ABC Enterprises

[Software Developers]

NETS1006

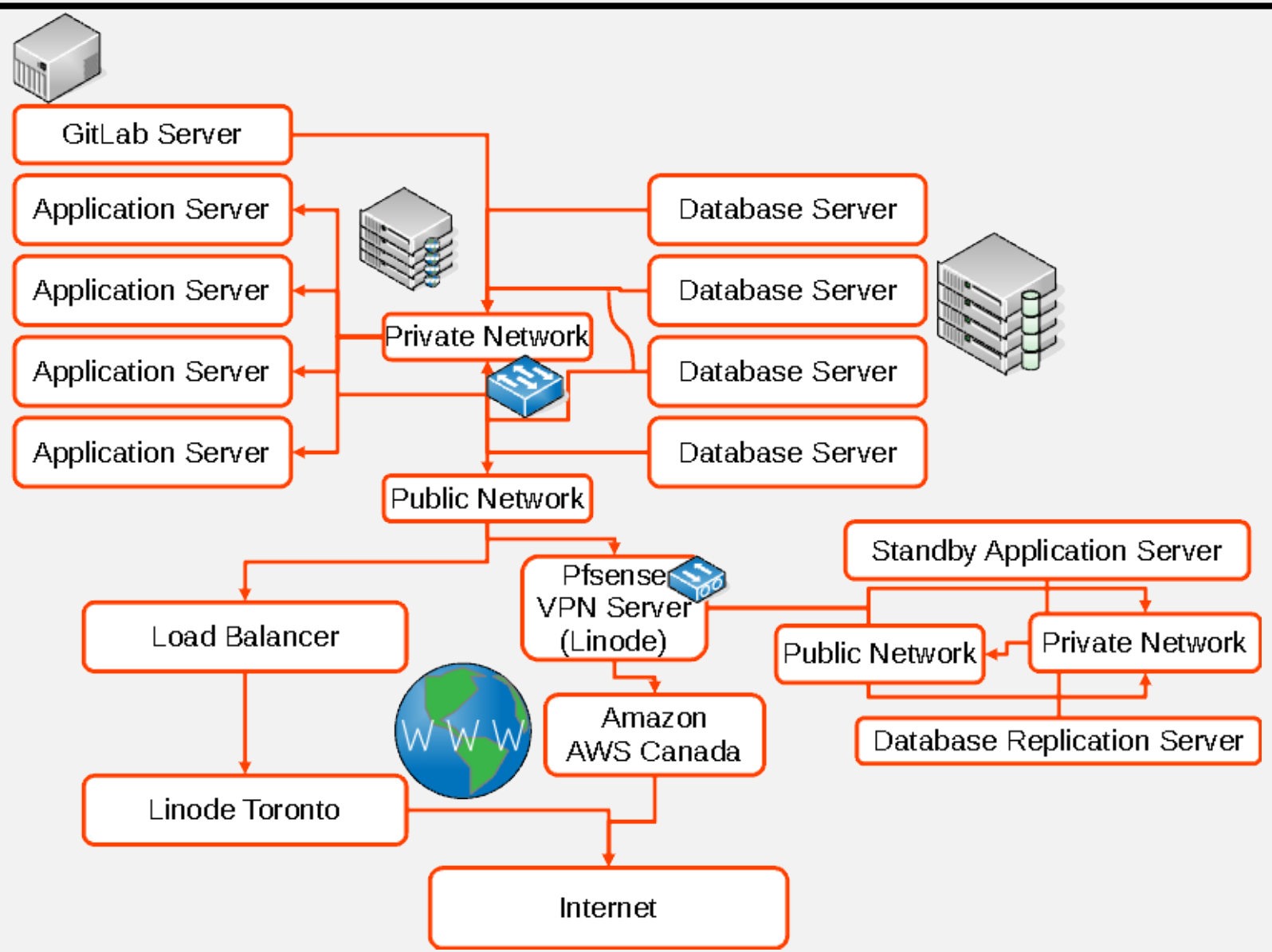
Group 2 (Blueberry)

