Updates since IETF98

• Previously
  – draft-ietf-alto-cost-calendar-01
  – Updated Feb. 13th 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
• 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, ...
"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
      },
      {"cost-type-names" : "num-latency",
       "number-of-intervals" : 24
      },
      {"cost-type-names" : "num-pathbandwidth",
       "number-of-intervals" : 24
      },
      {"cost-type-names" : "string-service-status",
       "time-interval-size" : "2 minute",
       "number-of-intervals" : 30
      }
    ],
    "uses" : [ "my-default-network-map" ]
  }  // ECM capab
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"      ]
    }
}
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]
  }
}