

The background of the slide is a blue gradient with a complex network diagram. The diagram consists of numerous small, light blue circular nodes connected by thin, dark blue lines, creating a web-like structure that fills the entire frame. The nodes and lines vary in opacity and brightness, giving a sense of depth and connectivity.

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Initial**

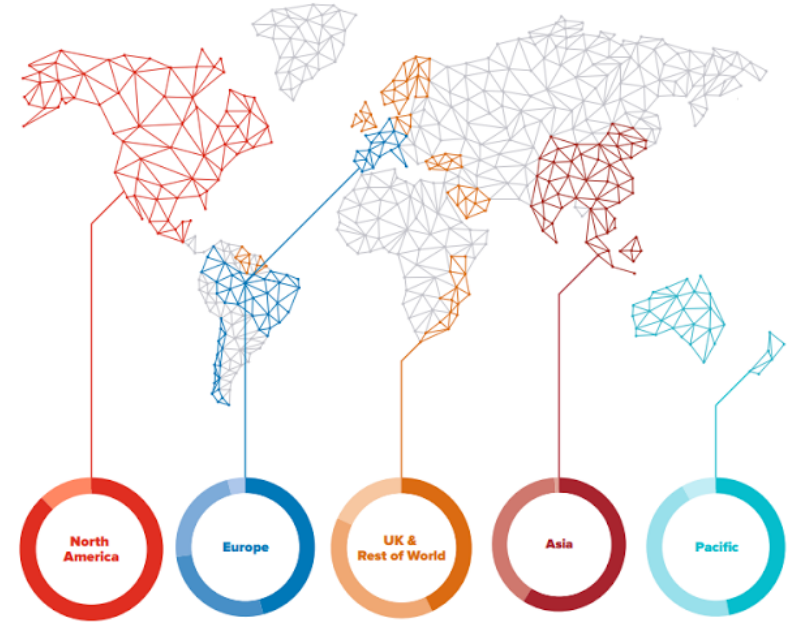
Global Deployment of SD-WAN

Mike Howell • October 2017

Rentokil Initial

Rentokil Initial is a member of the FTSE100 and is an international pest control and hygiene services company.

- 35,000+ employees
- 1800 local services teams
- 70+ countries
- 650+ offices
- 4 regional data centres in London, Singapore, Sydney and Philadelphia



“Over the next three years we see significant opportunities to drive revenues, reduce costs and help better serve and retain our customers through the deployment of digital technologies.”

Rentokil Initial tech at a glance

Internet of Things

Winners of 2016 UK BCS IT Industry Award for
Best Internet of Things Project

Google

35,000 Google Apps accounts globally, and
adoption of Google Chromebooks underway.
Replatforming business apps onto Google Cloud