ENTERPRISE OVERVIEW

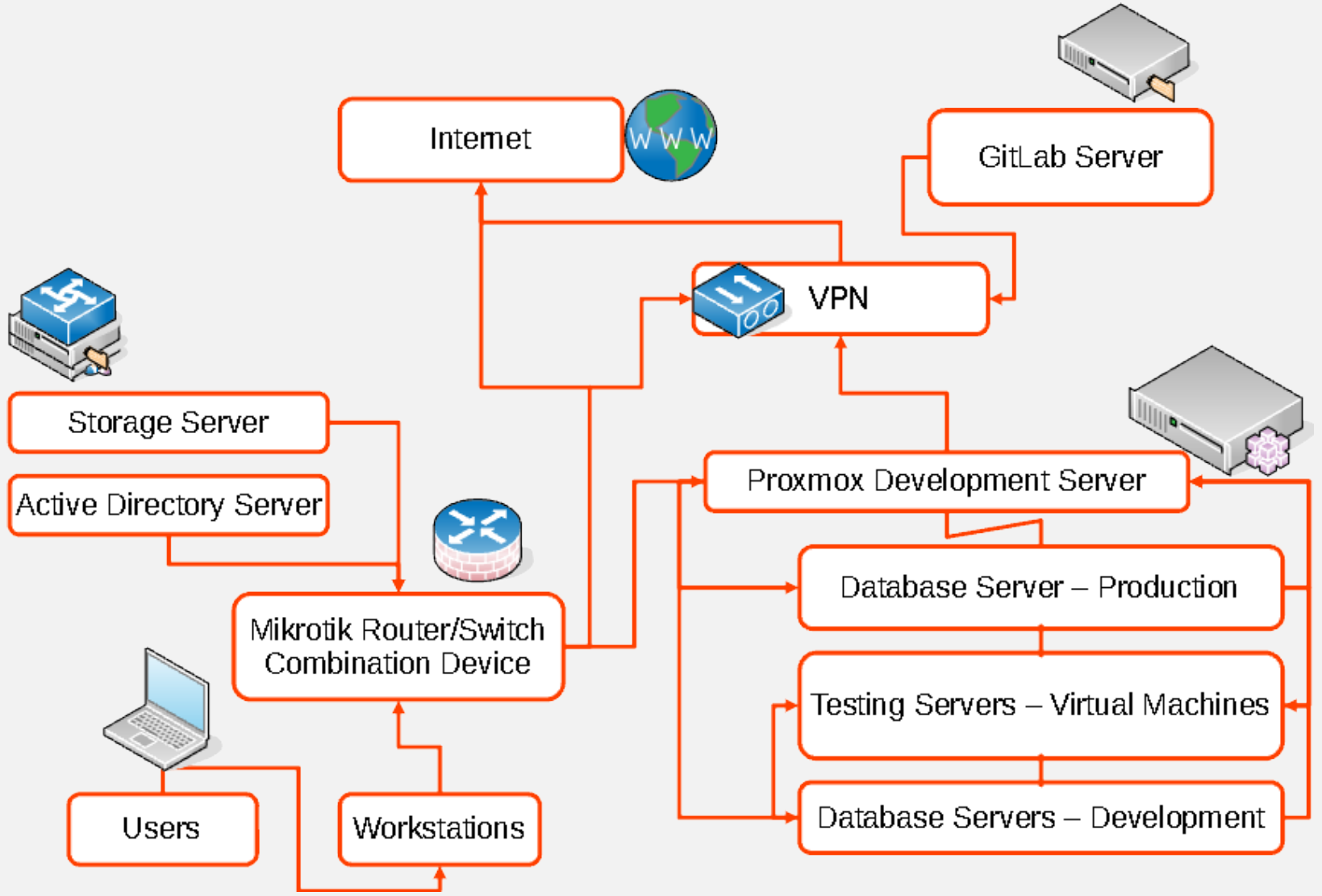
- Software consultancy providing SaaS for larger enterprise. It includes a staff of 35 including 12 Developers, 8 Testers, 2 Service Supervisors, 7 Sales and Marketing executive, and 6 Finance/Administration.
- ABC enterprise is managed by 3 equal, profit-sharing, partners.

- **Service Provided:**
  - ABC enterprise provides SaaS software development, hosting , and service.
  - 7/24 support available after final development. The one-time development cost includes 6 months support charges.
  - Services includes developing, testing, hosting and service supervising.
- **The Team:**
  - Developers(12) - on rotational shifts
  - Testers(8) - Testers perform 2 types of testing automated and manual.
  - Service Supervisors/QA(2) - Check the outcome and looks after quality assurance.
  - Sales and Marketing (7)- Responsible for online and offline marketing.
  - Finance/Administration (6)- Takes care of A/R, AP, Payroll, and keeping the office running smoothly.

