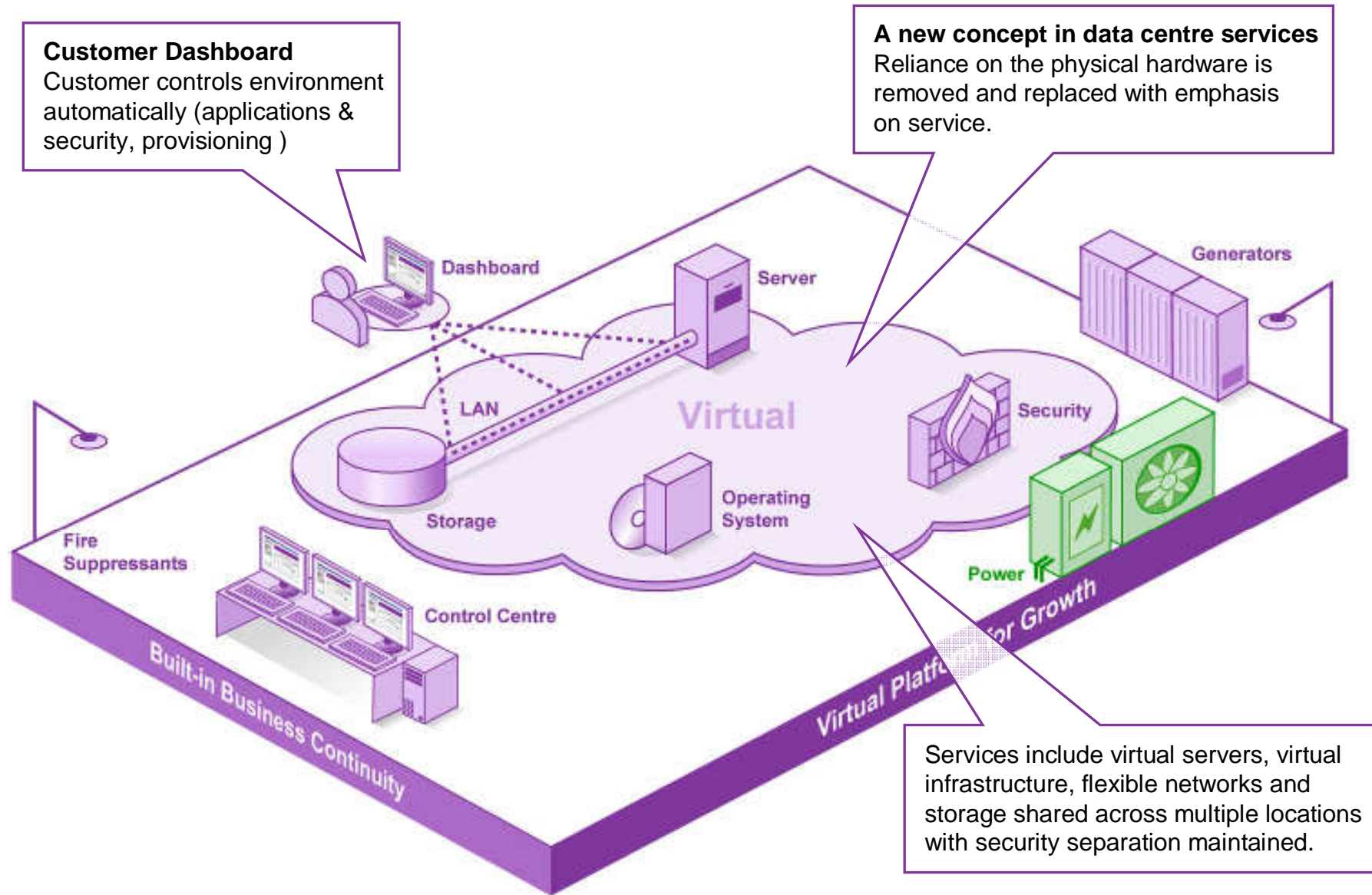**BT already had an answer to this internally**

- Internal consolidation project for 10,000 + servers
- 7:1 Solaris Consolidation on T2000's
- 15:1 Wintel Consolidation on HP using ESX Server
- 19:1 AIX Consolidation on p570's
- 40:1 HP-UX Consolidation using rx8660's
- "Liquid Storage" solution across our DCs
- A business case is now required for a physical server !!
- Our Internal and transit networks are Virtualised

BT's Virtual Data Centre

Legacy Data Centre

Applications

Operating Systems

Physical Hardware

Mixed Storage

Networks

Management

Virtual Data Centre - VDC

Virtual Applications — ORACLE

Virtual OS — Sun microsystems

Virtual Hardware — vmware / hp

Virtual Storage — NetApp

Virtual Networking — CISCO

Virtual Management — BT

BT Data Centre Services
Virtual Data Centre Services

Customer Dashboard
Customer controls environment automatically (applications & security, provisioning)

A new concept in data centre services
Reliance on the physical hardware is removed and replaced with emphasis on service.

Services include virtual servers, virtual infrastructure, flexible networks and storage shared across multiple locations with security separation maintained.

Dashboard

Server

Generators

LAN

Virtual

Security

Storage

Operating System

Power

Fire Suppressants

Control Centre

Built-in Business Continuity

Virtual Platform for Growth

Typical Customer Requirements 2008/9

– Central and local government/corporate outsourcing

– Hybrid of Dedicated and Physical models

– Like for like hosting (your mess in our space)

