Layer 2 Relay Agent & Relay Chaining in DHCPv4
DHC Working Group
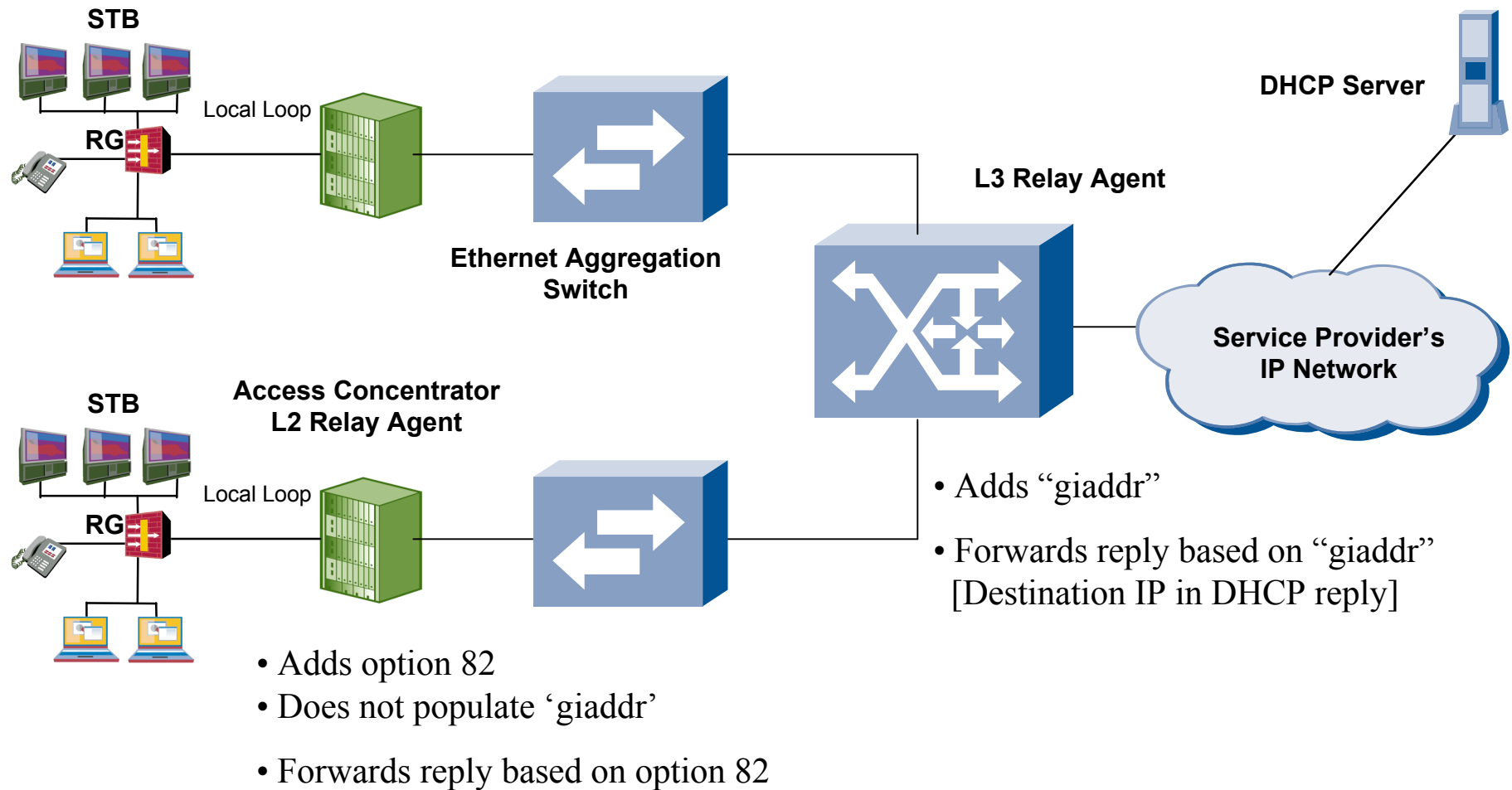
draft-joshi-dhc-layer2-relay-agent-01
draft-kurapati-dhc-relay-chaining-dhcpv4-01.txt

