

draft-ietf-alto-cost-calendar-02

## Updates since IETF98

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# Updates since IETF98

- Previously
  - draft-ietf-alto-cost-calendar-01
  - Updated Feb. 13<sup>th</sup> 2017
- Collected WG feedback
- Diffs between v01 and v02
  - Design updates
    - For backwards compatibility with RFC7285
    - For compatibility with Multi-Cost ALTO
  - Draft organization
  - Re-wording and clean-up,

## Design updates – IRD resources

- CalendarAttributes object in a resources entry
  - now has mandatory member “cost-type-names <1..\*>”
    - An array of one or more elements indicating the cost-type-name cost-type-names in the IRD entry to which the capabilities apply.
  - to be self-contained

## Example – IRD section 3.3

```
"resources" : {  
  "filtered-cost-map-calendar" : {  
    "uri" : "http://custom.alto.example.com/calendar/costmap/filtered",  
    "media-type" : "application/alto-costmap+json",  
    "accepts" : "application/alto-costmapfilter+json",  
    "capabilities" : {  
      "cost-constraints" : true,  
      "cost-type-names" : [ "num-routingcost", "num-pathbandwidth",  
                           "string-service-status" ],  
      "calendar-attributes" : [  
        {  
          "cost-type-names" : [ "num-routingcost", "num-pathbandwidth" ],  
          "time-interval-size" : "1 hour",  
          "number-of-intervals" : 24  
        },  
        {  
          "cost-type-names" : "string-service-status",  
          "time-interval-size" : "30 minute",  
          "number-of-intervals" : 48  
        }  
      ] // end calendar-attributes  
      "uses": [ "my-default-network-map" ]  
    }  
  },  
}
```

## Design updates – request format

- Section 4.1.1. “Calendar extensions in Filtered cost map requests”
  - Rules on member: if N = number of requested metrics
    - JSONBoolean      `calendared<1..*>`
  - The array MUST contain exactly N boolean values, otherwise the server returns an error.
  - If this field is not present, it MUST be assumed to have only values equal to "false".
- ➔ Consistency for clients supporting
  - Multi-Cost + Calendars
  - Single Cost + Calendars

# Design updates – response format 1/2

- 4.1.2. “Calendar extensions in Filtered Cost map responses”
  - New mandatory member: `JSONString cost-type-names`
    - For self-containment
    - will be `JSONString cost-type-names <1..*>`
- Added same rules as in section 4.2.2. “Calendar attributes in the Endpoint Cost Map response”
  - If the client request does not provide member "calendared" or if it provides it with a value equal to 'false', for all the requested Cost Types, then the ALTO Server response is exactly as specified in RFC 7285 [ID-alto-protocol] and [draft-ietf-alto-multi-cost].
  - If the value of member "calendared" is equal to 'false' for a given requested Cost Type, the ALTO Server must return, for these Cost Types, a single cost value as specified in RFC 7285.

## Design updates – response format 2/2

- 4.2.1. Calendar specific input in Endpoint cost map requests
  - object ReqEndpointCostMap has now members
    - [CostType cost-type;]
    - [CostType multi-cost-types<1..\*>;]
    - For Multi-Cost ALTO compatibility
- Text in sections 4.2.1 and 4.1.1 need text harmonization
  - On request object format description

# Draft organization updates

- Section 5 “Use cases for ALTO Cost Schedule”
  - Dropped
  - As other sections already include use cases and examples.
- Section 4.3 “Recap of rules related to ALTO Cost Calendars”
  - Dropped
  - Text was moved to Section 2.2.2 “Compatibility with legacy ALTO Clients”



# Re-wording

- Changed example metric name "Availbandwidth" to "bandwidthscore",
  - "bandwidthscore" reflects a generic e2e metric
  - "Availbandwidth" defined specifically for links in <https://tools.ietf.org/wg/alto/draft-ietf-alto-performance-metrics/>
- With the awareness that ultimately these metrics names may have to be changed to nonsensical names such as "shoesize".

# Discussion

- Consider ALTO Calendar for link metrics? e.g. Availbandwidth
  - see <https://tools.ietf.org/wg/alto/draft-ietf-alto-performance-metrics/>
- Consider ALTO Calendars for EP Properties ? E.G.
  - color/location/connection type
  - W.R.T night, morning, noon, afternoon, evening
- WG list question: “Is it possible that the ALTO server has several options of different combinations of “time-interval-size” and “number-of intervals” for ALTO client to choose for more fine-grained Cost Calendars?”
  - Answer was: “if Server can afford the workload may propose different Calendar attributes for a same Cost Type”
  - Issue: Client request should stay simple.
    - adding Calendar attributes combinations in request input parameters requires changing the design and adds complexity
  - Any opinion in the WG?

## Next steps

- Final text harmonization between Filtered Cost Map and Endpoint Cost Map Service
- Move to WGLC
- Thanks to: Dawn Chan, Li Geng, Yichen Qian for fruitful discussions and review feedback.

Thank you

Back-up slides

# 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",  
      "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
```

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",
      "numb-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]
    }
  }
}
```