

# ALTO Information Redistribution

draft-gu-alto-redistribution-01

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# Motivation

- P2P is highly-scalable
- Used to support content distribution to millions of users
  - 2009 U.S. Presidential Innauguration
  - 2009 Spring Festival Evening in China
- Goal:
  - Enable all interested ALTO Clients to obtain desired ALTO information

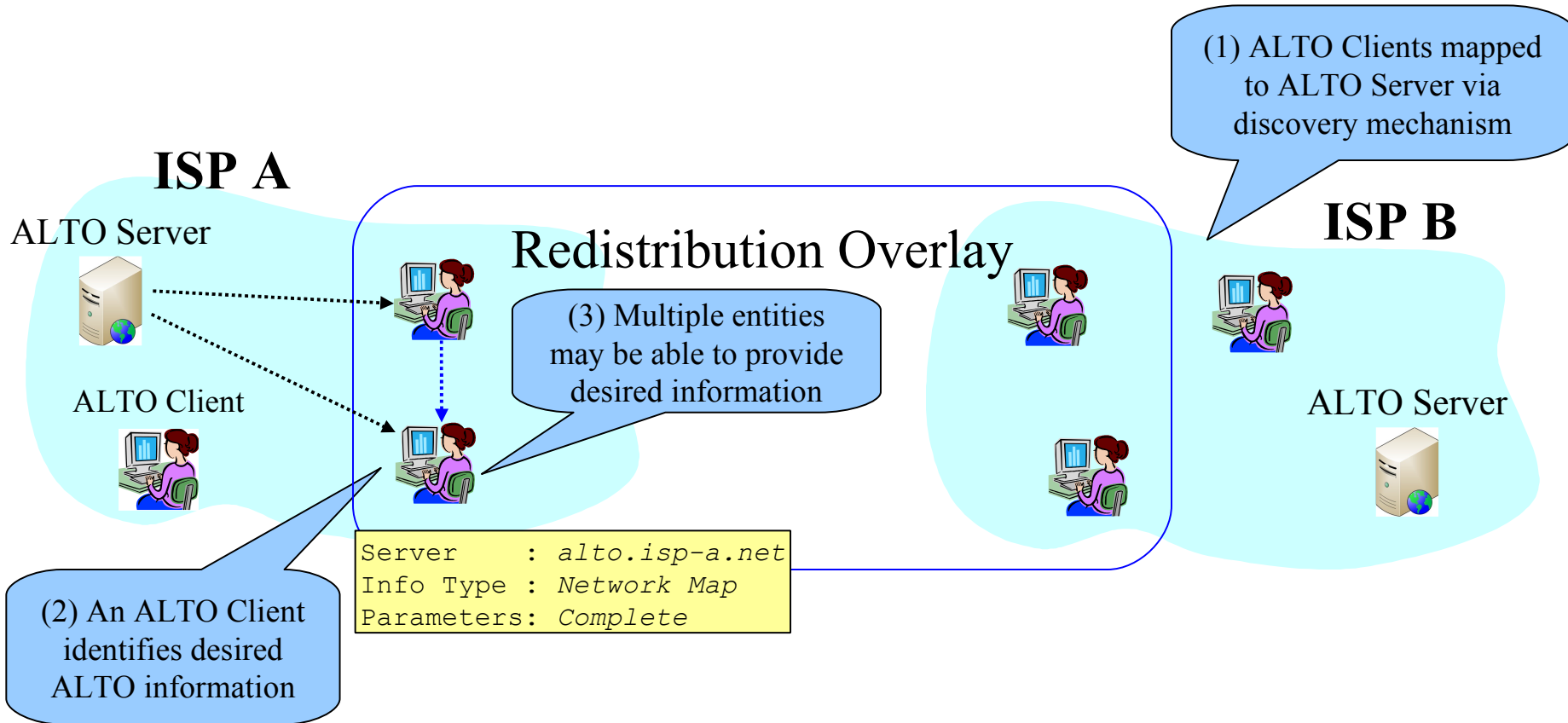
# ALTO Service Scalability

- Multiple methods to increase scalability are possible
  - Load balancing (deploy additional ALTO Servers)
  - Caching (use existing or deploy new web caches)
- Another technique: **Utilize P2P paradigm**
  - ALTO Clients may redistribute ALTO Information

