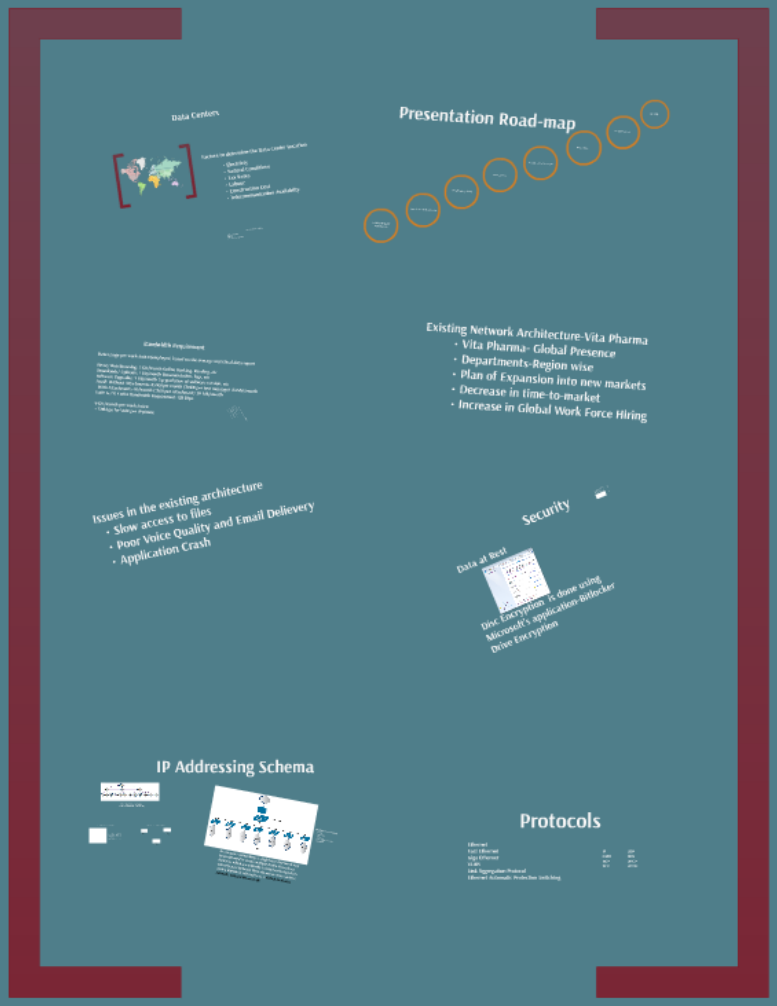

NETWORK REDESIGN- VITA PHARMA

Aditya Rajmane
Ishwarya RajendraBabu
Mansi Patel
Samira Sawant
Janhavi Bagwe
Utkarsha Shetye
Rohan Deshmukh

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NETV
VITA

Data Centers

Factors to determine the Data Center Location

- Electricity
- Natural Conditions
- Tax Rates
- Labour
- Construction Cost
- Telecommunication Availability

Presentation Road-map

Bandwidth Requirement

Data Usage per workstation employee) based on the average statistical data report

Heavy Web Browsing: 2 GB/month Online Banking, Reading, etc.
Downloads / Uploads: 1 GB/month Documentation, Mgs, etc
Software Upgrades: 5 GB/month Up-gradation of software version, etc
Email: In/Send Attachments -40MB/ per month (30kB per text message) 720MB/month
Web Attachments: IN/month-2MB per attachment) 50 MB/month
VoIP: G.711 Codec Bandwidth Requirement 128 Kbps

5 GB/month per workstation
• 128Kbps for VoIP per IP phone

Existing Network Architecture-Vita Pharma

- Vita Pharma- Global Presence
- Departments-Region wise
- Plan of Expansion into new markets
- Decrease in time-to-market
- Increase in Global Work Force Hiring

Issues in the existing architecture

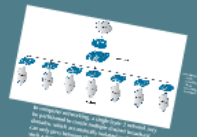
- Slow access to files
- Poor Voice Quality and Email Delievery
- Application Crash

Security

Data at Rest

Disc Encryption is done using Microsoft's application-Bitlocker Drive Encryption

IP Addressing Schema



Protocols

Ethernet
Fast Ethernet
Giga Ethernet
VLAN
Link Aggregation Protocol
Ethernet Automatic Protection Switching

