draft-ietf-alto-cost-calendar-12
Status and diffs with v11

July 25th 2019 IETF 105 – Montreal
ALTO WG

Sabine Randriamasy
Y. Richard Yang
Qin Wu
Lingli Deng
Nico Schwan
IESG review – December 2018

- Has 2 DISCUSSes. Has enough positions to pass once DISCUSS positions are resolved.
  - See https://datatracker.ietf.org/doc/draft-ietf-alto-cost-calendar/

- “DISCUSS” position at IESG
  - “is a blocking position; the document cannot proceed until any issues are resolved to the satisfaction of the Area Director who issued the DISCUSS.”
  - See https://www.ietf.org/blog/discuss-criteria-iesg-review/

- Discuss 1: design-related
  - String format of field "time-interval-size" : "1 hour", requires cumbersome parsing
  - If actual values change in calendars of long duration, how can the ALTO Client know?

- Discuss 2: Datatracker update not reflecting IPR declaration
  - Solved immediately: “replaces” field in Datatracker updated and IPR shows up respectively
Current draft status: “Active”

- Version v10 Submitted on Feb. 7th 2019
  - Addresses all IESG DISCUSS and COMMENTS

- WGLC ended February 25th

- Version 11 submitted on Feb. 27th 2019
  - Presented at IETF 104, addresses WG comments on JSON formats

- Current version v12, submitted on May 14 2019
  - Addresses WG chair review by Vijay

- Last WGLC ended July 21
V12 updates

• This new version addresses
  – Mirja and Jan's recommendations during our last WG session, regarding the referenced JSON encoding format
  – Review sent by Vijay
• draft-ietf-alto-cost-calendar-12.txt now uses RFC8259 as a normative reference. RFC8259 is obsoletes RFC7159. RFC7285 references RFC7159, as RFC8259 was not around at that time.

• The WG discussed this point and has not identified any ALTO protocol extension being tied to using UTF-{16,32}.

• Therefore, this point is addressed in section 7. "Operational Considerations" of draft-ietf-alto-cost-calendar-12.txt with the following text:
Updates upon Jan and Mirja’s recommendations

- New text in Section 7. "Operational Considerations »

"Clients and Servers supporting ALTO Calendars use [RFC8259].

[RFC7285] encodes its requests and responses using the JSON Data Interchange Format specified in [RFC7159]. In the meantime, [RFC7159] has been obsoleted by [RFC8259], that among others makes UTF-8 mandatory for text encoding to improve interoperability.

Therefore, ALTO Clients and Servers implementations using UTF-{16,32} need to be cognizant of the subsequent interoperability risks and it is RECOMMENDED for them to switch to UTF-8 encoding, if they want to interoperate with Calendar-aware Servers and Clients.«

- Sent e-mail to Adam Roach with the text proposal above on May 14 for feedback
Review feedback sent by Vijay

• Need for a thorough edit session
  – to ensure grammar and consistency in the document
  – to ensure that implementations deal with as less ambiguity as possible when following the protocol extension

• Many text improvements proposed
  – Cut long sentences, re-phrasing, spelling consistency on key terms

• « content-length » field in HTTP examples
  – In the presence of elucidations such as ("v1, v2, ..., v12"), clarify whether or not the content-length field accounts for the « real » number of bytes

• Thank you Vijay
Updates upon Vijay’s review - highlights

- Chased and shortened a number of long sentences
- Re-phrased S4, para 2 on reference time zone
- Adopted re-phrasing of S3.1 parag. 1, 2, 3 + added MUST
  - Multiple appearances of a Cost Type name in CalendarAttributes object of the "calendar-attributes" member MUST cause the ALTO client to ignore any occurrences of this name beyond the first encountered occurrence
- The "Content-Length" in the HTTP examples do include the elucidations, therefore
  - Added text in examples of Sections 4.1.3 and 4.2.3
  - The value of field "Content-Length" in the responses is computed as if "throughputrating" values were encoded in 2 digits. The same type of symbolization is used in the other example Server responses in Section 4.2.3 and Section 4.2.4 of this document.
- Adopted the suggested edits
2nd WGLC ended July 21

- WGLC issued by the chairs with the following comments
  - 1/ Ben indicated a couple of edge cases that need to be resolved.
    - Response sent to Ben on Feb. 8th, along with version V10
  - 2/ Alvaro noted that there is IPR tied to the precursor of this draft, as detailed in [2]. The chairs will like to ensure that the WG is aware of the IPR declaration inherited by draft-ietf-alto-cost-calendar, and duly considers it during the second WGLC.
    - IPR declaration was updated in December 2018
  - Version -12 of the document (the one being WGLC'd) addresses the IESG discusses and comments, as well as a review by one of the chairs (Vijay).

