

Network Working Group  
Internet Draft  
Intended status: Informational  
Expires: January 2015

Weiqliang Cheng  
CMCC

Yunbin Xu  
CATR

Guoying Zhang  
CATR

July 21, 2014

**ACTN Use-cases for Packet Transport Networks in Mobile Backhaul  
Networks  
draft-cheng-actn-ptn-requirements-00.txt**

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## Abstract

This document describes the key requirements for ACTN in carrier's transport networks, which mainly focus on the Packet Transport Networks.

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**1. Introduction**

MPLS-TP based packet transport network (PTN) has been widely used as mobile backhaul and enterprise customer private line/LAN solutions in many carrier's networks. The Packet Transport Networks work in different layers from L2 to L3 and in different areas such as access, metro and backbone networks. In the application scenarios, the most important requirements for operators are to solve the interoperability problems between multi-domain/multi-layer networks, realize the fast service provisioning, and improve the network operation efficiency.

The PTN operators may use ACTN to improve efficiency of provision and operation, optimize the resources utilization, and promote the customer's experiences. This draft mainly discusses the key requirements for ACTN in carrier's Packet Transport Networks.

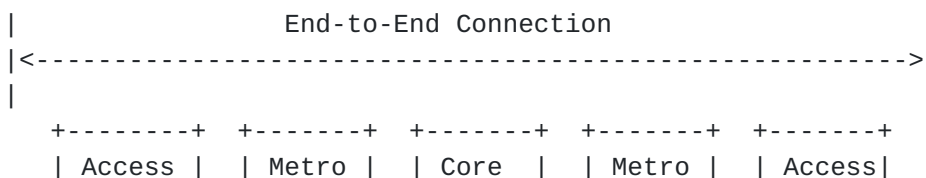
**2. ACTN Requirement for Packet Transport Networks**

**2.1. End-to-End Enterprise Services Provisioning**

The enterprise customer services are sensitive to the network quality, have strict time-limit requirement for service establishment. Faster end-to-end service provisioning may make the operators win the competition.

The operators had built a large scale of packet transport networks and divided them into different areas such as access, metro and backbone networks, each area has their own management systems. Currently in most application scenarios, PTN networks are using static provisioning with centralized Network management Systems (NMS). However, they are hard to meet the requirements of current enterprise services for fast provisioning and efficient operation.

The ACTN architecture [[ACTN-FWK](#)] should be considered to coordinate with traditional the networks management systems, so as to realize the end-to-end service provision.



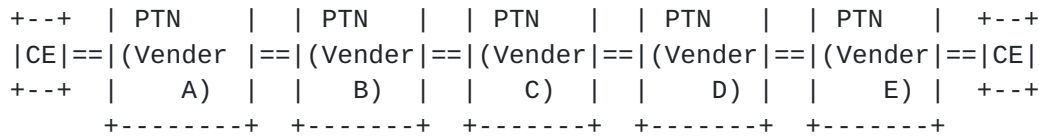


Figure 1 End-to-End Connection in Mobile Backhaul Networks

**2.2. Multi-layer coordination Requirement in L2/L3 Packet Transport Networks**

LTE backhauling requires the PTN to realize L3 network function. This function requires the management systems operate in different layers of networks, and leads to separate and fragmented network configuration. Further, the L2 PTN and L3 PTN networks may be provided by different vendors, and make the end-to-end provisioning much more complex. In the ACTN architecture, new functions such as topology detection and virtualization, auto-routing calculation are introduced. With these functions, operator can improve the user experiences and lower the OPEX.

On the other hand, operators want to obtain the flow information and realize the load balancing within L3 PTN networks,

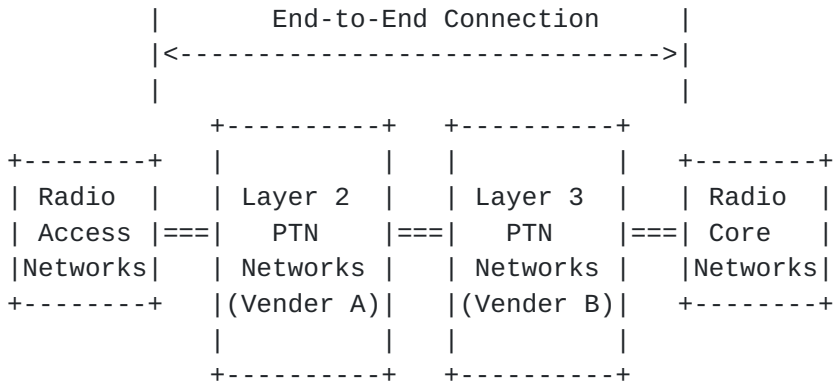


Figure 2 End-to-End Connection for L2&L3 PTN Networks

**2.3. Optimizing the network resources utilization**

The packet transport networks can support various performances monitoring matrix, such as traffic flow statistics, packet delay, delay variation, throughput and packet-loss rate, etc. All these performance parameters can support the enterprise customers SLA requirements. Through the performance monitoring, the PTN can

