

ALTO Performance Metrics

draft-ietf-alto-performance-metrics-07

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Outline

- Updates from v06-v07
- Remaining issues requiring WG discussions
- Next step

Updates Overview (v06-v07)

- Structure changes
- Many small text changes as well

1. Introduction	3
2. Challenges on data sources and computation of ALTO performance metrics	5
2.1. Data sources Challenge	5
2.2. ALTO performance metrics Computation Challenges	5
2.2.1. Configuration Parameters Challenge	5
2.2.2. Availability of end to end path values Challenge	6
3. Network Performance Cost Metrics	6
3.1. Cost Metric: OWDelay	6
3.2. Cost Metric: RTT	8
3.3. Cost Metric: PDV	10
3.4. Cost Metric: Hop Count	12
3.5. Cost Metric: Packet Loss	14
3.6. Cost Metric: Throughput	16
4. Traffic Engineering Performance Cost Metrics	18
4.1. Cost Metric: Link Maximum Reservable Bandwidth	19
4.2. Cost Metric: Link Residue Bandwidth	20
5. Security Considerations	22
6. IANA Considerations	23
7. Acknowledgments	23
8. References	23
8.1. Normative References	23
8.2. Informative References	25
Authors' Addresses	25

1. Introduction	3
2. Network Performance Cost Metrics	5
2.1. Cost Metric: One Way Delay (owdelay)	5
2.1.1. Intended Semantics	6
2.1.2. Use and Example	6
2.1.3. Measurement Considerations	7
2.2. Cost Metric: RoundTrip Time (rtt)	7
2.2.1. Intended Semantics	8
2.2.2. Use and Example	8
2.2.3. Measurement Considerations	9
2.3. Cost Metric: Packet Delay Variation (pdv)	9
2.3.1. Intended Semantics	10
2.3.2. Use and Example	10
2.3.3. Measurement Considerations	11
2.4. Cost Metric: Hop Count	12
2.4.1. Intended Semantics	12
2.4.2. Use and Example	13
2.4.3. Measurement Considerations	14
2.5. Cost Metric: Packet Loss	14
2.5.1. Intended Semantics	14
2.5.2. Use and Example	15
2.5.3. Measurement Considerations	16
2.6. Cost Metric: Throughput	16
2.6.1. Intended Semantics	17
2.6.2. Use and Example	17
2.6.3. Measurement Considerations	18
3. Traffic Engineering Performance Cost Metrics	18
3.1. Cost Metric: Link Maximum Reservable Bandwidth	19
3.1.1. Intended Semantics	19
3.1.2. Use and Example	19
3.1.3. Measurement Considerations	20
3.2. Cost Metric: Link Residue Bandwidth	21
3.2.1. Intended Semantics	21
3.2.2. Use and Example	21
3.2.3. Measurement Considerations	22
4. Operational Considerations	23
4.1. Data Source Considerations	23
4.2. Computation Considerations	24
4.2.1. Configuration Parameters Considerations	24
4.2.2. Availability Considerations	24
5. Security Considerations	24
6. IANA Considerations	25

Main Update (v06-v07): Metric Definition

- Restructure the definition of each metric to be consistent with ALTO base protocol (RFC 7285)

– v06, structure, for each metric,

- RFC7285

- Metric Name
- Metric Description
- Method of Measurement or Calculation
- Units of Measurement
- Measurement Point(s) with Potential Measurement Domain
- Measurement Timing
- Use and Applications

14.2. ALTO Cost Metric Registry

IANA has created and now maintains the "ALTO Cost Metric Registry", listed in Table 3.

Identifier	Intended Semantics
routingcost	See Section 6.1.1.1
priv:	Private use

Table 3: ALTO Cost Metrics

This registry serves two purposes. First, it ensures uniqueness of identifiers referring to ALTO cost metrics. Second, it provides references to particular semantics of allocated cost metrics to be applied by both ALTO servers and applications utilizing ALTO clients.

Requests to add a new value to the registry MUST include the following information:

- o Identifier: The name of the desired ALTO cost metric.
- o Intended Semantics: ALTO costs carry with them semantics to guide their usage by ALTO clients. For example, if a value refers to a measurement, the measurement units must be documented. For proper implementation of the ordinal cost mode (e.g., by a third-party service), it should be documented whether higher or lower values of the cost are more preferred.
- o Security Considerations: ALTO costs expose information to ALTO clients. As such, proper usage of a particular cost metric may require certain information to be exposed by an ALTO service provider. Since network information is frequently regarded as proprietary or confidential, ALTO service providers should be made aware of the security ramifications related to usage of a cost metric.

