Comparison of Reorder Metrics and Status of RD-RBD draft

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Comparison of Reorder Metrics

- Essential and Desirable Attributes
- Essential
  - Capture reordering (fundamental requirement)
    - Both Earliness & Lateness with extents. Consider sequences {1, 19, 2, 3, .., 18} and {1, 3, 4,..,19, 2}. Only RD captures earliness and lateness with extent.
    - Consider {1, 4, 5,….19, 2, 3}.

    N – reordering does not capture reordering.

Comparison of Reorder Metrics
Essential Attributes Contd.

- Low sensitivity to lost and duplicate packets
- On-the-fly computation
- Usefulness

  "The metrics must be useful to users and providers in understanding the performance they experience or provide."

  - Paxson, V., et. al., RFC 2330

- ….

Comparison of Reorder Metrics

- Desirable Attributes
  - Simple, yet informative
  - Low spatial complexity - buffering
  - Low computation complexity -comparisons
  - Robustness – {1, 250, 2, 3, 4, …}
  - Operations on measures - Cascade of networks

Comparison of Reorder Metrics

X – attribute is absent   ◖ - attribute is partially present   √ - attribute is present

Metric/ Attribute	RD	RBD	%	Reordering Extent	Byte- offset	n- reordering
Capture reordering	√	◖	X	◖	◖	X
Low sensitivity to loss and duplication	√	◖	√	◖	◖	◖
Usefulness	√	◖	X	◖?	◖?	◖
On-the-fly computation	√	√	√	√	√	√

Comparison of Reorder Metrics

X – attribute is absent   ◖ **- attribute is partially present**   √ **- attribute is present**

Metric/ Attribute	RD	RBD	%	Reordering Extent	Byte-offset	n-reordering
Spatial requirement	Constant	Constant	Constant ?	O(N)	O(N)	O(N)
Computation complexity	O(N)	O(N)	O(N)	$O(N^2)$	$O(N^2)$	$O(N^2)$
Operation for network cascade	√	X	X	X	X	X

Status of RD and RBD draft

- Paper on RD is accepted for publication:

  Nischal M. Piratla, Anura Jayasumana and Abhijit Bare, "RD: A Formal, Comprehensive Metric for Packet Reordering," IFIP Networking 2005, Ontario Canada, May 2005

- Several papers in pipeline for publication
- draft-jayasumana-reorder-density-04.txt is posted

Changes:

- Loss-orthogonal RBD removed
- Ready for next step - review

We make a motion that this draft be accepted as an "IPPM reorder metrics" draft