IT7099 Kalam Telecom Internet Service Provider

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Aim and Requirements

The Project Aim:

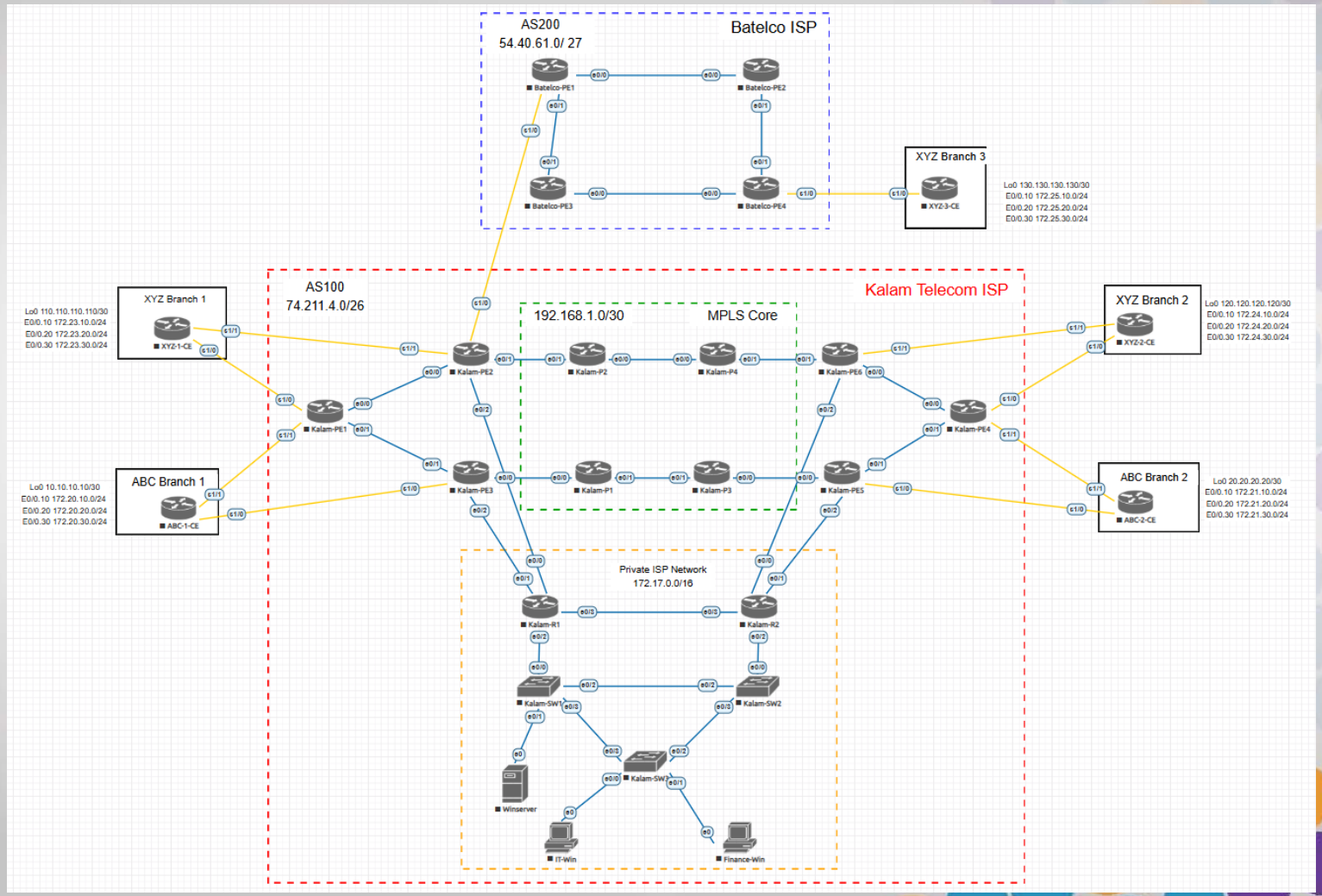
Design and implement a robust MPLS backbone infrastructure enabling the ISP to provide MPLS VPN service and reliable connectivity.

