

Peering Networks Test Bed Development

Ainur Zhakenova
azhakeno@iit.edu

Noman H. Ansari
nansari1@iit.edu

05-06-2009

The problem

For many reasons in real world today, SIP proxies prefer to use SIP-URI for their users, which includes two parts:

1. The user ID (usually name) of the user.
2. Fully Qualified Domain Name (FQDN) for the island where sip proxy lies.

for example: `alice@iit.edu`

The problem is, how would a proxy in one island locate the IP address of some other proxy in another island.

The solution

There is an existing solution for this

RFC 3263 – Session Initiation Protocol : Locating Sip Servers

It uses two DNS records: NAPTR and SRV to lead to the actual IP address (A record) of a particular SIP service

NAPTR for the Domain name → SRV for the SIP service → A record (IP address) for the SIP Proxy

Project Goal

The goal of this project is:

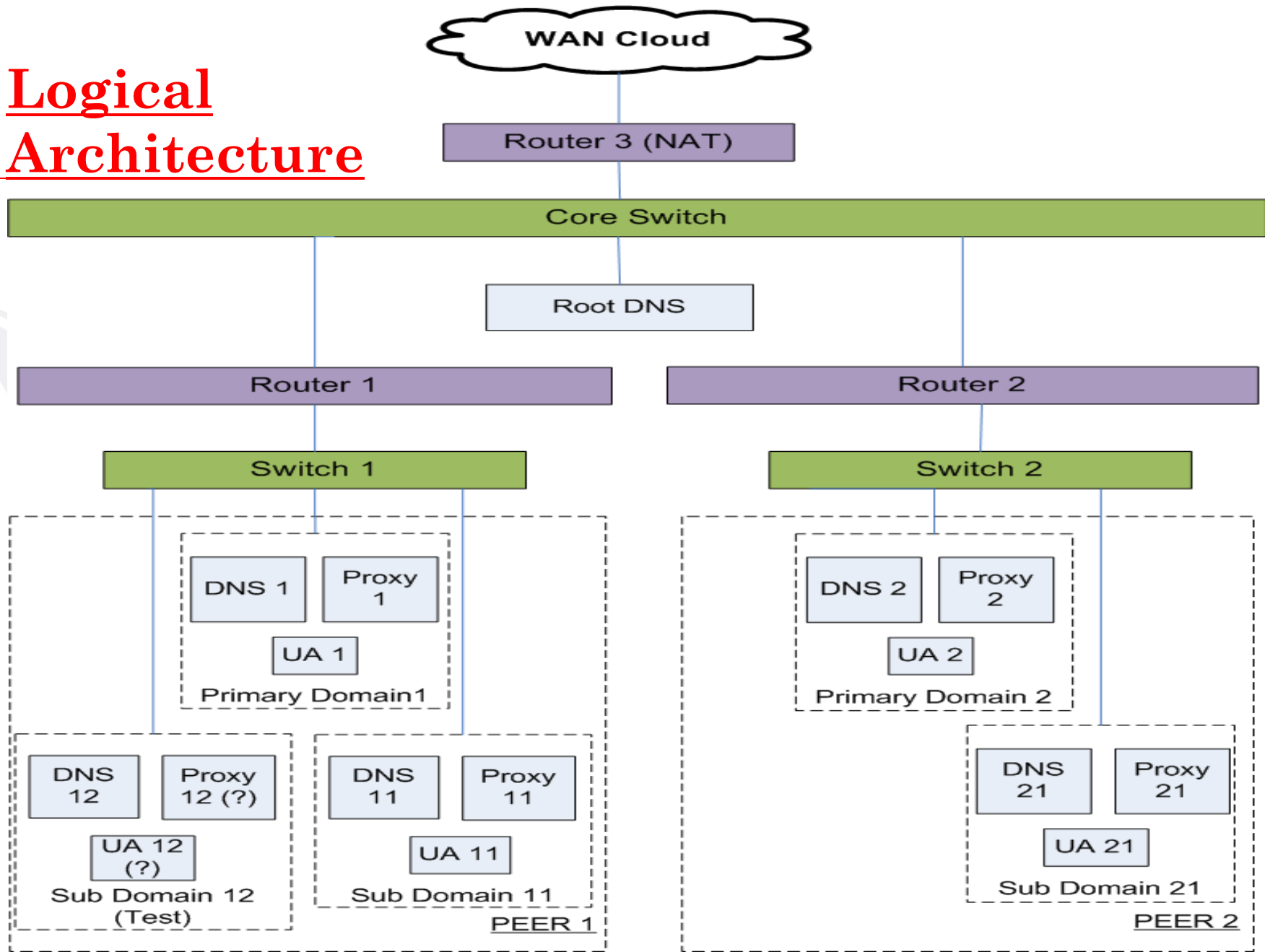
To configure a test bed with few isolated domains as the SIP islands with their respective SIP proxies and Name Servers, intended to demonstrate the information flow while locating sip servers using NAPTR and SRV records