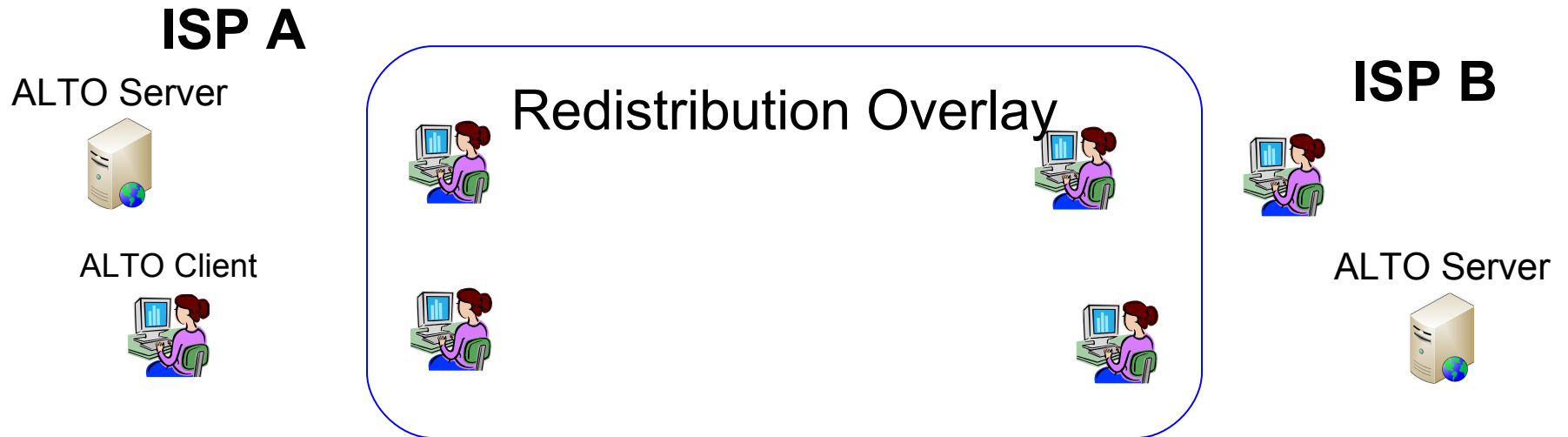
# Purpose of this Presentation

- Explore redistribution and identify design considerations
- Identify extensions to ALTO Protocol
- *Provide framework for discussion on redistribution*

