CDNi Delivery Metadata (draft-ietf-delivery-metadata-00)

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Motivation

- To presents several dCDN options related to content delivery
  - That influence the quality of experience
- CDN selection
  - Multiple downstream CDN transport arrangements
  - Based on traffic type, capacity, transport type (unicast/multicast)
- Request routing
  - To allow the uCDN to force the dCDN to operate a particular iterative request routing method as part of any iterative redirection mode (RFC8008)
- Traffic characterization
  - VOD, File, Live
  - Manifest URL, Service name

CDN Selection

FCI.CdnSelection

FCI.CdnSelection

- Property: cdn-transport-list
  - Description: A list of supported dCDN network transport arrangements.
  - Type: Array of FCI.CdnTransport objects that specify the allowed combinations.
  - Mandatory-to-Specify: Yes.

FCI.CdnTransport

- Property: cdn-name
  - Description: name of the downstream CDN transport arrangement. A downstream CDN operator may own several transport arrangements which may be the subject of a different delegation. A dCDN transport arrangement is named according to that property. The name is used with the corresponding MI.CdnSelection for pointing out one particular transport arrangement associated with the configuration metadata.
  - Type: String.
  - Mandatory-to-Specify: Yes. The name MUST be unique among the list exposed by the cdn-transport-list property of the FCI.CdnSelection object.
- Property: cdn-transport-type
  - Description: Transport type of the downstream CDN transport arrangement..
  - Type: String. Must be one of these values: "MULTICAST", "UNICAST".
  - Mandatory-to-Specify: No. The default is unicast. There is always one default dCDN unicast transport arrangement.
- Property: cdn-capacity-limits
  - Description: Exposes some capacity limits associated with that dCDN transport arrangement
  - Type: An array of FCI.CapacityLimit objects as defined in [SVTA2049].
  - Mandatory-to-Specify: No.
- Property: cdn-traffic-types
  - Description: a set of traffic types supported by this dCDN transport arrangement.
  - Type: An array of MI.TrafficType objects
  - Mandatory-to-Specify: No.

MI.CdnSelection

Property: cdn-name

- Description: Instructs the dCDN to perform delegation operations for a particular dCDN transport arrangement. The MI.CdnSelection configuration object MUST be associated with the metadata configuration objects dedicated to a particular host or a particular path match (see [RFC8006])
- Type: String. Must be one of those dCDN transport arrangement names as exposed by the dCDN through the FCI.CdnTransportSelection object.
- Mandatory-to-Specify: Yes.

Property: cdn-transport-selection

- Description: Enforces the selection of this downstream CDN (dCDN) transport arrangement according to a specified policy.
- Type: String. One of "attempt-or-failed", "attempt-or-besteffort", or "best-effort". For either of the first two values, the delegation MUST be attempted according to the dCDN delivery arrangement corresponding to the cdn-name property . If this is not possible, it is considered as an error and either fails (configuration failure) or the dCDN continues with a "best-effort" procedure respectively.. The "best-effort" value instructs the dCDN to try its best to fulfill the requested cdn-selection policy with no guarantees..
- Mandatory-to-Specify: No. The value "best-effort" is the default selection policy.


```
{
 "generic-metadata-type": "MI.CdnSelection",
 "generic-metadata-value": {
  "cdn-name": "MULTICAST",
  "cdn-selection": "attempt-or-failed"
 }
}
```

Request routing

FCI.RequestRouting

- FCI.RequestRouting
  - Property: request-routing-modes
    - Description: A list of supported request routing modes by the dCDN. This information is useful when the uCDN decides to perform a delegation in iterative mode.
    - Type: Array of strings. Values are: “DNS”, “HTTP”, or “MANIFEST_REWRITE”.
    - Mandatory-to-Specify: No. If the dCDN does not advertise the supported request routing modes, they are all supported by default.

```
{
  "capabilities": [
    {
      "capability-type": "FCI.RequestRouting",
      "capability-value": {
        "request-routing-modes": [
          "DNS",
          "HTTP",
          "MANIFEST_REWRITE"
        ]
      }
    }
  ]
}
```

MI.RequestRouting

- Property: request-routing-modes
  - Description: Instructs the dCDN to perform request routing according to one or more preferred modes among those supported and advertised by the dCDN through the FCI.RequestRouting object. One must understand that forcing (instead of letting the dCDN request router select) one particular request routing mode may trigger some inefficiency in the request routing process.
  - Type: Array of iterative request routing modes. The values are: “DNS”, “HTTP”, or “MANIFEST_REWRITE”.
  - Mandatory-to-Specify: No. By default, all request routing modes supported by the dCDN can be used by the dCDN as part of its request routing process.

```
{
  "generic-metadata-type": "MI.RequestRouting",
  "generic-metadata-value": {
    "request-routing-modes": [ "DNS", "HTTP" ]
  }
}
```

Traffic characterization

MI.TrafficType

- Property: traffic-type
  - Description: Designates the traffic type. The uCDN will use the literal that is most representative of the traffic being delegated.
  - Type: String, one of (vod | live | object-download)
    - vod: This is streaming of on demand video. The delivery can be rate controlled.
    - live: this is streaming live with possible constraints in terms of latency.
    - object-download: This is typically file download like WEB objects or VOD files. The delivery can be rate controlled.
  - Mandatory-to-Specify: Yes
- Property: hints
  - Description: Other traffic characteristics that the uCDN can indicate to the dCDN as suggestions for service optimization. This property accepts by default free-form unconstrained values. Some SVTA specifications may impose some well-defined values, as with the Open Casting specification [SVTA2065].
  - Type: Array of strings
  - Mandatory-to-Specify: No

```
{
  "generic-metadata-type": "MI.TrafficType",
  "generic-metadata-value": {
    "traffic-type": "vod",
    "hints": [ "catch-up"]
  }
}
```

MI.MediaServiceDescription

- Property: manifestURL
  - Description: Path of the manifest (mpd or m3u8) file related to this media service.
  - Type: String.
  - Mandatory-to-Specify: No.
- Property: mediaServiceName
  - Description: String describing or identifying the media service.
  - Type: String.
  - Mandatory-to-Specify: No.
- Property: maximumBitrate
- Description: This is the maximum bitrate in bits per second (bps) attached to the service delivery. If the service includes multiple representations or playlists, this property restricts the bitrate of each representation or playlist with a published bitrate to a value below this property's value. The property's value indicates the maximum bitrate provisioned for the service, regardless of the representations or playlists. This property must be set according to the maximum bitrate dedicated to the uCDN by the dCDN and published through the FCI.CdnDelivery (limit type "ingress") and/or the FCI.CapacityLimit (limit type "ingress").
- Type: integer.
- Mandatory-to-Specify: No. If not specified, the uCDN relies entirely on the dCDN for multiple services delivery. It is strongly encouraged to specify a maximum bitrate for allowing the uCDN to operate multicast delivery for several concurrent serv.

```
{
  "generic-metadata-type": "MI.MediaServiceDescription",
  "generic-metadata-value": {
    "manifestURL": "/live/channelXYZ/index.mpd",
    "mediaServiceName": "ChannelXYZ",
    "maximumBitRate": 5000000,
  }
}
```