SD-WAN

Driving cloud-enabled WAN with SD-WAN

Hyper Converged

Deployment of Hyper Converged infrastructure in all our global data centres

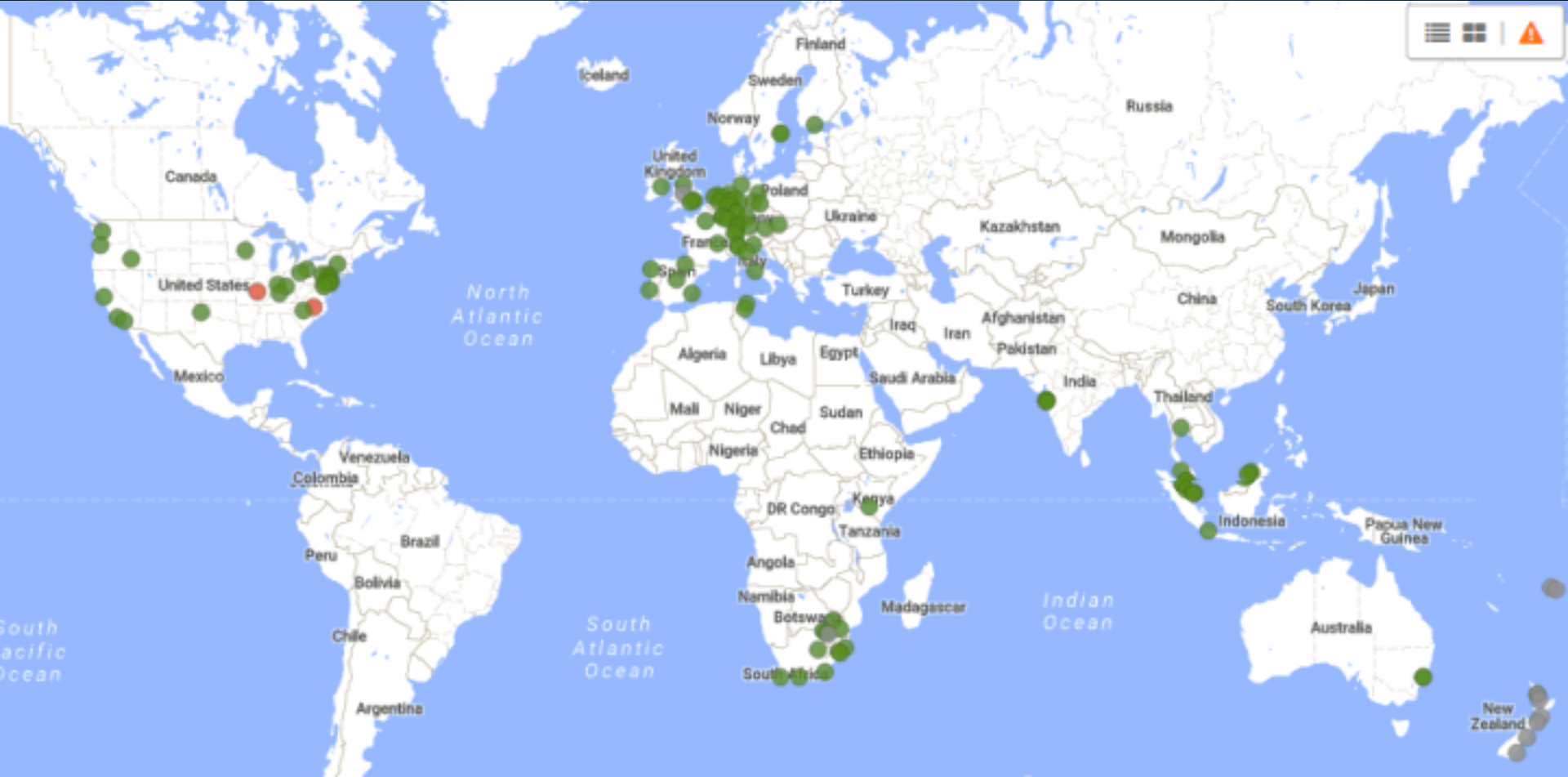


Current Global SD-WAN Deployment

Using **VeloCloud Cloud-Delivered SD-WAN** we have currently delivered SD-WAN connectivity to the following:

- **5 Continents**
 - North America, Europe, Africa, Asia, Australia
- **30 Countries**
 - Austria, Australia, Brunei, Canada, Switzerland, Germany, Spain, Finland, Fiji, France, Indonesia, Ireland, India, Italy, India, Kenya, Luxembourg, Malaysia, Netherlands, New Zealand, Portugal, Sweden, Singapore, Thailand, Tunisia, Singapore, UK, USA, Singapore, South Africa
- **4 Regional Data Centres**
 - London, Singapore, Sydney and Philadelphia
- **120+ Sites**
 - *Too many to list!*

Current Global SD-WAN Deployment



Business Challenges

Provide low latency high bandwidth connectivity to cloud-delivered services and applications

Deliver scalable and future-proof network capability

Greater business agility to provide secure connectivity quickly to anywhere in the world

