ALTO Incremental Updates

draft-ietf-alto-incr-update-sse-01

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Summary

• General framework for updates to any ALTO resource
  – Including Endpoint Cost & Property Services
  – Provides continuous updates, which may be full or incremental

• Server defines one or more Update Stream resources
  – Continuous stream of update messages for a resource set
  – One stream may update several resources (network + cost maps)

• Update Streams are optional & flexible
  – Server can offer updates for some, all or none of its resources

• Uses Server-Send Events (SSEs) over HTTP/1.1

• Approved as WG draft (IETF 93, March 2015)

• Test server: http://alto.alcatel-lucent.com:8000/directory
Changes Since Version -00

• Added selective stop
  – More graceful than just closing stream

• Update Stream resource accepts two requests:
  – start-updates establishes a stream, as before:
    "start-updates": {"network-map":{}, "cost-map":{}}
  – stop-updates tells server to stop some or all updates:
    "stop-updates": {"stream-id": "XXXXXXXX", "resources": ["cost-map"]}
  – Note: Version -01 uses different syntax; this is clearer
  – Client sends stop-updates request on a new TCP stream
    (SSE is one-way stream, server -> client)

• Server assigns unique stream-id for each update stream
  – Server returns as first event in stream
  – Client uses in stop-updates to identify stream
Status & Experience

• SSE issues:
  – SSE designed for events with small amounts of line-oriented text
  – Full cost map could be a 10-megabyte “line”
  – ALTO Server: inject new-lines periodically
  – ALTO Client: use SSE library which returns lines as they arrive

• “Updates” may give same value:
  – Example: When network map changes, easier to send full cost map than determine which costs actually changed

• Incremental updates issues:
  – Can be very difficult for server to decide what changed
  – Ordinal costs: You cannot change just one!
  – ECS via PID costs: new network map -> every cost might change
  – Filtered cost map with constraint test
  – Result: Server may send “unnecessary” full-replacement updates
So What’s Next?

• Incremental update is a WG charter item – and it’s late!
• Next steps?
  – Update to draft -02 (cosmetic, barring substantive comments)
  – Do off-line interop tests with other clients & servers?
  – Interested parties read the draft?
• Or should we just wait for HTTP/2?
  – Would eliminate stream-ids and associated security issues
  – But we would still use SSE; HTTP/2 “server push” does NOT help
  – Disadvantage: HTTP/2 is much more complicated than HTTP/1.1
  – Library support (client & server) is spotty
Backup Slides
Alternatives

• Use HTTP/2 (RFC 7540) instead of SSE
  - Affects transport; does not change update format
• Pluses:
  - IETF Standard
  - Should be widely supported – eventually
• Minuses:
  - Much more complex than HTTP/1.1
  - Not yet widely supported in libraries
  - HTTP proxies must support HTTP/2
• Recommendation:
  - We need incremental update NOW
  - Offer HTTP/2 version when support becomes common