

# draft-randriamasy-alto-cost-calendar-05

## Updates since -v04

October 27<sup>th</sup>, 2015 @ IETF 94 – Interim

Sabine Randriamasy

Y. Richard Yang

Qin Wu

Lingli Deng

Nico Schwan

---

# ALTO Cost Calendar in a nutshell

- Target WG work item: cost extensions (May 2015)
- ALTO Calendar
  - Array of time-dependent cost values for a given metric
  - Set of attributes describing time scope of the calendar
- Delay tolerant applications can schedule their connections
  - Optimal time for data transfers
- ALTO Clients can 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)

# 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

# Updates in v05

- IRD updates
  - Removed IRD resources attributes on repeated value arrays: "start-mode" and "repeat-indication"
- Instead: ALTO Server responses for FCM and ECM
  - may optionally use attribute "repeated"
    - When ALTO value arrays are repeated
    - To avoid serving requests on unchanged values
- 3 RULES to be included on Calendar information updates
  - RULE 1: Calendar start and duration VS request date
  - RULE 2: "HTTP Last-Modified" VS Calendar start and duration
  - RULE 3: "HTTP Last-Modified" VS Calendar start and duration
    - for repeated values

# ALTO Calendar v05- 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",  
      "number-of-intervals" : 24  
      },  
  
      // ... calendar attributes for "num-latency", "num-pathbandwidth" ...  
  
      {"cost-type-names" : "string-service-status",  
      "time-interval-size" : "2 minute",  
      "number-of-intervals" : 30  
      },  
    ]  
  }  
  "uses": [ "my-default-network-map" ]  
} // ECM capab
```

# 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",
      "numb-intervals" : 24,
      "repeated": 4 } ], //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]
    }
  }
}
```

# Next steps

- Request adoption as WG item



Thank you

Back-up follows

---

# Updates on FCM and ECS specifications

- FCM and ECS request must add 1 input parameter
  - `JSONBoolean calendar<1..*>`
    - `//list size = number of requested cost types`
- FCM and ECS responses have 1 additional field in « meta »
  - `CalendarResponseAttributes calendar-response-attributes <1..*>;`

```
object{
    JSONString    calendar-start-time;
    JSONString    time-interval-size;
    JSONNumber    number-of-intervals;
    [JSONNumber   repeated;] [OPTIONAL]
    // for «periodic» calendar-start-time: number of calendar iterations with
    same values
}CalendarResponseAttributes;
```
- Calendared Cost values are JSONArrays of time-dependent JSONValues

# Calendar rules

- **RULE 1: Calendar start and duration VS request date**

an ALTO Server indicating Calendars for a given cost-type in its IRD resources MUST provide one

- beginning at TS = “calendar-start-time” and
- with values for a duration  $DU = (\text{"time-interval-size"} * \text{"number-of-intervals"})$
- Such that if TR is the date of the client request, TR lies in the interval [TS, TS+DU]

- **RULE 2: “HTTP Last-Modified” VS Calendar start and duration**

we should not have values HL of “HTTP Last-Modified” such that  $HL < TS - DU$  since the design assumes that the Calendar values are updated periodically at intervals equal to DU.

- If the Server does not provide a Calendar on the next period for a cost-type, it MUST NOT list this Cost-Type in the “cost-type-names” member of calendared IRD resources.

- **RULE 3: “HTTP Last-Modified” VS Calendar start and duration for repeated values**

IF THE SERVER USES MEMBER “repeated” in its responses and if “repeated” has a value  $n > 1$  then we can have  $HL < TS - DU$  and RULES 1 and 2 are replaced by RULE 3, see examples of section 4.2.3

- we MUST have TR is the date of the client request, TR lies in the interval [TS, TS+n\*DU]