Simplify the network, streamline processes and provide increased bandwidth

Deliver better value for money



SD  **WAN**

velo  **cloud**

Benefits of SD-WAN

Cost	<ul style="list-style-type: none">● Cost effective ISP circuits replacing MPLS for less critical sites● Cost effective ISP circuits complementing MPLS to offload internet traffic for more critical sites● Cost effective x86 hardware to provide routing and firewalling at branch level
Security	<ul style="list-style-type: none">● End to end encryption of all data traversing the WAN, whether using MPLS or ISP overlay, data is fully encrypted and secured in transit● Built in firewall at every branch; implementing security boundary as close to the user as possible● Ability to send traffic to web-based security solutions for scanning
Agility	<ul style="list-style-type: none">● The ability to provision a branch within minutes using a 4G dongle● Reduced lead times with ISP circuits vs lengthy MPLS provisioning
Performance	<ul style="list-style-type: none">● On average a 5:1 increase in ISP bandwidth compared with same cost MPLS circuit
Visibility	<ul style="list-style-type: none">● Ability to view a complete application breakdown of all traffic flows across the SD-WAN compared with our existing archaic network monitoring

The background of the slide is a blue gradient with a complex network diagram. The diagram consists of numerous small, light blue circular nodes connected by thin, dark blue lines. Some nodes are larger and more prominent, acting as hubs. The overall structure is a dense, interconnected web of lines and nodes, suggesting a global or multi-organizational network.

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**Global Deployment
Service Considerations**

Supply of SD-WAN Services

- How should you consume SD-WAN?
 - As a service (aaS)?
 - Through a channel partner?
 - Through a MSP?
- Global or regional supplier of Hardware?
- Does provider have global reach and licensing to operate in all business regions?
- RMA hardware replacement, how quickly can the business function in an outage?



Service Considerations

Support

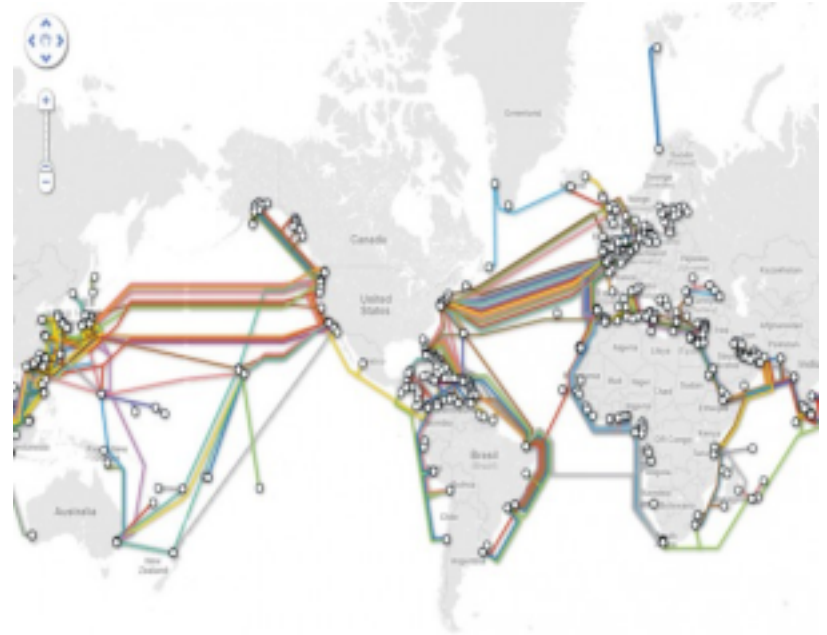
- How should you consume SD-WAN?
 - As a service (aaS)?
 - Through a channel partner?
 - Through a MSP?
- Should you outsource configuration or manage in house?
- How will support be managed on a global scale?
- Is your support supplier 24/7 or do you need support in each region?