IP
OSPF
RIP
BGP
TCP
HTTPS
DNS
DHCP

Presentation Road-map

Existing Network Architecture

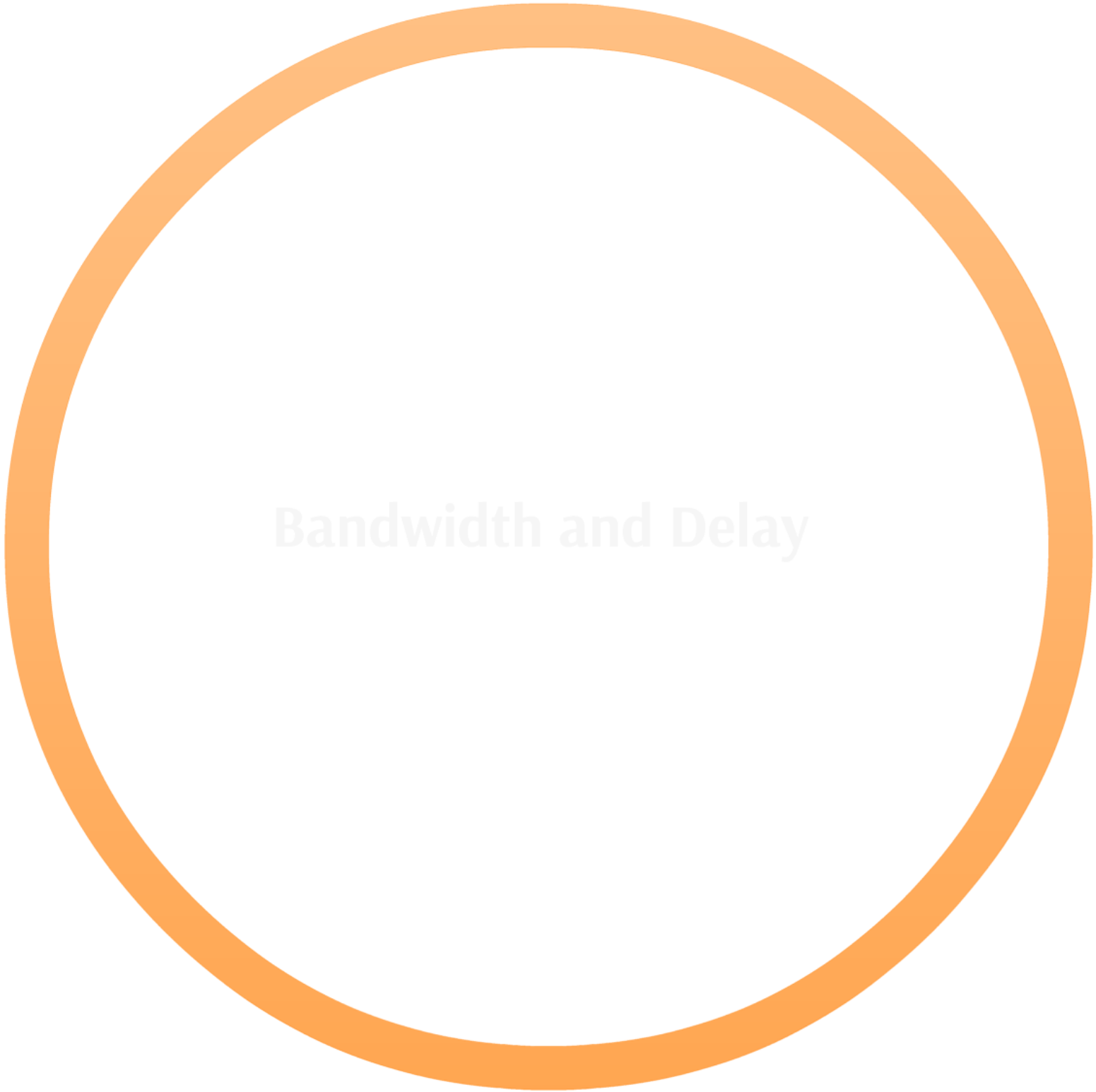
Issues in the network Architecture

IP Addressing Schema

VLANs and VPNs

Protocols and LAN Technologies

Data centers


Bandwidth and Delay

Security

Existing Network Architecture-Vita Pharma

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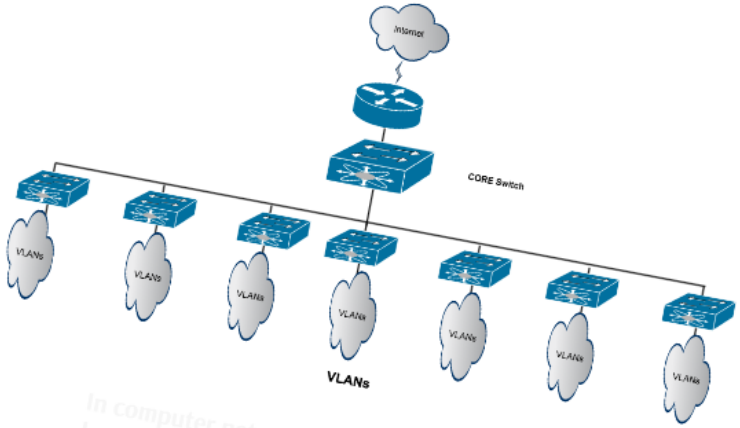
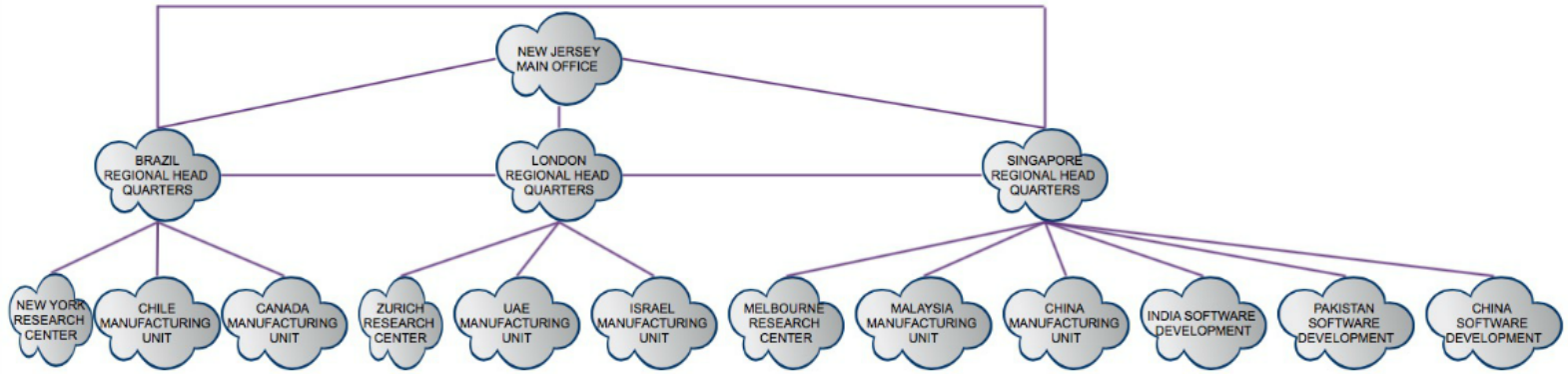
IP Addressing Schema

IP assigned based on regions
High Level Network Connectivity



In computer networking, a single layer-2 network may be partitioned to create multiple distinct broadcast domains, which are mutually isolated so that packets can only pass between them via one or more routers; such a domain is referred to as a **virtual local area network, virtual LAN or VLAN.**

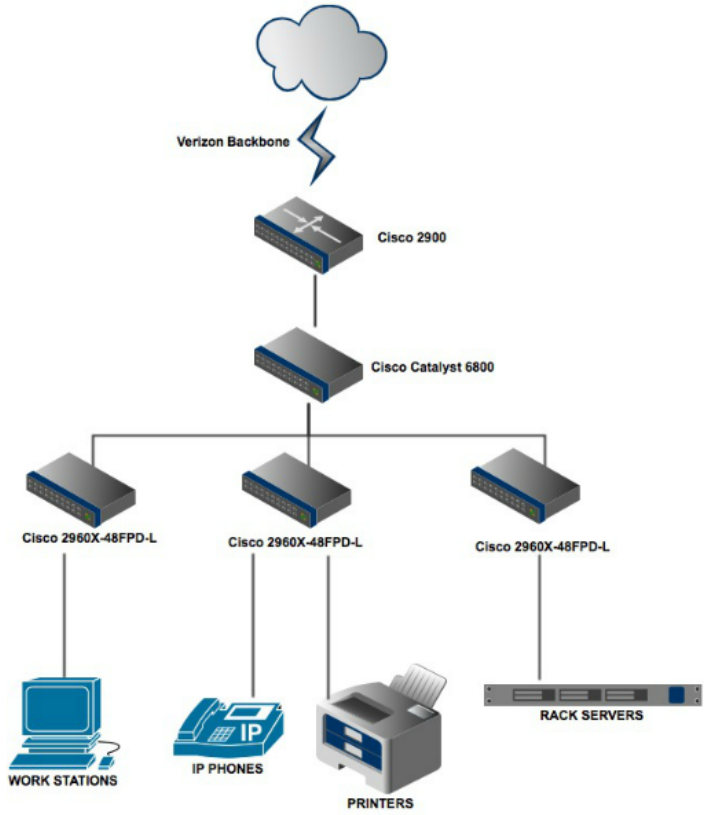
VPN (Virtual Private Network)
- Safety
- Anonymity
- Cheap
- Bandwidth of existing framework



HIGH LEVEL NETWORK CONNECTIVITY

IP assigned based on regions
High Level Network Connectivity

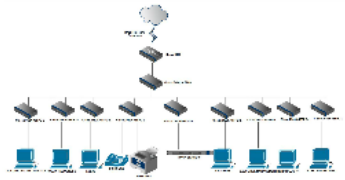
IP SCHEMA FOR MAIN OFFICE-NEW JERSEY



- The main office at the New Brunswick, NJ is allocated the 10.6.0.0 network.
- The network 10.6.0.0/24 is allocated for the workstation subnet.
- The network 10.6.1.0/24 is allocated for the IP phones and printer subnet.
- The network 10.6.2.0/28 is allocated for the server's subnet.