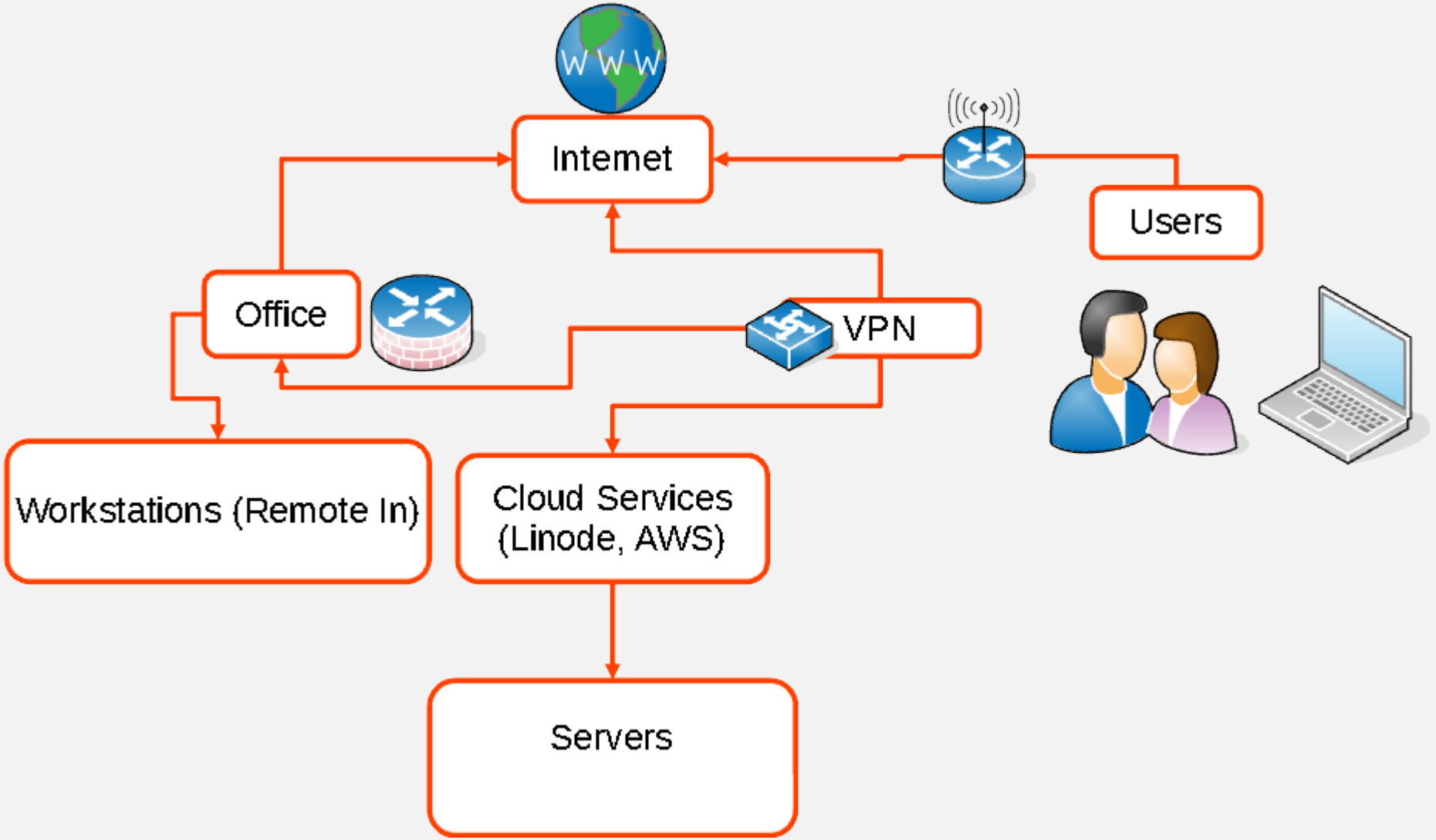
HOSTED INFRASTRUCTURE DEPENDENCY DIAGRAM



LOCAL INFRASTRUCTURE DEPENDENCY DIAGRAM



REMOTE WORKING INFRASTRUCTURE DEPENDENCY DIAGRAM



HIGH AVAILABILITY

- **High availability involves eliminating a single point of failure in each device variable.**
- **Load Balancer**- To avoid a single point of failure on web machine and respond to HTTP requests.
- **Floating IP Address-** If load balancer goes Down. we can use Floating IP Address.
- **Databases**- Database might fail for many different reasons because of the failure of software or hardware.
- **Internet Connections from Different ISP'S**- Need more than one high speed internet connection from different internet service providers.
- **UPS**: required for power protection