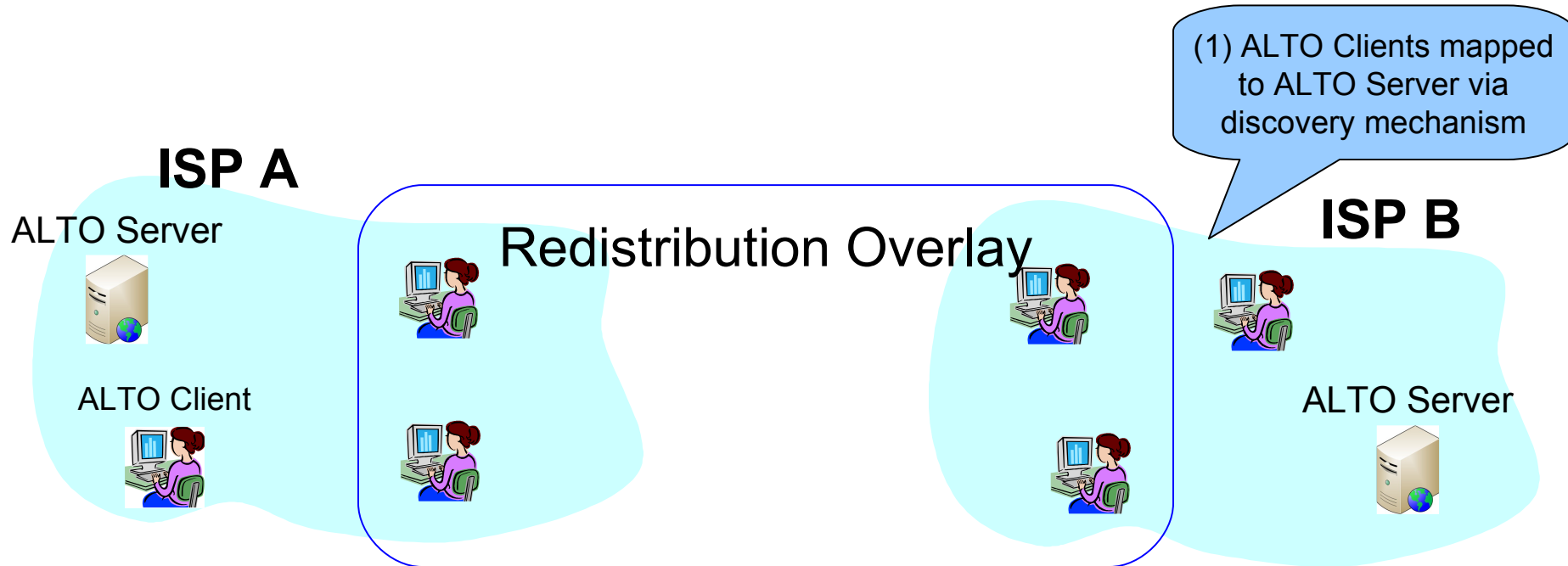
# Redistribution Framework



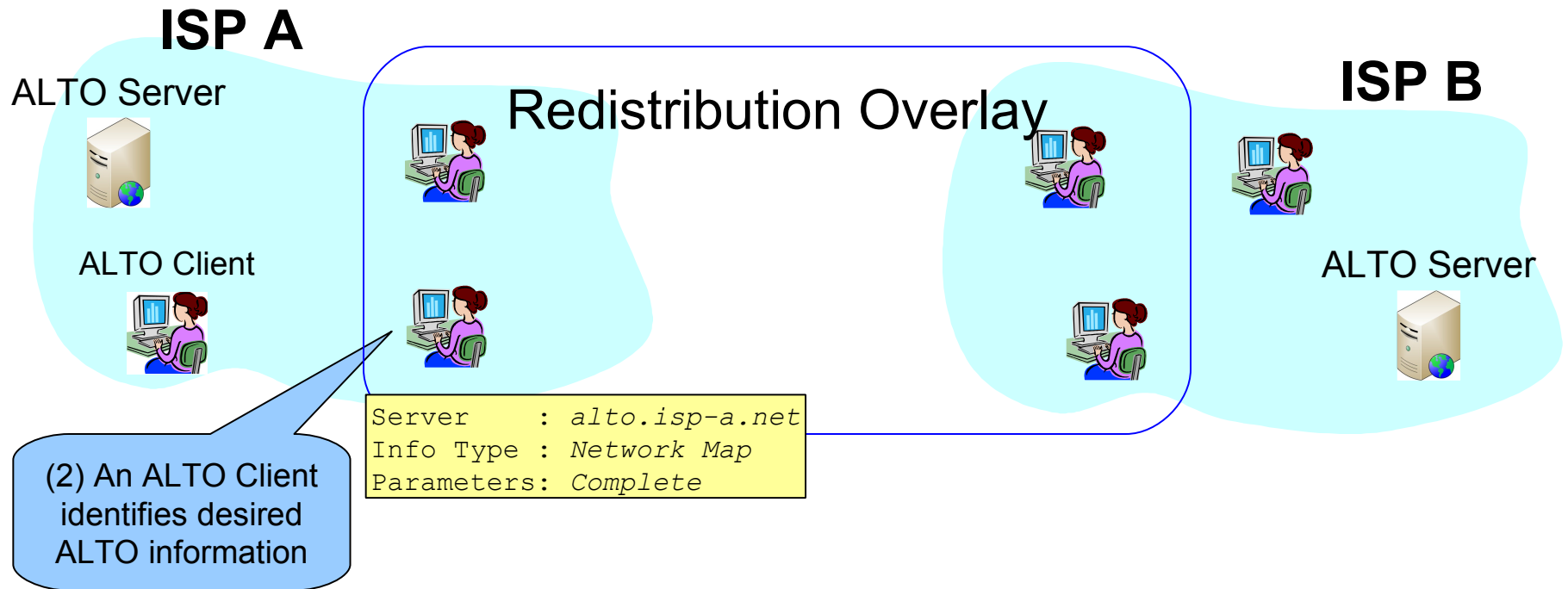
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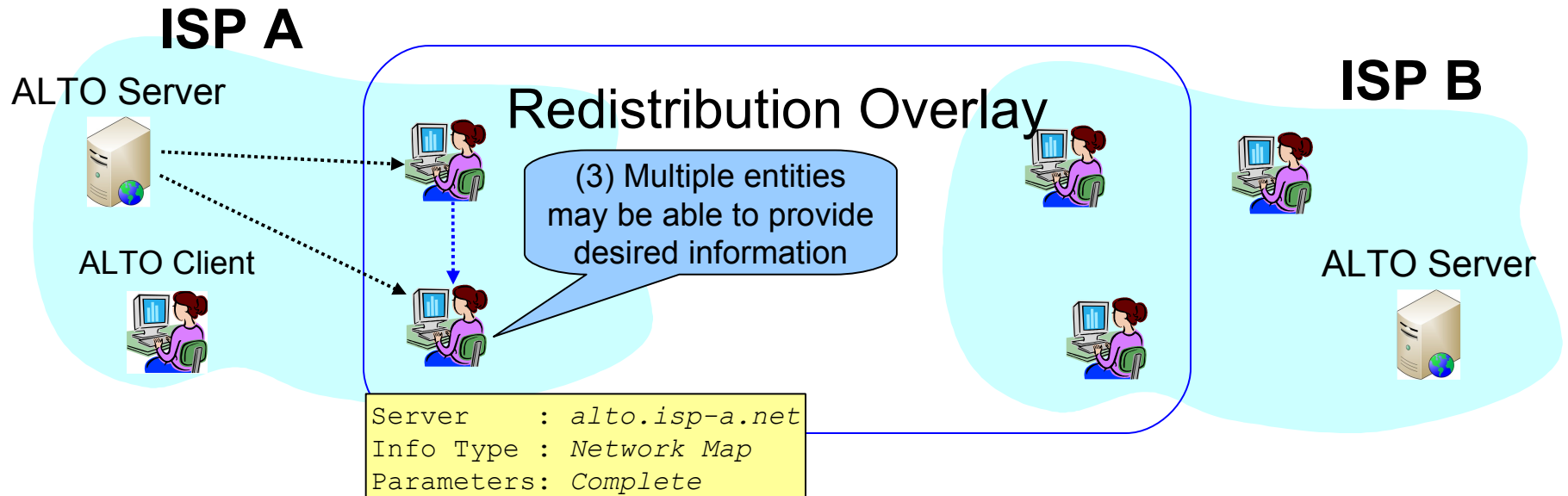


