TeRI and Valid/Allocated Numbers

Jon Peterson
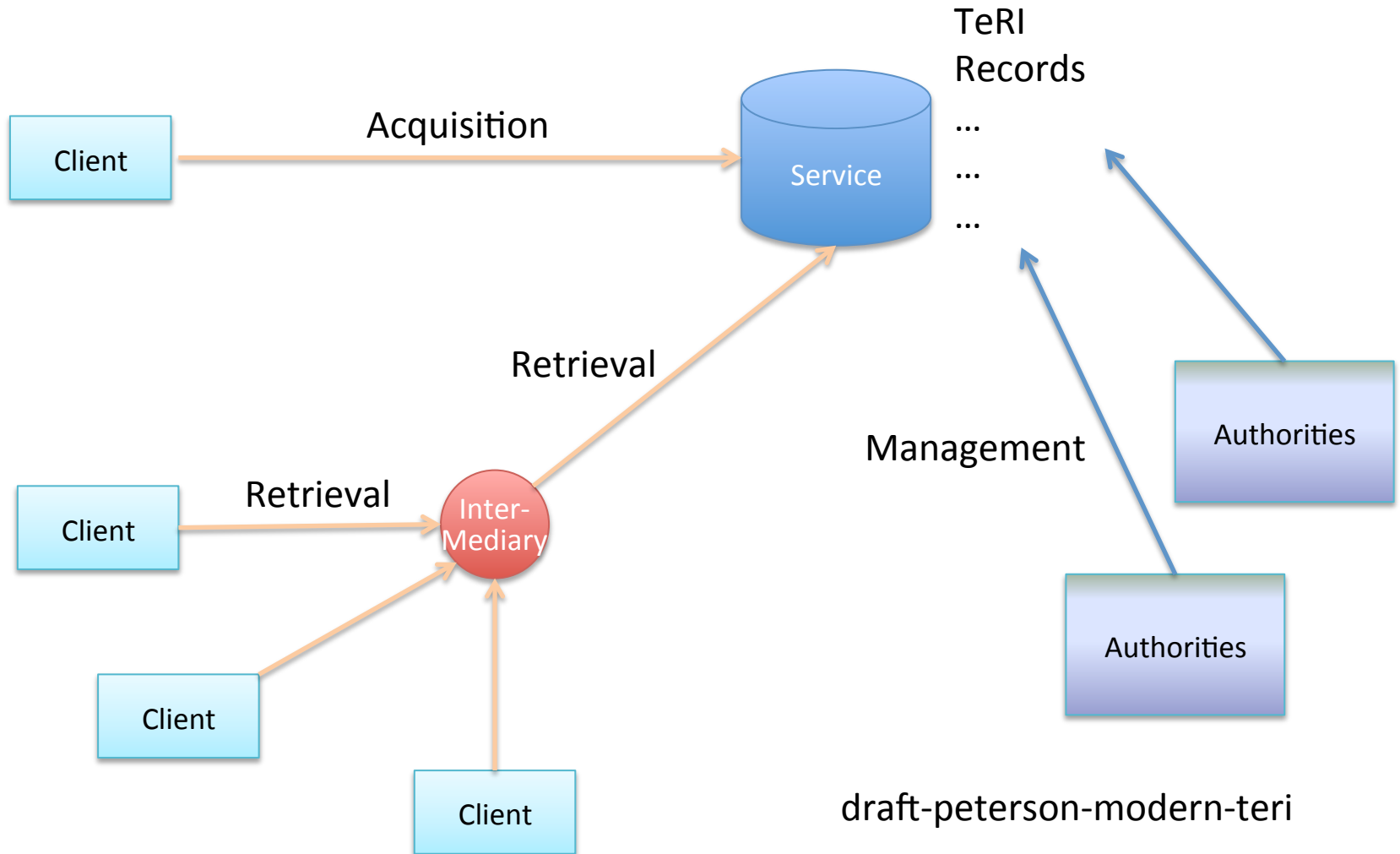
MODERN WG

IETF **100** (Singapore)

What is TeRI?