Key Requirements:

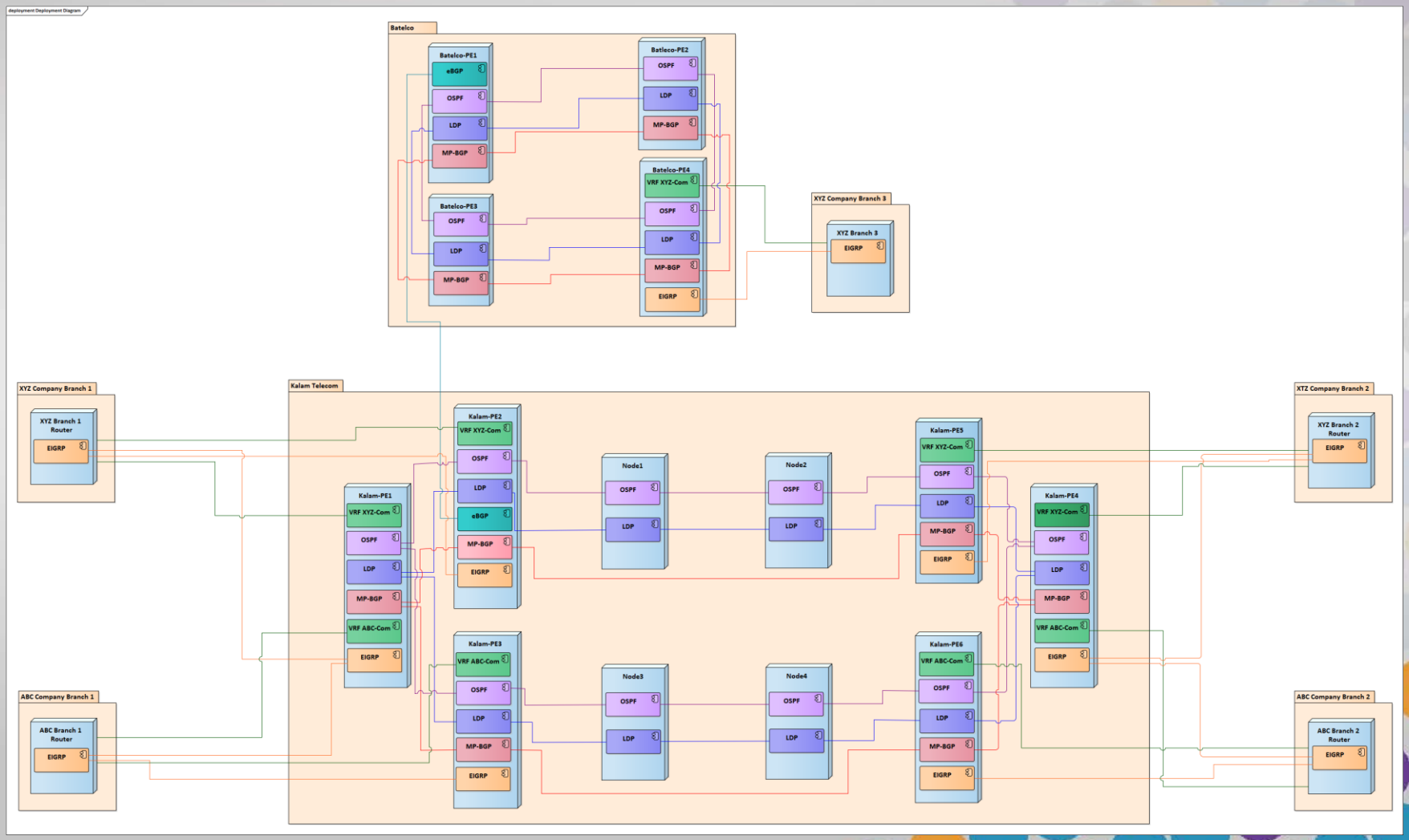
- Build a fully functional ISP carrier-grade infrastructure
- Deploy MPLS label-based network
- Implement MPLS VPN on top of MPLS network
- Deploy Inter-AS MPLS VPN network
- Implement dynamic routing protocol such as OSPF, EIGP and BGP

