

Multipoint Alternate Marking method for passive and hybrid performance monitoring

draft-ietf-ippm-multipoint-alt-mark-02

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Multipoint Alternate Marking

Point-to-point flows monitoring

Alternate Marking (**RFC 8321**) to monitor unicast point-to-point flows or multicast flows.

To have an IP (TCP/UDP) flow that follows a point-to-point single path we have to define, with a specific value, **5 identification fields** (IP Source, IP Destination, Transport Protocol, Source Port, Destination Port).



Multipoint Alternate Marking

We can monitor a multipoint unicast flow selected by **identification fields without any constrain**.

The monitoring network can be considered as a whole or can be split in Clusters.

The **Network Clusters** partition can be used at different levels to perform the needed degree of detail: Clusters can be **combined in new connected subnetworks** depending on the network topology.

Definition and mathematical formalization of the **algorithm for Cluster partition that can be applied to every graph**.

An Intelligent Performance Management approach

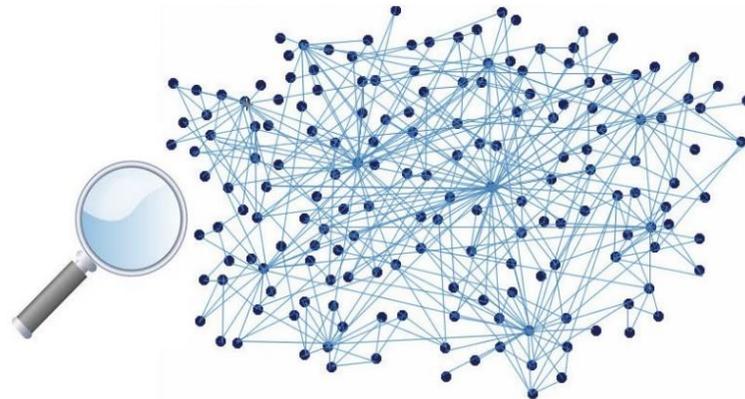
In general, it is resource consuming to monitor continuously all the flows and all the paths. A flexible and intelligent performance management is desired.

Network Zooming

- A Controller can calibrate and manage Performance Measurements.
- It can **start without examining in depth**. In case of necessity (packet loss or too high delay), an **immediate detailed analysis** can be **reconfigured and performed** and the problem can be localized in a specific Cluster or in a combination of Clusters

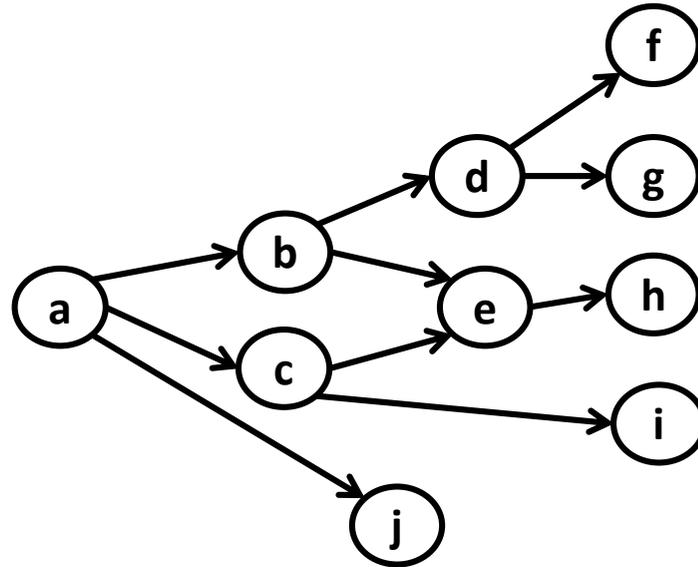
Two ways to act:

- 1) Change the traffic filter (identification fields) and select more detailed flows;
- 2) Activate new measurement points by defining more specified Clusters.



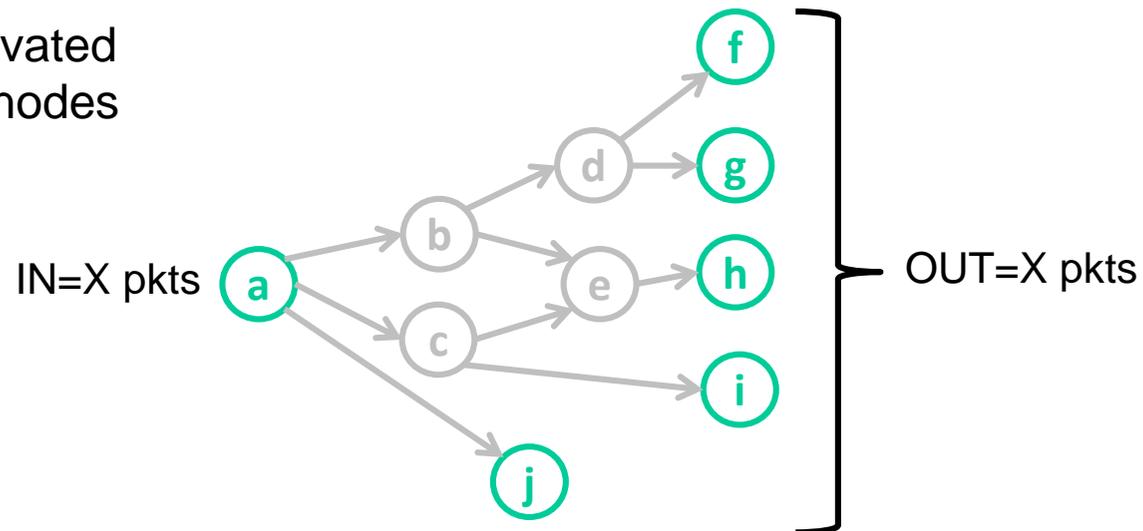
Example of Application (1/2)