– Almost exclusively Windows and Solaris technologies

– Provide costing on an infrastructure rental basis

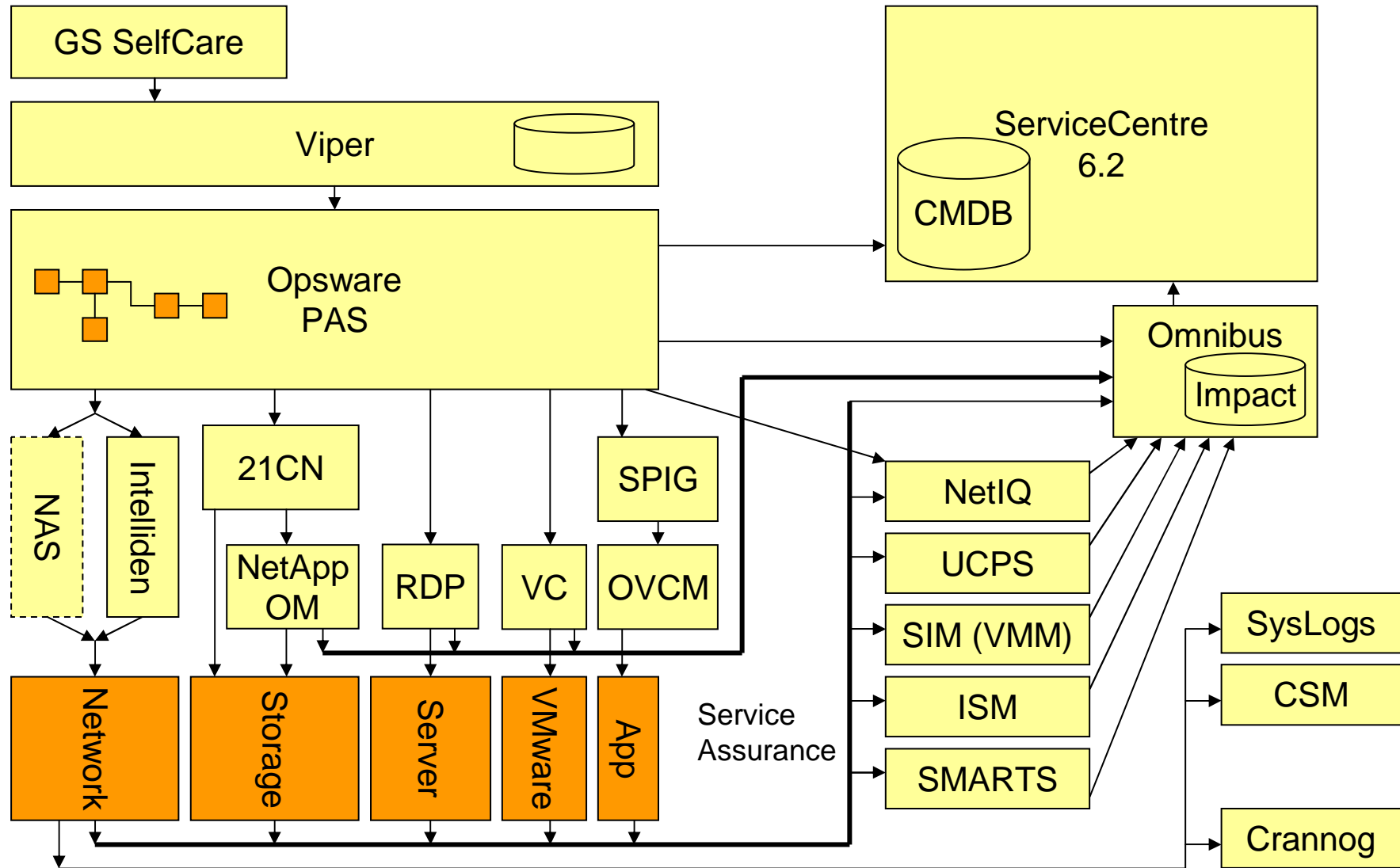– Provide an infrastructure built around an SLA eg > 99.5%

BT Data Centre Services
Virtual Data Centre Services – automated deployment

Automated deployment
Customer can automate deployment – configuration provisioning, capacity and processing on demand
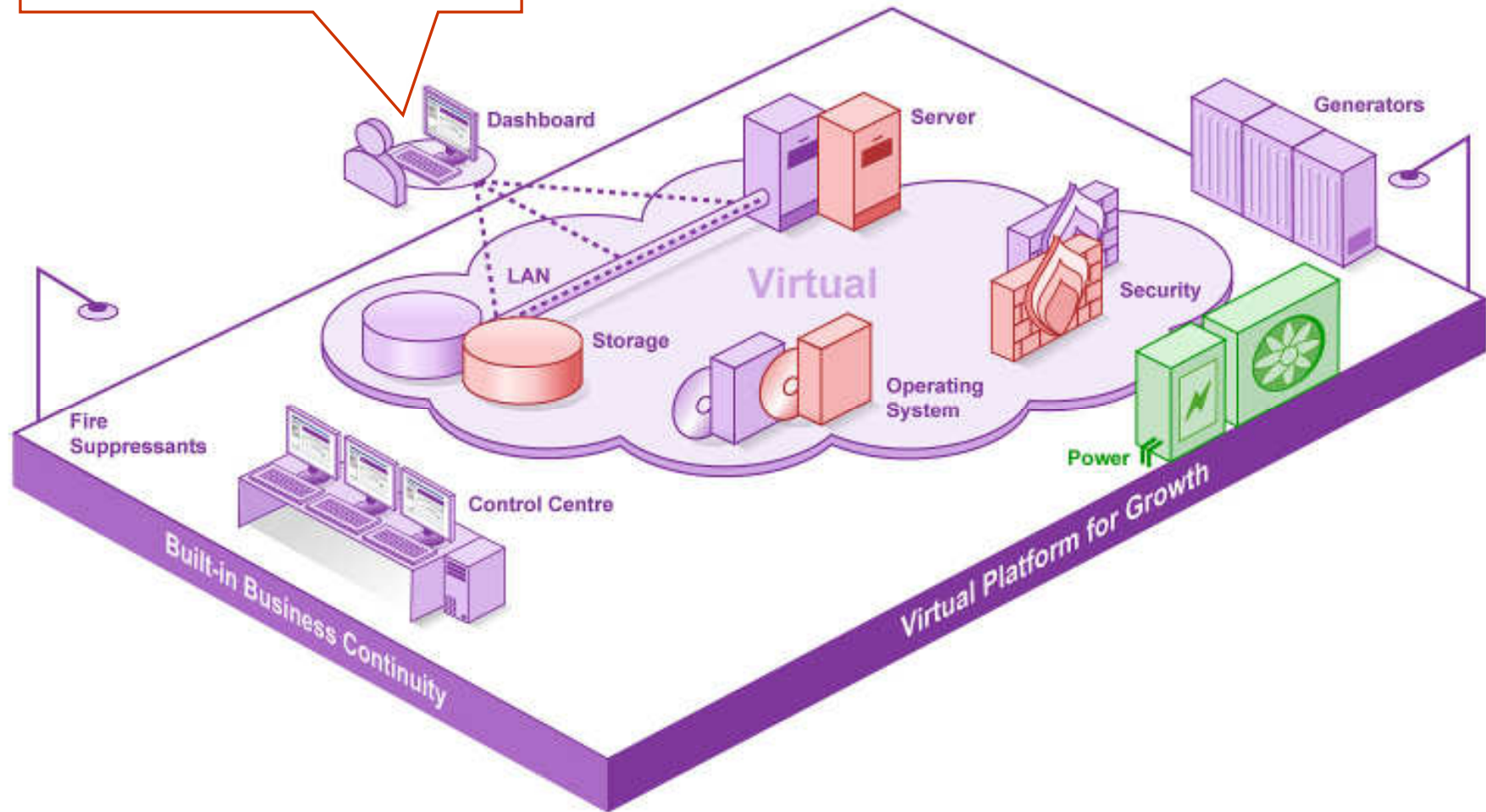
Today's Customer Requirements 2008

– Want BT to understand and transform their estate

– Provide flexible pricing based on service not hardware

– Minimise setup and CAPEX but maximise utilisation

– Provide flexible end to end infrastructure

– Ability to burst Compute and storage in the same fashion as network

– Minimise Carbon Footprint

– Increase service levels over time

– Continuous Migration (Avoidance of tech refresh)