(RFC 3263 “Session Initiation Protocol (SIP): Locating SIP Servers”)

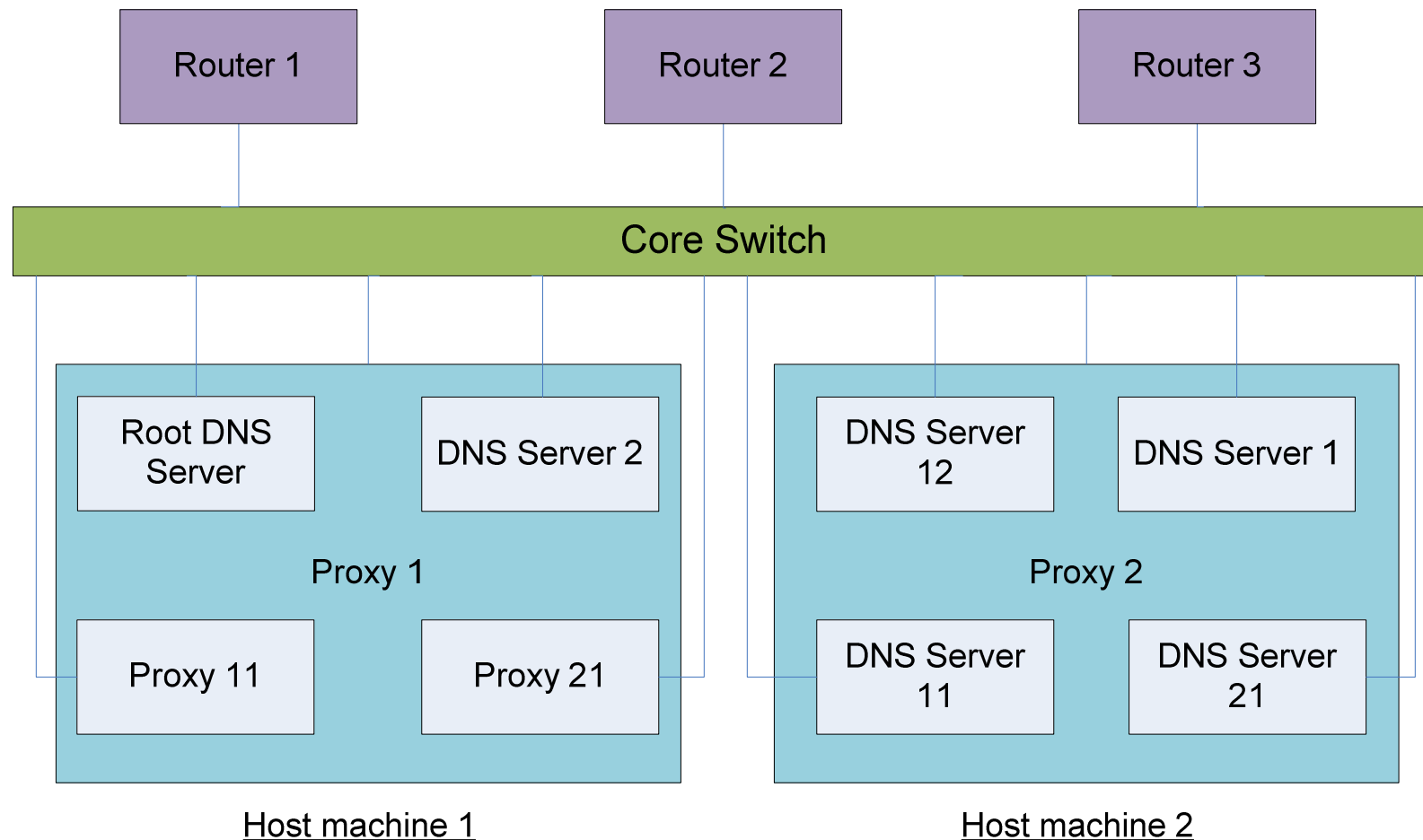
Tasks and Milestones

- Configure one VoIP Network
 - Configure OpenSER as SIP Proxy
 - Configure DNS for local resolution
- Clone to make five of such VoIP Networks at different levels of domain hierarchy.
- Analyze the call flow between different domains.
- Test other SIP Proxies and user agents for the compliance to RFC 3263 under this Test bed.