Service Considerations

ISP Suppliers

- Single Global Supplier
 - Easy to manage
 - Costly
 - Issues with delivery in remote sites
- Regional / Country Supplier
 - Cheaper
 - Large overheads in management
 - Language issue dealing with in country providers
- Hybrid

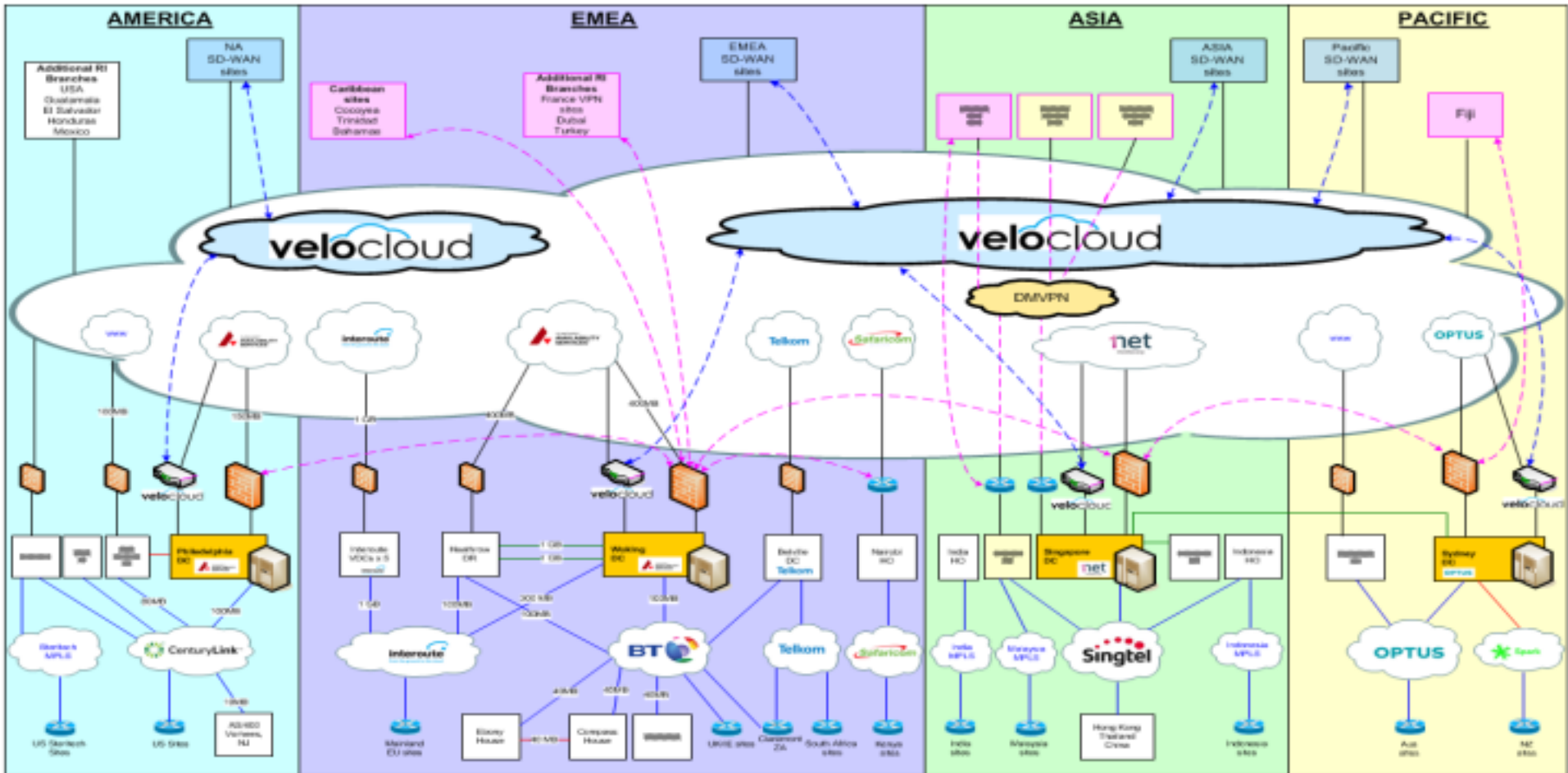


The background features a complex network diagram with various nodes and connecting lines in shades of blue and purple, set against a dark blue gradient.