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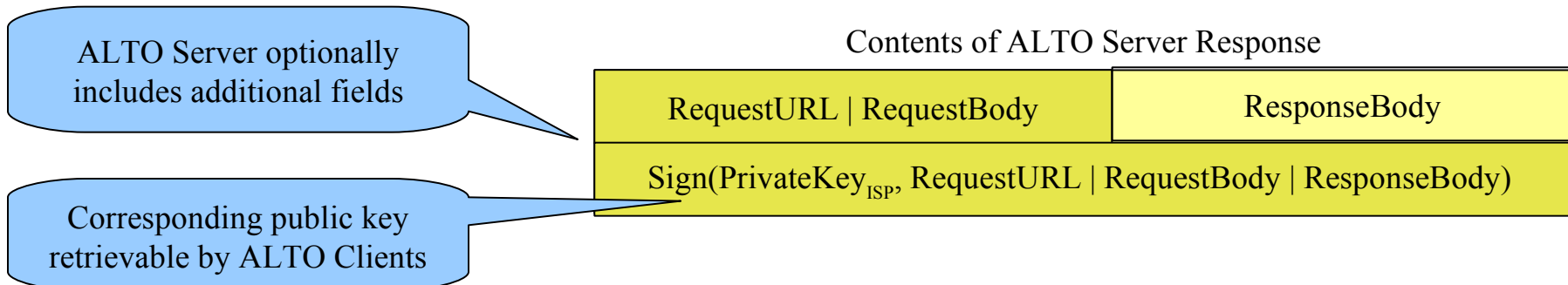
- Redistribution scheme needs some basic elements
- *ALTO Clients identify desired ALTO information*
  - Mechanism may be application-dependent
- *Transfer ALTO Information amongst ALTO Clients*
  - Mechanism may be application-dependent
- *Verify ALTO Information once received*
  - In some deployments, ALTO Clients may not be trusted
  - Suggest extensions to ALTO Protocol
- Other considerations as well (see draft for details)

