

draft-ietf-alto-cost-calendar-12

Status and diffs with v11

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ALTO WG

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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
 - <https://tools.ietf.org/html/draft-ietf-alto-cost-calendar-10>
 - **Addresses all IESG DISCUSS and COMMENTS**
 - Diffs at: <https://tools.ietf.org/rfcdiff?url2=draft-ietf-alto-cost-calendar-10.txt>
- WGLC ended February 25th
- Version 11 submitted on Feb. 27th 2019
 - <https://tools.ietf.org/html/draft-ietf-alto-cost-calendar-11>
 - 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

AD-WG chair comments on JSON encoding format

- 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

ALTO Calendar - example IRD - §3.3

```
"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, → NOW: "3600"  
        "number-of-intervals" : 24  
      },  
      // ... calendar attributes for "num-latency", "num-pathbandwidth" ...  
      {"cost-type-names" : "string-service-status",  
        "time-interval-size" : "2 minute, → 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

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 obsolete 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, ...

ALTO Calendar v02- example IRD - §3.3

```
"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, → NOW: "3600"  
        "number-of-intervals" : 24  
      },  
      // ... calendar attributes for "num-latency", "num-pathbandwidth" ...  
      {"cost-type-names" : "string-service-status",  
        "time-interval-size" : "2 minute, → 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

ALTO Calendar v05- example ECM - § 4.2.3

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

```
{  "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"    ]
  }
}
```

ALTO Calendar v05- examples ECM - §4.2.3

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]  
    }  
  }  
}
```