ANT
A Distributed Data Storage And Delivery System Aware of the Underlying Topology

Raúl Jiménez
TSLab - KTH

AIMS

- Design a new content distribution system

- Implement a prototype

OUTLINE

- Background

- Architecture

- Prototype

- Summary

- Future Work

BACKGROUND

- Content Distribution over the Internet
    - Content Providers
    - Internet Service Providers
    - Clients

BACKGROUND

- Content Providers
  - Control
  - Low cost distribution

- Internet Service Providers
  - Reduce inter-ISP traffic

- Clients
  - Fast, easy and cheap service

BACKGROUND

- Current Distribution Systems
  - client/server
    - One server -- many clients
  - P2P
    - Transfers between clients
    - Scalability

BACKGROUND

- How to manage traffic generated by P2P?
  - Analyzing P2P traffic
    - Block
    - Low priority
    - Caching
  - Collaboration
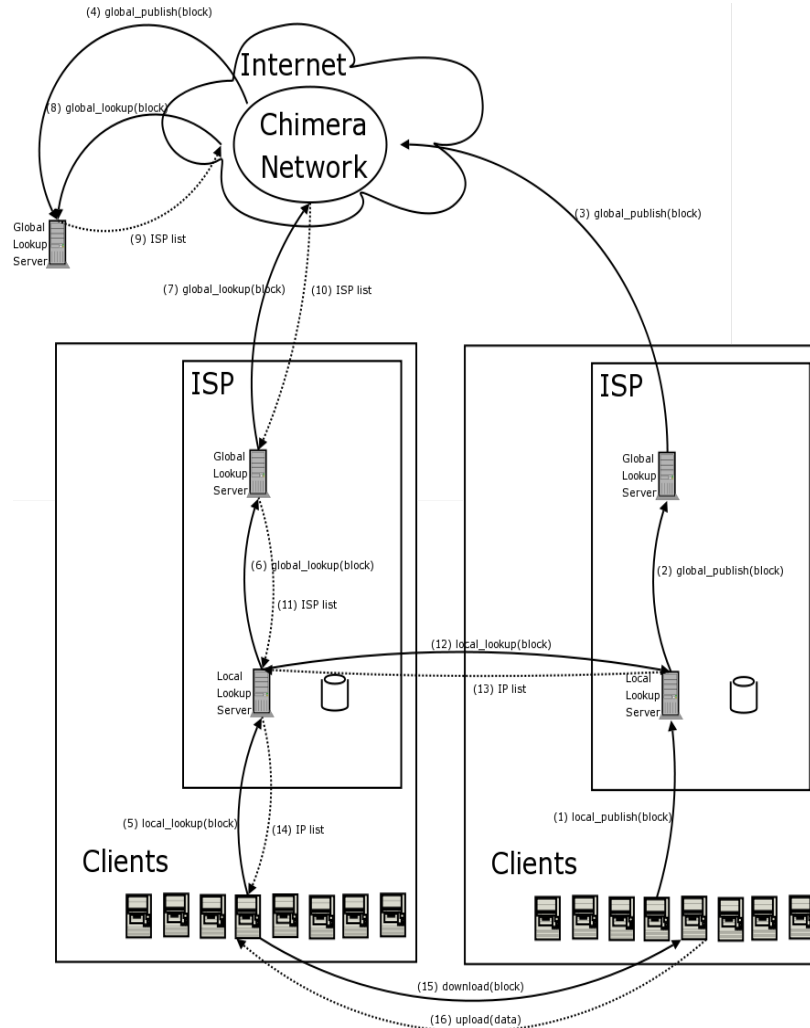   - Lookup service
    - Caching