# ALTO Information Distribution

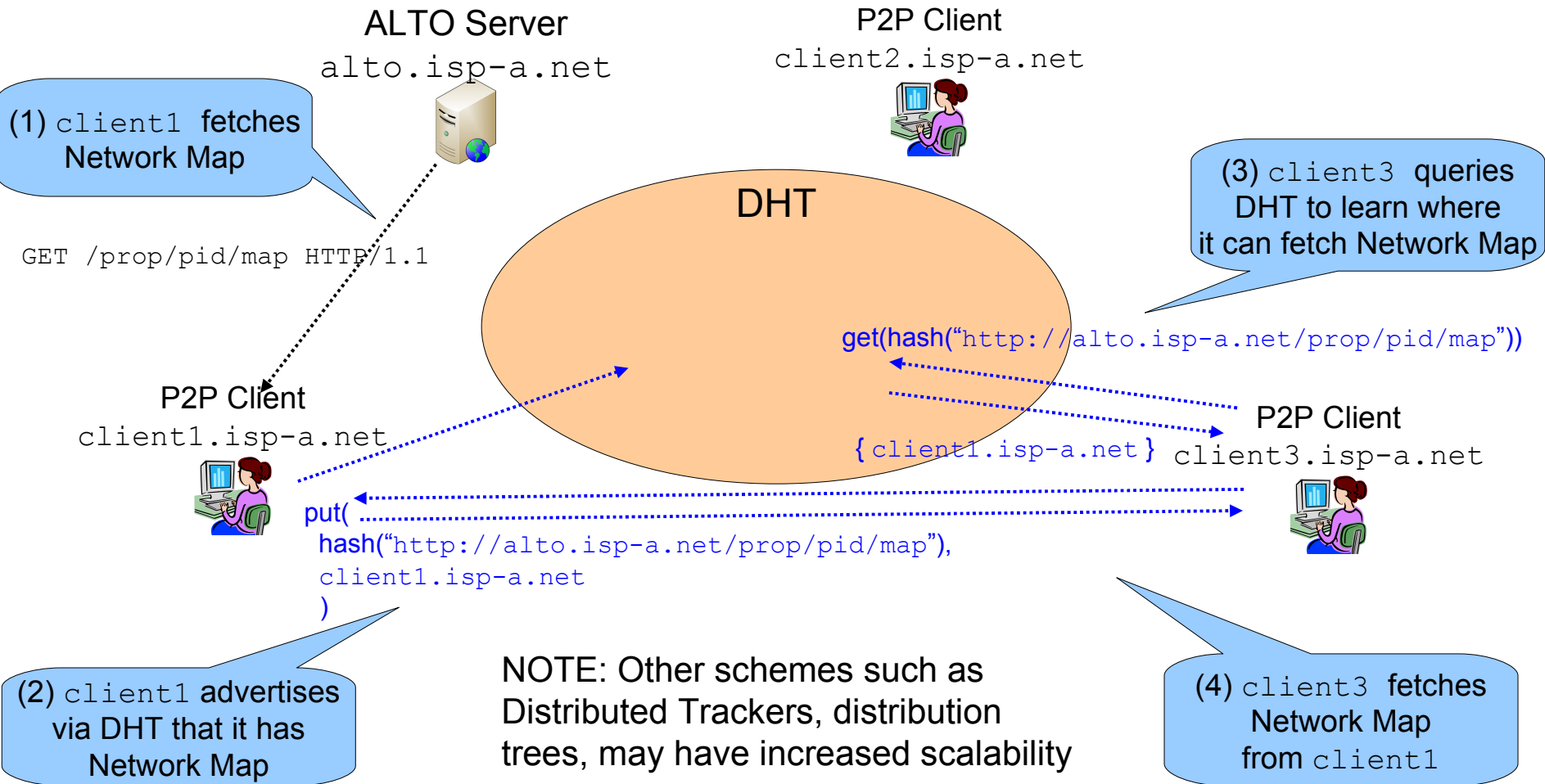
- ALTO Information is dependent on
  - *ALTO Server* (e.g., hostname and port)
  - *Type* (e.g., type of ALTO Query)
  - *Input Parameters* (e.g., ALTO Query parameters)
- *Reusable ALTO Information*
  - ALTO Information desired by multiple ALTO Clients
  - Redistributing *reusable* info can reduce ALTO Server load
- Examples (w.r.t. `draft-penno-alto-protocol-04`)
  - Reusable
    - Server Capability, Full Network Map, Full Cost Map
  - Non-reusable
    - Ranked list of endpoints (e.g., in BitTorrent)