DISASTER RECOVERY

- **Inventory hardware and software -** A full inventory of hardware and software in priority order.
- **Responsibility-** Lay out who is responsible for what - and identify backup personnel.
- **Create a communication** plan-Define a strong communication strategy will support us in mean time. Since might be phone line and email service may be disrupted during disaster.
- **Let employees know where to go in case of emergency -** If we are using a particular working site in an emergency, we notify all staff and delegate their responsibilities during the disaster.
- **Testing-** We must test our disaster recovery plan. As a result, it will aid in a quicker recovery..
- **Service-level agreements (SLAs) include disasters/emergencies -** Need proper information about emergency and disaster.

FAILURE SCENARIOS

- Delay Application Deployment [1]
- Database Backup Failure/Data Deletion [2]
- Network Failure[3]
- Virus Attack[4]
- Overuse of Resources[5]
- Power Outage[6]
- Bad Weather/Pandemic Situation[7]
- An Actual Disaster[8]

BASED ON THE FAILURE SCENARIOS THESE ARE THE IDENTIFIED RISKS:

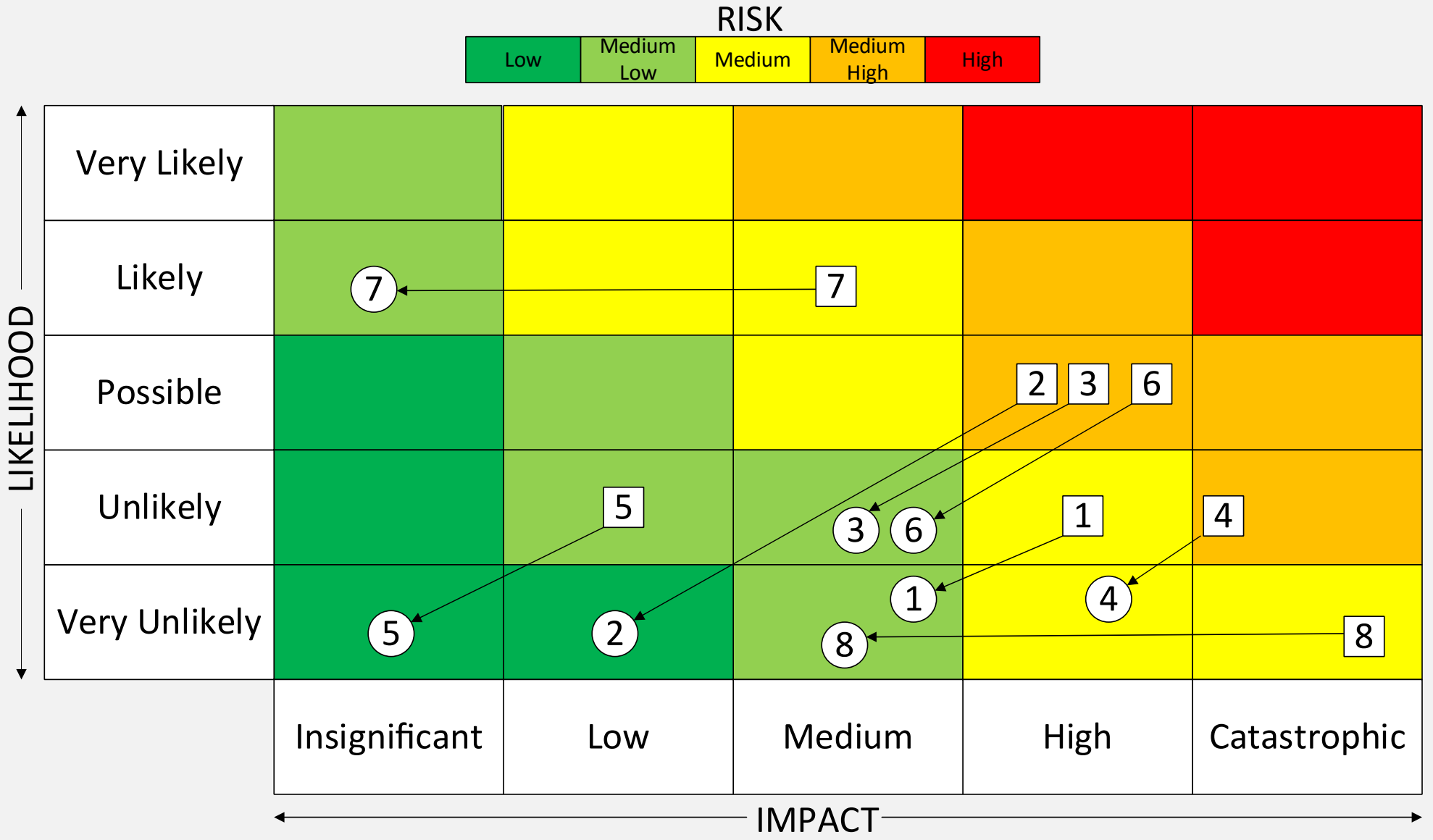
1. Dis-satisfied customers, having to complete re-work
2. Data loss
3. Loss of access to offsite and onsite resources
4. Down systems, ransomware, infected customers
5. Overloaded systems, unavailable applications
6. Down systems/application unavailability, data corruption from dirty shutdown
7. Staff unable to attend office
8. What if there’s a disaster and there’s no plan!