- WG feedback – thank you Jensen and Kai
  - Suggestions on spelling consistency
Next Steps

- Submit to AD
- Get feedback from Ben Campbell
Back-up slides
IESG review Dec 2018—ballot positions

- Adam Roach – AD Applications and Real-Time Area (art)
  - no objection w. COMMENT
- Suresh Krishnan – AD Internet Area (int)
  - no objection w. COMMENT
- Spencer Dawkins - AD Transport Area (tsv)
  - no objection w. COMMENT
- Ben Campbell - AD Applications and Real-Time Area (art)
  - has a DISCUSS and COMMENT
- Alissa Cooper – IETF and IESG chair - General Area
  - No objection w. COMMENT
- Alvaro Retana – AD Routing Area (rtg)
  - has a DISCUSS and COMMENT
- Benjamin Kaduk – AD Security Area (sec)
  - No objection w. COMMENT
IESG feedback on changes proposed in V10

- **Adam Roach – AD Applications and Real-Time Area (art)**
  - no objection w. COMMENT ➔ agreed on updates

- **Suresh Krishnan – AD Internet Area (int)**
  - no objection w. COMMENT ➔ agreed on updates

- **Spencer Dawkins - AD Transport Area (tsv)**
  - no objection w. COMMENT ➔ agreed on updates

- **Ben Campbell - AD Applications and Real-Time Area (art)**
  - has a DISCUSS and COMMENT ➔ feedback expected

- **Alissa Cooper – IETF and IESG chair - General Area**
  - No objection w. COMMENT ➔ agreed on updates

- **Alvaro Retana – AD Routing Area (rtg)**
  - has a DISCUSS and COMMENT ➔ agreed on updates

- **Benjamin Kaduk – AD Security Area (sec)**
  - No objection w. COMMENT ➔ agreed on updates
Updates in V10 - highlights

• Design has been changed to address the 2 DISCUSS issues
  – format of "time-interval-size": the value is now a JSON Number defined in seconds,
  – ALTO Calendars of long duration and changes in their actual values: it is now RECOMMENDED that Calendar-aware Clients and Servers also support the ALTO incremental updates service.

• References to RFCs updated wrt obsolescence upon agreement with WGL and IESG directors

• Many clarification text was added

• Section 4.1.2 has been reorganized

• Editorial updates on ipv6 formats, time zones, units...

• JSON errors hopefully corrected, some typo harmonization started
  – Corrections continued in V11
Discuss 1: "time-interval-size" format

- §3.1, definition of "time-interval-size"
  - Previous format: "time-interval-size" : "1 hour",
  - Risk of machine parsing error: why use « unit » : « 3 hour » instead of 2 separate fields for « time unit » and « number of units »?

- Solution: 2 design changes – section 3.1
  - New format: "time-interval-size" : "3600",
  - Value of "time-interval-size" now expressed in terms of number of seconds
  - Value is encoded in a JSON Number
  - ALTO servers SHOULD use at least IEEE 754 double-precision floating point [IEEE.754.2008] to store this value
  - Covers all desired duration ranges
"endpoint-cost-calendar-map": {
  "uri": "http://custom.alto.example.com/calendar/endpointcost/calendar/lookup",
  "media-types": ["application/alto-endpointcost+json"],
  "accepts": ["application/alto-endpointcostparams+json"],
  "capabilities": {
    "cost-constraints": true,
    "cost-type-names": ["num-routingcost", "num-latency",
                        "num-pathbandwidth", "string-service-status"],
    "calendar-attributes": [
      {"cost-type-names": "num-routingcost",
       "time-interval-size": "1 hour", \(\Rightarrow NOW: \text{"3600"}
       "number-of-intervals": 24
      },

      // ... calendar attributes for "num-latency", "num-pathbandwidth" ...

      {"cost-type-names": "string-service-status",
       "time-interval-size": "2 minute", \(\Rightarrow NOW: \text{"120"}
       "number-of-intervals": 30 },
    ]
  }
} // ECM capab
Discuss 1: on “repeated” Calendars – review text

• §4.1.2, last paragraph – about attribute « repeated » that allows the Client to use the same Calendar as many times as its values are repeated
  – « This implies that if an ALTO server delivers a calendar with a long duration, it cannot make changes to the metrics in that calendar,
  – or if it does make them it cannot expect the client to learn about those changes. Is that the intent?
  – If so, it seems to contradict language in the security considerations (§6) that future events may change and that the client should ensure information updates.
  – (The operational considerations [§7] also say the client does not need to query again during the calendar duration.) »
Discuss 1: “repeated” Calendars - Solution

• Section 2 « Overview of ALTO Cost Calendars »
  – Now explains that a Calendar can be used as a time table, but time tables do not predict unexpected incidents
  – ➔ It is RECOMMENDED that Servers providing Calendars also provide the «ALTO Incremental Updates » Service and that Calendar-aware Clients use it.

• Repeated this text in
  – Section 6 Security + Section 7 Operational

• In section 4.1.2: added a last paragraph explaining that
  – A Server may update a « repeated » Calendar once the repetition period has elapsed or upon unexpected changes
  – This change can be retrieved with the Incremental Updates Service
  – This text also addresses another comment on how to deal with « infinite » Calendar repetitions
Discuss 2

• « This document replaces [draft-randriamasy-alto-cost-calendar], but this information is not reflected in the datatracker.