SYSTEM ARCHITECTURE

- Semantic Layer

- Policy Layer

- **Data Layer**

COMPONENTS

- ANT-HILL Global Lookup Server
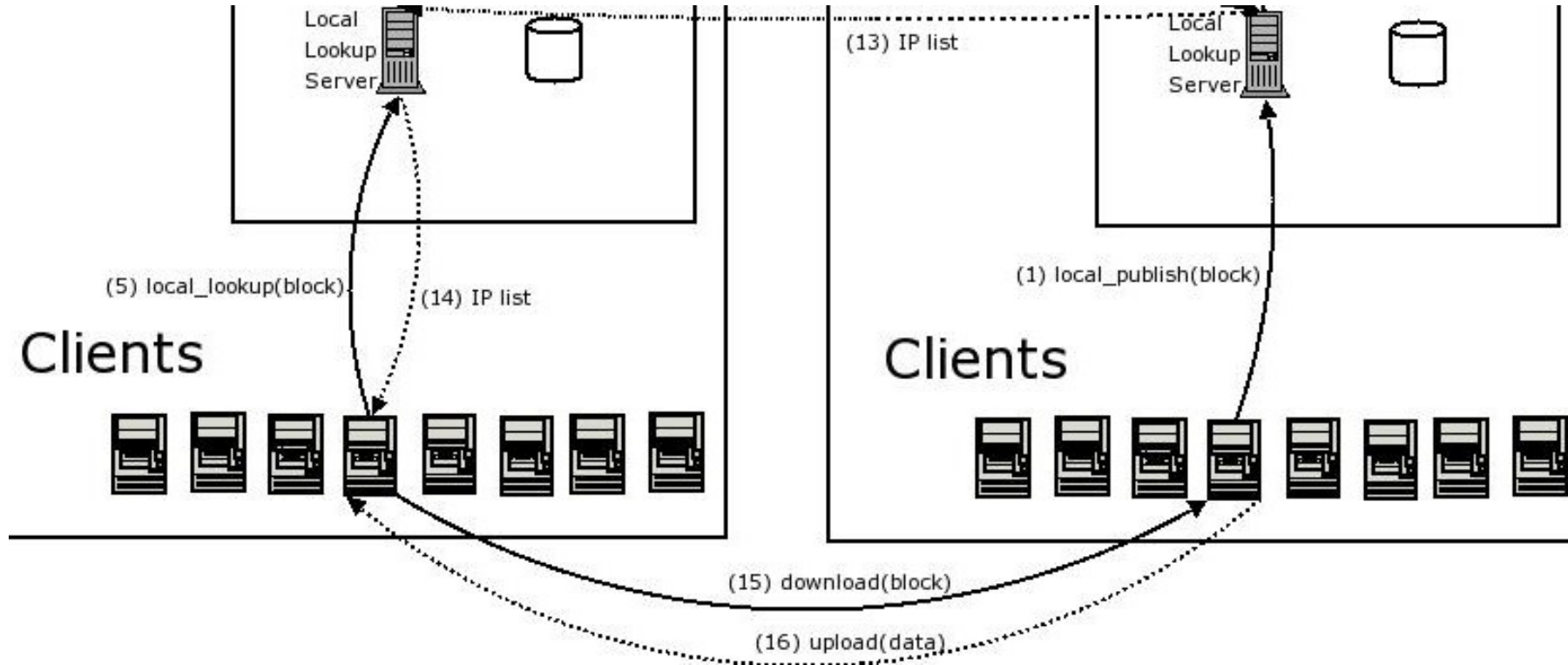
- ANT-HILL Local Lookup Server

- ANT Client

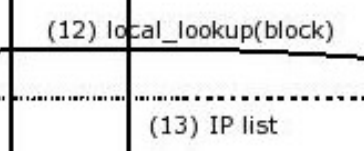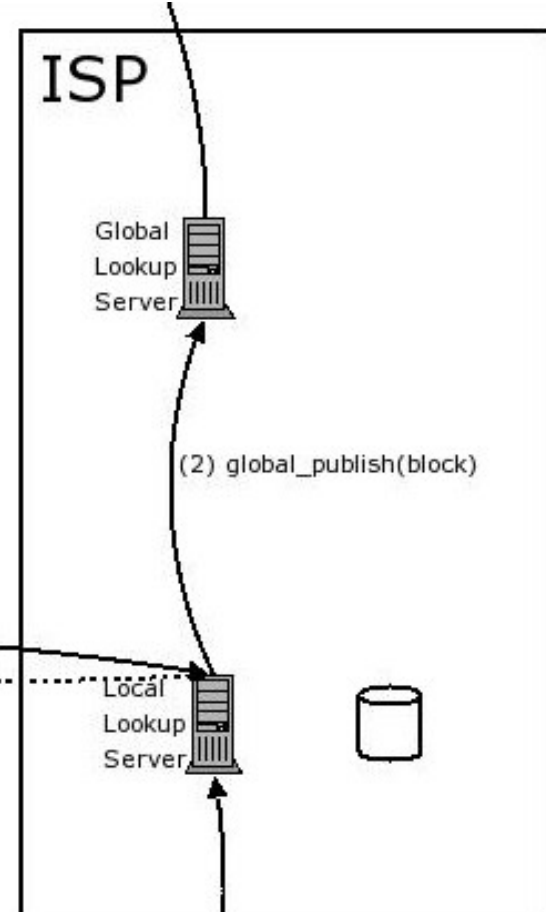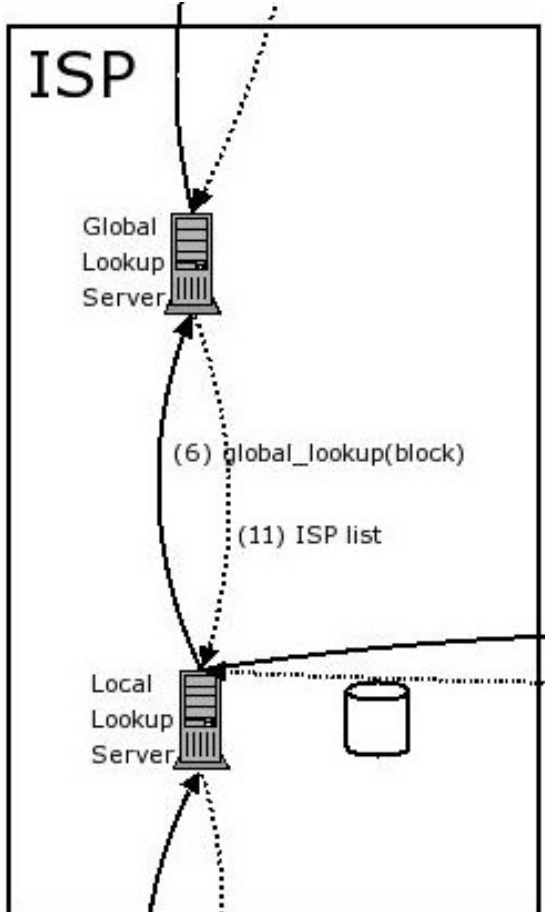# SYSTEM ARCHITECTURE