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**Global Deployment
Technical Considerations**

SD-WAN Architecture - Easy?!



Design Considerations

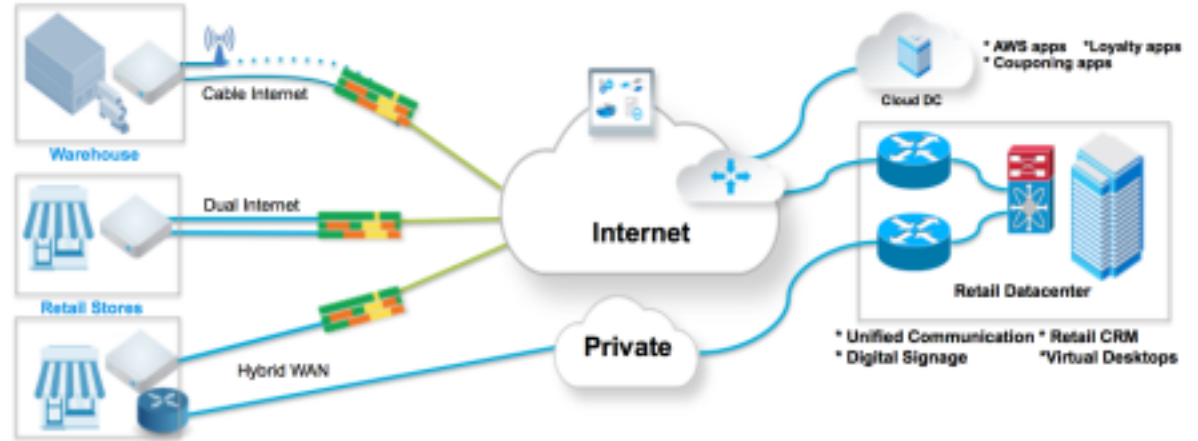
IP Addressing

- Set a standard and enforce it
- Avoid using NAT or VRFs unless necessary
- Use well known standards so they are easy to enforce (i.e. country dialing codes)
- Route summarisation helps ease transition in a hybrid environment

Design Considerations

Routing

- Carefully design routing flows in a hybrid MPLS/SD-WAN environment, factors to consider

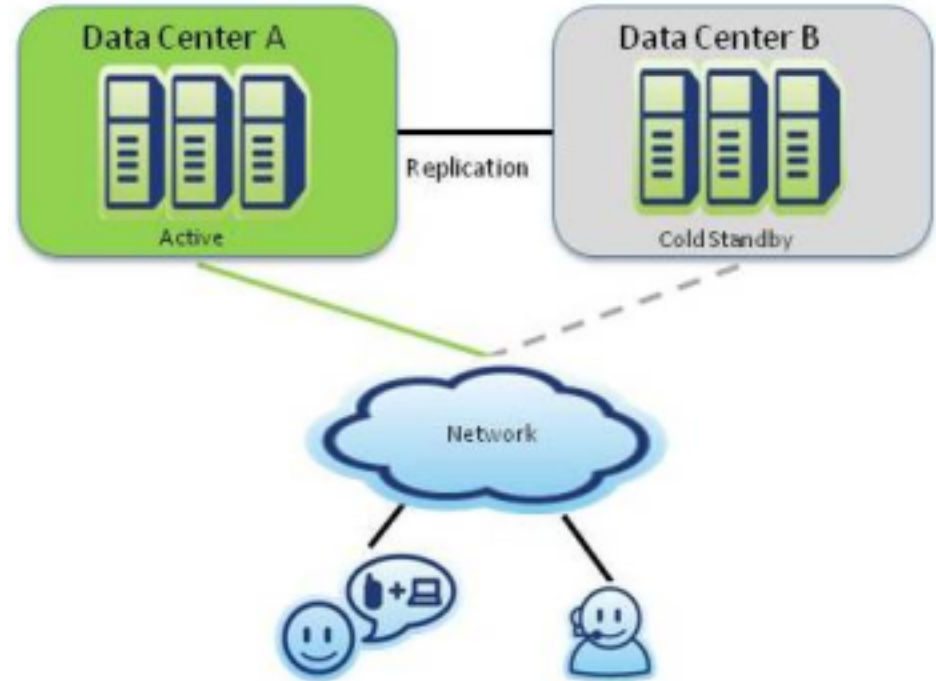


- Avoid inefficient routing in a hybrid environment:
- Static vs Dynamic = Control vs Overhead

