Multi-Paths Concurrent Measurement Protocol

draft-dang-ippm-multiple-path-measurement-01

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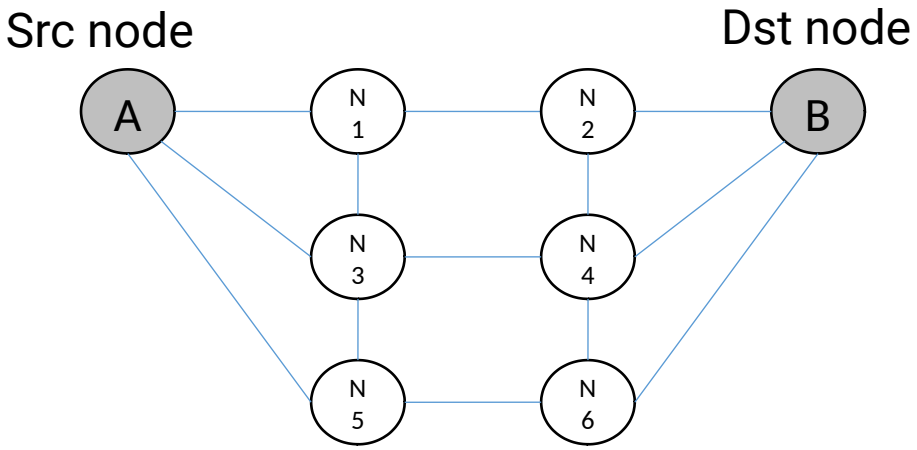
Overview

- Charter for IPPM WG: produced protocols for communication among test equipment to enable the measurement.

- Multiple Path Measurement [*draft-dang-ippm-multiple-path-measurement-01*] is mainly in concurrently measuring the multiple paths in equal-cost multi-path (ECMP) or unequal-cost multiple (UCMP) scenarios.

Multiple Paths



- Has a definite Src node and Dst node
- Be Adopted in the equal-cost multi-path (ECMP) or unequal-cost multiple (UCMP) scenarios

Path1: A->N1->N2->B
Path2: A->N3->N4->B
Paht3: A->N5->N5->B

- Each path of the multiple path are unidirectional.

Motivation

Path1: A->N1->N2->B
Path2: A->N3->N4->B
Paht3: A->N5->N5->B

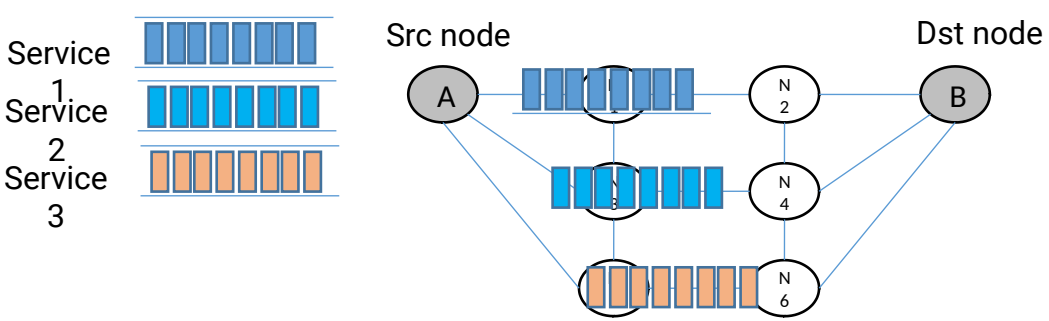


Figure1: Senario1

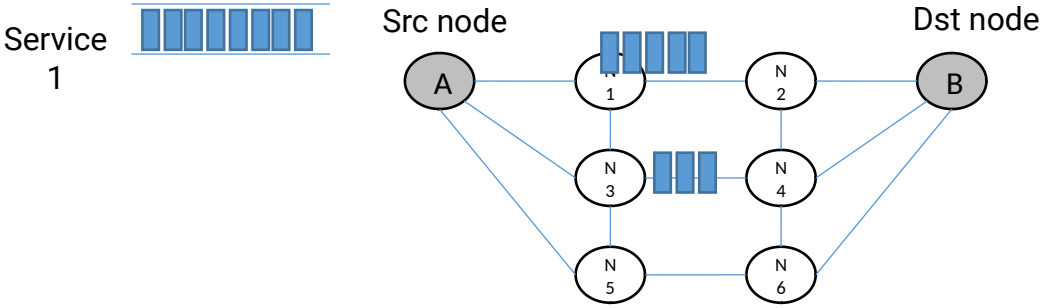
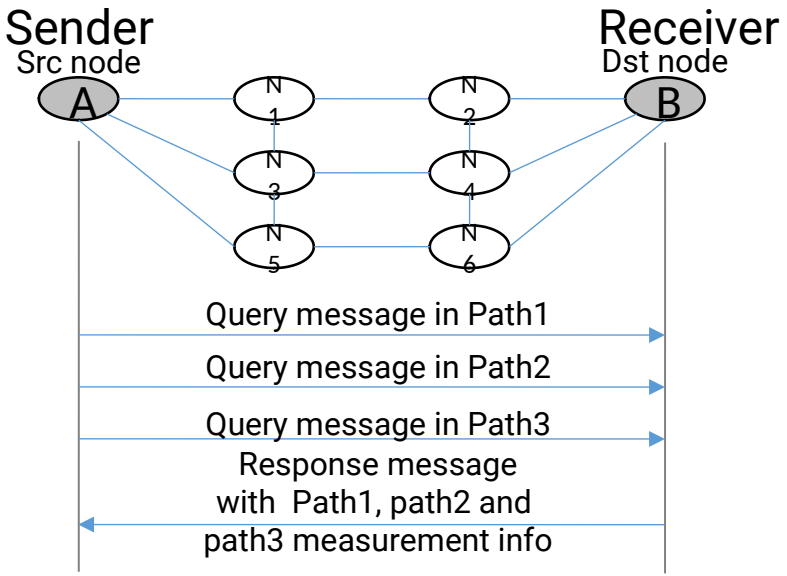