Client

- Publish

- Lookup

- Download

Client

Local Lookup Server

- Prioritize local transfers

- Find the best source

ISP

Global
Lookup
Server

ISP

Global
Lookup
Server

(6) global_lookup(block)

(2) global_publish(block)

(11) ISP list

(12) local_lookup(block)

Local
Lookup
Server

(13) IP list

Local
Lookup
Server

(5) local_lookup(block)

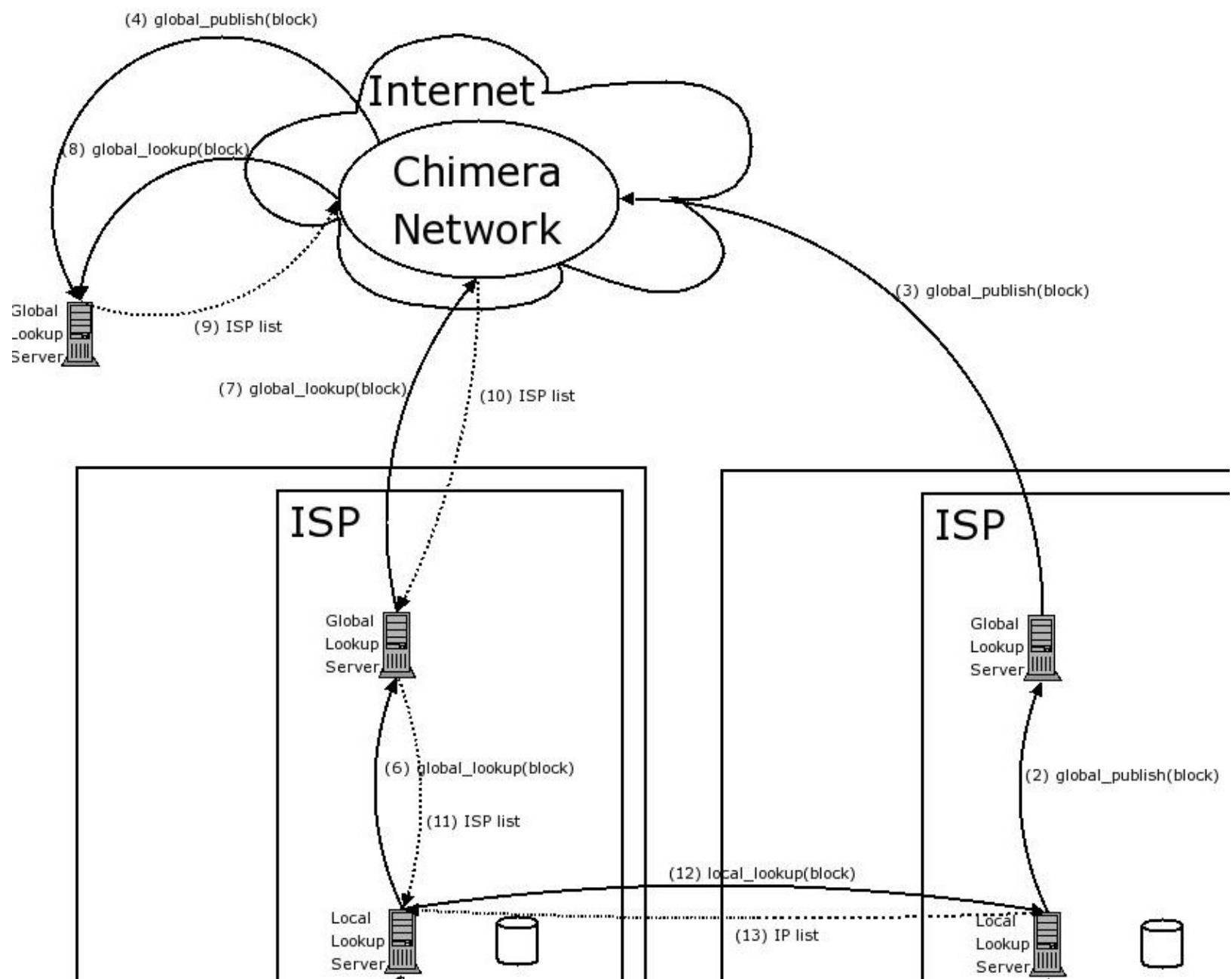(14) IP list

(1) local_publish(block)

