ALTO Deployment Considerations: Configuration and Monitoring by ISPs

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Motivation & Objective

- Motivation:
  - Many Telecom Operators have shown interests in deploying ALTO
  - China Telecom experiences issues during ALTO trials in network

- Objective
  - A reference to highlight key issues that an ISP should consider when considering ALTO deployment

Four Issues in ALTO Deployment

1. How does an ISP deploy and configure its ALTO servers? Specifically, an ALTO Server provides the Network Map and the Cost Map. How does an ISP configure these maps? Where does an ISP deploy ALTO servers?

2. Which application entities fetch ALTO information?

3. How does an application integrate ALTO information into its decision process?

4. How does an ISP (potentially with collaboration from applications) monitor the deployment of ALTO, so that the ISP can better understand the status as well as the policy impacts of its ALTO deployment?

This document focuses more on the ISP perspective, and focuses more on the first and the fourth issues.

Document Structure/Content

- ALTO Server Placement and Configuration
  - Server Placement
  - Network and Cost Map Configuration

- ALTO Deployment Monitoring
  - Monitoring Metrics
  - Monitoring Data Sources
  - Application/ISP Monitoring Integration

Concept: Optimization Area

- We define a network area for which traffic need be optimized using the ALTO service as an optimization area

- We found it helpful that an ISP defines Optimization Areas:
  - One Access Network (AN)
  - One MAN
  - Large network with multiple AN or MAN

- A large ISP may partition its network into multiple optimization areas

Network and Cost Map Configuration

- Network Map and Cost Map definition and Configuration are very important in deploying ALTO service

- There are tradeoffs when a large ISP defines its Network Map. If the partition of the network in the Network Map is too fine-grained, it may lead to higher complexity and overhead. On the other hand, a too coarse-grained Network Map may lead to suboptimal optimization

- Case1: (ADSL or Ethernet based access network with BAS server)
  - In this case, each such access network can use one PID. It is generally unnecessary to further divide such access networks. Also, it can be beneficial to combine several such access networks into a single PID

- Case2: (MAN including several access networks)
  - ISP can define one or several MANS as one PID. It is also possible that the ISP deploys ALTO independently in some MANs.

ALTO Deployment Monitoring

- Objectives
  - Assess the benefits of ALTO deployment
  - Adjust its ALTO configuration and policies

- To build a monitoring infrastructure for ALTO service, ISP should:
  a) Define the performance metrics to be monitored
  b) Identify and deploy devices to collect data to compute the performance metrics.

Network Metrics

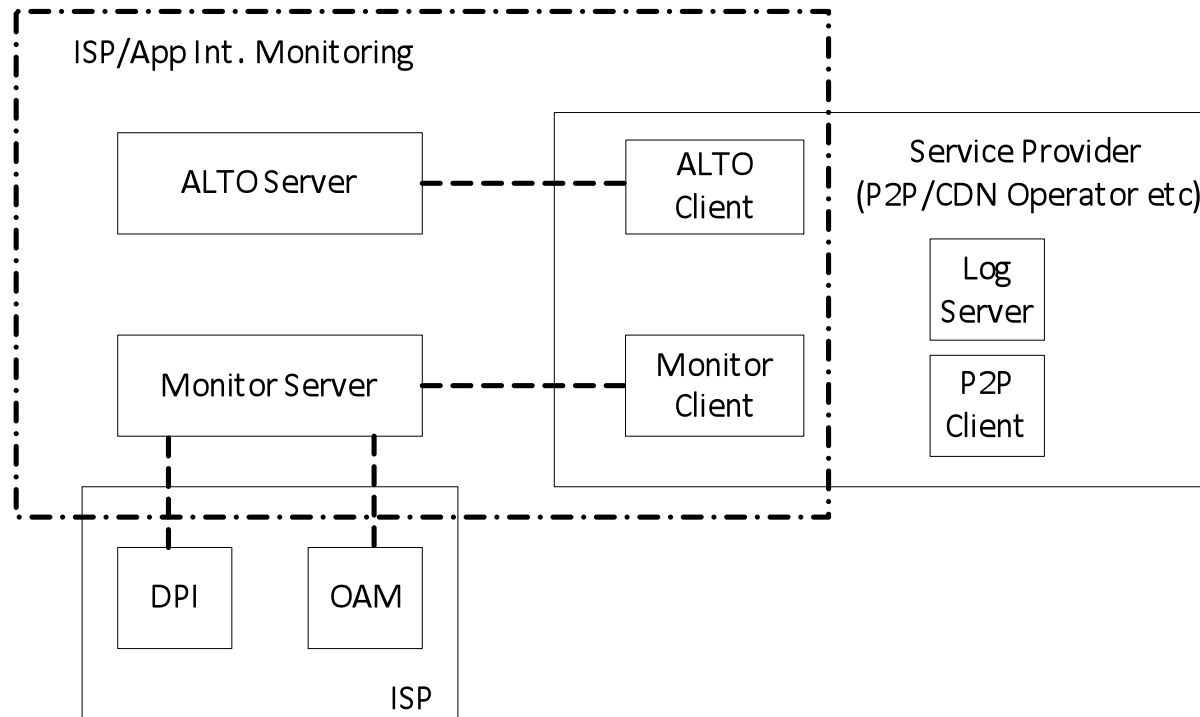| Network metric	Application metric
Inter-domain ALTO-Integrated Application Traffic	Application download rate
Total Inter-domain Traffic	
Intra-domain ALTO-Integrated Application Traffic	
Network hop count	

The metrics are defined based on:
a) Comcast's ISP Experiences in a Proactive Network Provider Participation for P2P (P4P) Technical Trial (RFC5632)
b) draft-lee-alto-chinatelecom-trial-01

Monitoring Data Sources

Data Sources	Provider
Application Log Server	Application provider
P2P Clients	Application provider(to P2P application)
OAM	ISP
DPI	ISP

Integrated Application/ISP Monitoring

ISP/App Int. Monitoring

ALTO Server

Monitor Server

DPI   OAM

ISP

ALTO Client

Monitor Client

Service Provider
(P2P/CDN Operator etc)

Log Server

P2P Client

Highly beneficial when an ISP and an Application can collaborate.

Monitoring Report Protocol

A useful tool is to define a
standard format for
Application
and ISP to exchange data.

```
HTTP/1.1 200 OK
    Content-Length: [TODO]
    Content-Type: application/alto
    {
      "meta" : {
          "version" : 1,
          "status" : {
              "code" : 1
          }
      },
      "metric1 name" : "value",
      "metric2 name" : "value",
    }
```

Thanks!!!

Q&A