A Use Case of Network Operation for Telecom Cloud

Yue Zhang China Telecom
Chongfeng Xie China Telecom

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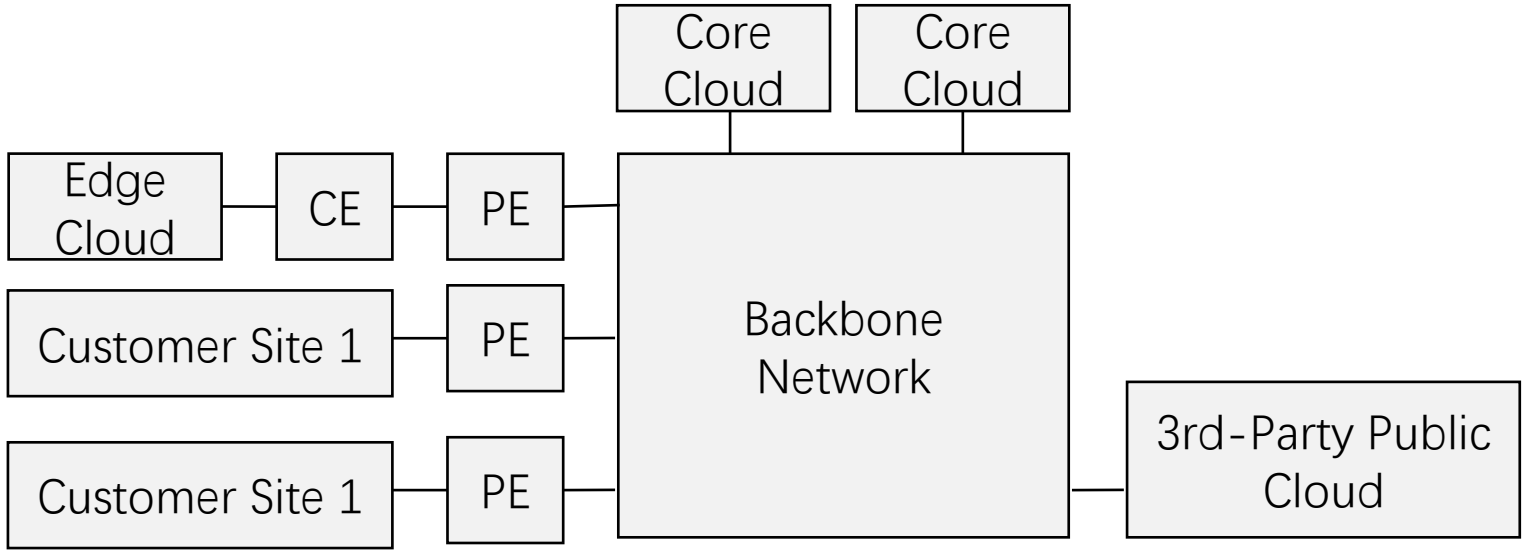
Overview

- Telecom cloud refers to a cloud computing system owned and operated by Telecom Service Provider (TSP).
- This document illustrates a typical use case of network for telecom cloud, including its network architecture and major capabilities. A general model is also proposed to support further discussion.
- The purpose of this document is to show the challenges encountered and identify the work of network operation for Telecom Cloud from the perspective of TSP.
- It was firstly submitted on October 21, 2024.