Logical Architecture

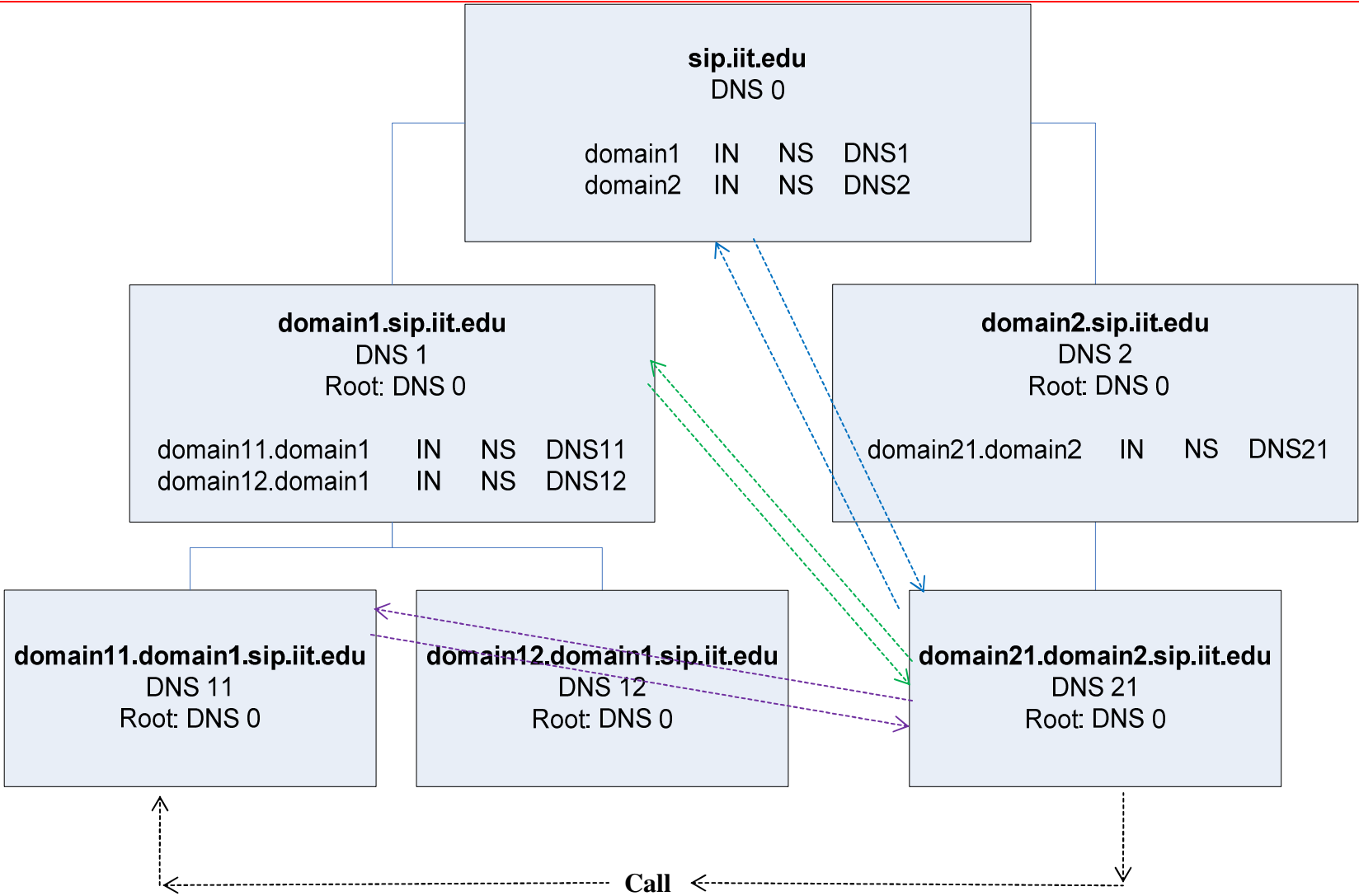


Physical Architecture





ILLINOIS INSTITUTE OF TECHNOLOGY



Nameservers' configuration

domain21 nameserver is aware only about its own sip proxy and the nameserver of its subdomain:

@origin=domain21.domain2.sip.iit.edu

ns	IN	A	10.10.2.23
proxy	IN	A	10.10.2.22

**_sip._udp.domain21.domain2.sip.iit.edu. 43200 IN SRV 0 0 5060
proxy.domain21.domain2.sip.iit.edu.**

**domain21.domain2.sip.iit.edu. IN NAPTR 2 0 "s" "SIP+D2U" ""
_sip._udp.domain21.domain2.sip.iit.edu.**

Nameservers' configuration (contd...)

Root DNS is aware of the nameservers for the corresponding domain peers:

domain1.sip.iit.edu	IN	NS	ns.domain1.sip.iit.edu
domain2.sip.iit.edu	IN	NS	ns.domain2.sip.iit.edu
ns.domain1.sip.iit.edu	IN	A	10.10.1.3
ns.domain2.sip.iit.edu	IN	A	10.10.2.3

Nameservers' configuration (contd...)

domain1 nameserver is aware only about its own sip service and the nameservers of its subdomains:

@origin=domain1.sip.iit.edu

domain11	IN	NS	ns.domain11.domain1.sip.iit.edu.
domain12	IN	NS	ns.domain12.domain1.sip.iit.edu.
ns	IN	A	10.10.1.3
proxy	IN	A	10.10.1.2
ns.domain11	IN	A	10.10.1.23
ns.domain12	IN	A	10.10.1.33

**_sip._udp.domain1.sip.iit.edu. 43200 IN SRV 0 0 5060
proxy.domain1.sip.iit.edu.**

**domain1.sip.iit.edu. IN NAPTR 2 0 "s" "SIP+D2U" ""
_sip._udp.domain1.sip.iit.edu.**

Nameservers' configuration (contd...)

domain11 nameserver is aware only about its own sip service:

@origin=domain11.domain1.sip.iit.edu

ns	IN	A	10.10.1.23
proxy	IN	A	10.10.1.22

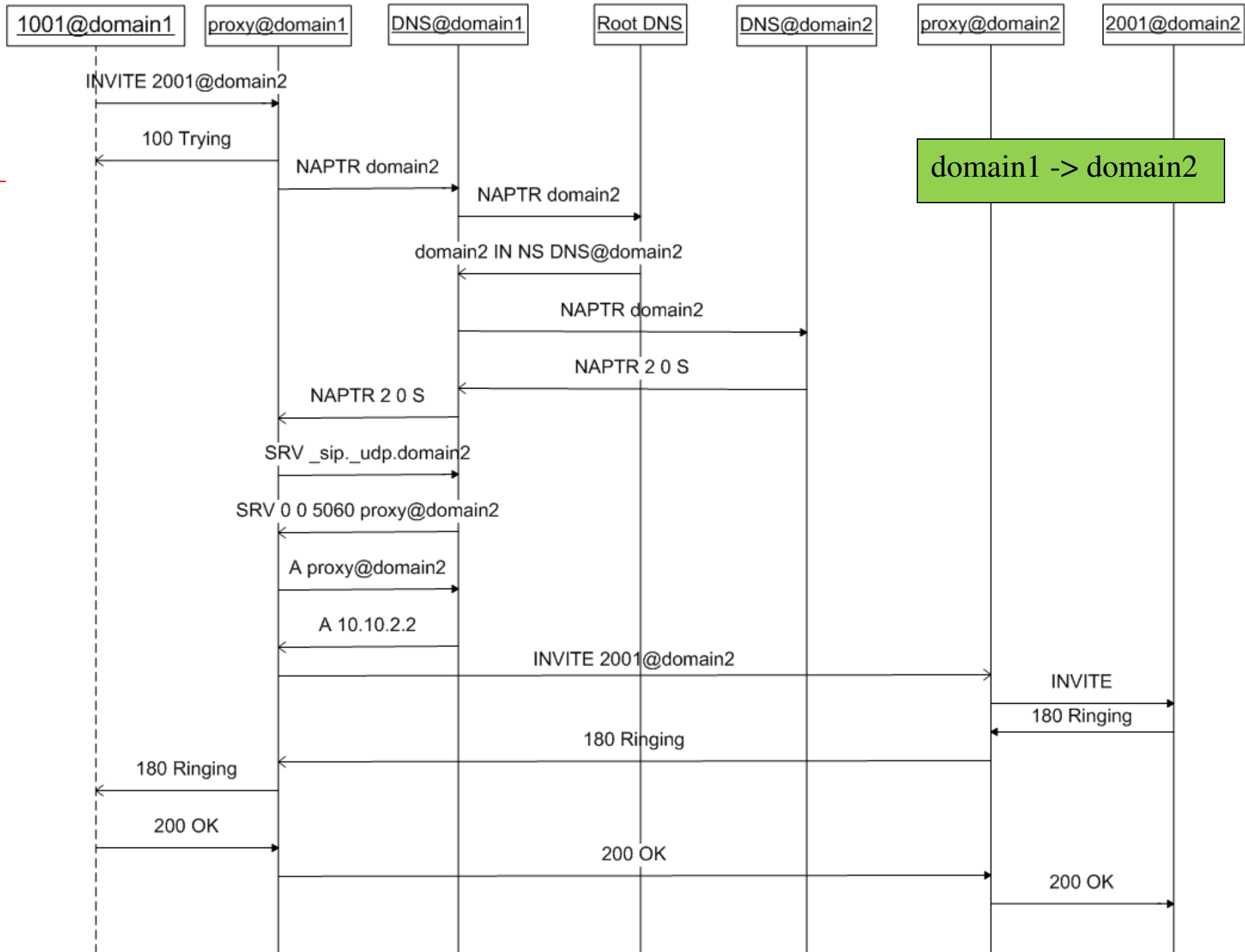
**_sip._udp.domain11.domain1.sip.iit.edu. 43200 IN SRV 0 0 5060
proxy.domain11.domain1.sip.iit.edu.**