– Provide Application/Service level SLA's not hardware SLA's

BT Data Centre Services

Virtual Data Centre Services – business benefits

![BT Data Centre Services]
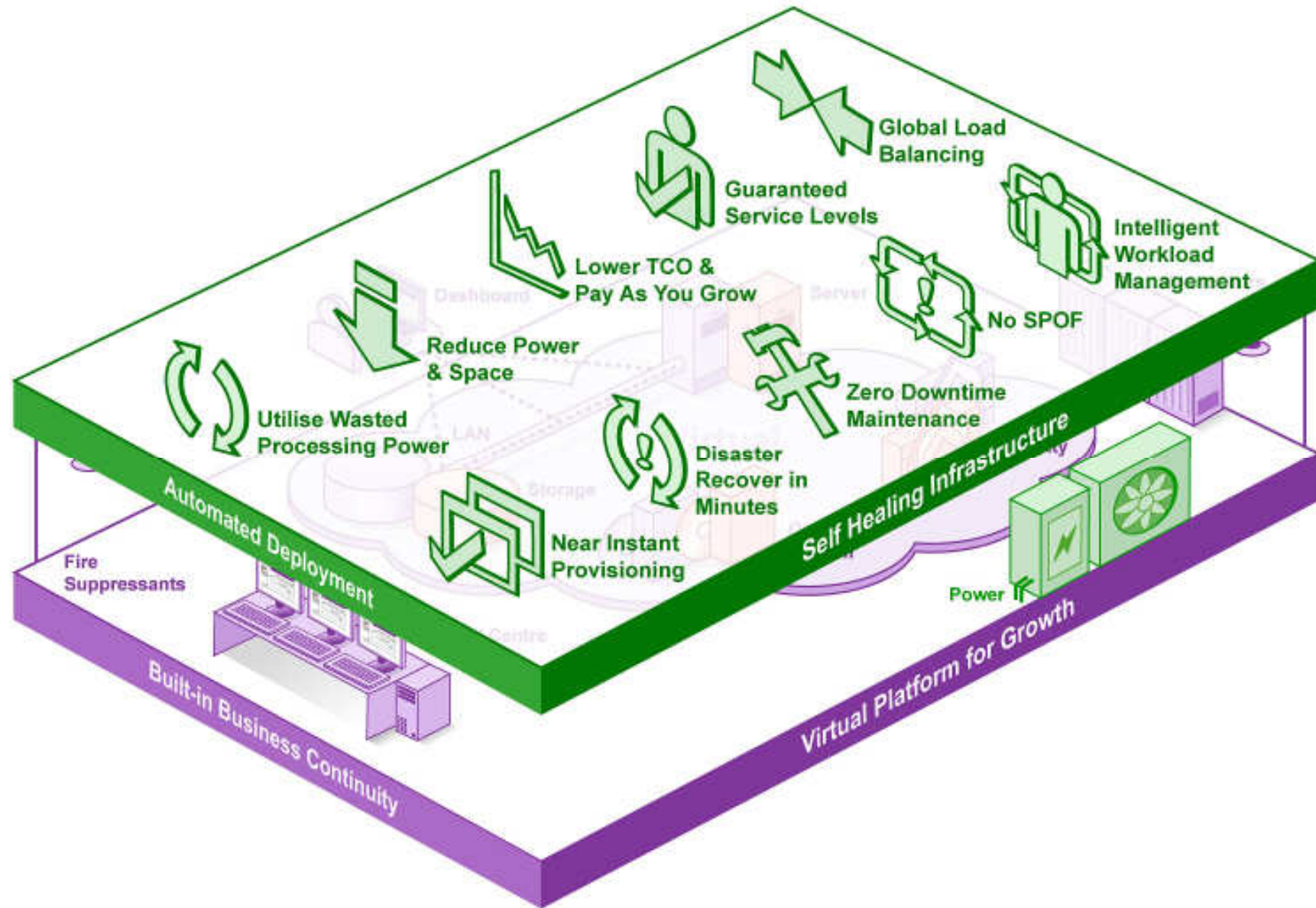
In complete transparency

- **The Virtual Business Center**
  - Management and monitoring of all your requests, including room operations
  - Review of the contractual information
  - Reports on the platform's key indicators
  - Document base (documentation, monthly reports, minutes from meetings…)
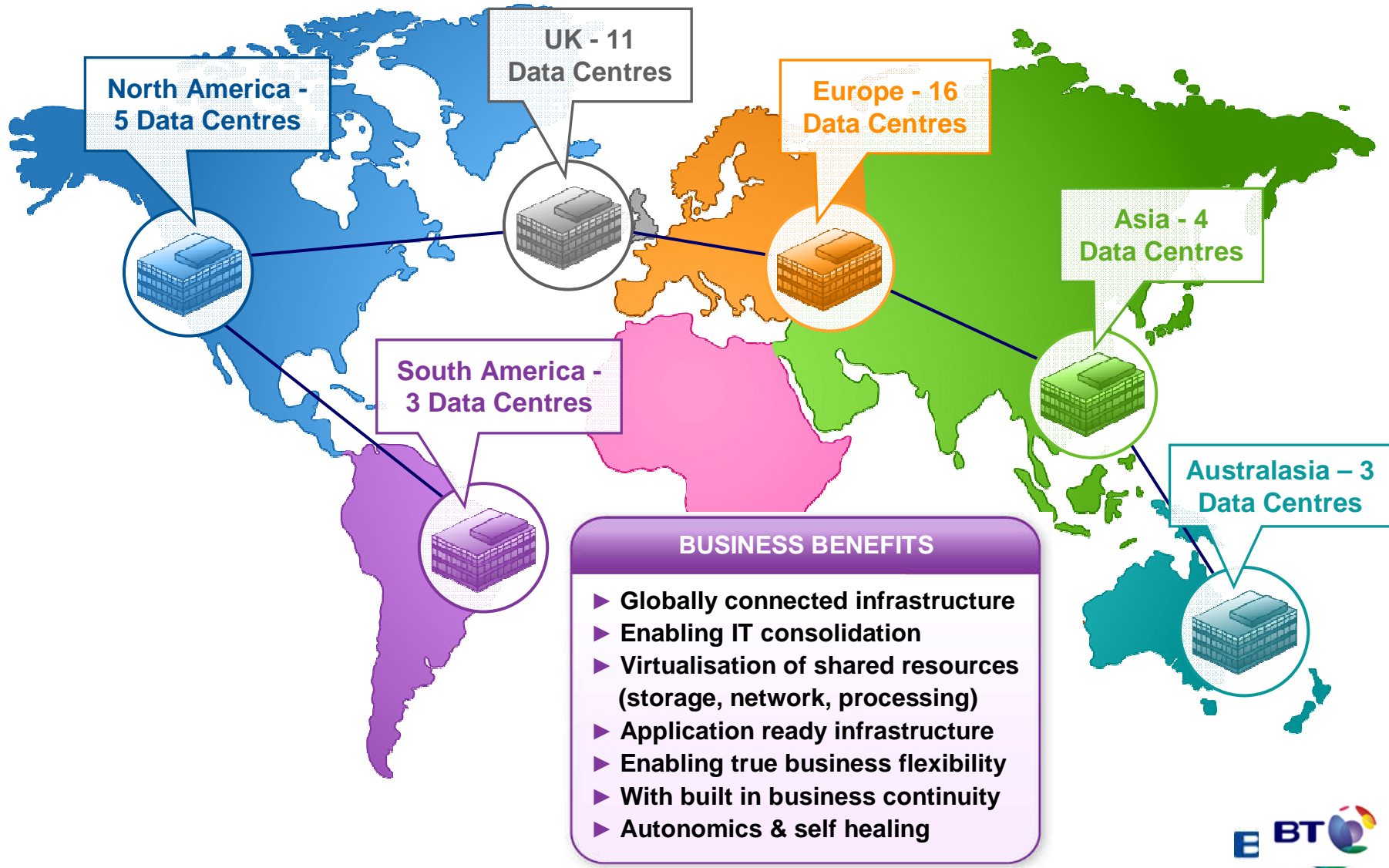
- **Platform & service documentation**
  - Asset management & monitoring
  - Documentation on all major changes to the platform and services
  - Regularly updated procedures
  - Monthly platform reports
  - Quarterly progress plans
  - Monitoring & updating of the reversibility plan

- **Service governance & changes**
  - Monthly steering committee
  - Quarterly strategic committee

BT Globally Connecting its Data Centres

North America - 5 Data Centres

UK - 11 Data Centres

Europe - 16 Data Centres

Asia - 4 Data Centres

South America - 3 Data Centres

Australasia – 3 Data Centres

BUSINESS BENEFITS

► Globally connected infrastructure
► Enabling IT consolidation
► Virtualisation of shared resources (storage, network, processing)
► Application ready infrastructure
► Enabling true business flexibility
► With built in business continuity
► Autonomics & self healing

E BT

BT Data Centre Services

The BT Virtual Datacenter (VDC)

- – End to end virtualisation of the data centre

- – Flexible virtual hosting solution for Windows/Linux/Solaris…..