• Individual draft has an IPR declaration attached to it [1], but the failure to link the two documents has resulted in the IPR indication not carrying over.

• The direct effect is that the IETF Last Call [2] explicitly says that "No IPR declarations have been submitted directly on this I-D.«

• Solved
  – Datatracker has been updated IPR now reflects correctly
Updated RFC references

- JSON Format now follows RFC 8259
  - JSON Format used in RFC 7285 was following RFC 7159, now obsoleted by RFC 8259
  - RFC 8259 normatively requires UTF-8 for text encoding to improve interoperability
  - Upon WG discussion,
    - the Calendar draft thus uses RFC 8259 and
    - the ALTO WG should identify extensions tied to UTF-16,32 encodings or encoding not supported by RFC 8259

- Reference time zone in UTC as per RFC 7231
  - Updated section 4 – paragraph 2
Section 4.1.2 reorganized for clarification

- 4.1.2 "Calendar extensions in Filtered Cost Map responses" updated among others
  - To distinguish response members sent by and to multi-cost aware Servers/Clients
  - Whether they are Calendar aware or not
  - To relate Calendar attributes between FCM responses and IRD resources specifications
Updates on examples – formats - errors

- JSON errors
  → JSON parsing needed

- Addresses in the IPv6 space in 2000::/3
  → used addresses from the 2001:db8::/32 documentation prefix instead

- Many valuable guidance on clearer wording
ALTO CALENDAR IN A NUTSHELL
ALTO Cost Calendar in a nutshell

- ALTO Calendar: allows deciding where to connect and when
  - Array of time-dependent cost values for a given metric,
  - Set of attributes describing time scope of the calendar
- Allows Delay tolerant applications to schedule their connections
  - Optimal time for data transfers
- Allows ALTO Clients to schedule their Calendar requests
  - ALTO servers may save transactions on repeated value arrays
- Applicable to
  - time-sensitive ALTO metrics
  - Filtered Cost Map (FCM)
    - for full Cost Map: use empty SRC & DEST
  - Endpoint Cost Map (ECM)
- Addresses target WG item: cost extensions (May 2014)
ALTO Calendar design

- Backwards compatibility with legacy Clients and Multi-Cost Map
  - Calendars associated to ALTO information resources
  - Calendar attributes specified in
    - IRD information resources of IRD
    - "meta" member of ALTO Server responses
- Does not introduce a new mode
- Does not introduce new media types
- Compatible with all cost-modes
  - numerical, string, ...
"endpoint-cost-calendar-map" : {
    "uri" : "http://custom.alto.example.com/calendar/endpointcost/calendar/lookup",
    "media-types" : [ "application/alto-endpointcost+json" ],
    "accepts" : [ "application/alto-endpointcostparams+json" ],
    "capabilities" : {
        "cost-constraints" : true,
        "cost-type-names" : [ "num-routingcost", "num-latency",
                              "num-pathbandwidth", "string-service-status" ],
        "calendar-attributes" : [ {
            "cost-type-names" : "num-routingcost",
            "time-interval-size" : "1 hour", \( \Rightarrow \) NOW: “3600”
            "number-of-intervals" : 24
        },
        
        // … calendar attributes for "num-latency", "num-pathbandwidth“ ...

        {"cost-type-names" : "string-service-status",
        "time-interval-size" : "2 minute", \( \Rightarrow \) NOW: “120”
        "number-of-intervals" : 30 },
        ]
    "uses" : [ "my-default-network-map" ]
} // ECM capab

Calendar-aware clients understand text in blue. Legacy ALTO clients ignore it
POST /calendar/endpointcost/lookup HTTP/1.1
Host: alto.example.com  Content-Length: [TODO]
Content-Type: application/alto-endpointcostparams+json
Accept: application/alto-endpointcost+json,application/alto-error+json

```json
{
  "cost-type": {
    "cost-mode": "numerical",
    "cost-metric": "routingcost"
  },
  "calendared": [true],
  "endpoints": {
    "srcs": ["ipv4:192.0.2.2"],
    "dsts": [
      "ipv4:192.0.2.89",
      "ipv4:198.51.100.34",
      "ipv4:203.0.113.45"
    ]
  }
}
```
HTTP/1.1 200 OK
Content-Length: [TODO]
Content-Type: application/alto-endpointcost+json

{
  "meta": {
    "cost-type": {
      "cost-mode": "numerical",
      "cost-metric": "routingcost"
    },
    "calendar-response-attributes": [
      {
        "calendar-start-time": "Mon, 30 Jun 2014 00:00:00 GMT",
        "time-interval-size": "1 hour", ➔ NOW: “3600”
        "number-of-intervals": 24,
        "repeated": 4
      }
    ], // means: same value array for Monday, Tuesday, Wednesday, Thursday

  } // end meta

  "endpoint-cost-map": {
    "ipv4:192.0.2.2": {
      "ipv4:192.0.2.89": [v1, v2, ... v24],
      "ipv4:198.51.100.34": [v1, v2, ... v24],
      "ipv4:203.0.113.45": [v1, v2, ... v24]
    }
  }
}