# ALTO Information Verification

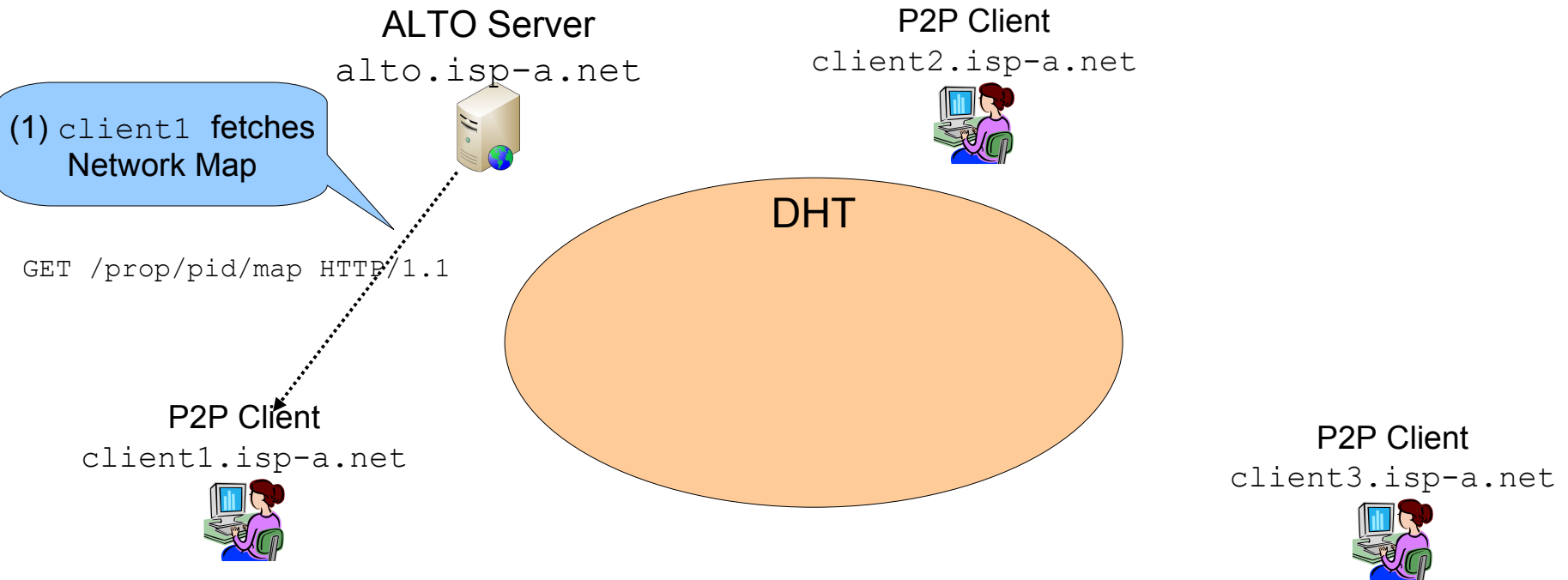
- Focus on case where raw ALTO Query Response is redistributed
  - Note that P2P application *could* perform irreversible transformation (e.g., filtering) during redistribution
- ALTO Clients should be able to determine:
  - “Is this what I requested?” (server, query type, params)
  - “Did my ALTO Server generate it?” (crypto. check)
- Simple proposal (w.r.t. `draft-penno-alto-protocol-04`)