- – Scalable on demand storage, compute and network

- – A Commodity based infrastructure

- – Rapid deployment timescales

- – Pay-as-you grow (up or down) pricing model

- – Automation of management/support facilities

- – International rollout across UK, Europe and ROW

"The ideal virtual data centre dynamically balances workloads across a computing [environment] and redistributes hardware resources in response to changing needs. The challenge is to implement these load-balancing and resource-balancing features so they are transparent to client applications"

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The Technical and Commercial Challenges

- Treat Network, Compute and Storage as commodity items
- Abstract OS/Application from hardware
- Provide a centralised management environment
- Use autonomics and automation to provide low service costs
- Cease seeing datacentre, CPU, storage, networks as separate
- Creating a billing and reporting engine to allow this to happen
- Creating an ITIL service model to support the VDC
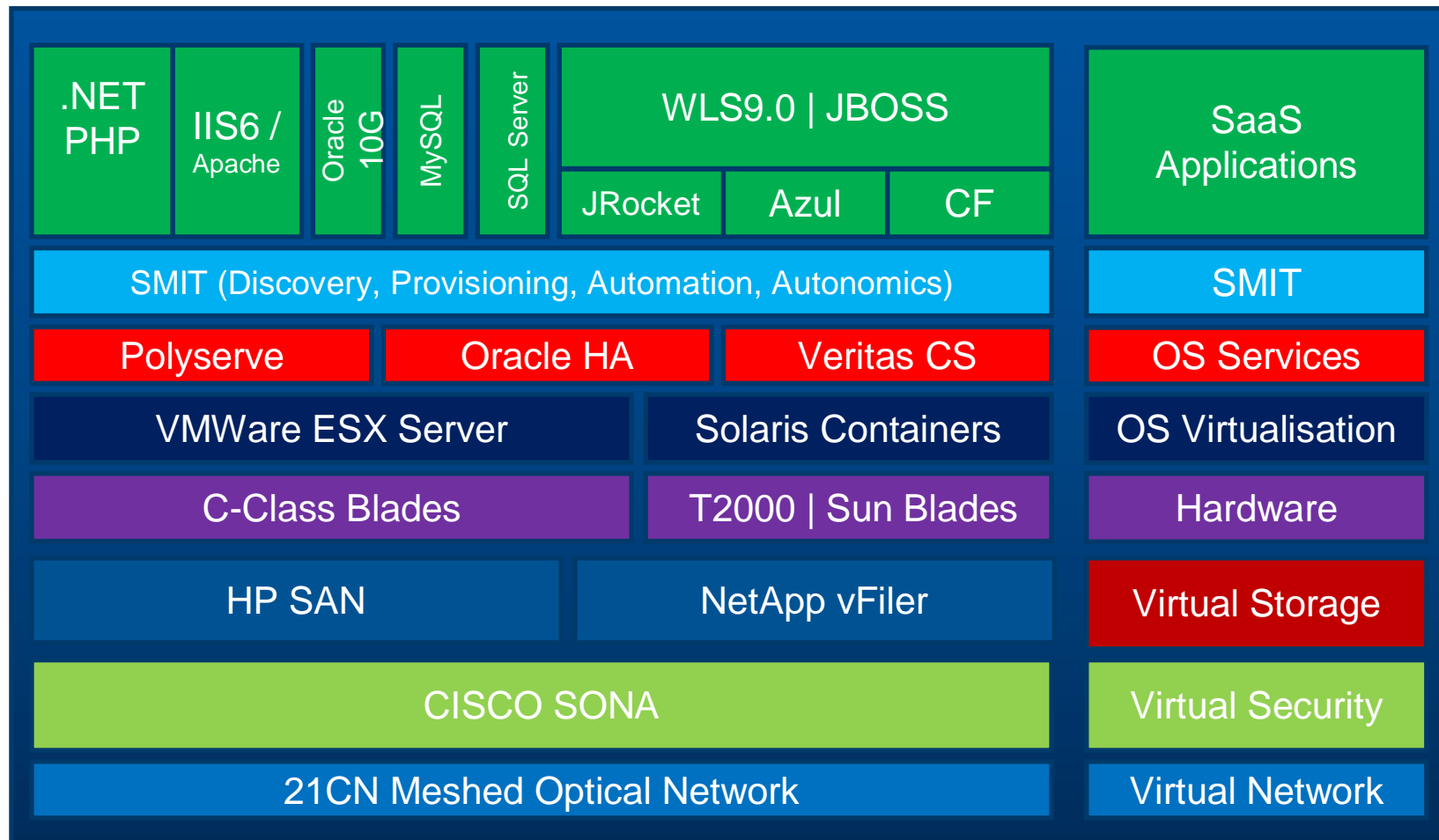- Total end to end virtualisation, starting at the bottom and working up

