DECADE Content Replication

draft-yry-decade-replication-00

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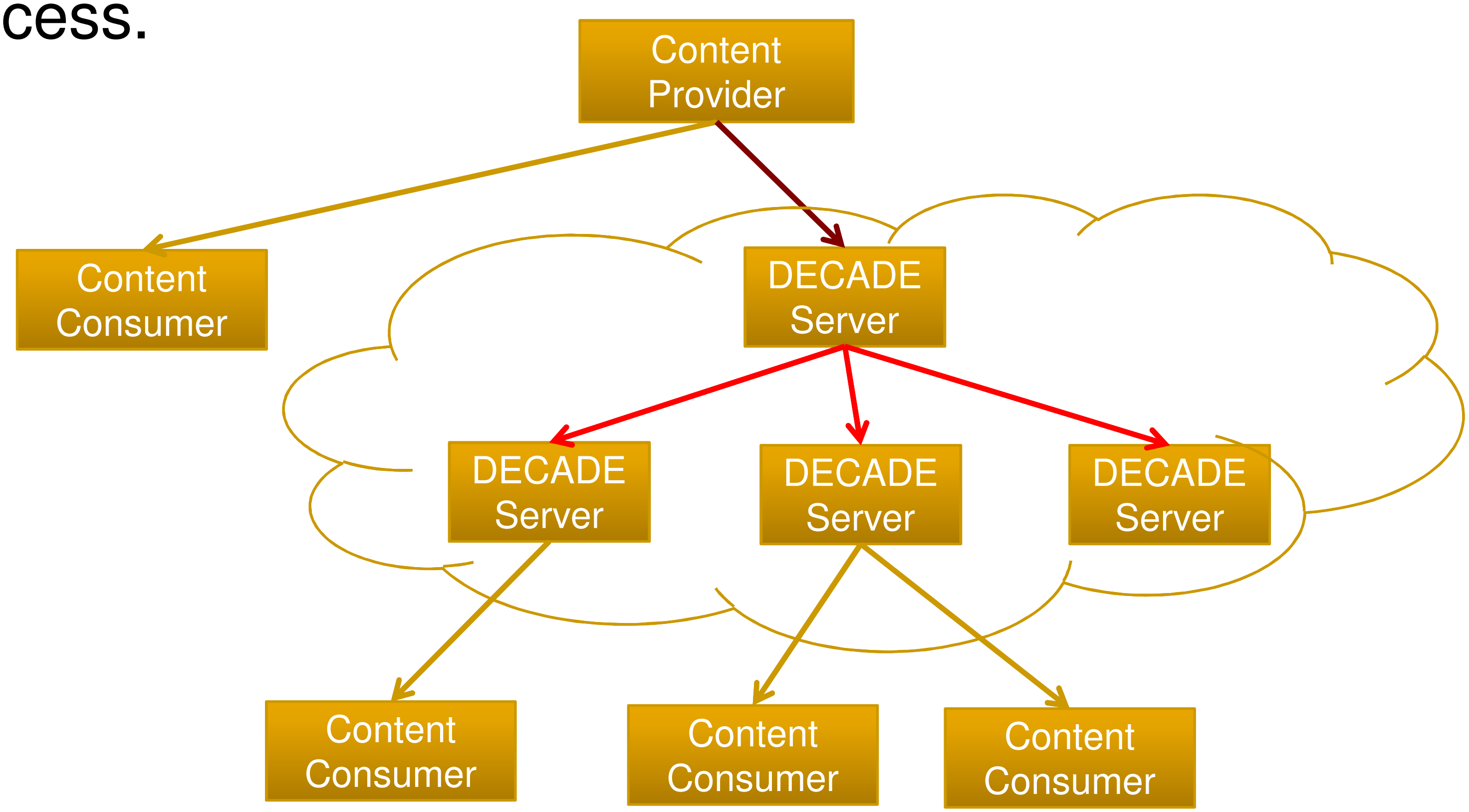
Content Replication & Access

- Replication
  - To determine, which DECADE Server(s) should store a given piece of content, when, and from where does a storing DECADE Server get the content?

- Access
  - To determine, for a request for content from a Content Consumer, which DECADE Server(s) should serve the request?

Tree Structure

- We assume that DECADE should support the following recursive tree structure for content replication and access.