RISK MATRIX

1: Customer Issues
2: Data Loss
3: Network Failure
4: Ransom/Malware
5: System Overload
6: Power Issues
7: WFH Event
8: No DR Plan

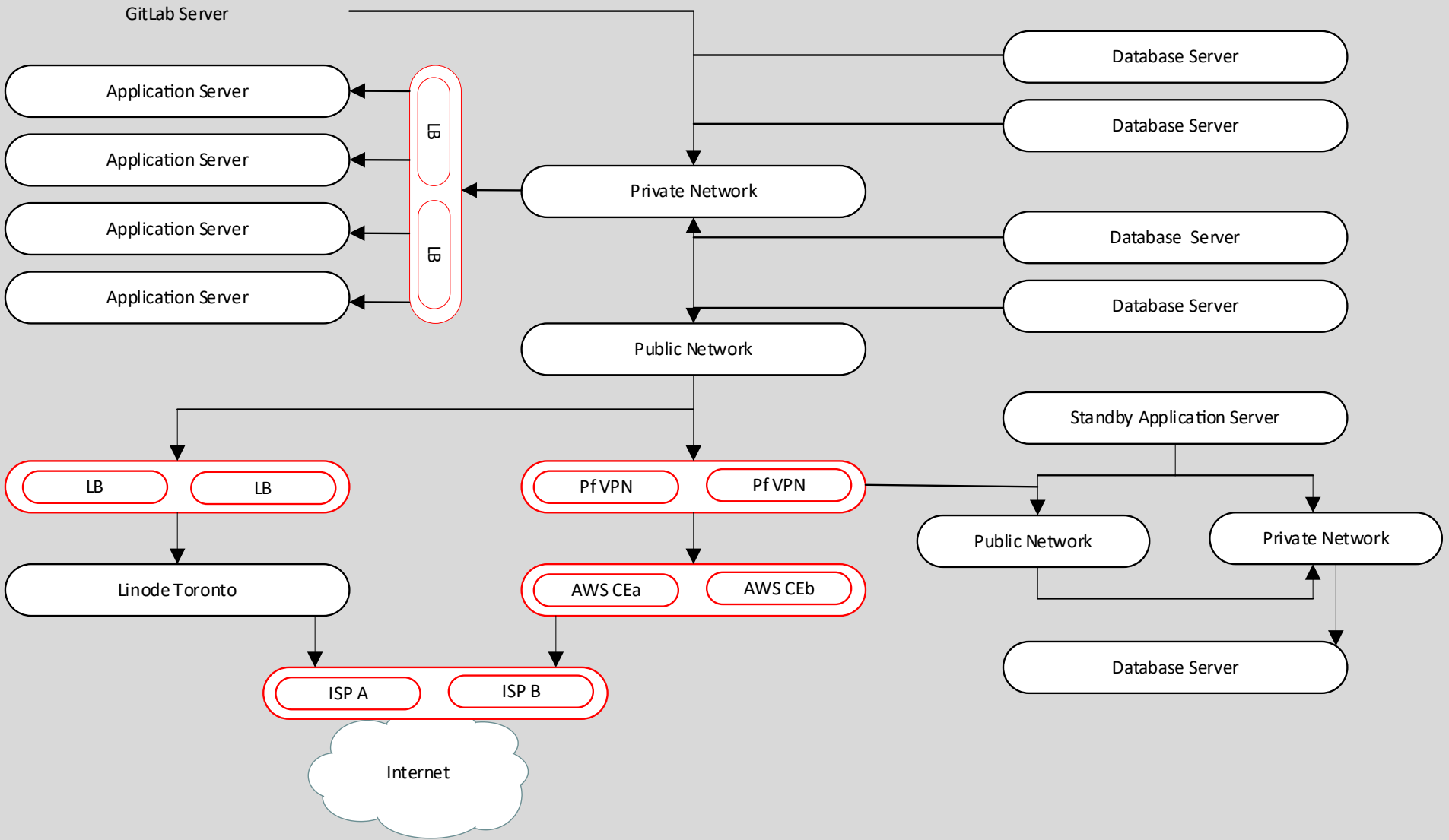
[#] Inherent Risk

(#) Residual Risk



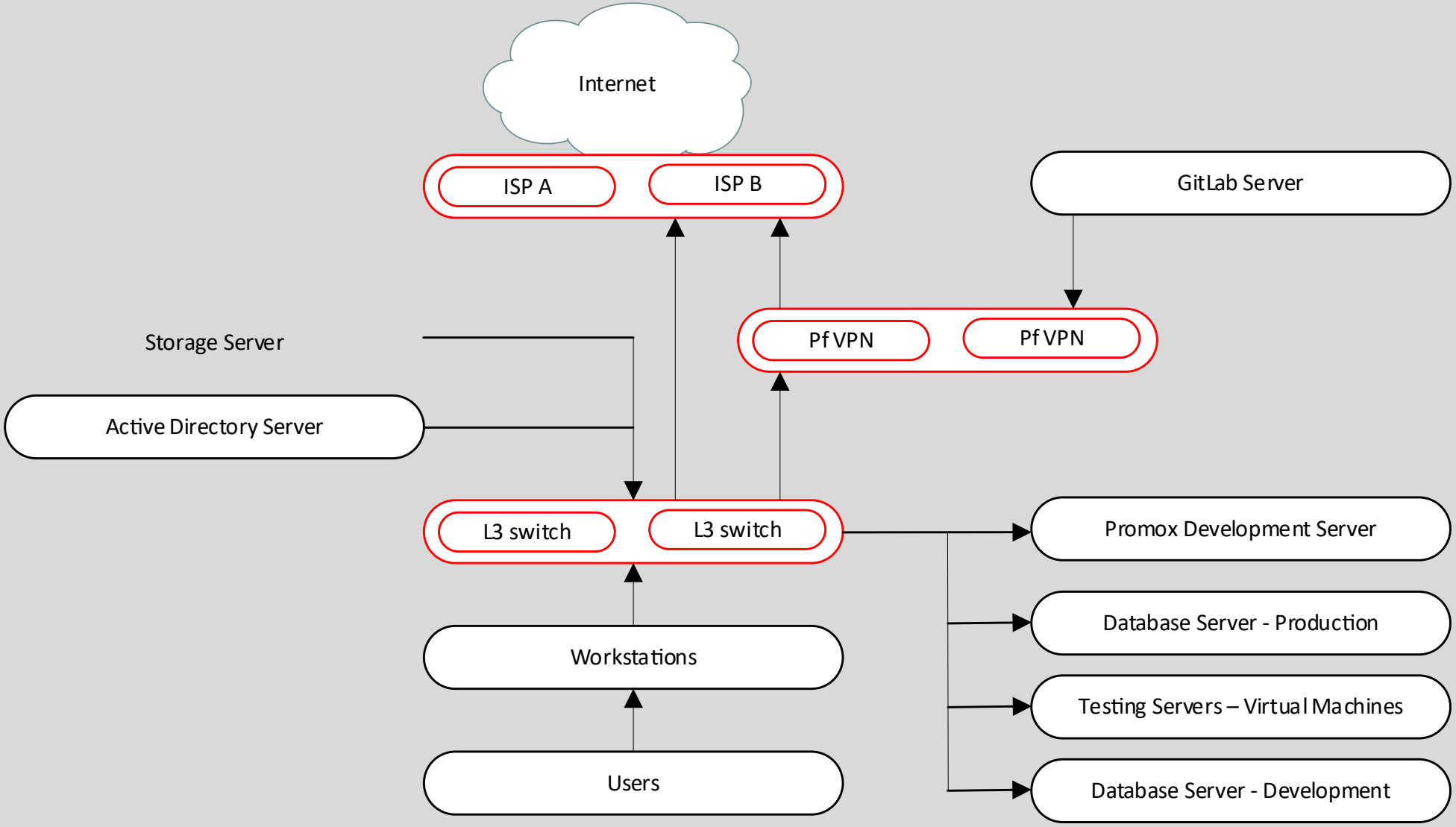