BT Data Centre Services

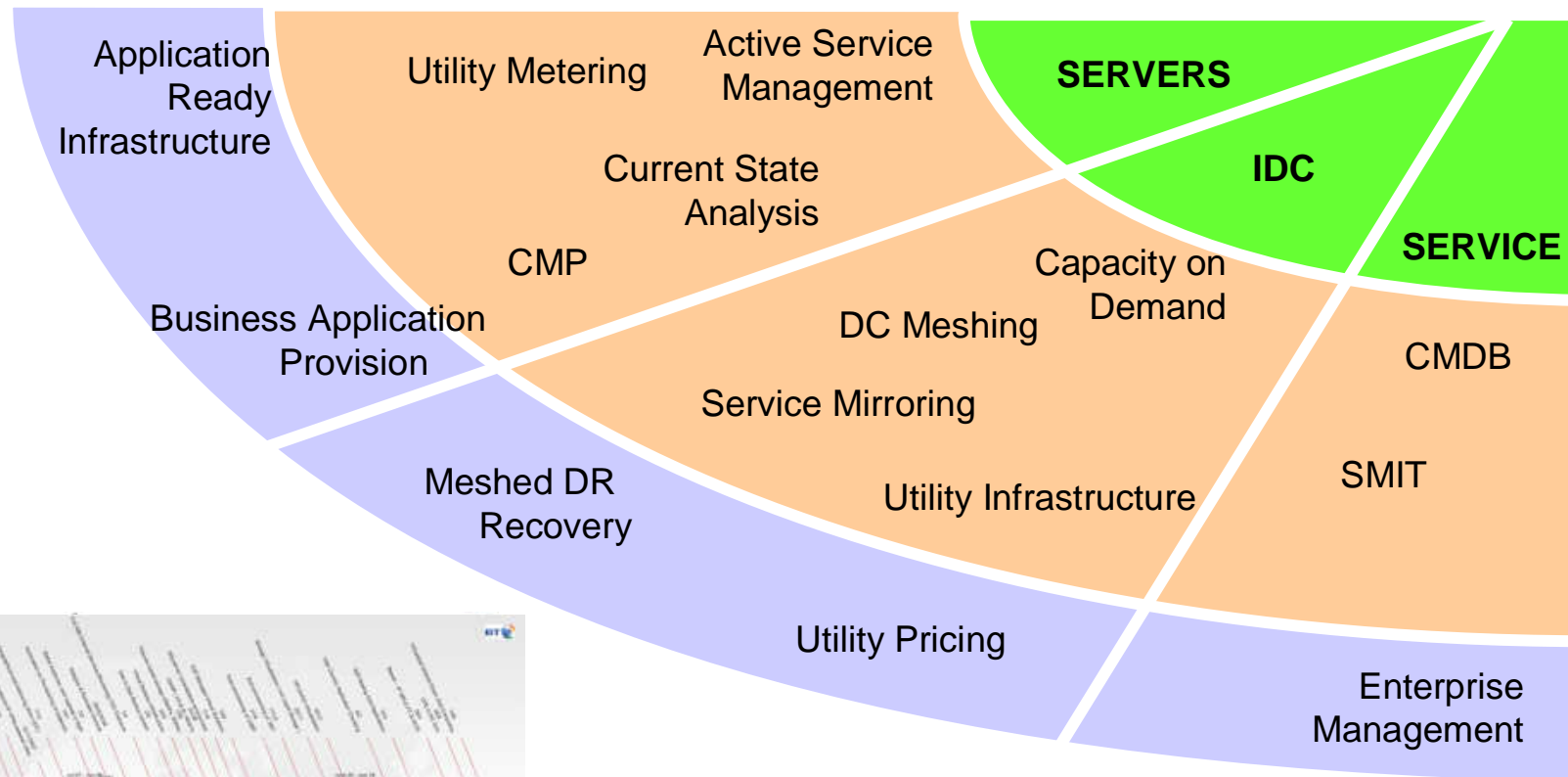Virtual Data Centre Services – self healing, automated with built in business continuity

Virtual Data Centre Mesh
across BT's high speed global network enabling applications and services to move between meshed data centres with virtual load balancing

Virtual Load Balancing

Virtual

Virtual

Virtual

Virtual

Virtual

Virtual

BT
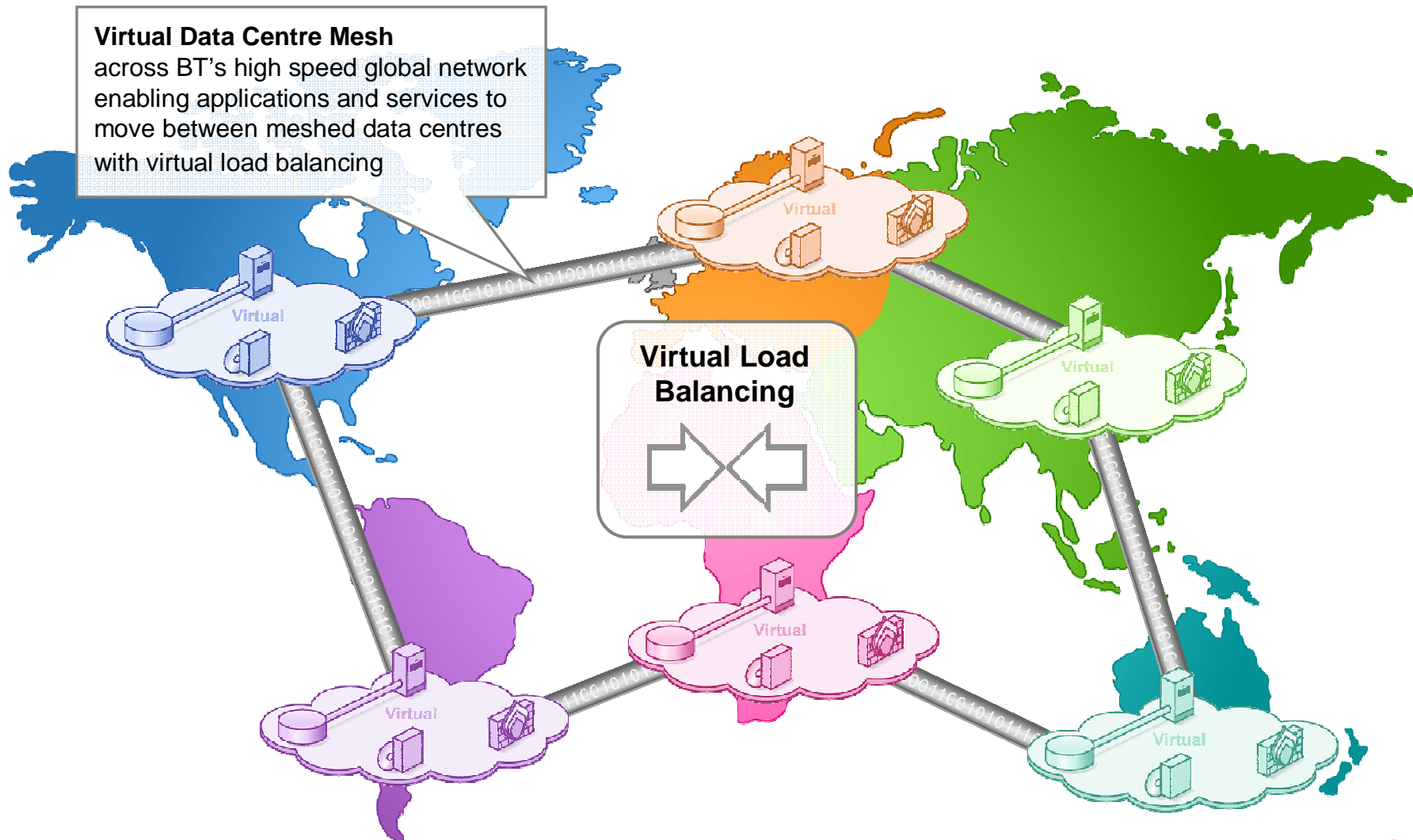
Network – 21st Century Network (21CN)

