CDN Interconnect Metadata

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Motivations

- Fully RESTful interface
- Provide a deterministic way for a Surrogate/Request Router to discover/obtain CDNI Metadata
  - Independent of the specific EU request that triggers the need for the CDNI Metadata
- Allow a dCDN to determine which uCDN(s) may delegate a Site
  - For a given EU request a dCDN knows which uCDN to ask for the associated CDNI Metadata
- Support both asynschronous & synchronous distribution
  - Asynchronous: dCDN can request CDNI Metadata in advance of EU request
  - Synchronous: dCDN can deterministically identify appropriate CDNI Metadata resources and request them in response to EU request
- Simple interface configuration/bootstrapping

RESTful-ness

- Fully RESTful interface
- Influenced by Atom (RFC 4287)
  - Use of “Feed” as an index into CDNI Metadata
- Leverages standard HTTP(S) for addressing & transfer of resources
- Minimal client/server coupling
  - Provides implementation flexibility in how CDNI Metadata server structures URIs used by resources
  - Responses/Resources are self-describing
    - Through the use of defined Media-Types & Relationships
- Reuses standard HTTP cache-ability semantics
  - Each object is independently addressable resource
  - Provides for “inlining” to optimize individual cacheability Vs number of RTTs to obtain all required CDNI Metadata resources
  - CDNI Metadata interface responses are cacheable Independently of the specific EU request that generated the CDNI Metadata request