Technologies

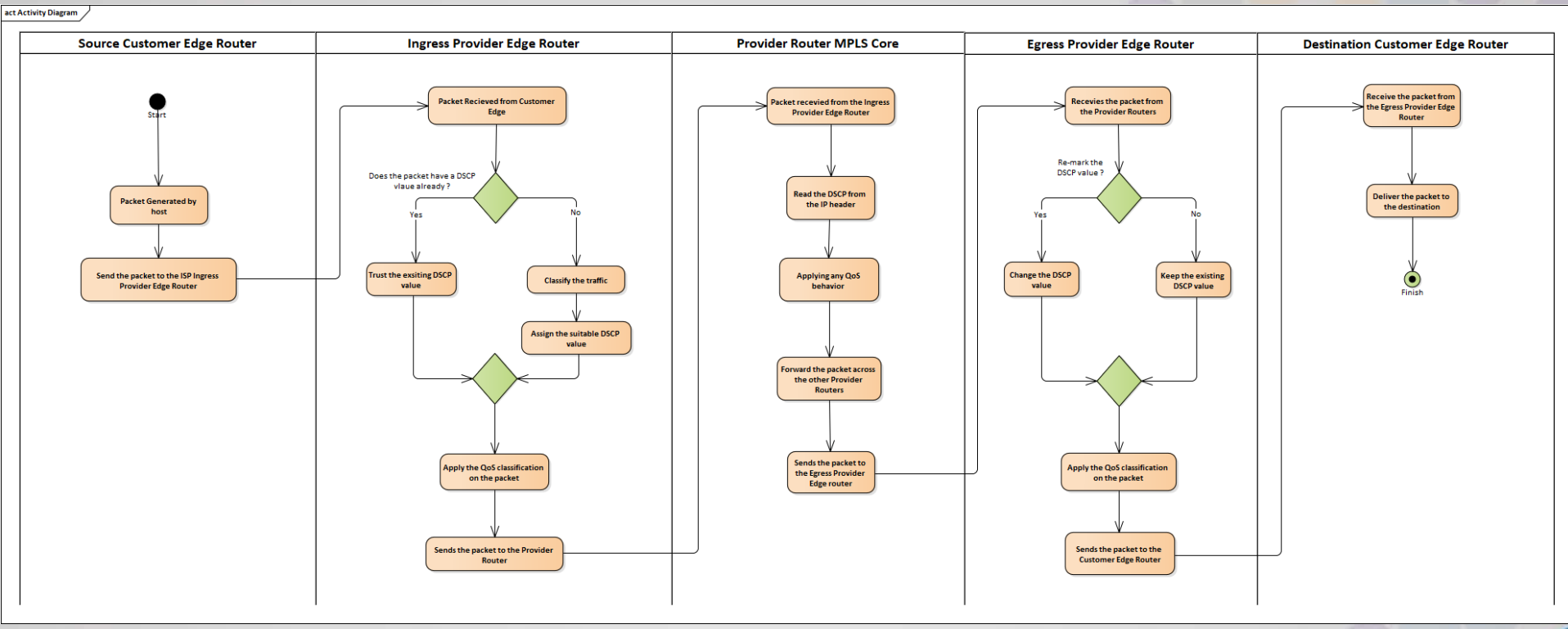
Topology Design



Deployment Diagram



Activity Diagram



Object File -
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Features

1. MPLS-Based ISP Backbone
   - Efficient label switching
   - Flexible service delivery
2. Multiprotocol Routing Architecture
   - Inter-AS connectivity using MP-BGP
   - Internal coverage using OSPF and EIGRP
3. MPLS VPN Service
   - Customer Traffic isolation using VRFs
   - Secure connectivity for multi-branch customers
4. Quality of Service
   - Traffic prioritization for certain traffic
   - Improve the network performance
5. Centralized Services
   - AAA Service
   - Syslog Service

Bahraini Perspectives & LESPI

Legal
- Compliance with Legislative Decree No.48 of 2002
- Conforms to PDPL Law No. 30 (2018)

Ethical
- Ensure the safety and integrity of the customer data
- Compliance with Consumer Protection Regulation of 2017

Social
- Reduces service disruption during update
- Follows the TRA quality of service framework

Professional
- Follows the international standards
- Implement ISO 27001 security standards

Bahraini Perspectives
- Support the 2030 Vision
- Avoid destroying the public trust

Challenges

Technical Challenges:

- Limited resources to run the simulation platform.
- Windows Server 2016 incompatibility with EVE-NG, replaced with Windows Server 2012.
- High resource usage for multiple MPLS network and MP-BGP topology.
- Windows 11 high resource usage, replace with much older OS such as Windows 7.
- The absence of the traffic generators, illustrated with a sample example.

Management Challenges:

- Project strict time limitations.
- Decision making under time pressure.
- Restricted access to tools or data.

Skill acquired:

- Time management and prioritization.
- Decision making under pressure.
- Resource optimization.

Future Work

- Deploying ASA or some kind of firewall
- Implementation of BGP Route Reflector
- Deployment of additional Internal Services
- Enhanced Security through advanced route maps
- Implementing Segment Routing over MPLS (SR-MPLS)
- Integration of traffic generators and Automation

Live Demo

- VLAN Segmentation and Inter-VLAN routing
- AAA and Syslog Service demonstration
- MPLS labels between the core layer
- MPLS VPN customer site-to-site connectivity
- Quality of Service Verifications

Note:
Due to resource limitations for the simulation environment, it may become unstable during the live demonstration. As a result, routers may require restarting to continue the demo.

Q&A – By Panel