Scotland

England

21CN Meshed
Optical Network

Wales

Ireland
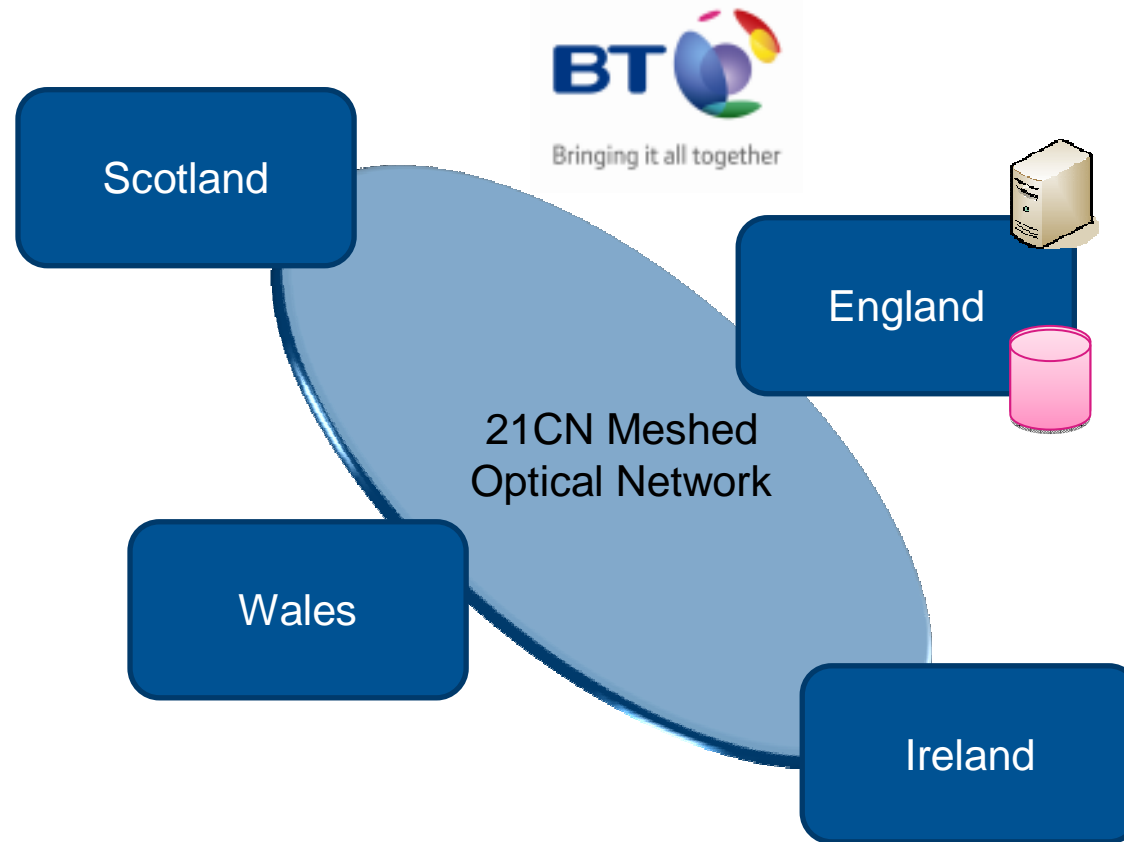
The Virtual Datacenter Architecture

| .NET PHP | IIS6 / Apache | Oracle 10G | MySQL | SQL Server | WLS9.0 \| JBOSS | | | SaaS Applications |
| | | | | | JRocket | Azul | CF | |