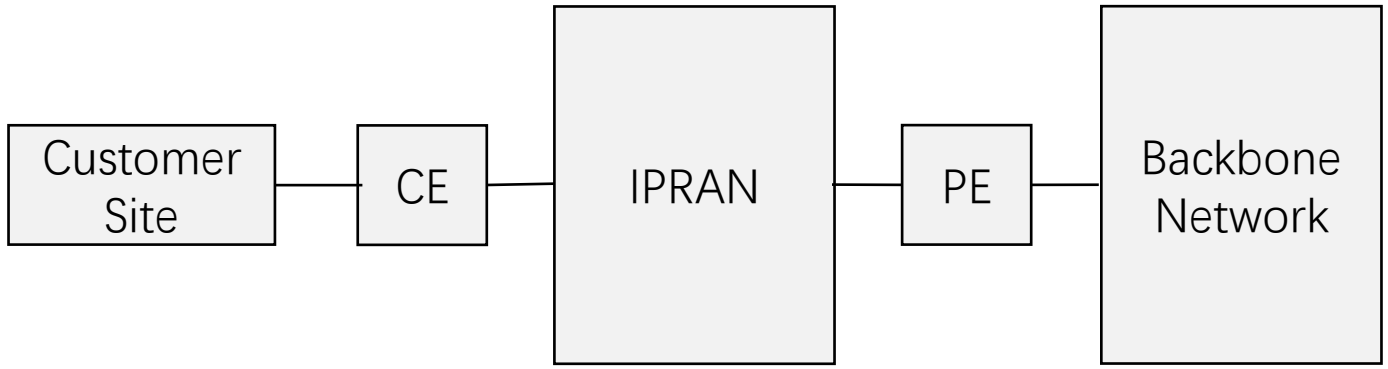
Introduction

- A TSP deploys a distributed backbone network using MPLS or SRv6+EVPN to connect cloud resource pools across a wide area, enabling customers to access both local and remote telecom clouds.
- Telecom Cloud facilities include Core Cloud, edge cloud, telecom cloud and third-party public cloud may be interconnected through the network.。
- The performance of the cloud depends on the performance and management of the underlying network.



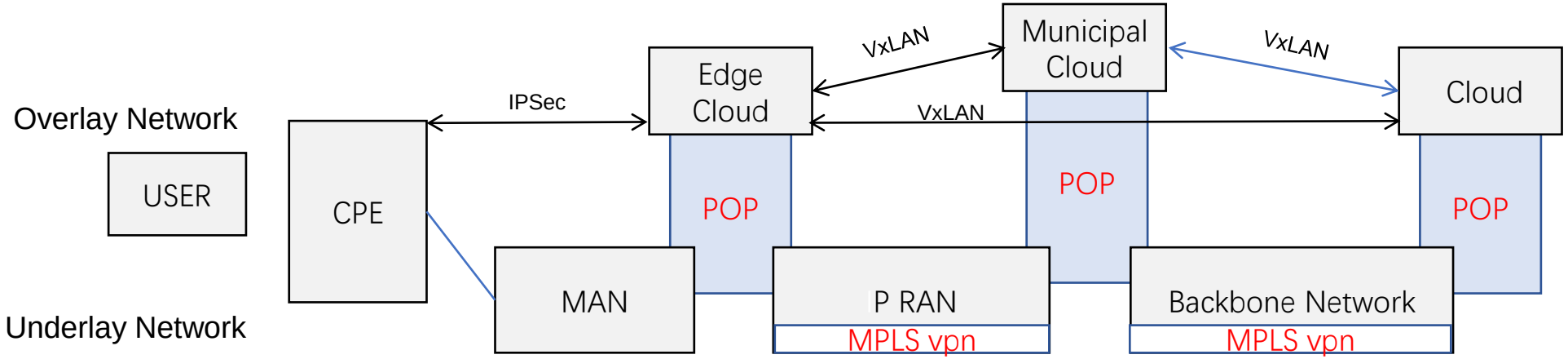
Cloud Access Service/Cloud leased Service

- Cloud access service enable customers to seamlessly connect their IT resources or data centers to the telecom cloud resource pools through the telecom cloud management/control system.
- Telecom cloud resource pool sites are usually deployed close to customers to reduce data transmission latency and provide a more localized service experience.
- Requirements: Agile provisioning, ensuring low latency and high reliability of data transmission, providing customers with network operation status.



Inter-DC/Cloud Connection Service

- Inter-DC/Cloud Connection is an overlay network which needs configurations of tunnel endpoints, encapsulation protocols, etc.
- Manual configuration only works for small-scale network. For large tenants, automatic service activation and delivery should be mandatory.
  - Agile service activation
  - Exposure of network to cloud, so workload may be deployed in an informed fashion
  - Dynamic adjustment of network resources to adapt to cloud scaling
  - High stability, reliability and secure



Problem statement and gap analysis

Frankly, current TSP network can’t yet perfectly meet the needs of the cloud, due to both managerial and technical reasons.