**domain11.domain1.sip.iit.edu. IN NAPTR 2 0 "s" "SIP+D2U" ""
_sip._udp.domain11.domain1.sip.iit.edu.**

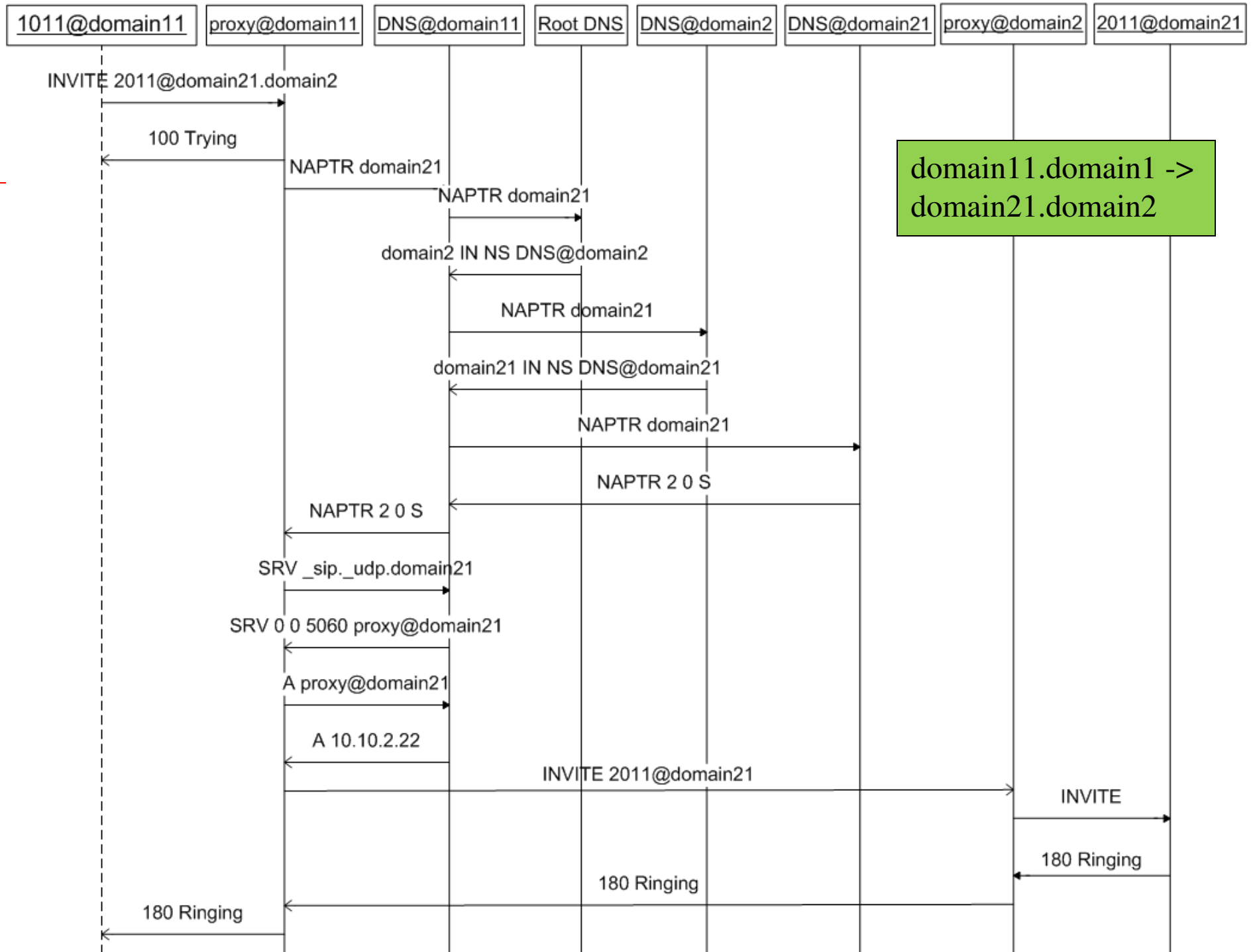
Call Set Up

The three cases have been considered:

- 1.the call from a domain1 SIP user to a domain2 SIP user;
- 2.the call from a domain1 SIP user to domain2 SIP user;
- 3.the call from a domain1 SIP user to a domain2 SIP user;



domain1 -> domain2



Testing Different Proxies on Testbed

Asterisk SIP Proxy:

- It asks for SRV records only but not for NAPTR records.
- Worked OK with the system designed.

Brekeke SIP Proxy:

- It asks for SRV records only but not for NAPTR records.
- Due to the trial version, had limited provision to change the configuration. Didn't allow to define our DNS so we couldn't make the call.

Testing Different UA's on Testbed

Different User Agents were tested for registration by defining the FQDN of respective domain, not by defining directly the name of the proxy machine. So client is expected to query for NAPTR, SRV and A records in sequence.

Snom 360 IP Phones:

- Behaved as expected.