1) Full Network Monitor



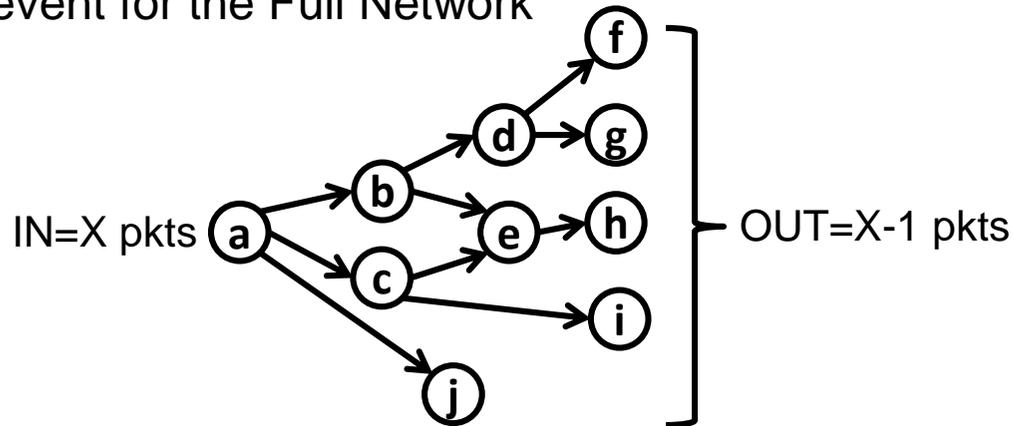
Everything is good: Packet Loss = 0 and Delay/Jitter less than SLA values

Counters are activated only at the edge nodes

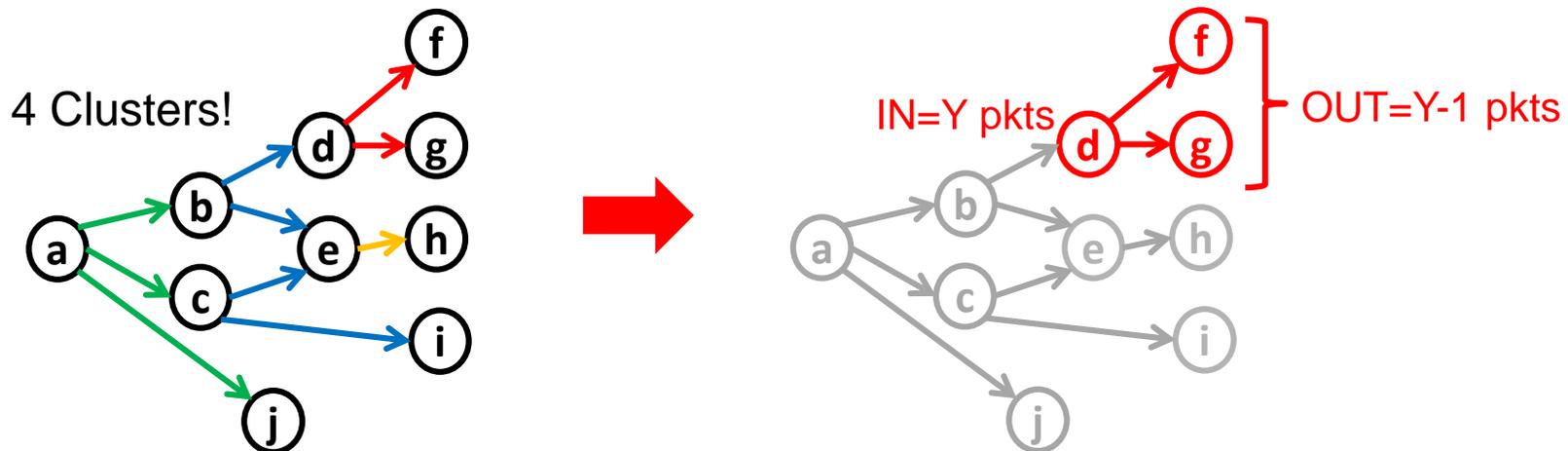


Example of Application (2/2)

2) Packet Loss event for the Full Network



3) Configure Clusters Partition and locate which Cluster has the problem



4) More specific traffic filter



A complete Performance Measurement Framework

- **Packet Loss** can be measured on Cluster basis or by considering a combination of Clusters; and the borderline cases of single flows and whole network.
- **Delay measurements** can be done in different ways:
 - **multipoint path basis measurement:** the delay value is representative of an entire multipoint path. The mean delay for a multipoint path can be defined.
 - **single packet basis measurement:** the multipoint path is used just to easily couple packets between inputs and output nodes of a multipoint path. Hashing (**RFC5475**) and Multipoint Alternate Marking are coupled in this case
 - Clusters simplify the correlation of the samples from a topological point of view **in terms of space**
 - Marking method anchor the samples to a specific period and simplify the correlation **in terms of time**

Changes from -01

Some implementation considerations:

An architecture where the centralized Data Collector and Network Management can apply the intelligent and flexible Alternate Marking algorithm is needed.

- PBT ([draft-song-ippm-postcard-based-telemetry](#)) gives a chance
- [draft-zhou-ippm-enhanced-alternate-marking](#) generalizes the alternate marking metadata

New Use Cases:

- SDWAN: path selection for the WAN connection based on per Cluster and per flow performance
- Helps Traffic Visualization and topology mapping application

Next steps

The document is stable.

Beginning the path to become RFC.

Inputs and Comments always welcome