- An information model for three functions related to telephone numbers

1. Acquisition operations
   - How does a Client request new numbers from a Service?
     - Usually entails the creation and signing of a new Record by an Authority
2. Management operations
   - How does a Client push records into a Service?
     - Either provisioning a new Record into a Service or updating an existing one
3. Retrieval operations
   - How does a Client pull Records from a Service?
     - Search operations that admit of Restrictions for Service or Administrative data

- Core conceit: these functions all operate on overlapping data
  - If you can provision it, you should be able to query for it, and vice versa
  - TeRI provides a full lifecycle ecosystem for Records about telephone numbers

The TeRI Interfaces

Client — Acquisition → Service

TeRI Records
...
...
...

Retrieval

Client — Retrieval → Inter-Mediary — Retrieval → Service

Client

Client

Management

Authorities

Authorities

draft-peterson-modern-teri

Operations and Records

- Each Operation consists of a Request and a Response
  - All operate our core building block: **TeRI Records**
- Requests will have a Source, Subject, and sometimes Restrictions (formerly Attributes)
  - Source indicates the originator of the Operation
  - Subject would typically be a TN itself (or a range)
- Responses will have a Response Code
  - For the "bindings" to various transports, a lot of Request and Response syntax will devolve to a using protocol
  - HTTP, for example, has its own response codes

TeRI Records

- TeRI Records are collected at Services
  - Services could be public, and centralized and monolithic, or distributed, or private
    - The Operations and information model will be the same
  - Multiple Records might cover any given TN
    - And multiple TNs might be covered by a given Record
  - Records are trusted based on the Authority that generated them
    - Usually not based on the Service that shared them
- Entities from the MODERN framework act as
  - Clients
    - Users, CSP, Government Entities
  - Services
    - Registries, Registrars, CSPs

TeRI for Number Validity

- draft-peterson-modern-teri-valid
- A problem space much discussed in North America today
  - How to share information about blocks of valid and allocated numbers
    - Some abusive calls (robocalls, etc.) originate from invalid or unallocated numbers
    - Carriers could potentially block such calls or subject them to special treatment
- Seems like a good MODERN use case

The approach in teri-valid

- New TeRI Record element for "Allocated", 3 values:
    1. "**Yes**": the numbers covered by this TeRI Record have been allocated, and may or may not be assigned
        - Mostly used for number blocks ("R" Records)
    - "**Assigned**": all the numbers covered by this TeRI Record are known to be assigned for use
        - Mostly used for individual number ("T" Records)
    - "**No**": This is a valid block but it is known that no numbers in it are currently assigned.
        - Syntactically valid, like an area code not in use yet.
- Invalid number ranges don't have Records at all
    - No Authority can or should sign for them – a whitelist

A TeRI Record for a valid block

```
{
    "Identifier":"x989hjfd0",
    "Authority":"registry.example.org",
    "Access":"Public",
    "Subject":[{"R":"12125551"}],
    ...
    "Allocated":"yes"
        }
```

- This explains that the thousand-block 212/555-1XXX has been allocated, numbers under it may or may not be assigned at the moment
- Takes a whitelist approach, where the non-existence of a Record signifies invalid

Different Record Categories

- Two varieties of Records in the draft today
  - "R": TN range (e.g. traditional North American blocks)
  - "T": Individual TNs (e.g. freephone)
- Right now they are not hierarchical – just separate
  - Both could live at the same Service
    - A Retrieval on a given number might yield one of each: the block level "it's allocated" Record and the individual TN "it's assigned"
  - Some numbers aren't doled out in blocks
    - Individual freephone numbers are allocated individually, not in blocks
  - Obviously, Records could be cross-indexed when they contain overlapping blocks of numbers if need be
- Any need for data to be more structured?

Queries vs. Propagation

- Right now, draft explains how to use the Retrieval Operation to ask about a call in progress
  - No one wants to take a real time RTT for a network dip during call processing
  - That Request could just be a local database dip
- Need a way to acquire Records in bulk for local access
  - Draft talks about Retrieving "R" Records for "1"
    - Recommends that Records should enumerate all valid NPA/NXX's, say.
- TeRI's server-to-server Operation is Management
  - Authorities could push these bulk Records to Services through Management Operations to populate local databases
  - Also possible it do it in a pull model, where Clients retrieve to populate local databases
  - DRiP is also perhaps part of that story, per Chris's thoughts

Next Steps

- Energy needed, and discussion
- Need more input on Record elements
- Need to get the terminology consistent between this and baseline TeRI
- Maybe time to get TeRI concrete?
  - Define clear profiles and bindings
  - Really need to start building out a ReSTful binding
  - Need to flesh out JSON further, but anything else?
- When we have something more concrete, and with some energy, look toward adoption