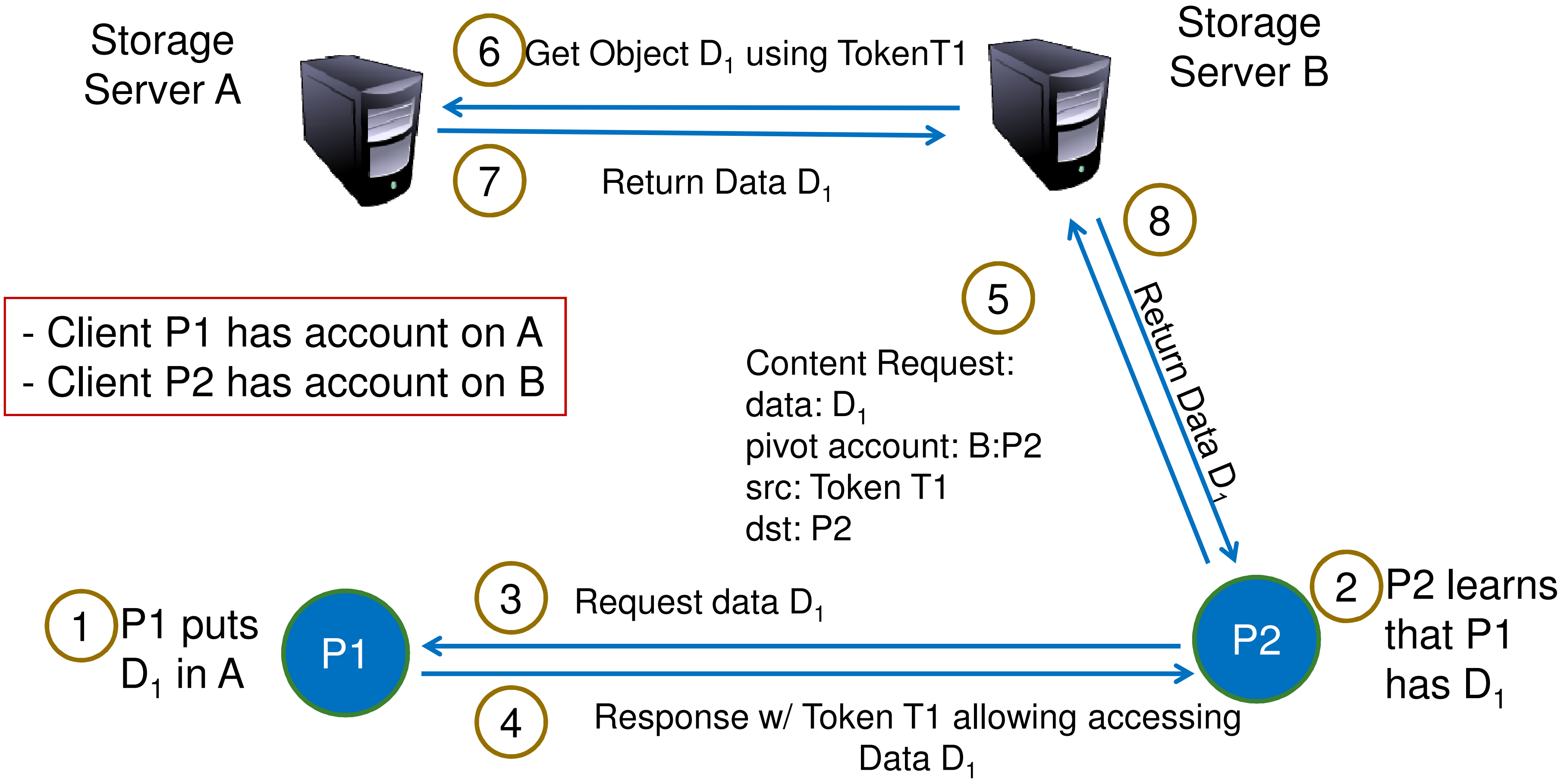
Design Issues on Tree Construction

- Proactive Push vs. On-demand Pull
  - Proactive Push: push content to DECADE Server(s) before Content Consumer requests.
    - Benefits: Reduce latency of content distribution;
    - Issues: May have higher wastes on storage/bandwidth if push locations are hard to predict;

  - On-demand Pull: pull content into DECADE Server(s) upon Content Consumer requests.
    - Benefits: Much lower ratio of wasted resources on storage/bandwidth; further improvement on efficiency by using Piggybacked replication;
    - Issues: May have latency issue in some real-time use cases;