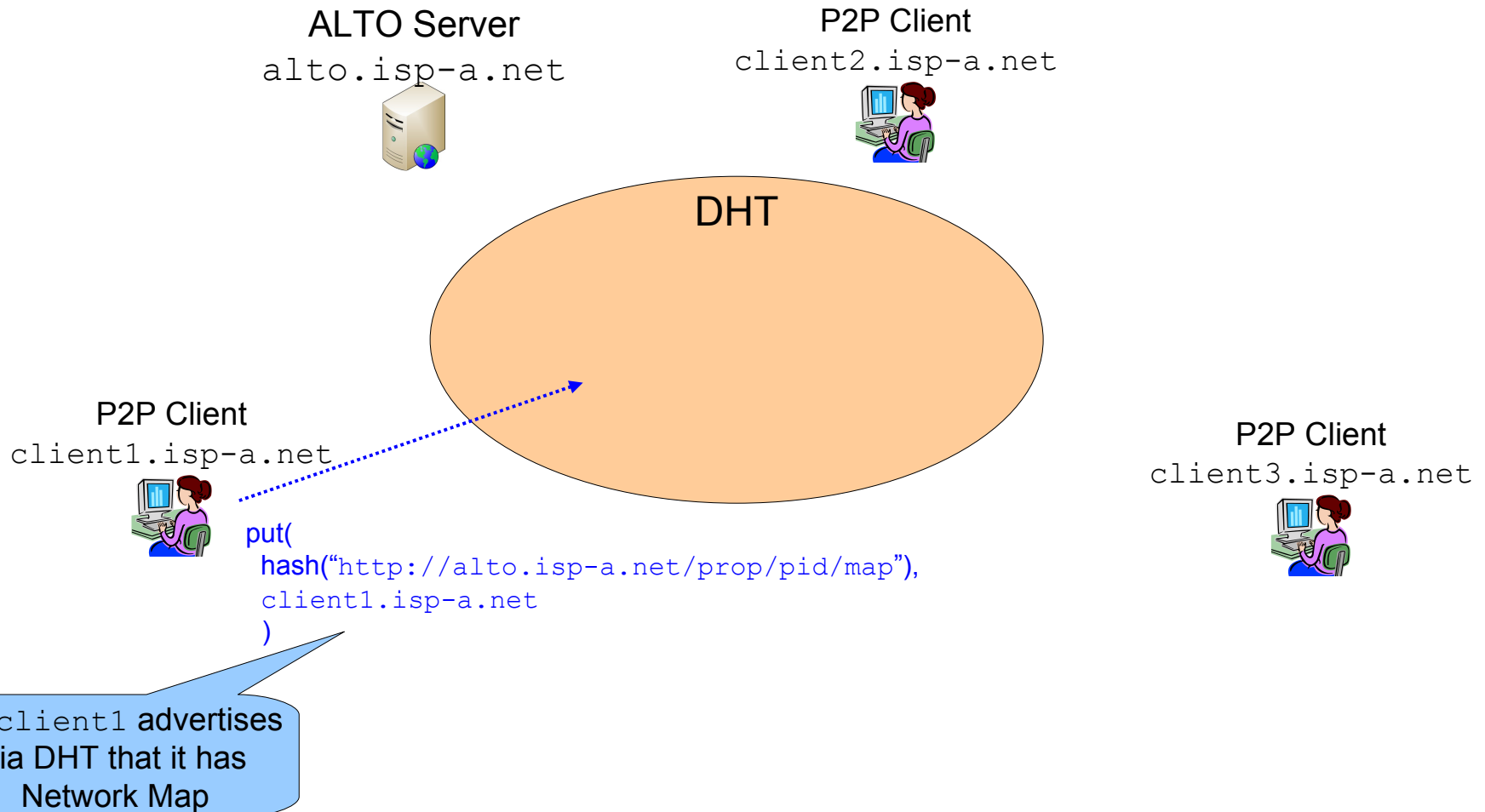
# Illustrative Example: Trackerless P2P Overlay