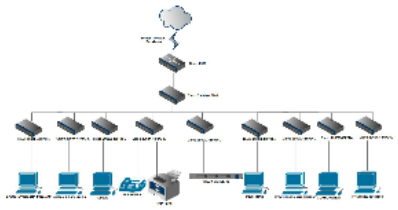
IP Addressing Schema for Regional Headquarters

IP Schema Regional Headquarters Brazil



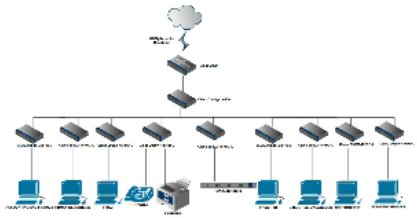
10.1.2.192/26-10.1.2.255/26
10.1.3.0/26 – 10.1.3.63/26
10.1.3.64/26 – 10.1.3.127/26
10.1.3.128/26 – 10.1.3.191/26
10.1.3.192/28 – 10.1.3.207/28

IP Schema for Regional Headquarters - London



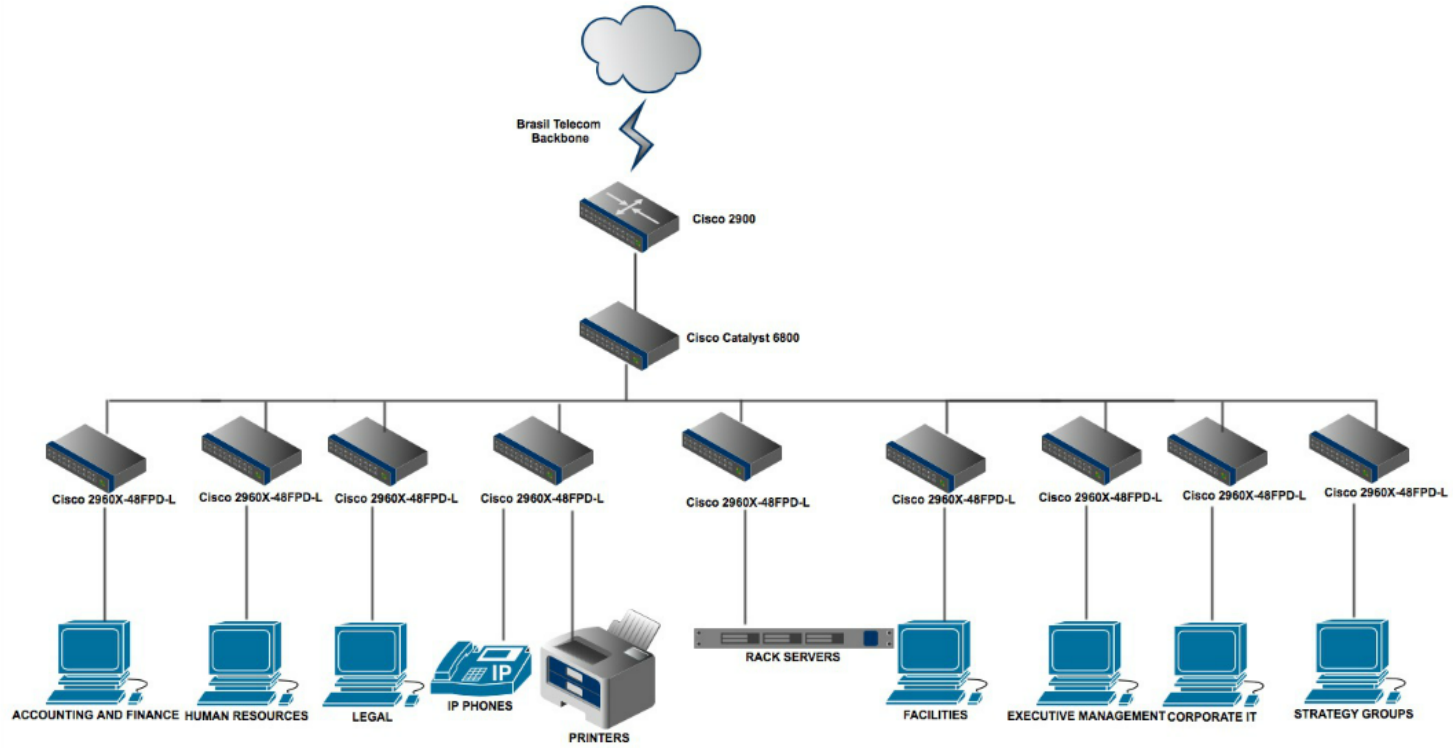
10.2.1.1/23 – 10.2.1.255/23
10.2.2.0/26 – 10.2.2.63/26
10.2.2.64/26 – 10.2.2.127/26
10.2.2.128/26– 10.2.2.191/26
10.2.2.192/26– 10.2.2.255/26
10.2.3.0/26 – 10.2.3.63/26
10.2.3.64/26 – 10.2.3.127/26
10.2.3.128/26– 10.2.3.191/26
10.2.3.192/28– 10.2.3.207/28

IP Schema for Regional Headquarters Singapore



10.3.1.1/23 – 10.3.1.255/23
10.3.2.0/26 – 10.3.2.63/26
10.3.2.64/26 – 10.3.2.127/26
10.3.2.128/26– 10.3.2.191/26
10.3.2.192/26– 10.3.2.255/26
10.3.3.0/26 – 10.3.3.63/26
10.3.3.64/26 – 10.3.3.127/26
10.3.3.128/26 – 0.3.3.191/26
10.3.3.192/28 – 0.3.3.207/28