Update (v06-v07): Metric Definition

- Restructure the definition of each metric to be consistent with ALTO base protocol (RFC 7285)
 - v06, structure, for each metric, defines
 - Metric Name
 - Metric Description
 - Method of Measurement or Calculation
 - Units of Measurement
 - Measurement Point(s) with Potential Measurement Domain
 - Measurement Timing
 - Use and Applications
 - v07, structure, for each metric, defines
 - Metric Name
 - Metric identifier
 - Intended semantics
 - Metric Description
 - Metric Representation
 - Use and Example
 - Measurement Considerations
 - Method of Measurement or Calculation
 - Measurement Point(s) with Potential Measurement Domain
 - Measurement Timing



Metric Details

Metric	Representation
One-Way Delay, RTT, Packet Delay Variation	A single JSONNumber conforming to Sec. 6 [7159] (int [frac] [exp]); Must be non-negative; units is ms; NO infinity
Hop Count	The metric value type is a single 'JSONNumber' type value conforming to the number specification (Section 6, [RFC7159]). The number MUST be an integer and non-negative.
Packet Loss	The metric value type is a single 'JSONNumber' type value conforming to the number specification (Section 6, [RFC7159]). The number MUST be non-negative. The value represents the percentage of packet loss.
Throughput, Max Reservable BW, Residue BW	The metric value type is a single 'JSONNumber' type value conforming to the number specification (Section 6, [RFC7159]). The number MUST be non-negative. The unit is Mbps.

- Suggestions but not adopted: (1) add infinity; (2) allow units such as ms, Mbps/Kbps/Gbps, ...

Update: Operations Considerations

- Substantially extended the section on operations considerations, to discuss,
 - Data Source Considerations
 - Active (specific measurement models such Poisson, ..., periodical)
 - Passive (derivation from existing data such as logs)
 - On-demand
 - Computation Considerations
 - Data cleaning, aggregation, inference, ...

Remaining Issue (1): Metric Def Consistency and Reusability

- A basic issue is consistency and reusability in IETF

IPPM metrics [1][2]

ALTO performance metrics [this document]

Identifier	Intended Semantics
owdelay	See Section 2.1
rtt	See Section 2.2
pdv	See Section 2.3
hopcount	See Section 2.4
pktloss	See Section 2.5
throughput	See Section 2.6
maxresbw	See Section 3.1
residuebw	See Section 3.2

- UDP
 - RTDelay_Active_IP-UDP-Periodic_RFCXXXXsecY_Seconds_95Percentile
 - RTLoss_Active_IP-UDP-Periodic_RFCXXXXsecY_Percent_LossRatio
 - OWPDV_Active_IP-UDP-Periodic_RFCXXXXsecY_Seconds_95Percentile
 - OWDelay_Active_IP-UDP-Poisson-Payload250B_RFCXXXXsecY_Seconds_<statistic>
 - OWDelay_Active_IP-UDP-Periodic20m-Payload142B_RFCXXXXsecY_Seconds_<statistic>
- TCP
 - RTDelay_Passive_IP-TCP_RFCXXXXsecY_Seconds_<statistic>
- DNS
 - RTDNS_Active_IP-UDP-Poisson_RFCXXXXsecY_Seconds_Raw RLDNS_Active_IP-UDP-Poisson_RFCXXXXsecY_Logical_Raw

[1] <https://datatracker.ietf.org/doc/draft-ietf-ippm-metric-registry/>

[2] <https://datatracker.ietf.org/doc/draft-ietf-ippm-initial-registry/>

Discussion: Metric Def Consistency and Reusability

- Many levels of reusability and consistency
 - Reusability:
 - based ALTO metric registry on IPPM metric registry, or
 - not
 - Consistency
 - » Same ID
 - » Same metric

Remaining Issue (2): Operations and Security Considerations

- How much to update
 - Operations considerations
 - Security considerations

Next Step

- Discussion with IPPM
- Finalize updates and submit an update

Backup Slides