FINAL DESIGN

Updated Hosted Infrastructure Dependency Diagram



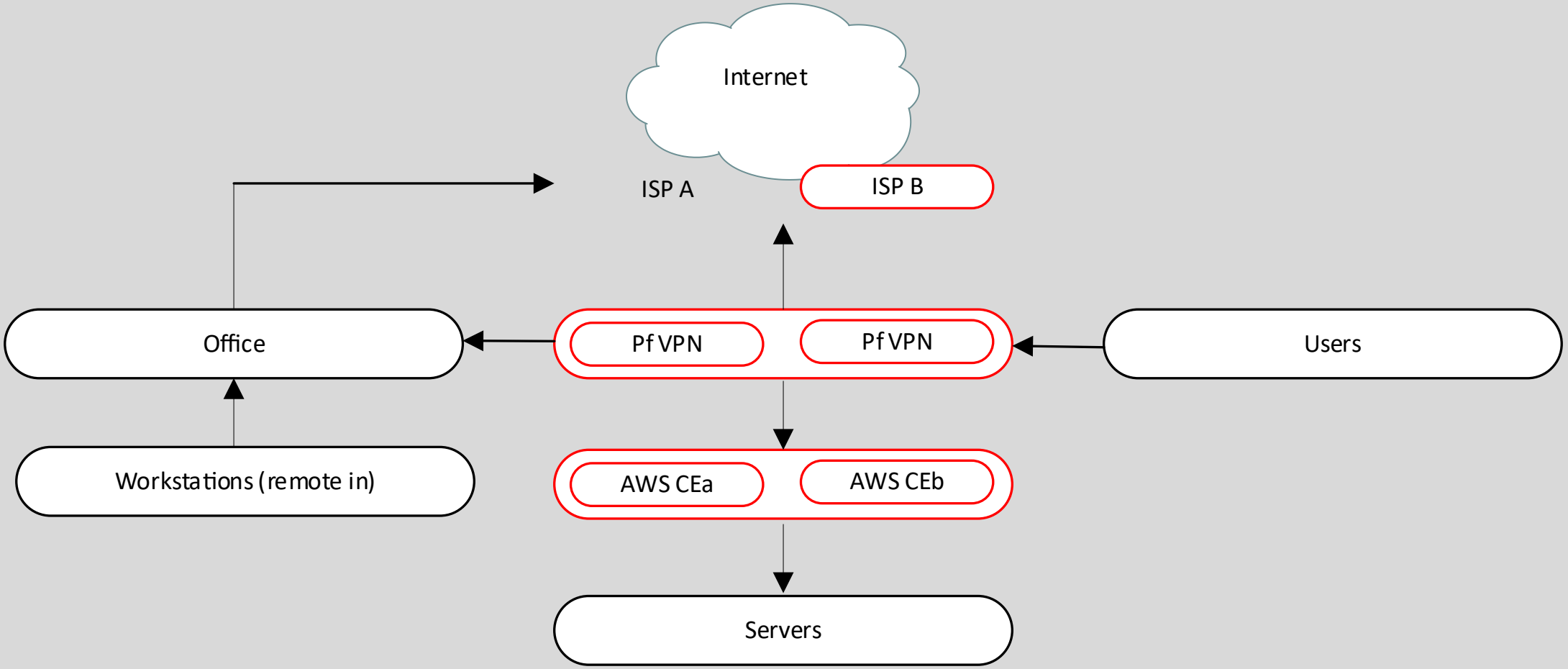
FINAL DESIGN

Updated Local Infrastructure Dependency Diagram



FINAL DESIGN

Updated Working Infrastructure Dependency Diagram



HARD COST

- **Failover Cluster:**

  - Hosted Infrastructure, 4 Application Servers, 4 Database Servers, RAID 10 implementation for redundancy, using "Linode" as our cloud service provider1

  - The base cost of 16 core, 32 GB memory, 5 TB storage, and Transfer Rate of 10 TB cost is CAD 968

