Open Performance Testing Protocol

OPTP

Concepts

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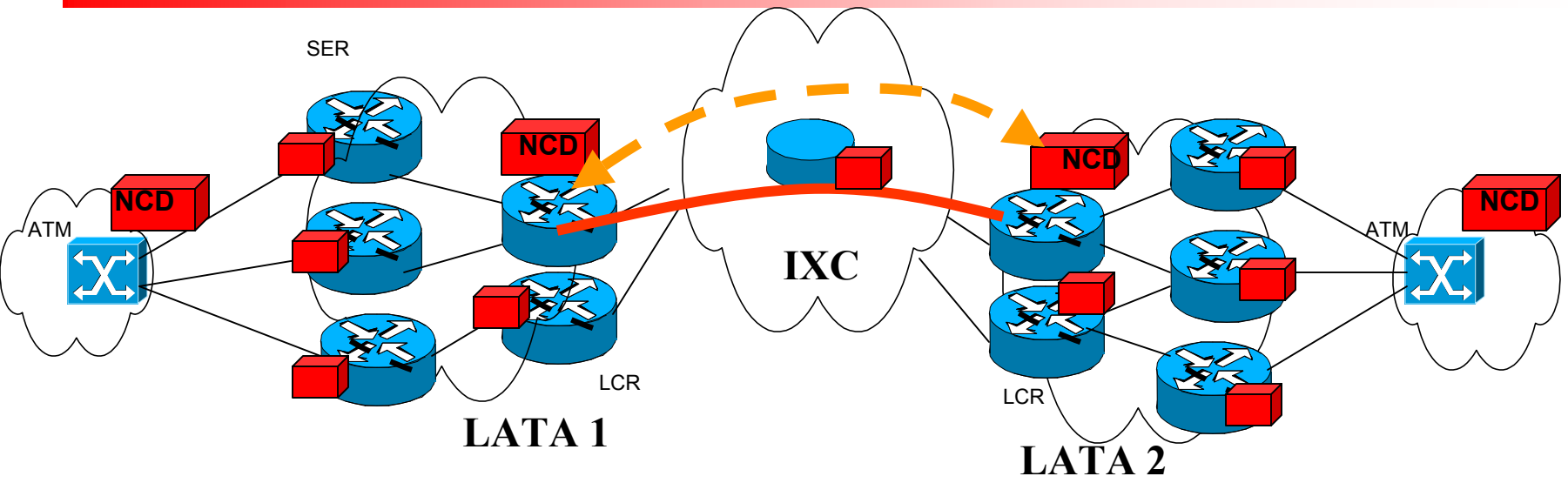
Some Preliminaries

- **SLA and performance testing is the key element of service delivery in telecom data networks; tested are internal networks as well as interprovider networks**
  - *Some services with very strict performance standards – VoIP, VIDEO RT, RT, lossless data services, cannot be offered without strict performance monitoring*
  - *Network monitoring is a huge infra structure and operations effort – It cost lots of moneys*
  - *Network Services require 24/7* performance monitoring, with nearRT notification of problems
- **Monitored are mostly:**
  - *Latency 1-2-way, jitter, packet loss, availability*
- **Monitored are ALL segments of the network – BB, Core, Access, Customer sites**
- **Monitored streams out-of-band or in band, per QoS (at least higher end classes)**
- **Multiple network technologies are involved: TLS, ATM, IP, ..**
- **There is no common testing standards between providers and manufacturers of network equipment**
  - *Some approaches – IP SLA (SAA), Brix, Agilent, Spirent- usually dedicated HW*
- **The only common standard is ICMP or OAM cell based application – needless to say it is not good enough**
- **We have good exiting performance measure standards:**
  - *RFC 2679, RFC 2680, RFC 2330, RFC 2681, RFC 2678, MEF ……*
- **We do not have common measurement protocol**
- **And there is TOD**

Some Preliminaries (cont)- current approach



- Place dedicated HW –network collection devices (NCD) at key locations (end point) in the network.
- Testing is done between NCDs. NCD is a network device that is a part of the network- each end point may require a dedicated NCDs.
- A dedicated NCD provides the required measurement stability and accuracy; current integrated solutions are no reliable enough – technical design problem
- NCD must be managed as a network element; very difficult to implement at Customer premises
- Current approach is expensive and difficult to scale.
- Scaling numbers number of NCD points –BB < 50; core 100, Access <1000, CP > 1000s (guess)

Open Performance Testing Protocol OPTP - Concepts

- Protocol that measures basic (which) network performance parameters
- Protocol is located at the production network element
- Protocol is accurate – it is not affected by the production traffic processing
- Supports HW time stamping
- Supports collection of basic statistics
- Is vendor independent allowing for the inter vendor testing
- Supports QoS (p-bits, DSCP, EXP); must look like data traffic
- Supports <1ms accuracy
- Supports IP end points
- Support some security features
- Supports in-band out of band tests

High-Level Requirements

- **OPTP should support *RFC 2679, RFC 2680, RFC 2330, RFC 2681, RFC 2678,* or subsets of them**
- **OPTP should be expandable (to support new tests)**
- **OPTP should support storage and forwarding (push or pull) results to the performance Collection System.**
- **Any OPTP end point can be an originator of tests**
- **Any OPTP test point can be the end point of tests**
- **OPTP should support at interface time stamping**
- **OPTP should support in band and out of band testing**
- **OPTP should support authentication services**

High-Level Requirements (cont.)

The following test parameters should be configurable (at the minimum):

- Destination IP Address, PVC, VLAN ID, Class of Service (802.3p P-Bit) IP DSCP
- Packet rate
- Packet length
- Test duration
- Packet time to live
- Latency buckets (for aggregation of results in classes)
- Jitter buckets (for aggregation of results in classes)
- Jitter measurement offset

High-Level Requirements (cont.)

The following parameters should be recorded from each test (at the minimum):

Round Trip Latency
- Minimum (msec)
- Maximum (msec)
- Average (msec)
- Buckets (number of packets in each Bucket)

Jitter – Originating-Destination, Destination-Originating
- Minimum (msec)
- Maximum (msec)
- Average (msec)
- Buckets (number of packets in each Bucket)

Number of Round Trip Packets

Number of Lost Packets

Number of Out-of-Sequence Packets

Proposal

- Initiate work on a draft RFC to define industry standard for testing network performance OPTP with IPPM forum.
- I propose two drafts; requirements for OPTP and the specification for the protocol
- I wanted to obtain the feedback from the members of the IPPM group about possible support for such an effort