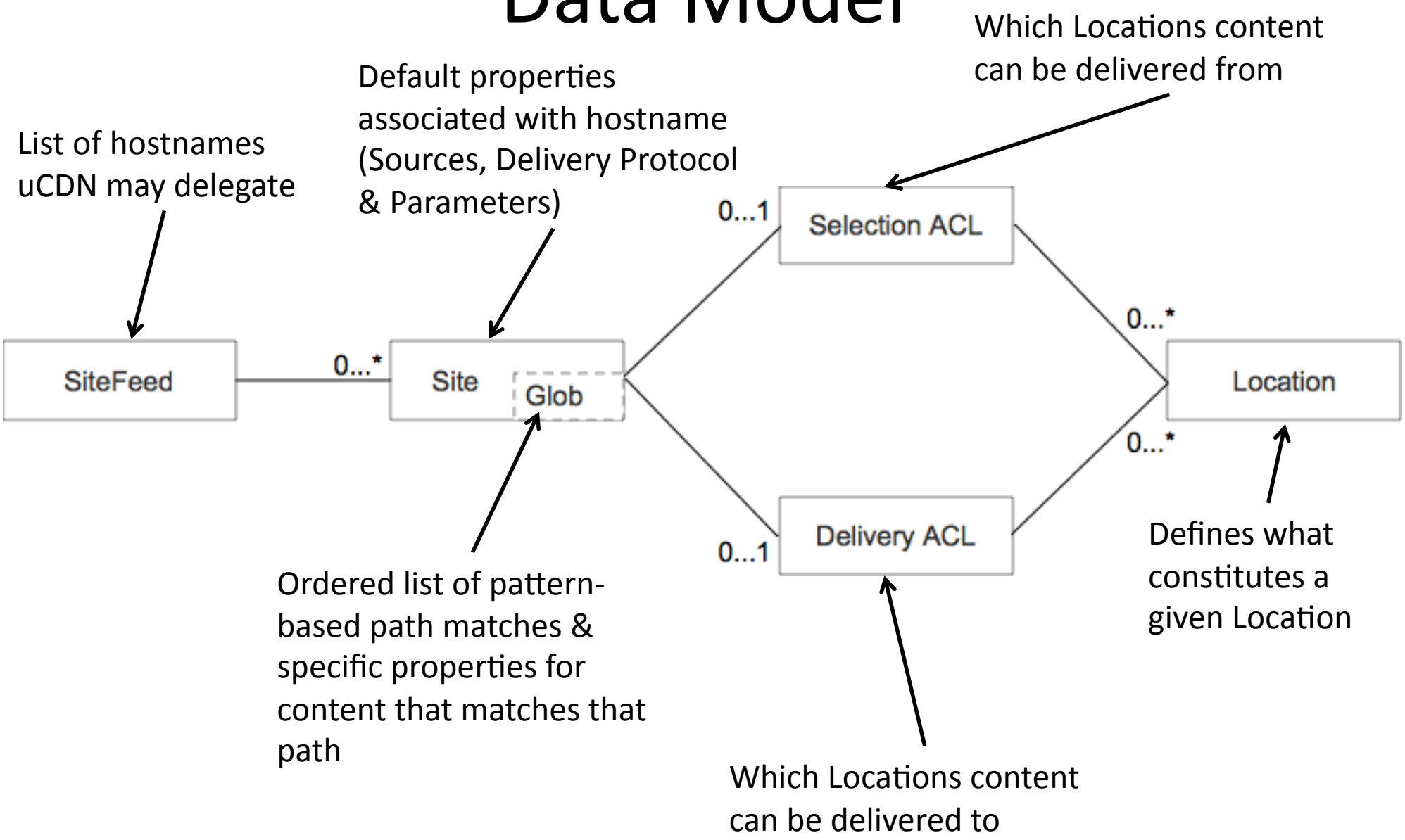
Determinism

- Uses a SiteFeed as an index into the CDNI Metadata of a uCDN
  - Primary Index into CDNI Metadata is “hostname”
    - Could easily be extended to provide other indexes if required, e.g. if CDNs were to use a single hostname to aggregate/hide multiple CSPs
- Indexing on hostname & ordered list of Globs (path matches)
  - Provides a deterministic way for a Surrogate/Request Router to discover what properties apply to specific content
  - Still deterministic if paths/globs overlap
- Requests across CDNI Metadata interface do not vary depending on specific content EU requested
  - Makes responses cacheable without CDNI application knowledge

Configuration & Extensibility

- Bootstrapping
  - Only configuration required is URI of SiteFeed
    - Everything else is discoverable
- Data Model & Objects are easily extended
  - New Data Objects
    - Define new Media Types & Relationship
    - Define properties of the new Data Object
  - Extending existing Data Objects
    - Define new properties
    - Up-rev Media Type version

Data Model


List of hostnames uCDN may delegate
Default properties associated with hostname (Sources, Delivery Protocol & Parameters)
Which Locations content can be delivered from
SiteFeed
0...*
Site
Glob
0...1
Selection ACL
0...*
Location
0...*
0...1
Delivery ACL
Ordered list of pattern-based path matches & specific properties for content that matches that path
Which Locations content can be delivered to
Defines what constitutes a given Location

Object encoding

- Proposes JSON encoding
  - Easier to parse than XML
  - but could easily support an XML encoding if required
- Initial set of properties is illustrative
  - Minimal set to demonstrate the concepts

Object encoding structure

```
{
    "base": JSONString,
    "links": JSONArray,
    "inline": JSONDictionary,
    "property1": Value,
    "property2": Value,
    …
    "propertyN": Value
}
```

- `"base":`
  - Prefix for any relative URLs in the object.
    - Similar to XML base tag
- `"links":`
  - The relationships of this object to other addressable objects.
    - See next slide
- `"inline":`
  - Dictionary of inlined objects
    - Keys: URI fragments which are used to refer to inlined objects
    - Values: The inlined object itself.
- `"propertyX":`
  - Individual properties of the object

Object encoding structure - Links

```
{
    “title”: “Everywhere”,
    "href”:
        “http://metadata.cdni.example.com/locations/everywhere”,
    "rel": "SelectionAllow",
    "type": "application/vnd.cdni.metadata.location+json”
}
```

- “title”:
  - Human readable title
    - MUST be hostname in SiteFeed
- “href”:
  - URI of the referenced object
- “rel”:
  - Relationship between this object & the object being referenced “propertyX”:
- “type”:
  - Media Type of the object being referenced