IP Schema-Regional Headquarters-Brazil



CORPORATE 10.1.2.192/26-10.1.2.255/26

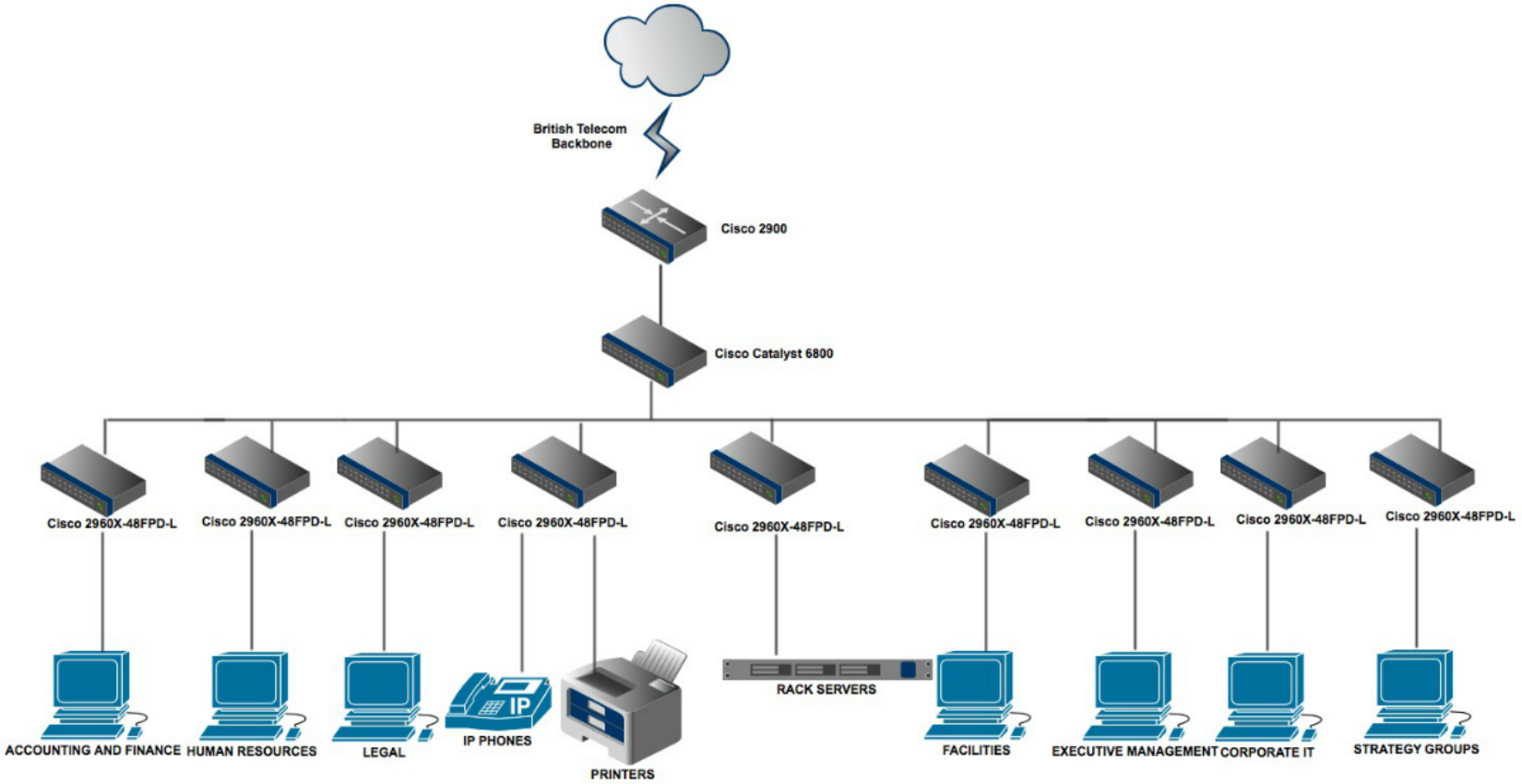
FACILITIES 10.1.3.0/26 – 10.1.3.63/26

EXECUTIVE MANAGEMENT 10.1.3.64/26 – 10.1.3.127/26

STRATEGY GROUPS 10.1.3.128/26 – 10.1.3.191/26

SERVERS 10.1.3.192/28 – 10.1.3.207/28

IP Schema for Regional Headquarters - London



Voice **10.2.1.1/23 – 10.2.1.255/23**

Accounting and Finance **10.2.2.0/26 – 10.2.2.63/26**

Human Resources **10.2.2.64/26 – 10.2.2.127/26**

Legal **10.2.2.128/26– 10.2.2.191/26**

Corporate IT **10.2.2.192/26– 10.2.2.255/26**

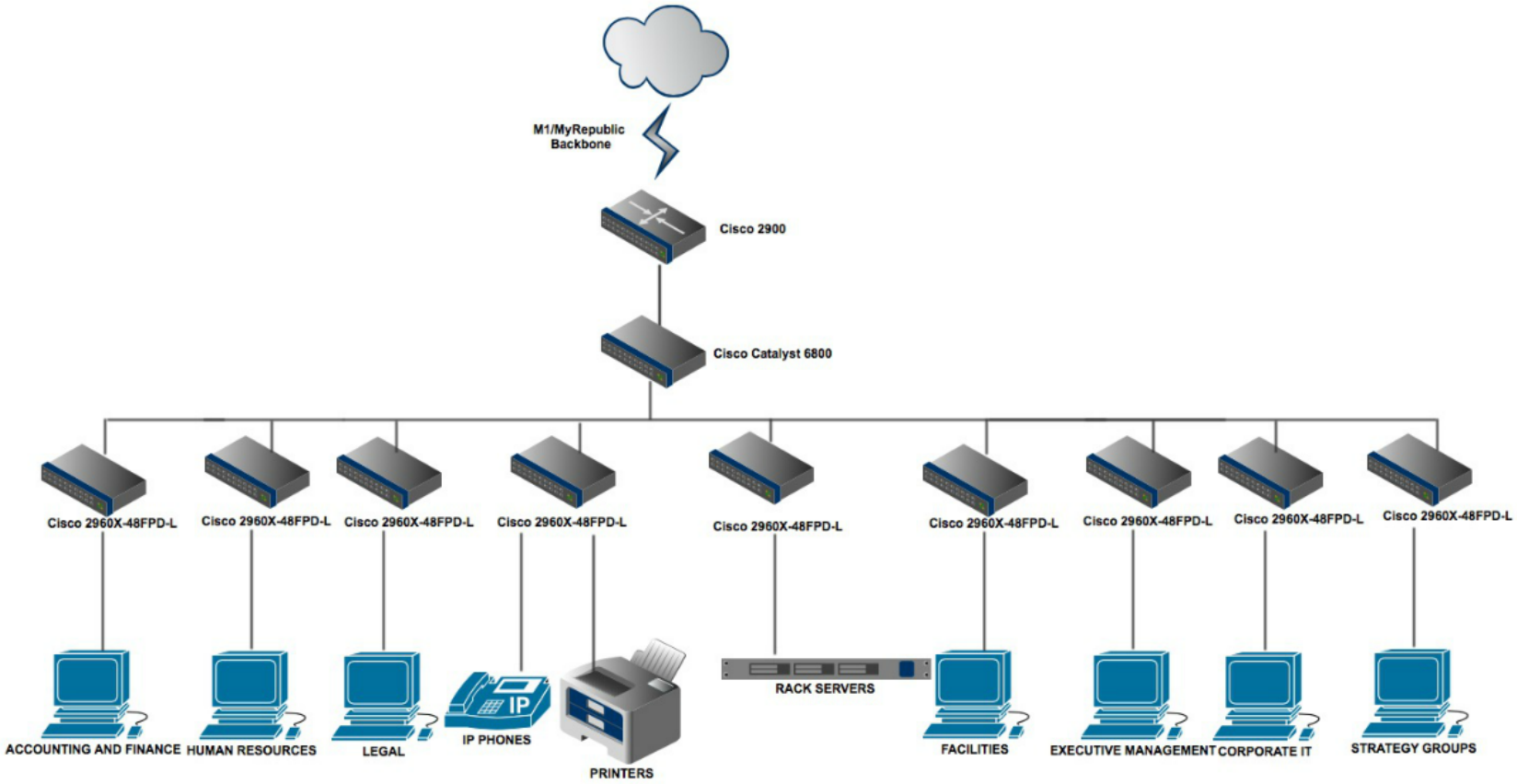
Facilities **10.2.3.0/26 – 10.2.3.63/26**