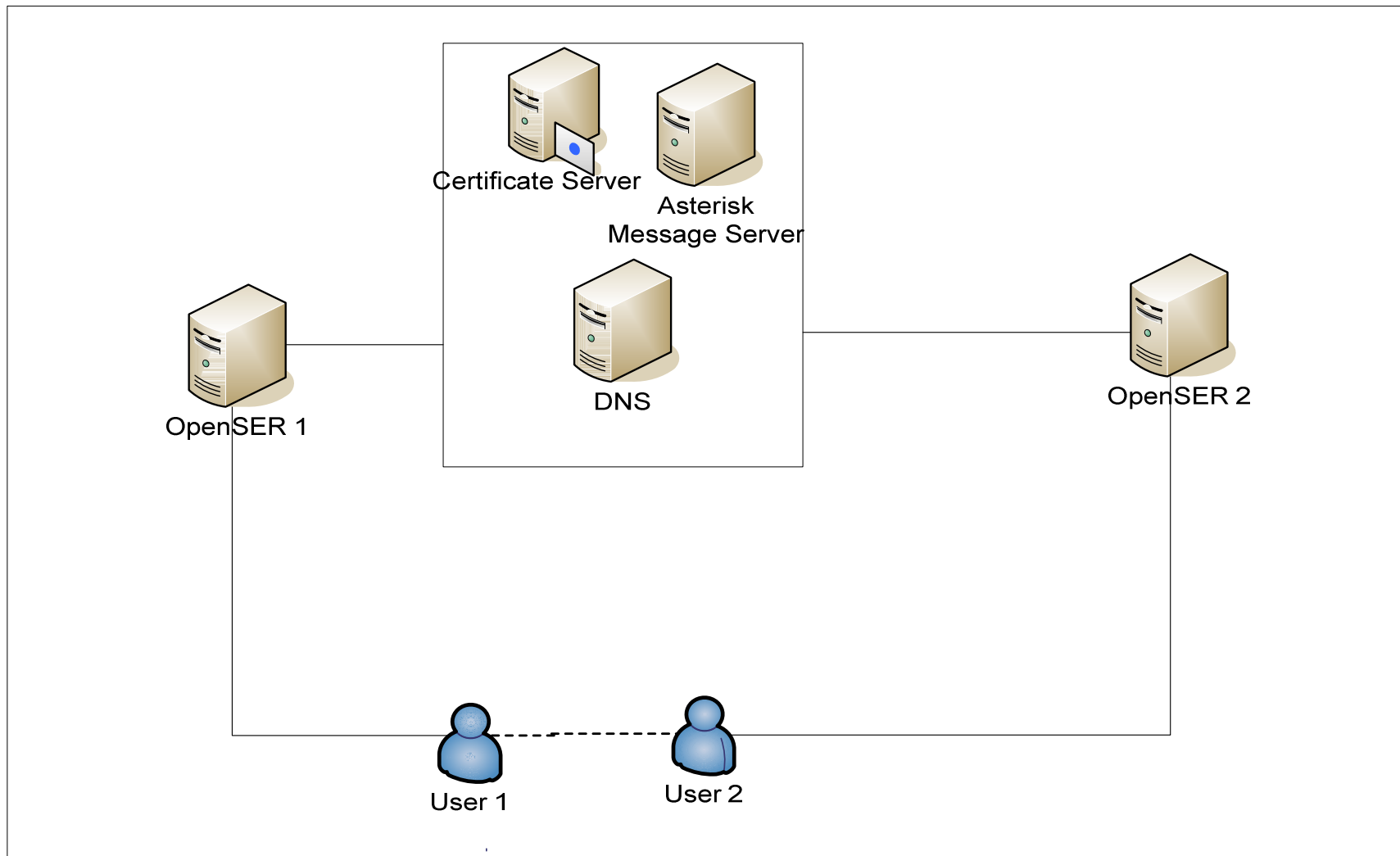
Xlite Soft Phones (v 3.0):

- Behaved as expected.

Questions or comments?



InCharge Systems Identity Solution



Session Initiation Protocol

Request-Line: INVITE sip:5152015260@ics2.iit.inchargesys.com SIP/2.0

Message Header

Contact: <sip:5152015258@64.131.110.239:64052>

To: "5152015260"<sip:5152015260@ics1.iit.inchargesys.com>

From: "5152015258"<sip:5152015258@ics1.iit.inchargesys.com>;tag=c10c7c61

[.....]

Date: Mon, 04 May 2009 15:55:32 GMT

Identity:

dip1UdWskSiunjDp2Ez6u/AAmE7T/Du8sZZF15Ye/LrbmxTeT+wITIFyqtcq7qx5A6lwVb
GeYqwt6f23fquIYA==

Identity-Info:

<<http://ics1.iit.inchargesys.com/keys/keys/int/5152015258.pub>>;alg=rsa-sha1

P-hint: outbound