Clients

Clients

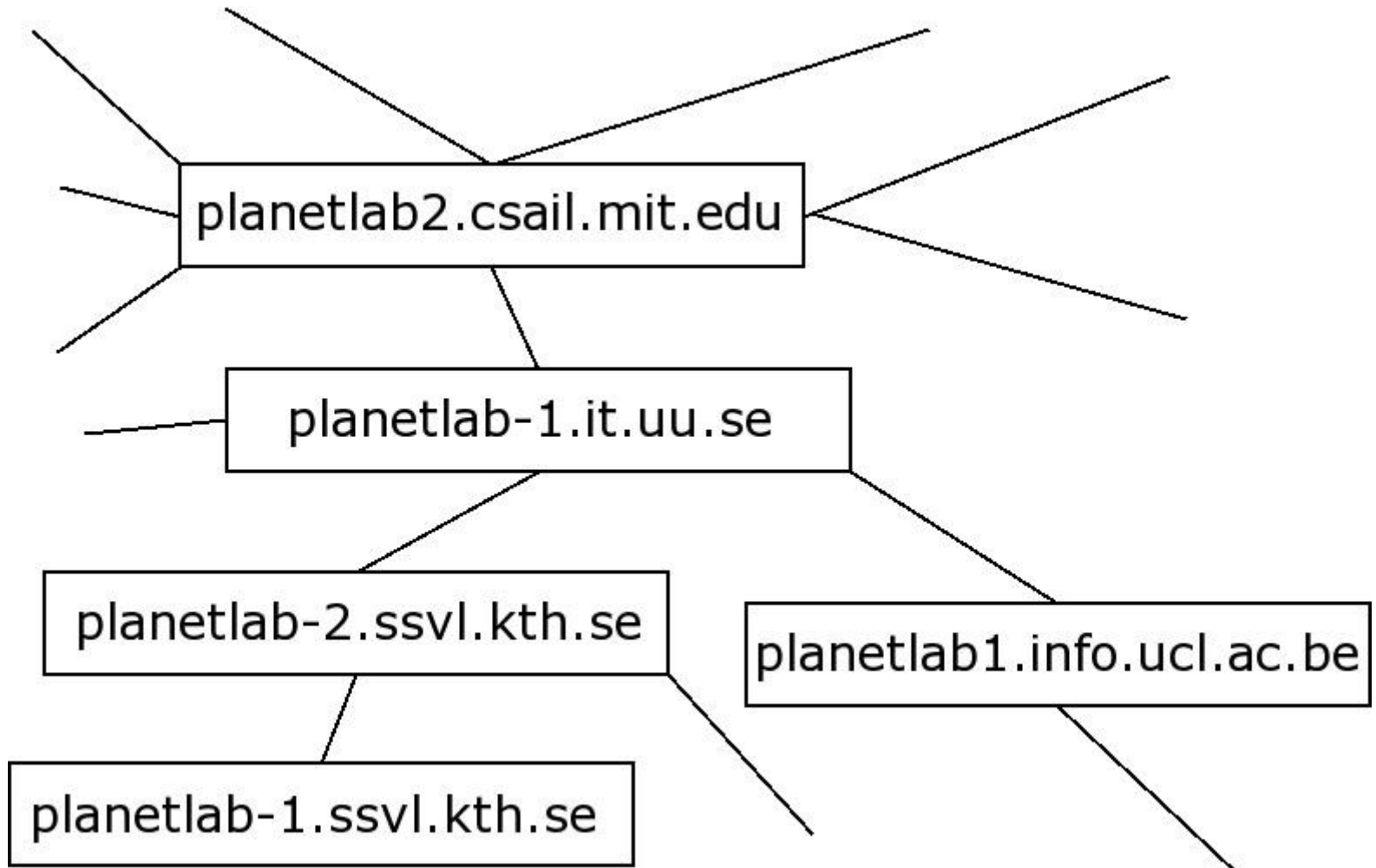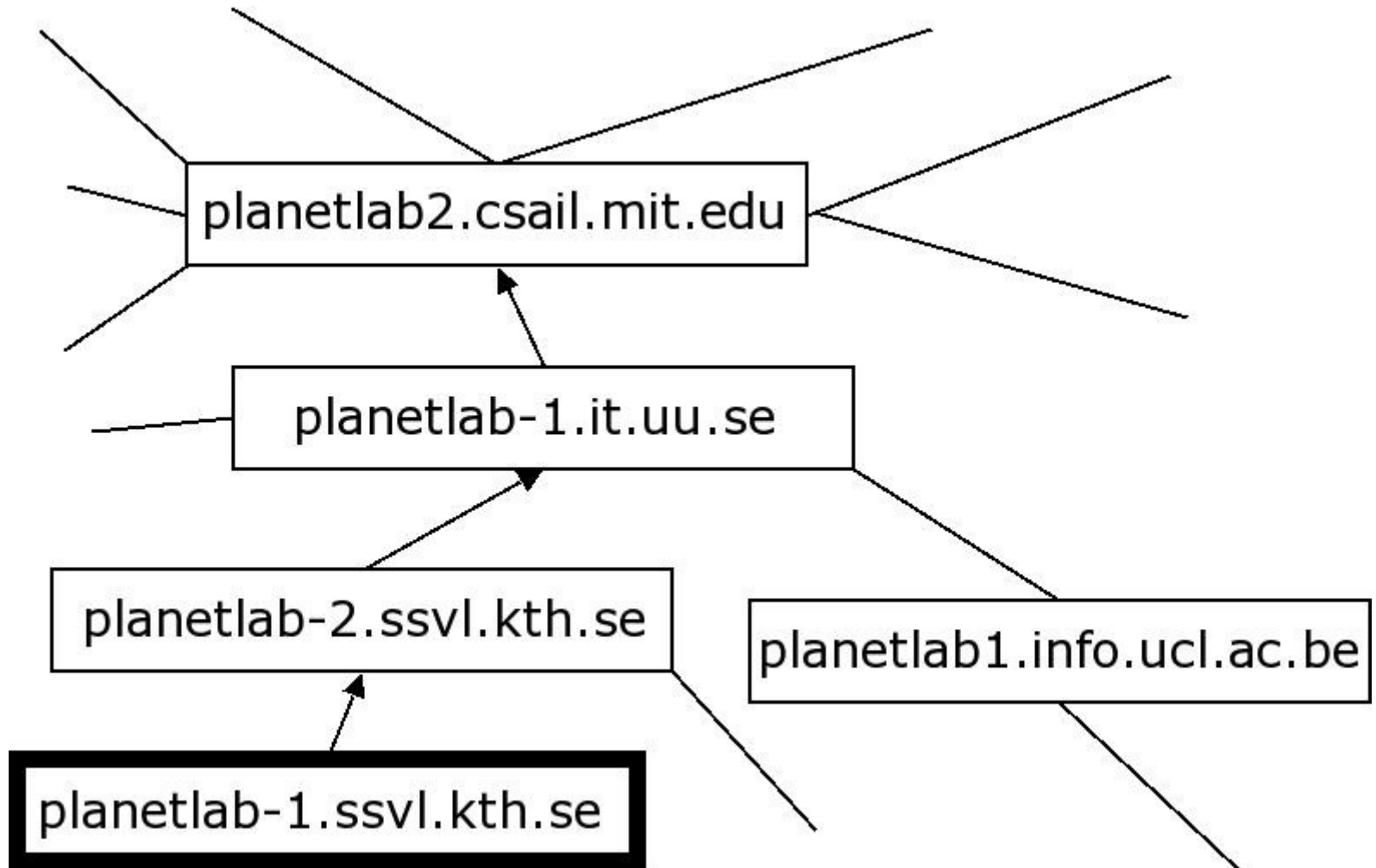# Global Lookup Server