Executive Management **10.2.3.64/26 – 10.2.3.127/26**

Strategy groups **10.2.3.128/26– 10.2.3.191/26**

Servers **10.2.3.192/28– 10.2.3.207/28**

IP Schema for Regionl Headquarters- Singapore



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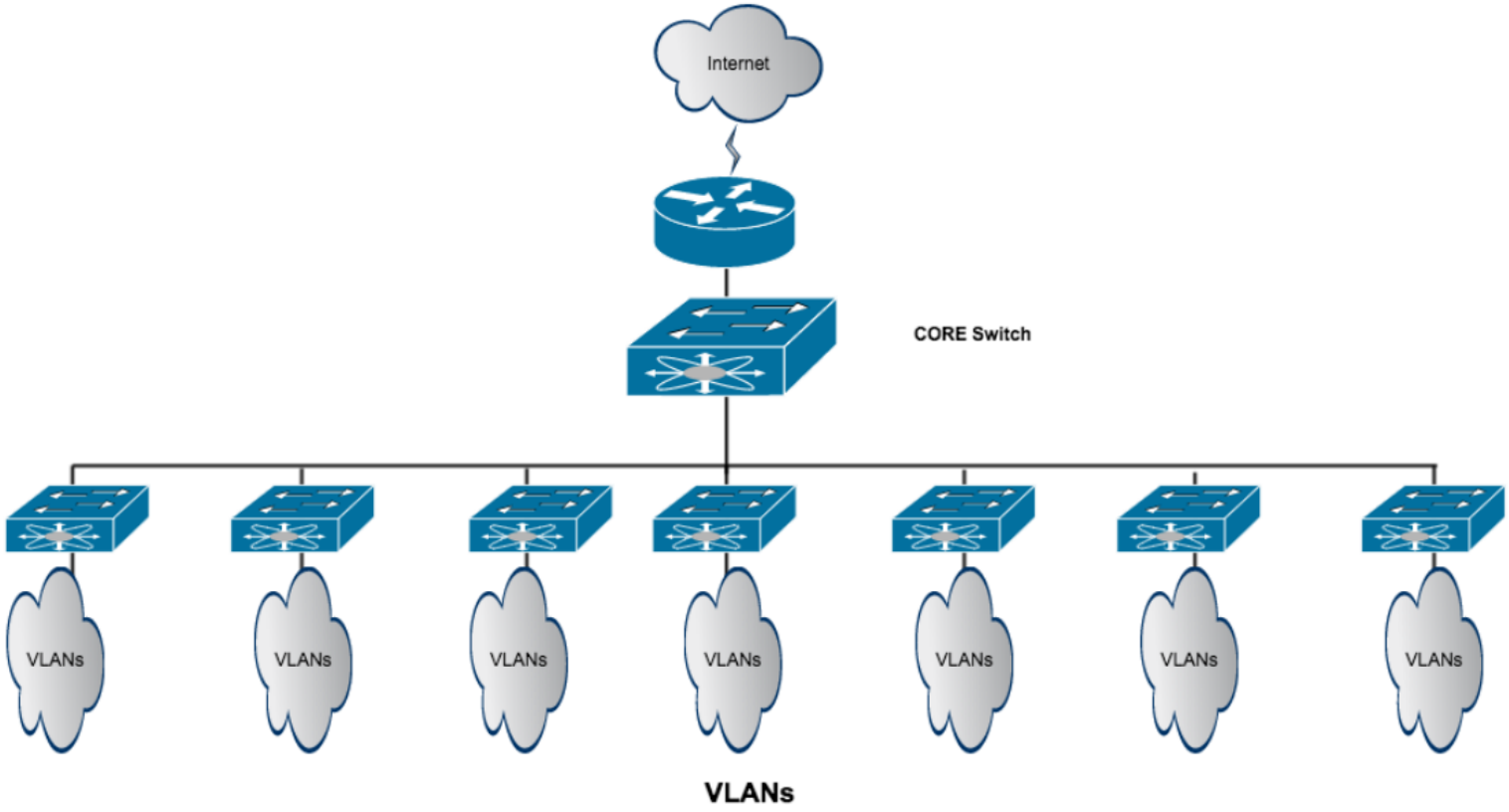

VPN (Virtual Private Network)

- Safety
- Tunnelling
- Cheap
- Reusability of Existing framework

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Ethernet Automatic Protection Switching

IP
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TCP

UDP
DNS
DHCP
HTTPs

Ethernet

Fast Ethernet

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Link Aggregation Protocol

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Factors to determine the Data Center Location

- Electricty
- Natural Conditions
- Tax Rates
- Labour
- Construction Cost
- Telecommunication Availabilty

IP

OSPF

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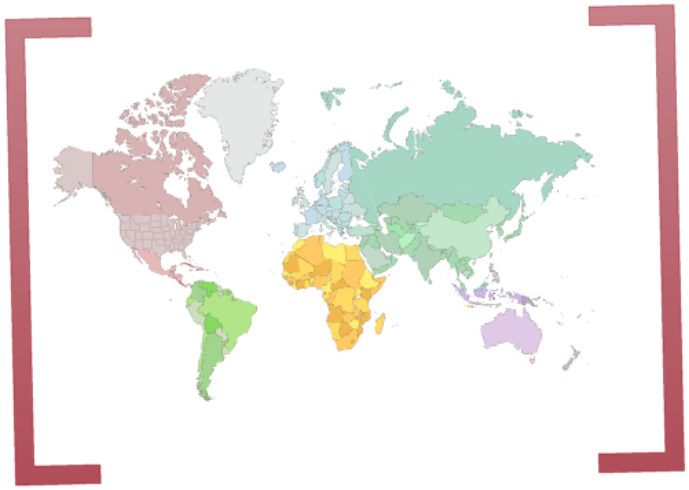
HTTPs

