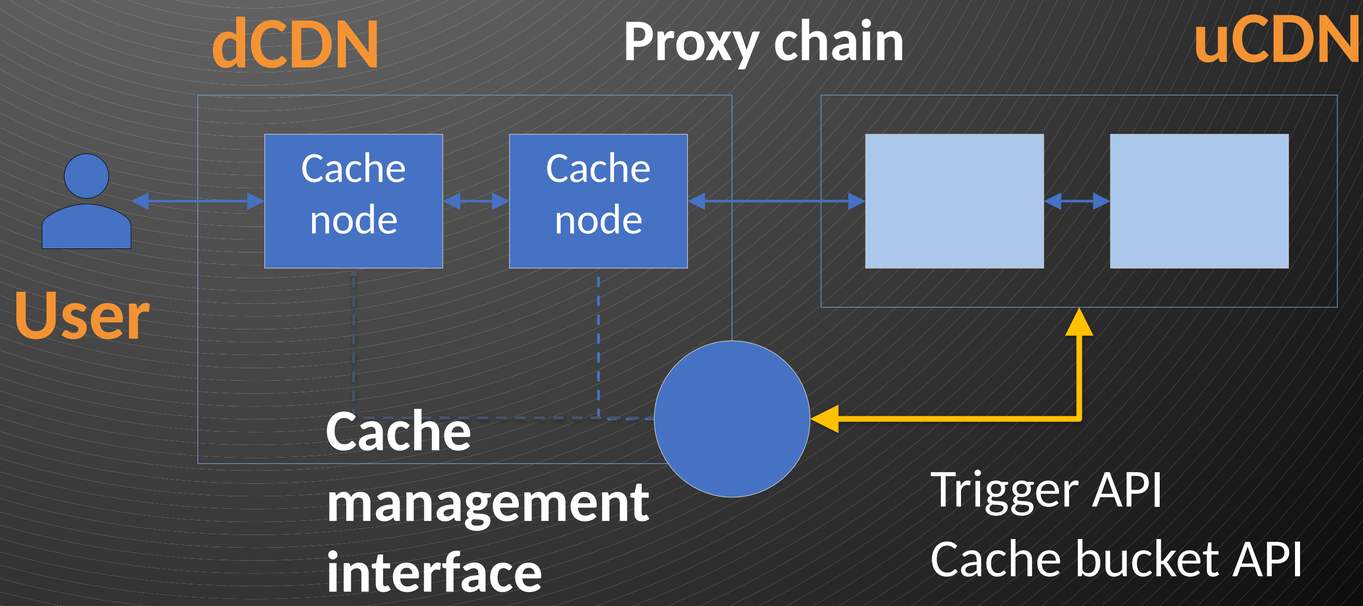
CDNI Working Group
IETF 118

Cache Management Interface

Motivation

- Industry-standard interface for CDN cache management
  - Prepositioning, invalidation and purge
  - Automation of manual and semi-manual processes
  - Multi-CDN
  - Span operator CDNs and public CDNs
- Regional content placement and cache management
- Performance optimization through cache hints
- Edge storage management
  - Quota management
  - Catalog replication