- Link between the local network and the Internet
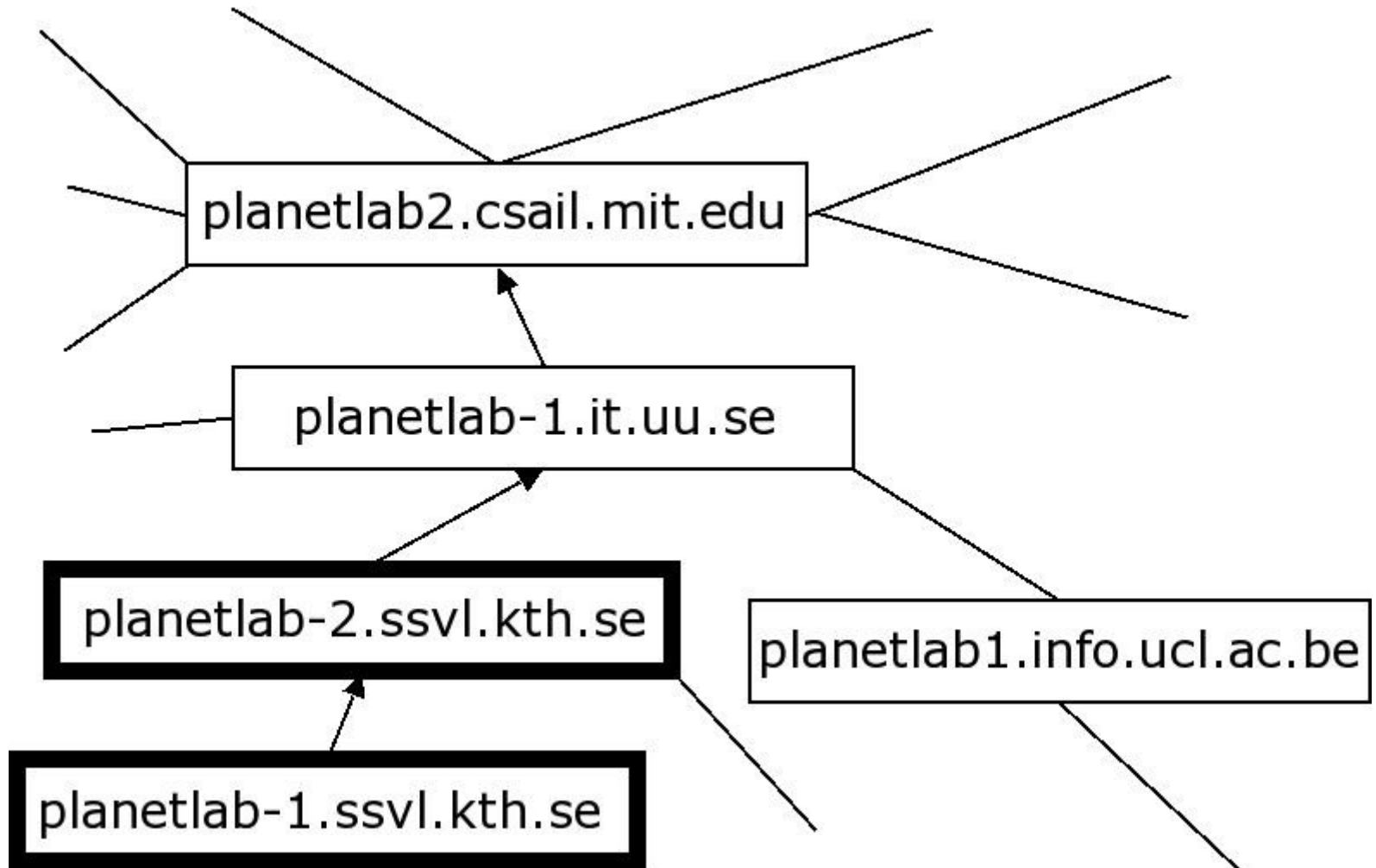
- A lookup service topologically aware: **Chimera**

