

Error Performance Measurement in Packet-switched Networks

draft-mirsky-ippm-epm

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What is EPM?

- OAM toolset includes methods to detect defects and measure performance
- Defect is an inability to communicate. Defect in PSN is Loss of path continuity, i.e., there's no path through the network to get a packet from the source node to the destination node.
- Defect state is the state of 100% packet loss – bridge Fault Management and Performance Monitoring OAM
- Packet Loss is an infinite delay of a packet
- Error Performance Measurement – methods of quantitative characterization of the network condition between endpoints.

EPM is Active OAM

- EPM is well-known in constant bit-rate, e.g., TDM, communication technologies (ITU-T G.826 and G.827)
 - based on the guaranteed presence of data, several EPM states and metrics defined, including state of path availability and unavailability
- A packet-switched network is based on the principle of statistical multiplexing and does not provide a predictable, guaranteed rate of receiving packets in the specified flow.
- Only active OAM can create a sub-flow with a predictable rate of packets that can be used by EPM OAM

EPM Apparatus

- Consider using G.826/G827 EPM parameters:
 - Errored Interval (second)
 - Severely Errored Interval (second)
 - Error-free Interval (second)
- Consecutive intervals form a period of:
 - Availability
 - Unavailability
- To make it stable, the definition of a period includes hysteresis. For example:
 - Ten consecutive Severely Errored intervals determine that a path is in an unavailable period that started at the beginning of the first Severe Errored interval.
 - A sequence of Errored and Error-free intervals shorter than ten does not change the state of the path, i.e., it is still in unavailable period.
- Other metrics:
- Errored Interval Ratio = $\text{Errored Intervals} / \text{Total Number of Intervals}$
- Severely Errored Interval Ratio = $\text{Severely Errored Intervals} / \text{Total Number of Intervals}$

Next steps

- Consider suitable OAM tool(s)
- Welcome comments, questions
- Contributions, cooperation are most appreciated

Thank you