| SMIT (Discovery, Provisioning, Automation, Autonomics) | SMIT |

| Polyserve | Oracle HA | Veritas CS | OS Services |

| VMWare ESX Server | Solaris Containers | OS Virtualisation |

| C-Class Blades | T2000 \| Sun Blades | Hardware |

| HP SAN | NetApp vFiler | Virtual Storage |

| CISCO SONA | Virtual Security |

| 21CN Meshed Optical Network | Virtual Network |

Virtual Data Centre Architecture Roadmap
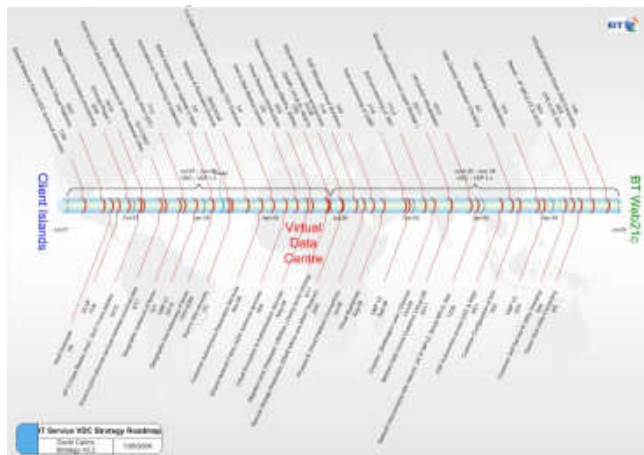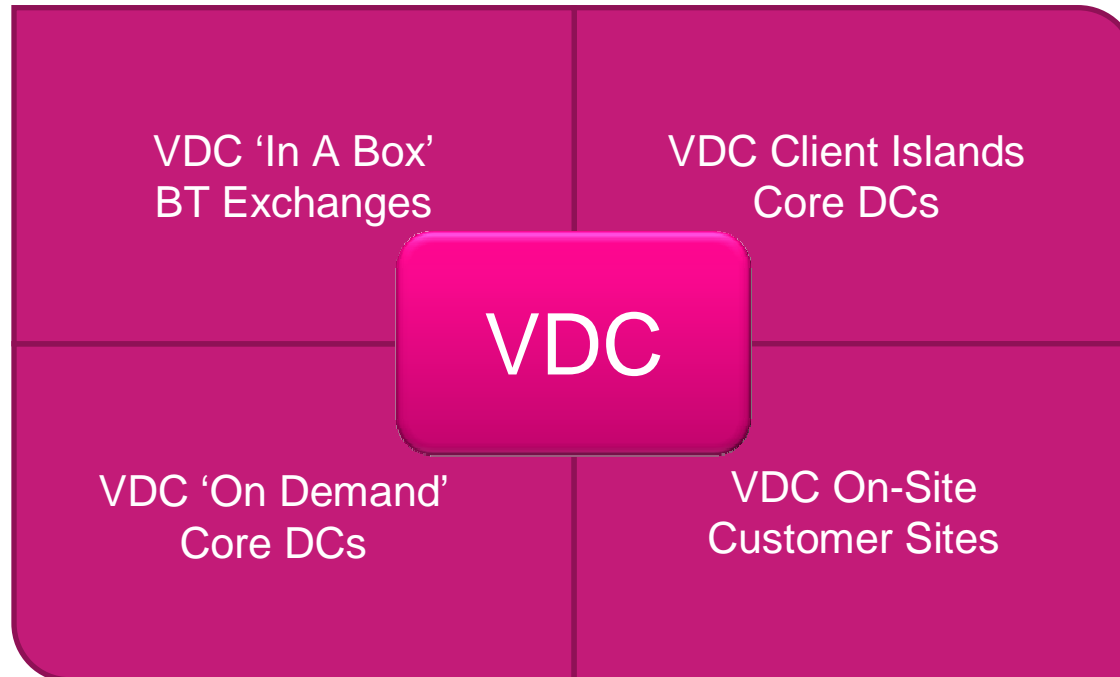
# The Before picture
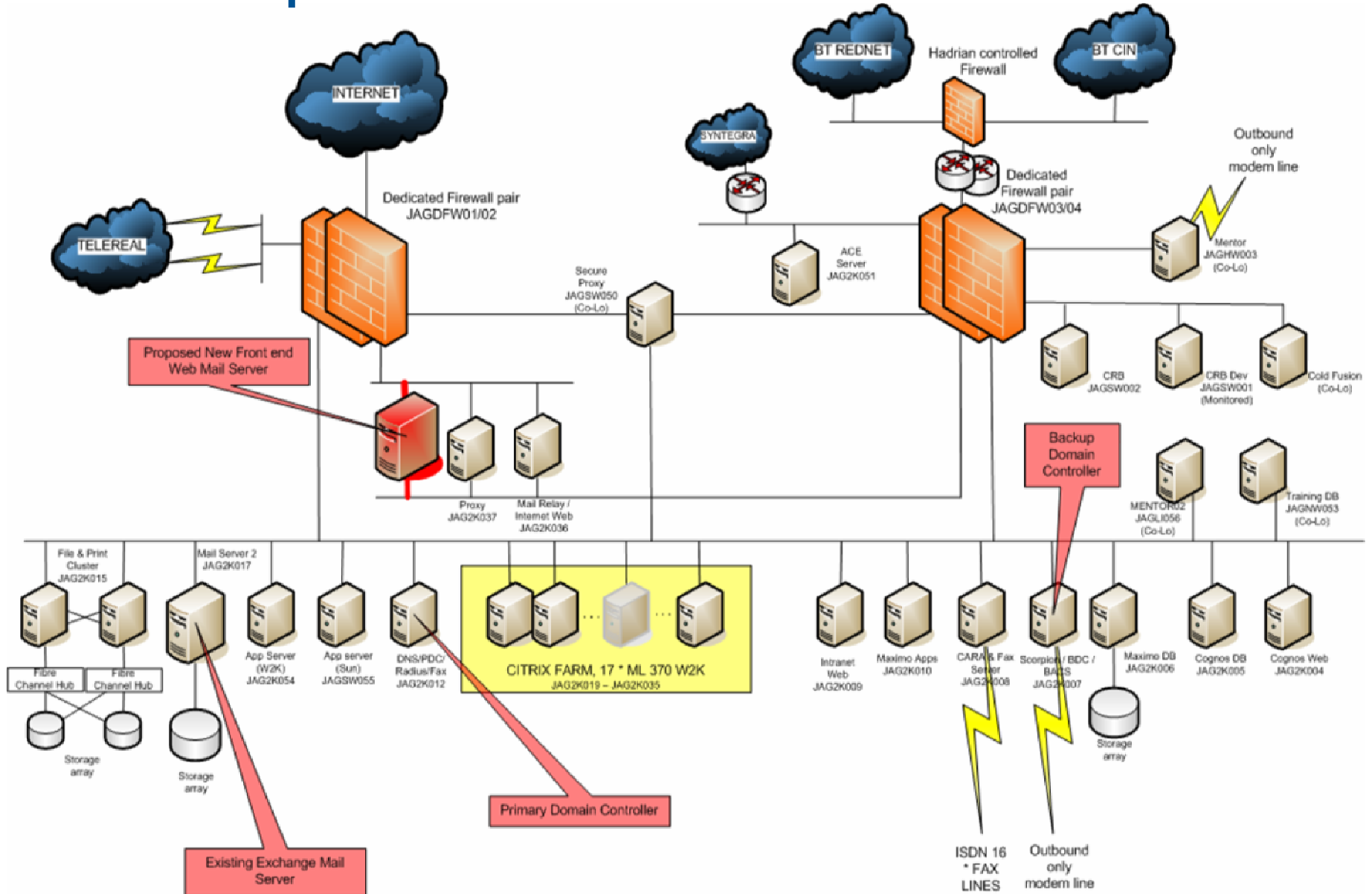
The After picture
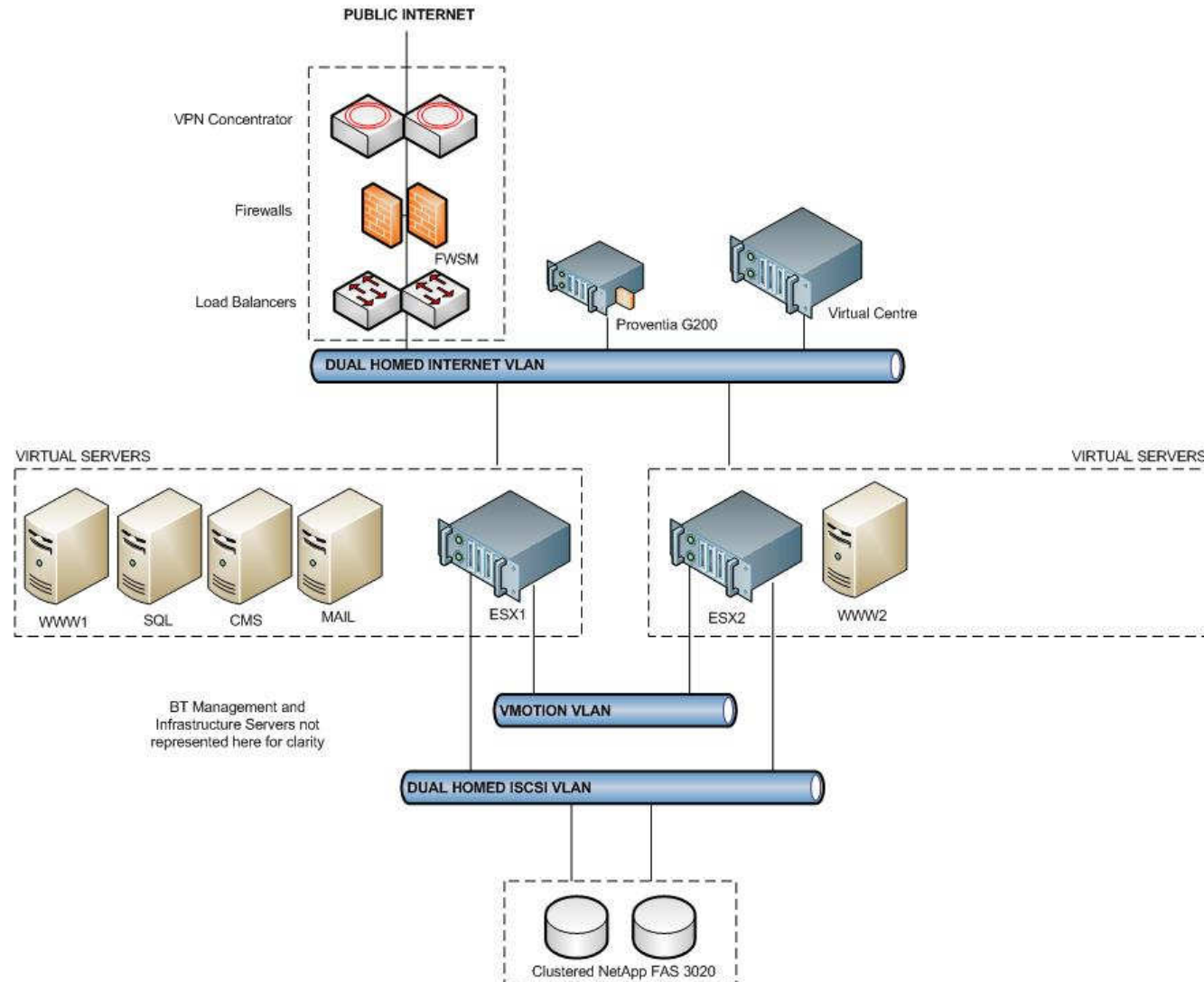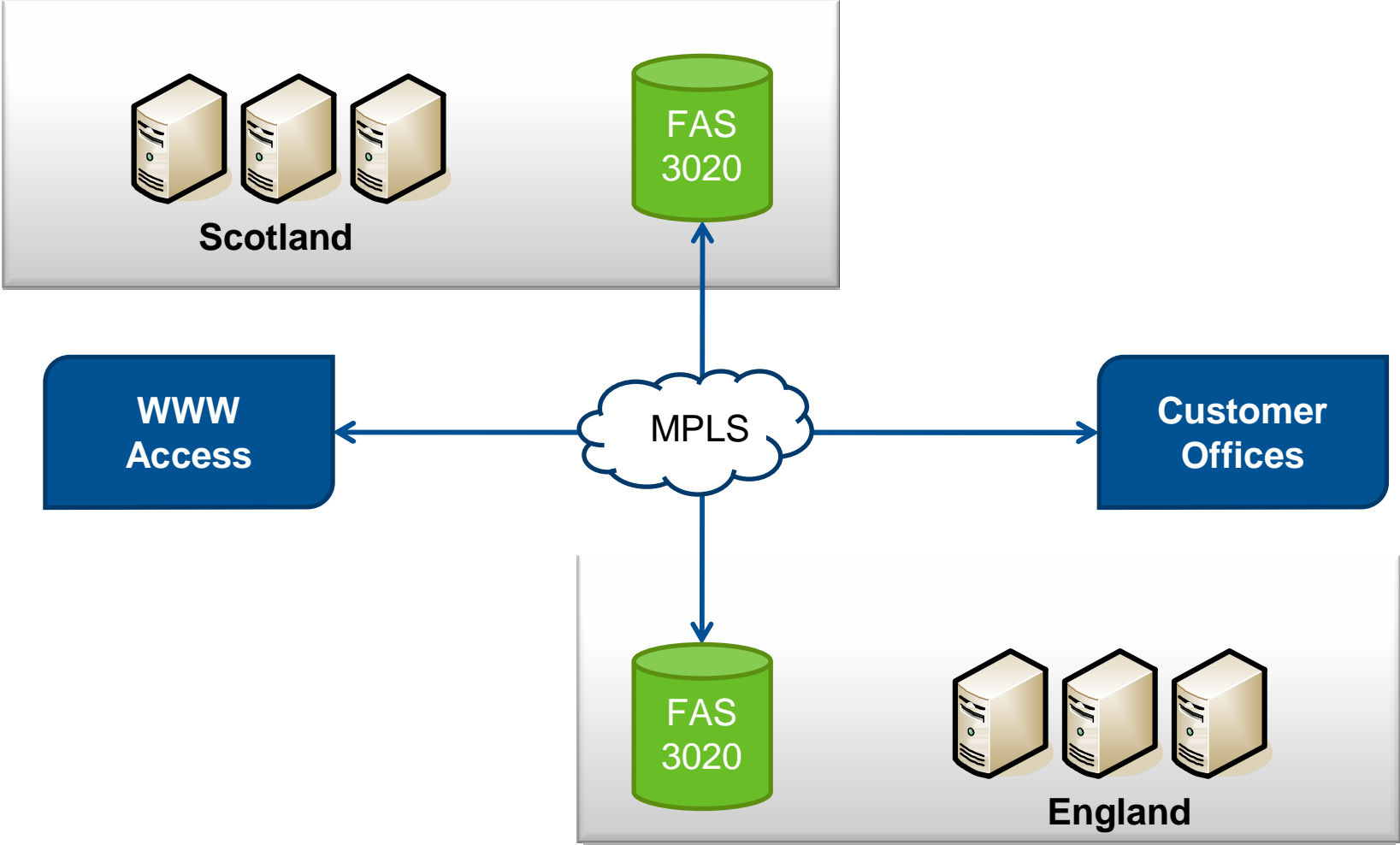
Key Learning Points