Design Considerations

Disaster Recovery

- Ensure you have considered routing to a DR facility in your SD-WAN network design
- Decide whether failover to DR facility should be automatic or manual



Design Considerations

Security

- End to End encryption in SD-WAN. Does this cause issues? (i.e. WAN Optimisation)
- Should you treat HTTP/HTTPS any differently to other protocols.
- Are there any specific traffic flows which are required by law to break out from specific locations?



Design Considerations

Web Filtering

- How can you enforce web-filtering at the edge?
- Can SD-WAN Application Recognition replacing traditional Web Filtering?



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**Global Deployment
Deployment
Considerations**

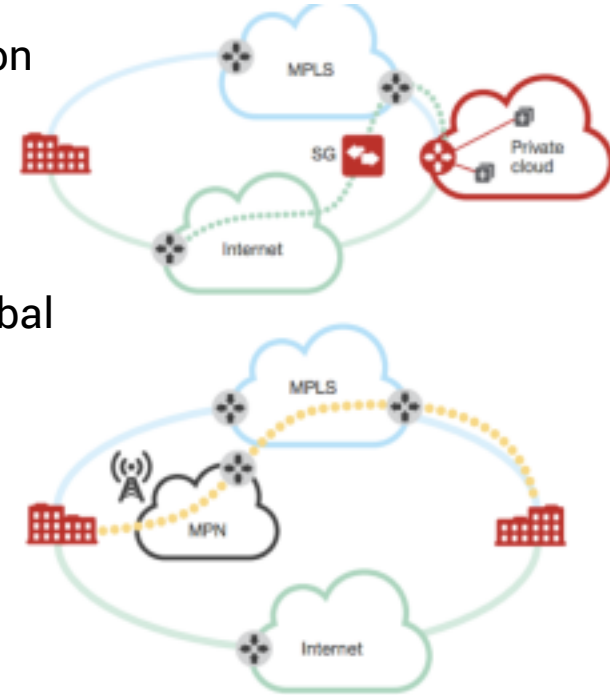
Deployment

- **Proof of Concept**

- Ensure it can run in parallel to your current production network
- Ensure you assess the deployment against a measurable success criteria
- Ensure it spans multiple regions to truly test the Global reach

- **Global Deployment**

- Establish connectivity to your hub sites (Data Centres)
- Plan country / regional deployments so as not to impact any branch to branch traffic
- Pay close attention to current WAN contracts to avoid incurring heavy cease chargers



Conclusions

- Not all SD-WAN solutions are created equal. Due diligence is key, ensure you outline your requirements in advance and assess vendors based on this
- Defining the service around supply and support is paramount in a global deployment, there may not be a one size fits all approach. If there is it may come at a costly premium
- Architecting a global hybrid network requires planning, trying to do this on the fly will result in network inefficiencies and outages.

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Future Network Architecture

A hybrid approach to network connectivity to enable cloud platforms

Bring Internet connectivity closer to the end user to improve performance

Reduce reliance on MPLS networks and move towards direct Internet connectivity

Keep up with increasing demands on bandwidth from use of cloud and video calls

Improve connectivity between regions to enable global support collaboration

Deliver consistent wireless network experience

Reduce supplier complexity and cost

Business benefits

Improved access to applications - data centre and cloud

Improved provisioning time allowing greater business agility

Consistent service provided by a hybrid infrastructure

Improved resilience and availability

Better value for money

Considerations

Cloud-based applications can often mean single instances globally, which may increase distance between users and hosting

Application, hosting and network architecture must be considered in detail to avoid performance issues