  - 8 servers*CAD 968= CAD 7,744

  - Annual Cost= CAD 92,928

  - For the same service in AWS, it would have cost us, CAD 236,379

  - Cost reduced by 60 % by selecting the proper cloud service provider

- **Data Backup:**

  - Implemented incremental snap mirroring of storage system: On-Demand Plan

  - Standby Application Server: Reserved Plan

  - Both hosted in AWS

  - Reserved Plan: 32 Core, 192 GB memory, 13 Tb storage, and 20 TB transfer rate cost CAD 4000 annually

HARD COST

- **Internet Service:**
  - Primary ISP: Bell Business Internet Dedicated Plan[1]
  - Added Second ISP: Rogers Business Internet Plan (Download up to 1Gbps/
  - Upload up to 50 Mbps)
  - Cost CAD 259.97/month * [On 3 years terms]
  - Stackable Switch: Model No. SG350X-24P, switching capacity: 128 Gbps[2]
  - Cost: CAD 1074
- **Network Security:**
  - Added Solar Wind Patch Manager PM 140003
  - Supports up to 14000 nodes
  - Subscription-based license cost CAD 2482
- **Power Outage:**
  - Average Power Consumptions by business-critical equipment: 13.95 KW/h or 17.43 KVA/hr with a power factor of 0.8
  - Minimum UPS requirement= 1.2 * Average Power Consumption = 16.74 KW/h or 20.9 KVA/hr
  - UPS Selected: EATON 9355 20KVA + 2* EBC-724
  - Cost = $ 24,935+ 2* $ 9,764 = CAD 44,463

SOFT COST

- **Quality of Software**
  - Training entire software development team about Agile SDLC
  - Each additional developer/QA member cost around CAD 125,000 annual
  - Attending Seminar/Staff Training costs CAD 3,500 annual per person and totals up to CAD 122,500
- **Marketing**
  - Additional Sales staff cost up to $60,000 + commissions
  - Trade shows cost varies from $5k- $50k
  - Outsourcing digital marketing to an agency cost $15,000 per month
- **Work from home**
  - Core users issued laptops instead of desktops1
  - Laptop Issued: Dell XPS 15 10th gen Intel Core, 16 GB, 512 GB SSD
  - Total cost: 2200 * 22=48400 CAD $ 48,400

CONCLUSION

- In the given description, the company had no Disaster Recovery or Response team.[1]
- Well documented and well tested DR plan is essential.[2]
- They had a basic network infrastructure with high possibilities of SPOFs.[3]
- Updated infrastructure provides High Availability and Business Continuity by eliminating SPOFs.[4]
- Reliable DR plan builds confidence in the service we provide to our customers.[5]

Q & A

REFERENCES

- “Cloud Compute, Storage, and Transfer Estimator.” Linode, www.linode.com/estimator. Accessed 10 Apr. 2021.
- “Rogers Business Internet Service.” Rogers, www.rogers.com/business/internet-services/internet. Accessed 10 Apr. 2021.
- “Cisco SG350X-24P.” Pc-Canada, www.pc-canada.com/item/SG350X-24P-K9-NA.html. Accessed 10 Apr. 2021.
- “Patch Manager: Remote Desktop Patch Software | Solarwinds.” Solarwinds, www.solarwinds.com/patch-manager. Accessed 10 Apr. 2021.
- “Eaton 9355 UPS | EatonGuard.Com.” Eatonguard, www.eatonguard.com/Eaton-9355.asp. Accessed 10 Apr. 2021.
- “Dell XPS Laptops - High Performance Notebooks | Dell Canada.” Dell, www.dell.com/en-ca/shop/dell-laptops/sr/laptops/xps-laptops?%7Eck=bt. Accessed 10 Apr. 2021.
- “Pandemic Preparedness” David Sarabacha, MBCPDeloitte& Touche, LLP
- “Scaling Up Your SaaS Product Infrastructure: High-Availability” medium.com, medium.com/@OfirChakon/scaling-up-your-saas-product-infrastructure-high-availability-22c132957dc9. Accessed 12 Apr. 2021.

THANK YOU

Presented By:

Krishna Bhuva [200460891]
Urmila Jangid [200455665]
Satish Karki [200436272]
Manoj Kewatiya [200464991]
Kyle Knierim [200468404]
Rakesh Raval [200460896]
Harsh Jitendra Shah [200464969]
Dave Shingler [200473247]