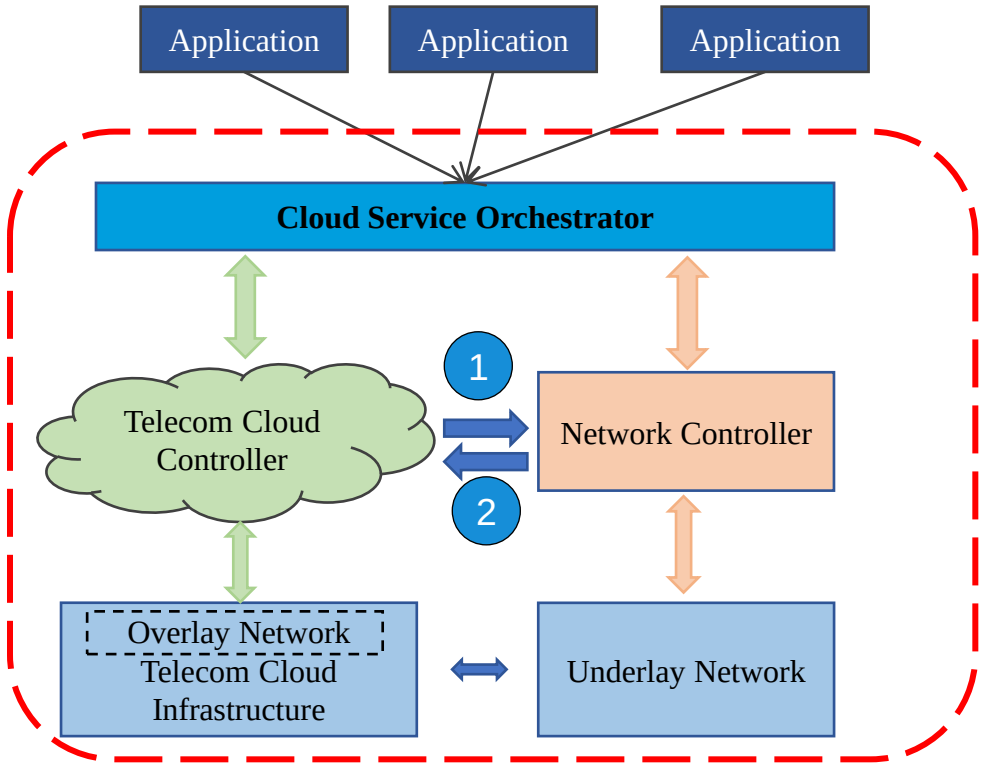
- Lack of definition for Key Interfaces, in particular, interface between controllers of network and cloud
- Lack of key data models, in particular, cloud resource model
- Lack of Unified Operation and Maintenance Management Monitoring (IOAM)
- Lack of Unified Cloud-Network Orchestration Mechanism

Network Operation Model for Telecom Cloud

- In this model, interfaces need to be defined between the Telecom Cloud Service Management/Control System and the Network Control System to achieve seamless data exchange and command transmission.
- This includes standardized API calls, data formats, and communication protocols.

1 Interface from Cloud to Network, enforce connectivity service to provide guarantees
- SLO enforcement (latency, jitter, etc.)
- Network resource adjustment for cloud scaling
- Network traffic scheduling
- Security isolation requirement

2 Interface from Network to Cloud, expose the network information to cloud
- Network performance data
- Data path of a specific overlay network
- Usage of a specific node or link
- Notification of Network fault event



Comments received and revisions

Luis Miguel

- There is a need to enhance the capability of exposing network or cloud resources, such as network topology and cloud computing capabilities, and to provide a comprehensive and complete view.
- It is necessary to establish an interface between the cloud management system and the network management system.

Next Steps

- Comments and suggestions are welcome, and further refinement will be made to improve the document.

Thank you!