(4) global_publish(block)
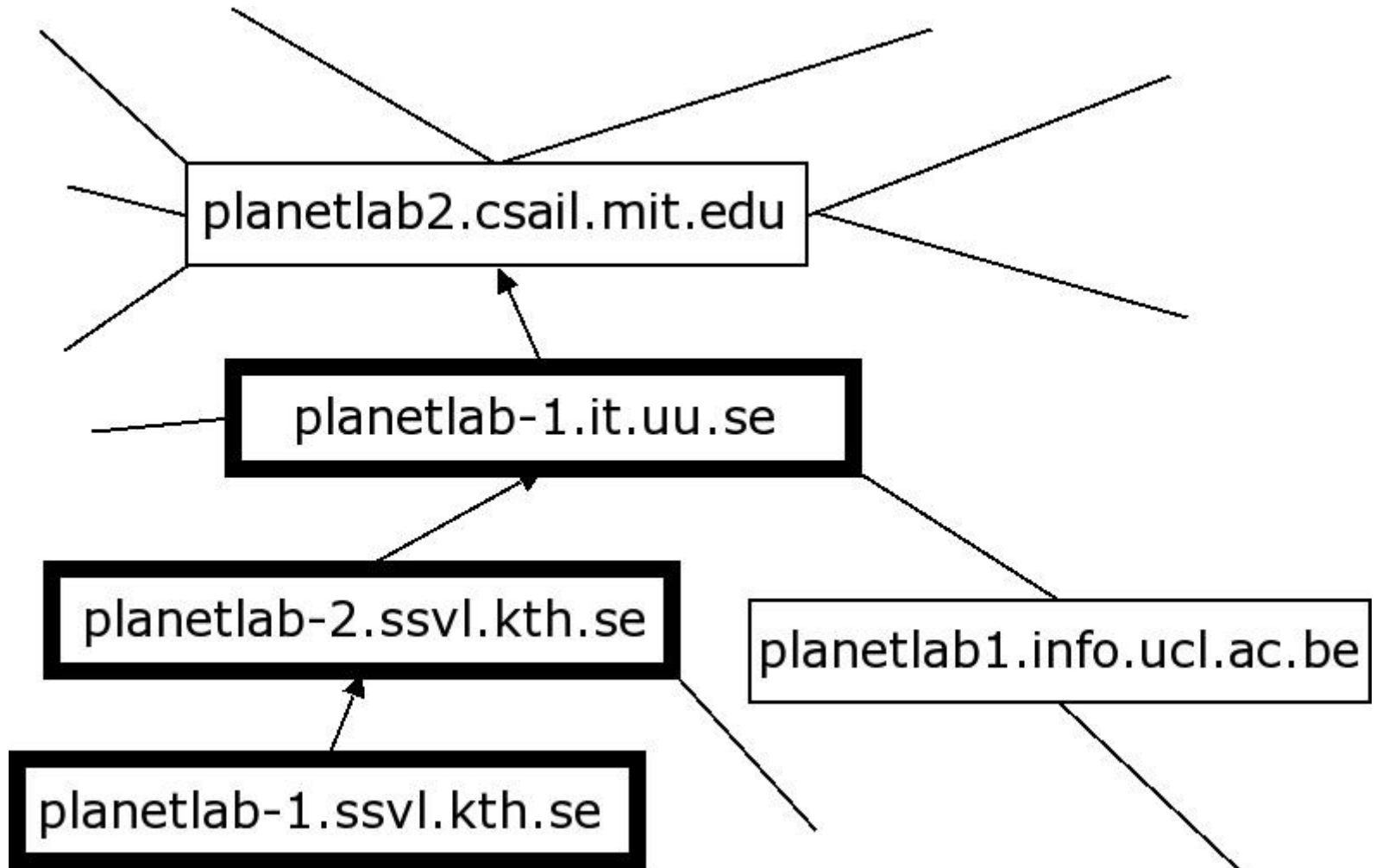
Internet

Chimera Network

(8) global_lookup(block)

Global Lookup Server

(9) ISP list

(7) global_lookup(block)

(10) ISP list

(3) global_publish(block)

ISP

ISP

Global Lookup Server

Global Lookup Server

(6) global_lookup(block)

(11) ISP list

(2) global_publish(block)

(12) local_lookup(block)