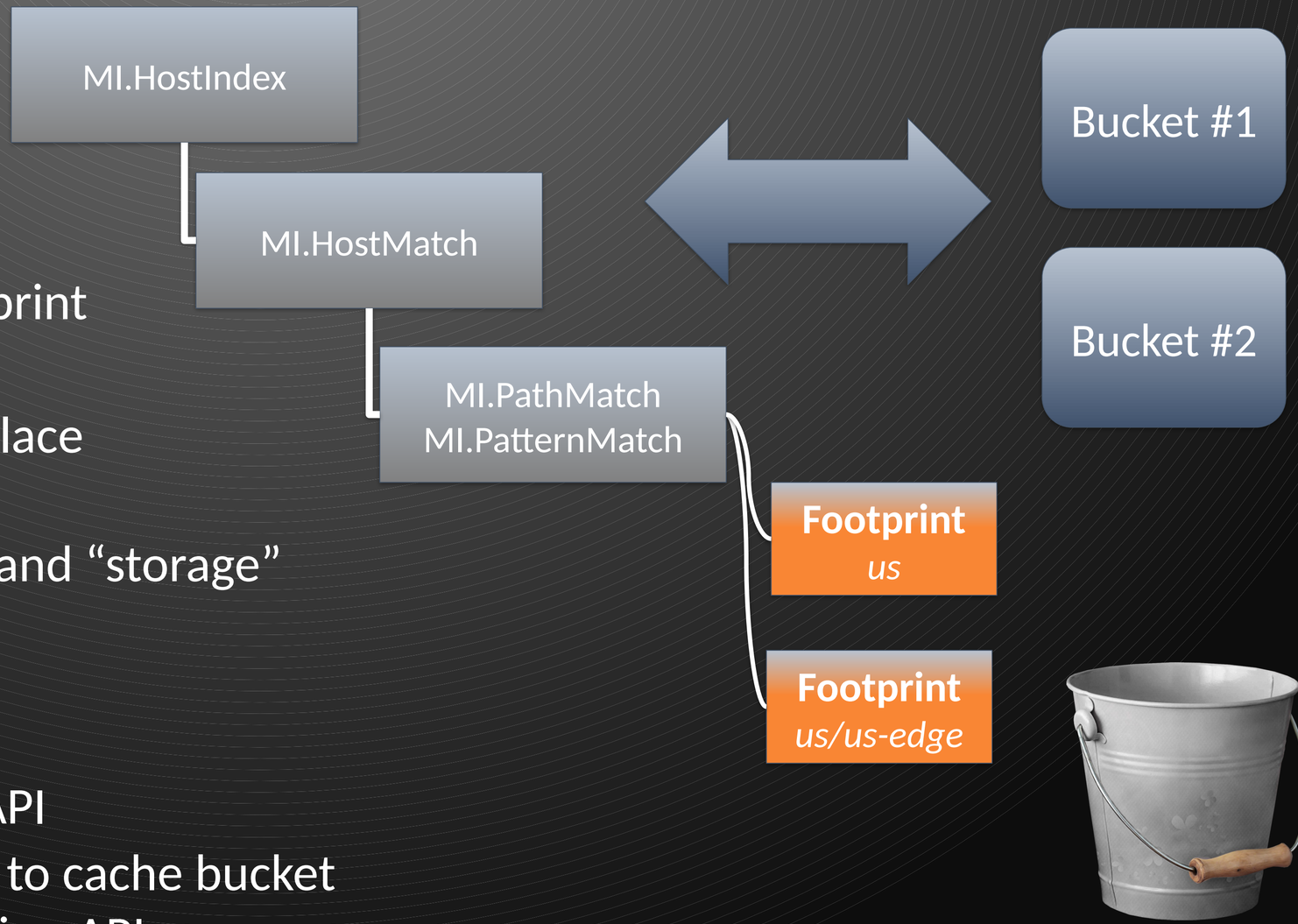
Interface Architecture



- **Operations API**
  - CDNI trigger v2 compliant
  - Purge, invalidate, preposition
- **Cache bucket API**
  - Cache bucket lifecycle
  - REST API

Cache Buckets

- **Containers of cache objects**
  - Storage allocation per content type and/or geographical footprint
  - Default cache bucket
  - All trigger API operations take place within bucket context
  - “Cache” type (dCDN managed) and “storage” type (uCDN managed)
- **API support**
  - Separate bucket management API
  - Attach configuration MI objects to cache bucket metadata objects via configuration API



Key Features

- **CI/T v2 API**
  - Object list
  - Preposition and purge policies
  - Advanced scheduling
  - Extended status and error reporting to support object lists
  - Use of content category (content.ccid)
- **Cache buckets: footprint support and more**
- **Object tagging (MI GroupingExtended)**
- **Object priority (MI CachePriority)**
- **Cache hints**
- **Re-use of configuration metadata**

Proposed CDNI Roadmap

- **Core CI/T v2 draft**
  - Non-manifest object lists
  - Trigger execution priority
  - Published URL vs. cache key URL
  - Status v2: return object list (MI ObjectList)
  - Error v2: etimeout error code and object lists
- **Trigger extension policies**
  - Preposition
  - Scheduling and recurrence via JCAL/iCalendar
  - Purge
- **Cache management**
  - MI CacheBucket objects and API
  - MI Grouping (Extended)
  - MI CachePriority

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Named Footprints

Motivation

- New dCDN use cases emerged that require advanced footprint capabilities
  - Distinct access networks under common dCDN management
  - Differentiated CDN layers (edge and “last-mile” cache layers)
  - CDN requirements by geography (e.g. GDPR)

- These use cases call require
  - Footprints to be used in metadata inside and outside of FCI (e.g. in configuration, logging, cache management) in a consistent manner
  - Complex footprint definition logic
  - Support for dynamically changing footprints

Initial Scope

- Extend FCI to advertise referenceable named footprint objects
  - Footprints accessible via both common advertisement and individually
  - Hierarchical advertisement
  - Namespace support
  - Client-side caching support
- CDNI operation changes to include retrieval and periodic refreshment of footprint advertisements
- Add two new footprint types
  - “named” footprint type references the FCI advertisement
  - “expr” footprint uses CDNI MEL expressions to define a footprint
- Change complex footprint types to specify an optional datasource (“asn”, “country” and “subdivisioncode”)

Proposed Edits for v01

- **Miscellaneous syntax fixes**
- **Push footprint updates**
- **Support for self-published geofeeds via RFC8805**

```
"footprint-def": {
   "footprint-type": "countrycode",
  "footprint-source": {
             "footprint-source-type": "rfc8805",
           "footprint-source-uri":
"http://noc.ietf.org/geo/google.csv",
      }
       "footprint-value": ["us", "ca"]
}
```

Named Footprints vs ALTO

- **ALTO (Application Layer Traffic Optimization)**
  - **Access network provider to publish its network topology, route availability and associated cost to enhance request routing for application end points on its network (e.g. P2P, multi-CDN client steering)**
- **Named Footprints**
  - **dCDN to publish its coverage footprints so that uCDN can associate specific application end points with this dCDN and delegate requests to dCDN**
  - **dCDN doesn’t necessarily have authoritative topology and route availability information for all footprints it covers**
  - **uCDN may use ALTO-aware steering to choose between multiple dCDNs advertising coverage for same client**

THANKS!