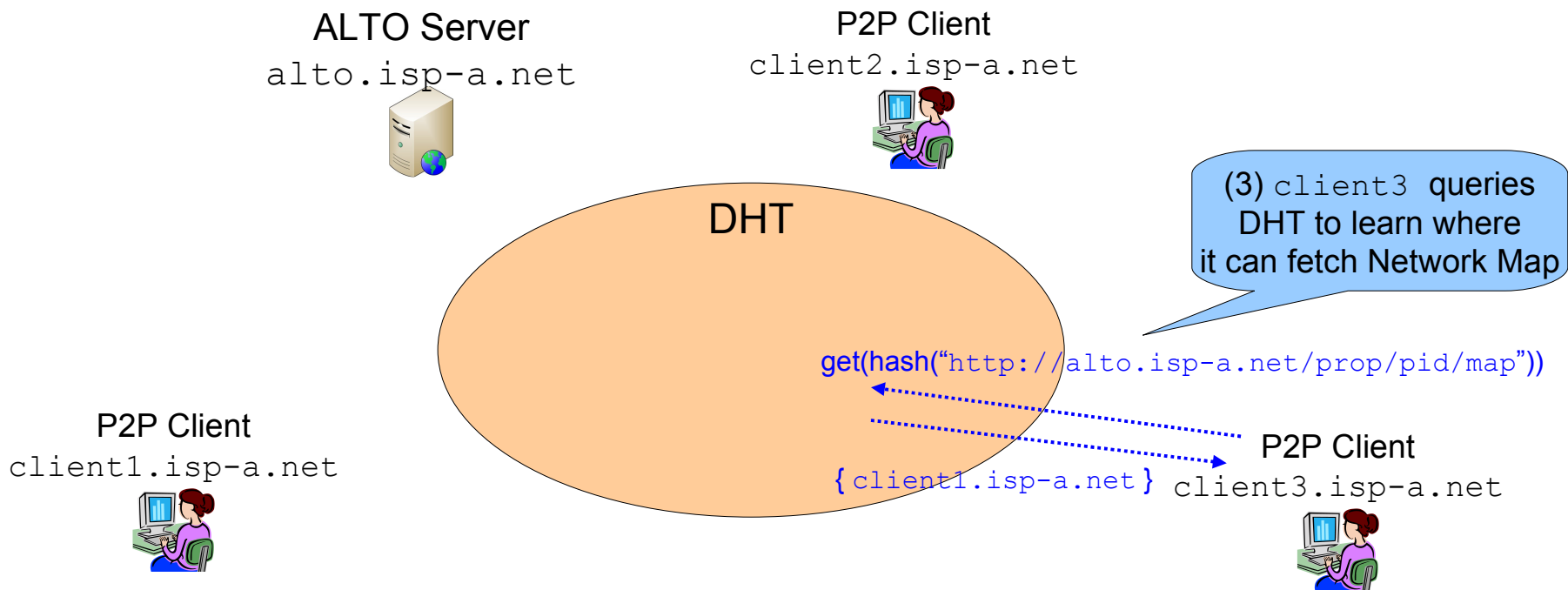
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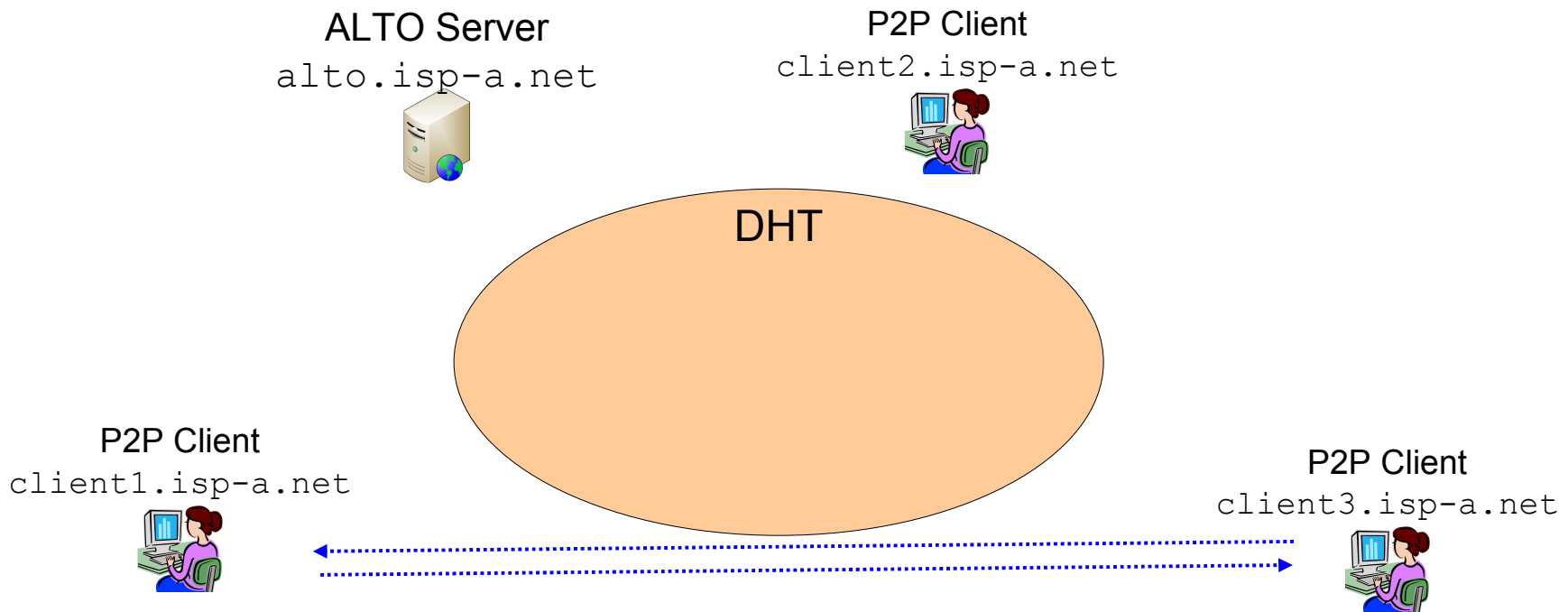


# Illustrative Example: Trackerless P2P Overlay





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NOTE: Other schemes such as Distributed Trackers or re-using existing P2P application overlay are also possible

(4) `client3` fetches Network Map from `client1`

# Discussion Points

- To what extent should ALTO Protocol support redistribution?
  - Sign subsets of ALTO responses?
  - Sign only some ALTO responses?
    - E.g., for queries with limited/no input parameters
  - Sign all ALTO responses?
    - Might require specifying how to echo input parameters, etc
  - No support at all?
- Are additional requirements needed for ALTO Protocol?

Thank you