A Simple Pull Example

- Client P1 has account on A
- Client P2 has account on B



Storage Server A

6 Get Object D_1 using TokenT1

7 Return Data D_1

Storage Server B

8 Return Data D_1

5 Content Request:
data: D_1
pivot account: B:P2
src: Token T1
dst: P2

1 P1 puts D_1 in A

P1

3 Request data D_1

4 Response w/ Token T1 allowing accessing Data D_1

P2

2 P2 learns that P1 has D_1

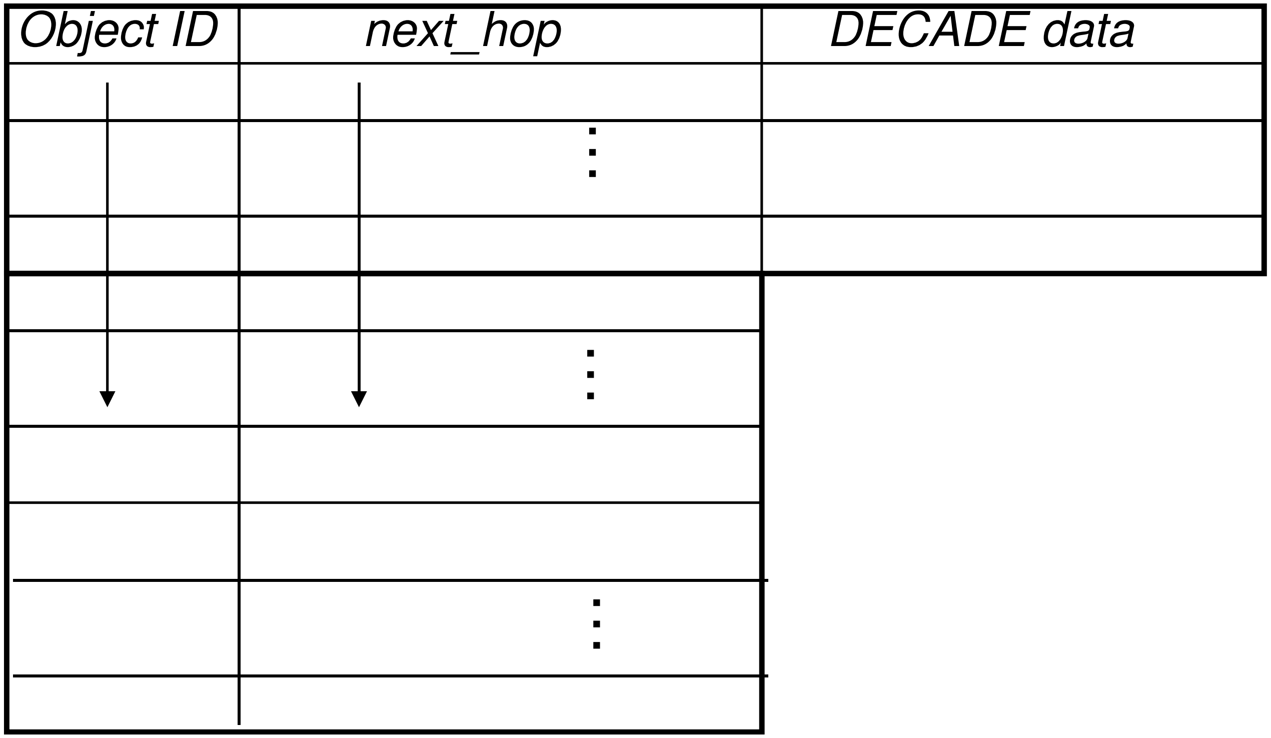
General Pull Mechanisms 1/2

- DECADE-Core-Stateless Design
  - A full pull chain in DECADE content request.

Object ID	NextHop S1	NextHop S2	NextHop … …

General Pull Mechanisms 2/2

- DECADE-Core-Stateful Design
  - Introduce content forwarding table into DECADE server.
  - Control plane can update the content forwarding table.



Next Steps

- Just a start and need further work on:
  - Evaluation of controller (e.g. Application control, or DECADE Service Provider control, or hybrid mode) of replication and access tree;
  - Detailed design of DECADE content forwarding table – e.g. table structure, suitable object ID naming space, etc;
  - … …
- Comments are highly appreciated.

Thank you