**3. Virtual Networks Operations for Packet Transport Networks**

Figure 3 shows an example of virtual network operations for packet transport networks. In order to realize end-to-end service provision, the ACTN architecture [ACTN-FWK] should consider coordination with traditional network management systems. By the network virtualization and abstraction, the traditional networks can be considered as a virtual network for VNC service provider, which can be realized by network management systems providing an abstract agent for VNC, or the VNC providing traditional interface for NMS.

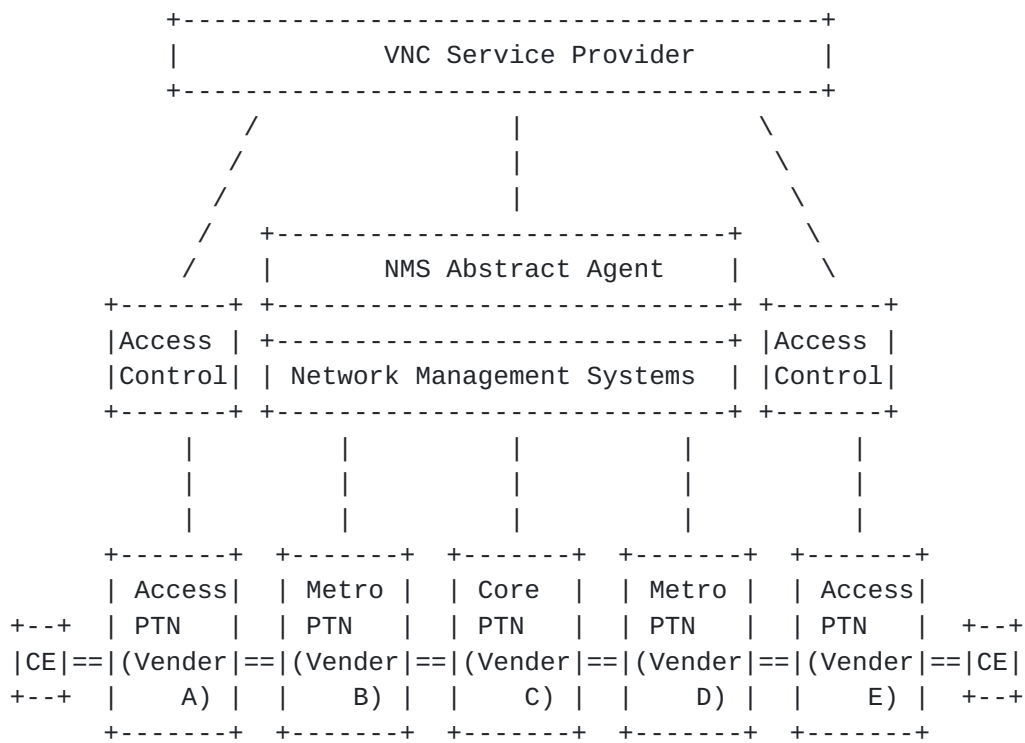


Figure 3 End-to-End Connection in Mobile Backhaul Networks

**4. Security Considerations**

This document raises no new security issues.

## 5. IANA Considerations

No new IANA considerations are raised by this document.

## 6. References

### 6.1. Informative References

- [ACTN-FWK] Daniele C., Luyuan Fang, Yong Lee and Diego Lopez, "Framework for Abstraction and Control of Transport Networks", [draft-ceccarelli-actn-framework-02](#).
- [ACTN-PERF] Yunbin Xu, Weiqiang Cheng, Guoying Zhang and Haomian Zheng, "Use Cases and Requirements of Dynamic Service Control based on Performance Monitoring in ACTN Architecture", [draft-xu-actn-perf-dynamic-service-control-01](#).

### Authors's Address

Weiqiang Cheng  
China Mobile Communication Company  
No.32 Xuanwumen West Street, Xicheng District, Beijing, China  
Email:chengweiqiang@chinamobile.com

Yunbin Xu  
China Academy of Telecom Research  
NO.52 Huayuan Beilu, Haidian District, Beijing, China  
Email: xuyunbin@catr.cn

Guoying Zhang  
China Academy of Telecom Research  
NO.52 Huayuan Beilu, Haidian District, Beijing, China  
Email: zhangguoying@catr.cn