Data Centers



Factors to determine the Data Center Location

- Electricty
- Natural Conditions
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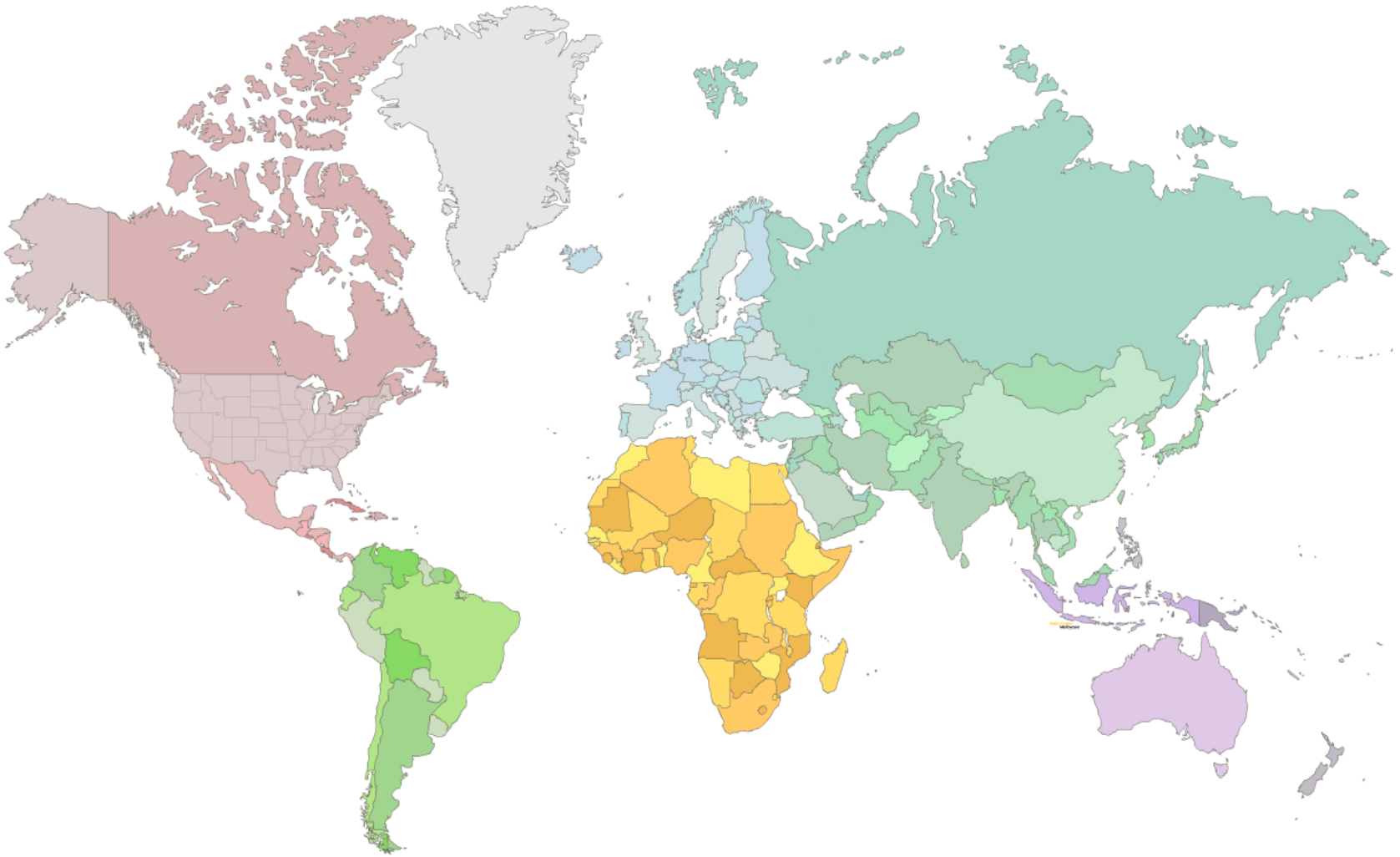
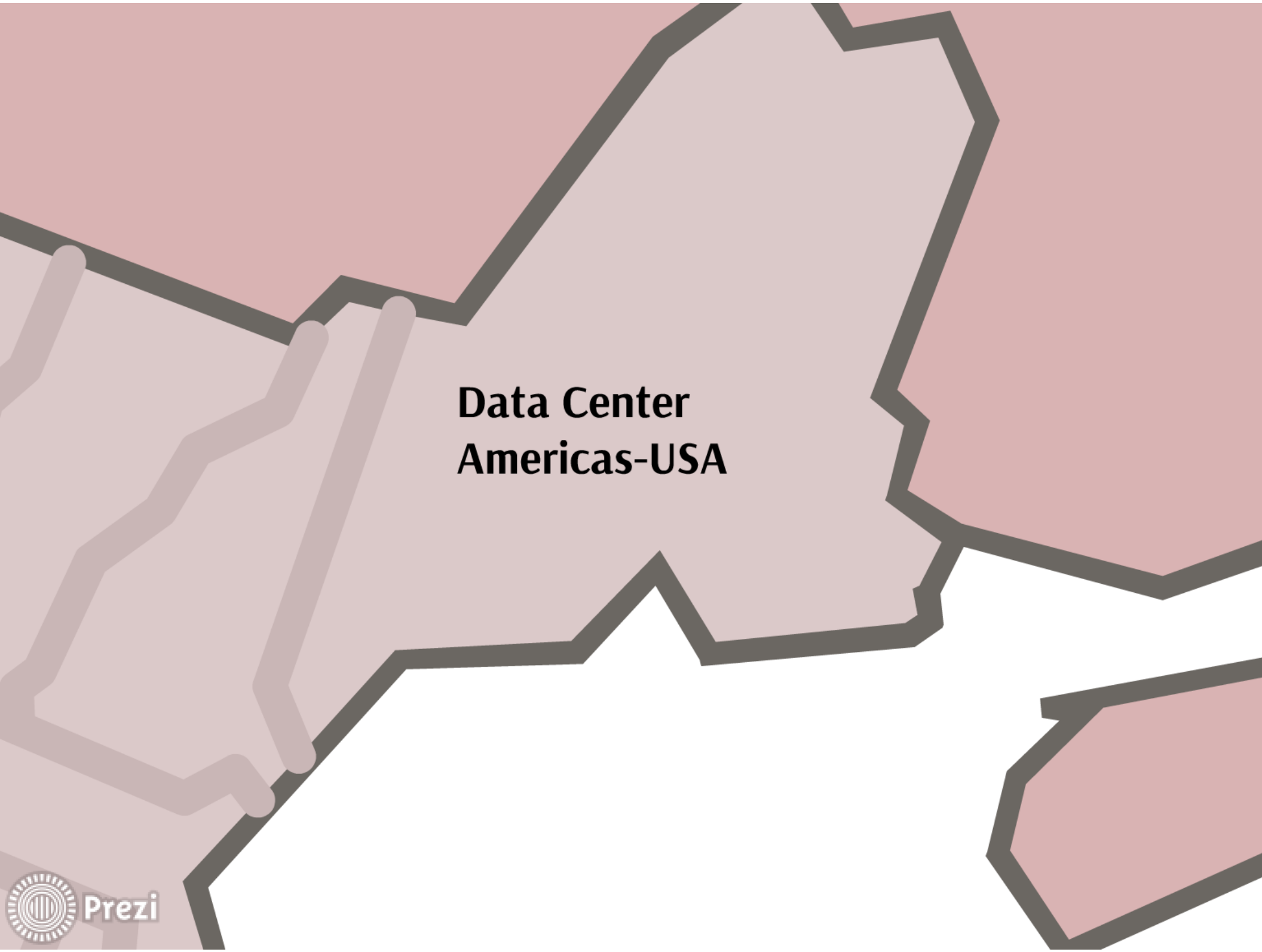
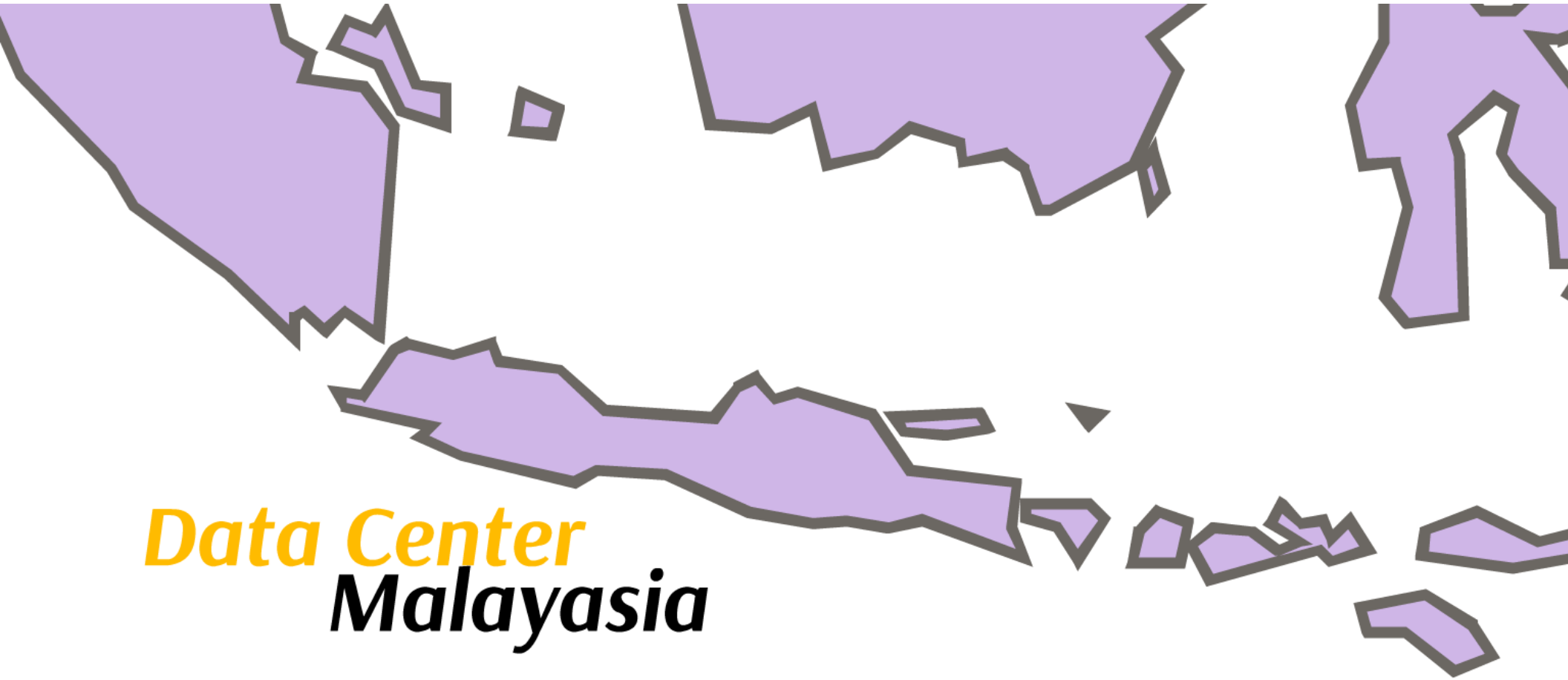
Data Center Connectivity