Education of Customers

> Lack of Understanding

> Belief of Understanding

> Belief in the solution

> A demonstration speaks volumes as do references

> Delivery Education throughout the enterprise

Key Learning Points

Planning and Implementation

> Physical to Virtual is NOT a magic bullet

> Thoroughly Audit any platform before migration

> Test any migration before carrying out in anger

> Ensure customer understands the capabilities

> Do not assume the customer knows what they have

> Network path testing & disablement
> of DRS/HA/Vmotion if possible during
> migration

> CMDB is key !
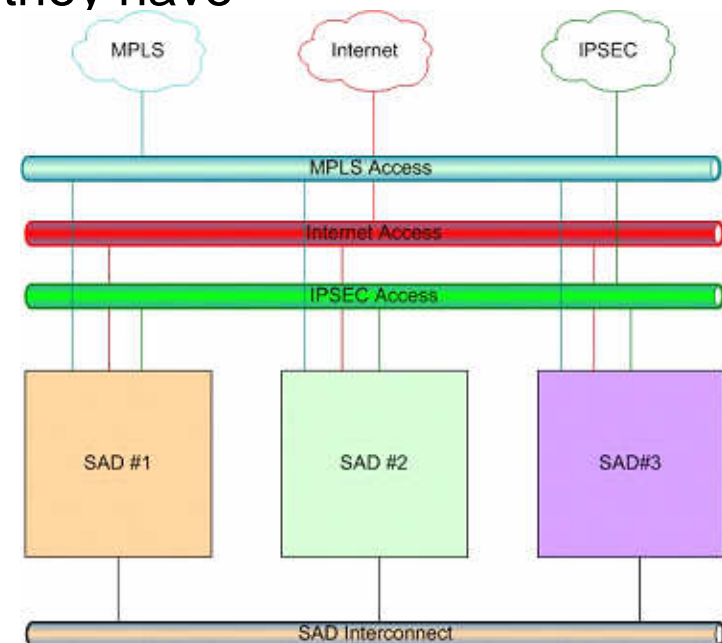
Key Learning Points

Ongoing Management of Customer

> Ensure customer understands limitations of technology

> Provide metrics that show your customer their benefits

> Drive consolidation throughout the enterprise

> Constant technology evolution ....
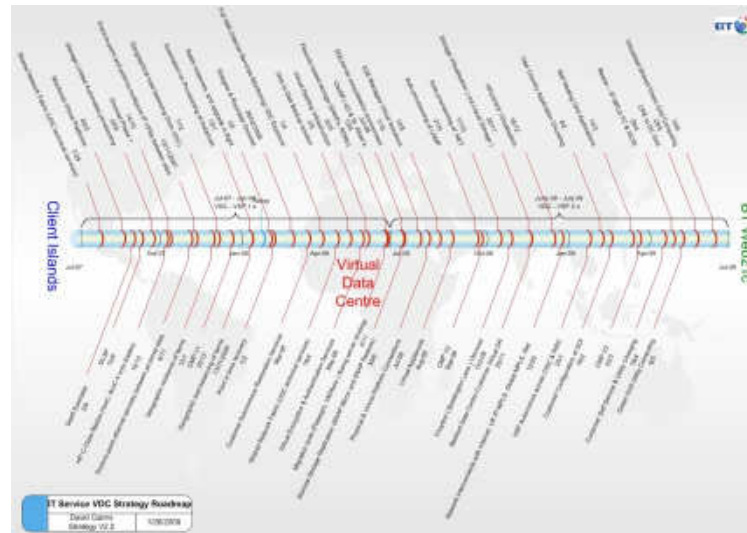
Summary

> Virtualising a layer in a DC is "off the shelf"

> BT is pioneering the VDC concept from end to end

> Investment in Networks through to three A's
>   Automation – Autonomics - Autonomy

> BT's VDC is rolling out throughout US, Europe and Asia

> Case Study material online here

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BT Data Centre Services

Thank you

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