Figure2: Senario1

- Senario1: The services with different quality requirements is imported to the available paths on demand.
- Senario2: There is a path congestion. The part of traffic causing the path congestion is adjusted to other light loads.
- Challenge: Each path is measured separately in traditional method. If you want to ensure that the data obtained by the test is available and accurate, the test start point and end point in multiple paths must be consistent.
- Solution: The Multi-Path Concurrent Measurement Protocol (MPCMP) is required.

Multi-Path Concurrent Measurement Protocol



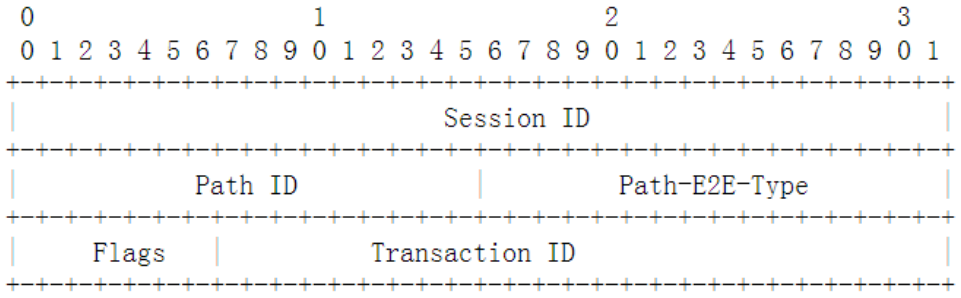
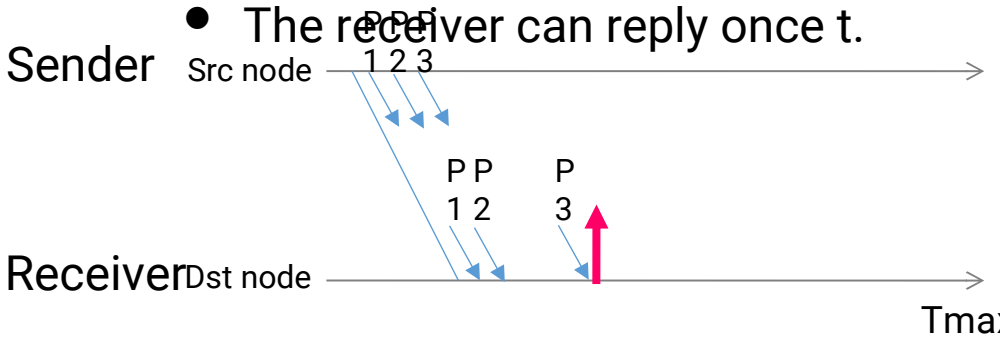


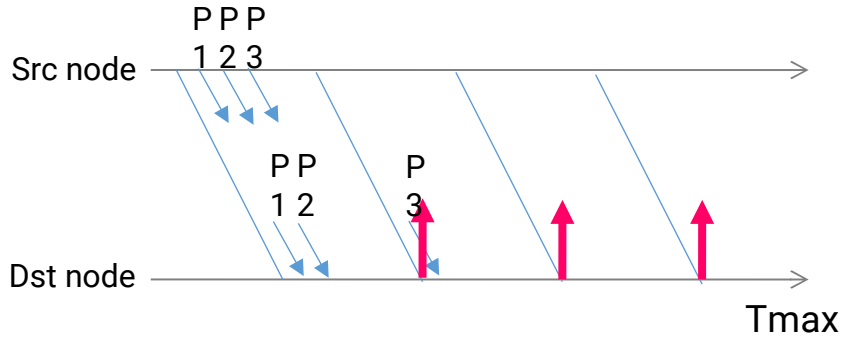
Figure 1: MPCMP Path header

- The sender **generate a multipath measurement at the same time.**
  - Each path has its own query message.
- **Get the quality data of a multipath measurement at the same time through any path**
  - The measurement results at the receiver can be sent back or sent in a sesponse message because the main consideration is to save network bandwidth.
- Session ID: A set of multiple paths
- Path ID: One path of the session.
- Flags: Identify the query or response type.

Measurement Mode

- **Long-term measurement**
  - The receiver can wait until it receives all measurement requests of a set of path and then responds.
- **Short-term measurement**
  - The sender can query once t.
  - The receiver can reply once t.





When the period is shorter, the measurement accuracy is higher.

Next Step

- Think deeply in conjunction with Segment Routing Policy and In-situ OAM (IOAM) scenarios

Thank you!