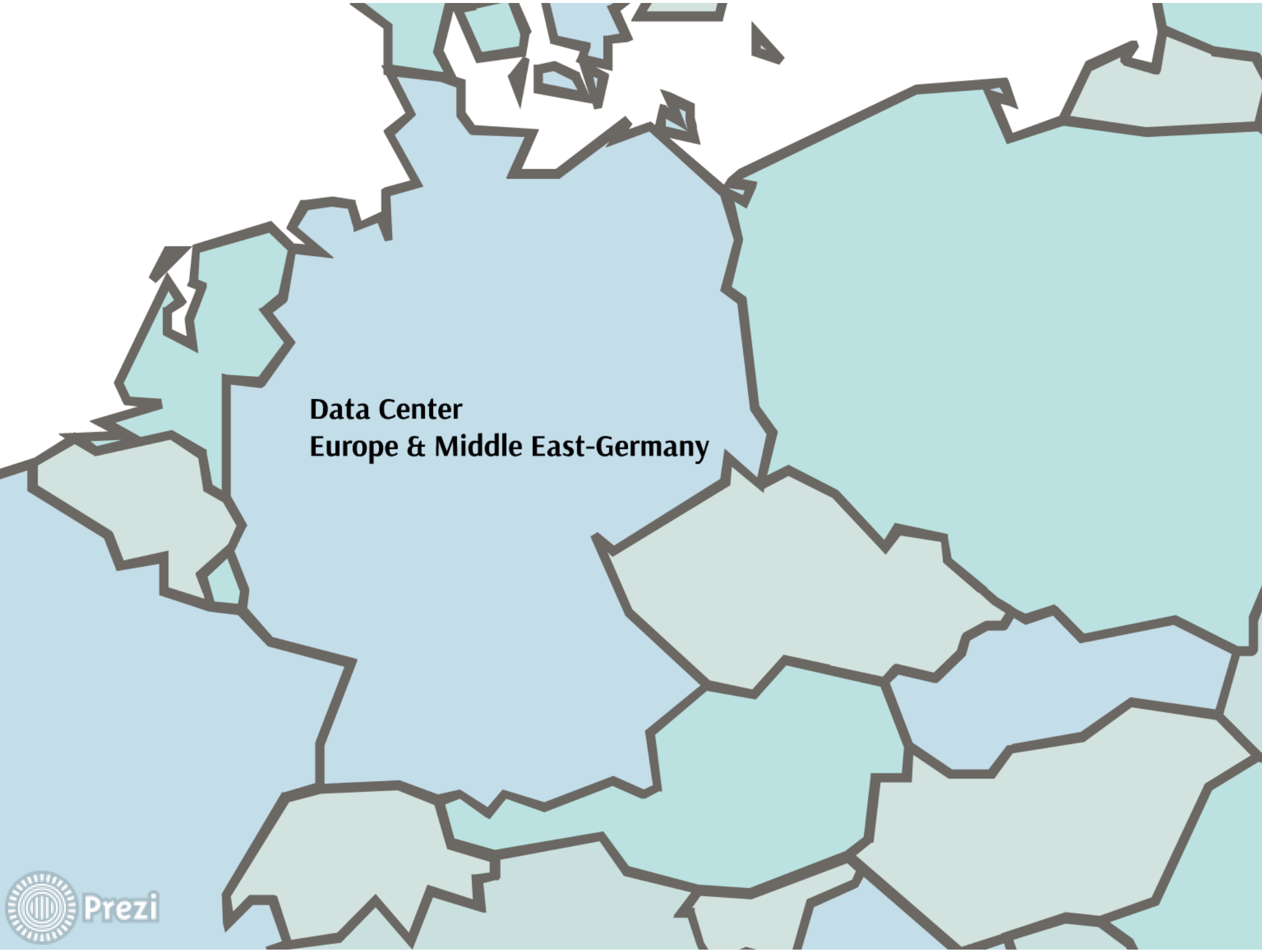
Approach: -MLPS
Why MLPS?
Data Center Connectivity




Data Center
Americas-USA



Data Center
Malayasia


Data Center
Europe & Middle East-Germany

Data Center Connectivity

Approach: =MLPS
Why MLPS?
Data Center Connectivity

Bandwidth Requirement

Data Usage per workstation(employee) based on the average statistical data report

Heavy Web Browsing: 2 GB/month Online Banking, Reading, etc
Downloads/ Uploads: 1 GB/month Documentation, logs, etc
Software Upgrades: 5 GB/month Up-gradation of software version, etc
Email: Without Attachments-4500/per month (30KB per text message) 135MB/month
With Attachments-10/month (3MB per attachment) 30 MB/month
VoIP: G.711 Codec Bandwidth Requirement-128 kbps