Local Lookup Server

(13) IP list

Local Lookup Server

CHIMERA NETWORK

PUBLICATION

PUBLICATION

PUBLICATION

PUBLICATION
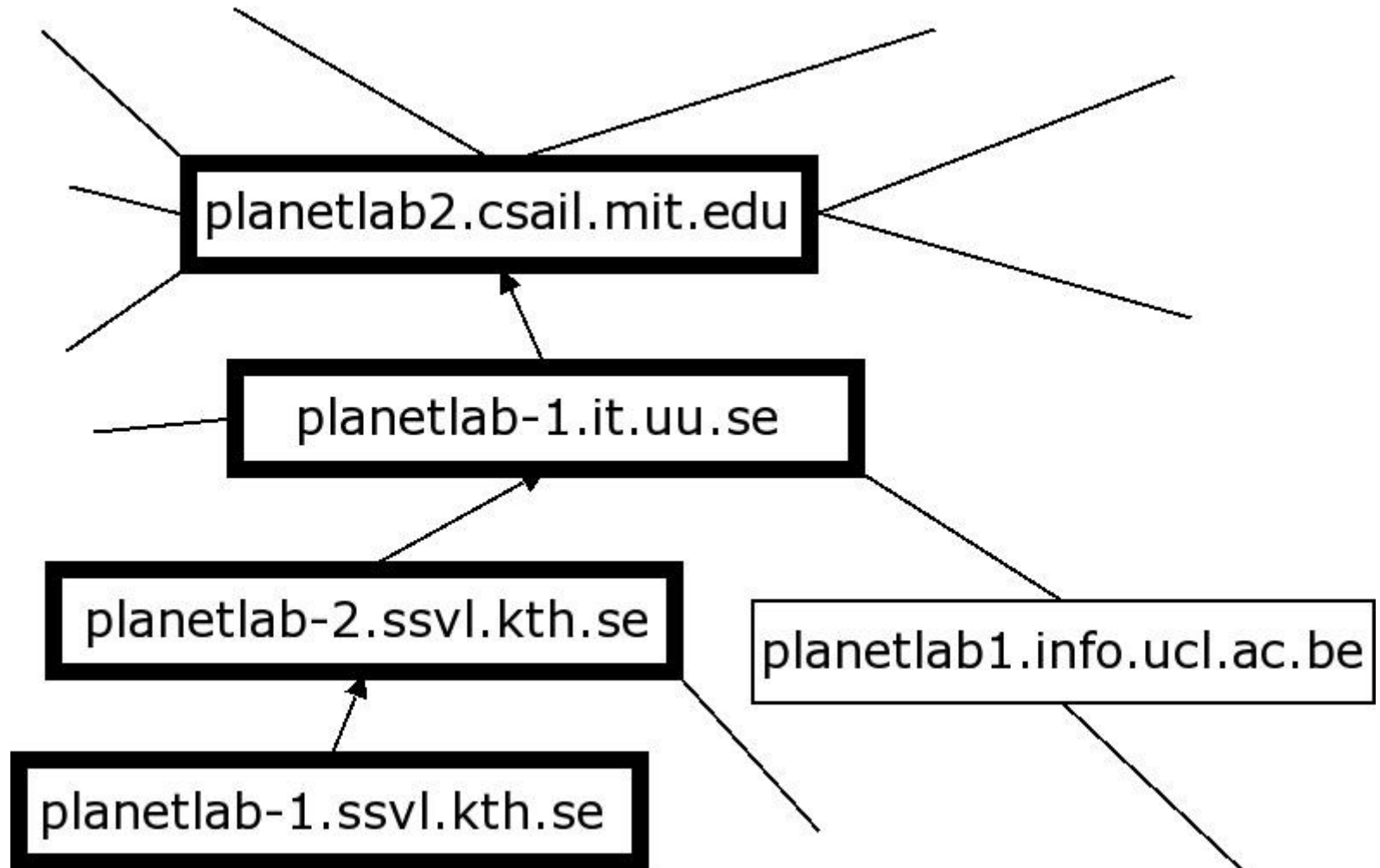
LOOKUP

PlanetLab

source: http://www.planet-lab.org/
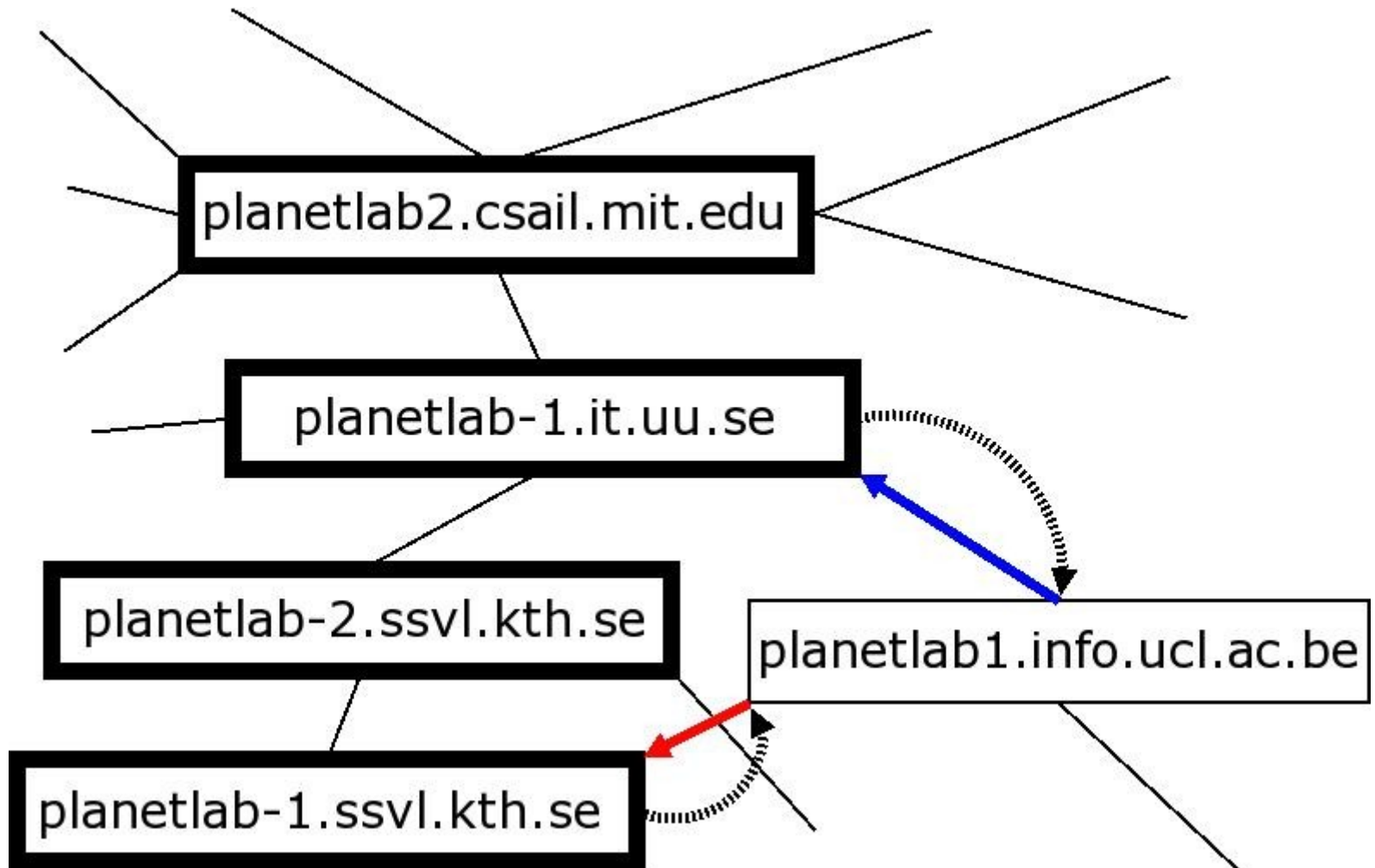
SUMMARY

- The problem has been analyzed

- A new design was carried out

- A prototype of the data layer has been implemented

- Tested over 300 hosts around the world

FUTURE WORK

- Prototype measurements

- Policy layer

- Semantic layer

- Pre-fetch

ANT
A Distributed Data Storage And Delivery System Aware of the Underlying Topology

Raúl Jiménez
TSLab - KTH