ALTO Performance Metrics

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Outline

- Updates between IETF 111 and IETF 112 (v17 -> v18 -> v19)
  - Clarify the definition of CostMetric string
  - Clarify IANA Considerations
- Ongoing discussion with one review
  - cost-context parameters

```
object {
  CostMetric   cost-metric;
  CostMode     cost-mode;
  [CostContext cost-context;]
  [JSONString  description;]
} CostType;

object {
  JSONString    cost-source;
  [JSONValue    parameters;]
} CostContext;
```

CostMetric Definition (Sec. 2.2)

- Definition
  - Clarified grammar:
    - “A cost metric string consists of a base metric identifier (or base identifier for short) string, followed by an optional statistical operator string, connected by the ASCII character colon (':', U+003A), if the statistical operator string exists. Examples of cost metric strings then include "delay-ow", "delay-ow:min", "delay-ow:p99", where "delay-ow" is the base metric identifier string; "min" and "p99" are example statistical operator strings.”
  - Clarified statistical operator:
    - “cur: the instantaneous observation value of the metric from the most recent sample (i.e., the current value).”
  - Clarified default statistical operator:
    - “If a cost metric string does not have the optional statistical operator string, the statistical operator SHOULD be interpreted as the default statistical operator in the definition of the base metric. If the definition of the base metric does not provide a definition for the default statistical operator, the metric MUST be considered as the median value.”
    - Residual bandwidth (Sec. 4.2.3) and maximum reservable bandwidth (Sec. 4.3.3): The default statistical operator is the current instantaneous sample; that is, the default is assumed to be "cur".

IANA Considerations (Sec. 7)

- Make clear
  - “A new ALTO cost source can be added after IETF Review [RFC8126], to ensure that proper documentation regarding the new ALTO cost source and its security considerations have been provided…”
  - “Requests to add a new value to the registry MUST include the following information:
    - Identifier: The name of the desired ALTO cost source type.
    - Intended Semantics: ALTO cost source type carry with them semantics to guide their usage by ALTO clients. Hence, a document defining a new type should provide guidance to both ALTO service providers and applications utilizing ALTO clients as to how values of the registered ALTO endpoint property should be interpreted.
    - Security Considerations: ALTO cost source types expose information to ALTO clients. ALTO service providers should be made aware of the security ramifications related to the exposure of a cost source type.”

Ongoing Discussion: Cost Context Parameters

- Current design: Provide an opaque (JSONValue) container for deployment specific customization and future extensions.
- Review comment: how much to make it machine readable.

```
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  CostMode     cost-mode;
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  [JSONString  description;]
} CostType;

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```

	nominal	sla	estimation
One-way Delay	value	link	link
Round-trip Delay	value	link	link
Hop Count	value	link	link
Loss Rate	value	link	link
TCP Throughput	value	link	link
Residual Bandwidth	value	link	link
Max Reservable Bandwidth	value	link	link

More Metrics On the Way Already

- Metric
  - tput (4.1.3)
    - “To give the throughput of a TCP congestion- control conforming flow from the specified source to the specified destination; see [RFC3649, Section 5.1 of RFC8312] on how TCP throughput is estimated.”
  - New adaptive flows may give different results, e.g., max-min