9 GB/month per workstation
+ 128kbps for VoIP per IP phone

Estimated Workstations and VoIP enabled devices

New Jersey: HO: 300 ws + 300

RHQ: 500/3 : 200ws + 160 ip devices

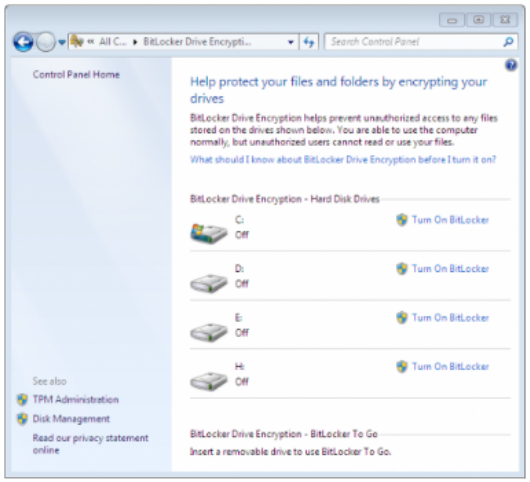
Research: 300 employees: 50ws + 50

Sales: medium size 60-70ws + 50
Small size: 30-40ws + 30

S/w development: 200ws + 200

Security

Data at Rest



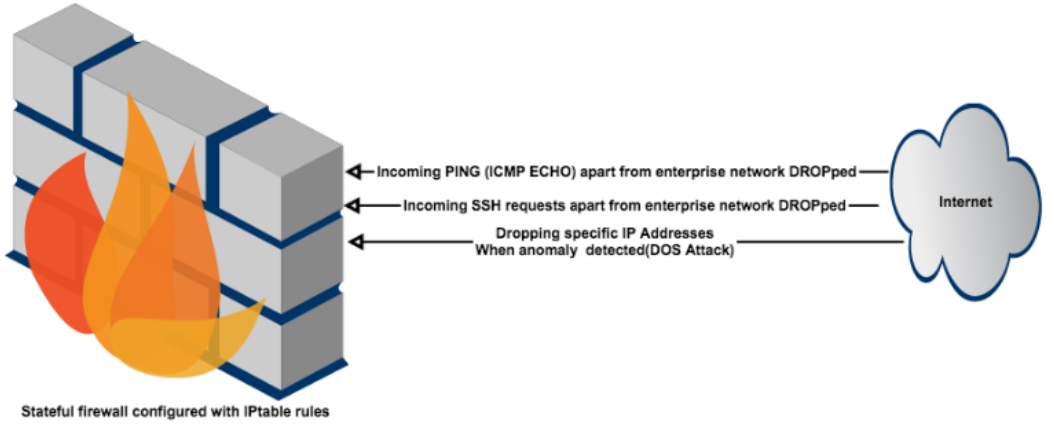
Disc Encryption is done using Microsoft's application-Bitlocker Drive Encryption

Data in Transit

Data through VPNs- Research Department and Finance department will have the most sophisticated data in transit so these departments will communicate through IPSec VPNs.

Network Perimeter Security:

Stateful firewalls- These firewalls are configured with iptable rules to restrict the ingress and egress traffic.

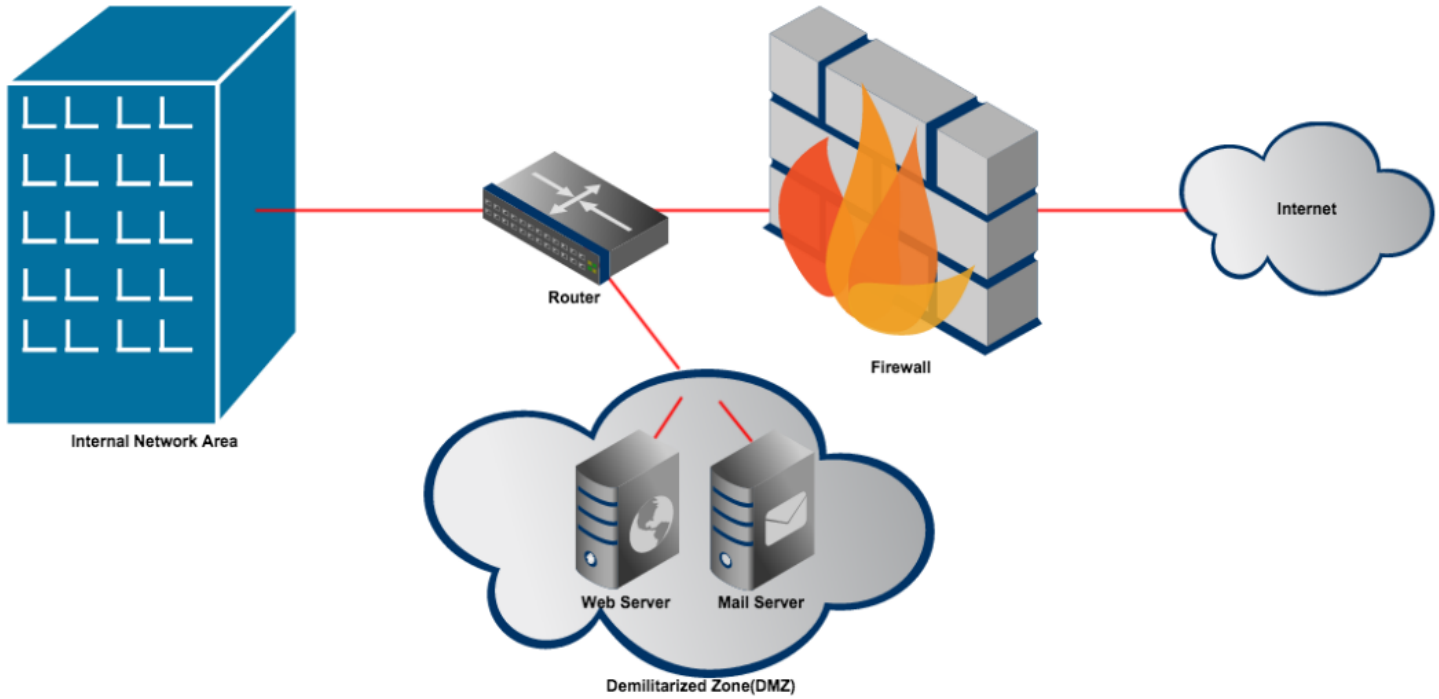


Stateful firewall configured with IPtable rules

All network firewalls are configured statefully

DMZ

Demilitarized zone(DMZ)-DMZ acts as the middle stage between Internet and enterprise network. This structure helps protecting the internal server and resources from being exposed.
Web server and email server is placed in the DMZ.



Structure of Demilitarized zone at different geographical locations

Wireless environment security:
Wi-Fi protected Access-2 (WPA2), IEEE 802.11i is used in the Wireless environments of the enterprise. It has strongest encryption to date and uses AES(256-bit), which is a very strong block cipher. It includes 4-way handshake between STA(host) and AP(Access Point).Both AP and STA are authenticated.

Using HTTPS for the HR application and Company's website:
HTTPS is HTTP on the top of TLS/SSL protocol.
Application level security is provided through it.

Safe Browsing(Using Citrix Farm VMs):
Saves from client side attacks.
Internet browsing is done through the application which is connected to the network outside CORP network in the CITRIX farm.