CDNI Capacity Insights Capability Advertisement Extensions

Nov 2021
Capacity Insights

What draft are we discussing?

- CDNI Capacity Insights Capability Advertisement Extensions
- draft-ryan-cdni-capacity-insights-extensions-01
What are the goals of the Capacity Interface?

- Provide framework for information exchange to facilitate traffic delegation decisions
- Establish limits that are specific to delegation relationship
- Define limits in unambiguous, mutually understood units
- Bidirectional communication between delegation participants
- Leverage CDNi as much as possible, extend where needed
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How does the communication work?

- **FCI.CapacityLimits**
  - Specify the limit of traffic that should be delegated in units, such as Bits per Second, called limit-types
  - References a specific Telemetry source which outlines current usage of a particular limit-type

- **FCI.Telemetry**
  - Allows the advertisement of what types of Telemetry sources are supported
  - Initially scoped to generic Telemetry sources, but paves the way for a formal Telemetry interface integration

- **MI.RequestedCapacityLimits**
  - Provides a vehicle for the uCDN to ask the dCDN for an update to established Limits
Capacity Insights – FCI.CapacityLimits

- Total-limits: limit for all traffic associated with a uCDN/dCDN relationship
- Host-limits: limit for traffic for a specific CDN-Domain (published host)
- Each limit is scoped to a footprint (as per the CDNi FCI specification)
- Each limit references a Telemetry source which provides data with the same scope as the defined limit (i.e. Bits per Second for Host X within Footprint Y)
- GOAL: How much can you send, and how can you track how much you are sending
"capabilities": [  
  {  
    "capability-type": "FCI.Telemetry",  
    "capability-value": {  
      "sources": [  
        {  
          "id": "capacity_metrics_region1",  
          "type": "generic",  
          "metrics": [  
            {  
              "name": "egress_5m",  
              "time-granularity": 300,  
              "data-percentile": 50,  
              "latency": 1500  
            },  
            {  
              "name": "requests_5m",  
              ...  
            }  
          ],  
          "configuration": { ... optional ... }  
        }  
      ]  
    }  
  ]  
]  
  
- Lists the supported Telemetry Sources which include an id, type and metrics.
- Telemetry data is uniquely identified within a source by id and metrics.name.
- FCI.CapacityLimits reference Telemetry sources by id and metrics.name.
- Each metric outlines key characteristics of telemetry data such as data latency, granularity, etc..
- Currently type is limited to ‘Generic’ and is meant to allow for advertisement of ad-hoc/preexisting data sources.
- Types will eventually expand to include reference to a formal Telemetry interface.
- While this is being defined within the Capacity specification, this is meant to provide a general way to advertise Telemetry data.
Capacity Insights – Polling Workflow

- **uCDN**
  - Delay until Limit TTL expired?
    - Yes: Limit \(\rightarrow\) \(x\)
    - No: Poll Traffic Limits
  - Poll Traffic Limits
    - uCDN API
        - Traffic Delegation Check
          - Delegate traffic
            - Yes: Usage \(\rightarrow\) Limit?
              - No: Deliver traffic
              - Yes: uCDN
          - No: uCDN
{ "host": "serviceA.cdn.example.com", "host-metadata": { "metadata": [ ...,..., { "generic-metadata-type": "MI.RequestedCapacityLimits", "generic-metadata-value": { "requested-limits": [ { "limit-type": "egress", "limit-value": 8000000000, "footprints": [ { "footprint-type": "ipv4cidr", "footprint-value": ["192.0.2.0/24", "198.51.100.0/24"] } ] } ] }, { ... } }

- Allows uCDN to ask dCDN to reconsider current CapacityLimit with suggested values
- Solicitations are specific to a CDN-Domain/Published host
- uCDN does a PUT to the dCDN Configuration endpoint
- dCDN considers request, and if it accepts sends an updated FCI.CapacityLimit to the uCDN
- If dCDN rejects, no action is taken
Capacity Insights – Solicitation for Update Workflow
Thank you!