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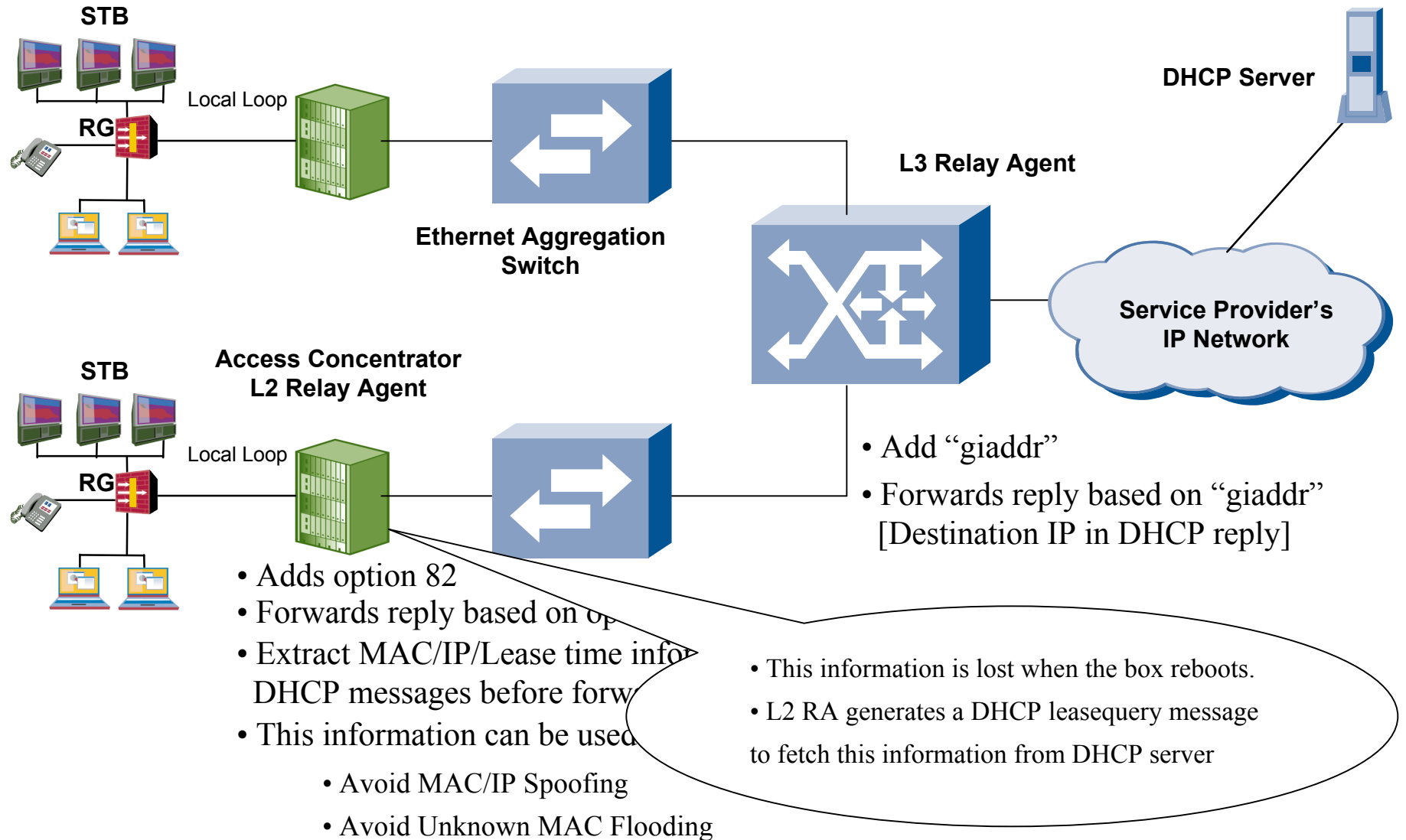
Layer 2 Relay Agent Draft

- Defines Layer 2 Relay Agent functionality and architecture

- Handling DHCPLEASEQUERY in L2RA. Extension of RFC 4388 to Layer 2 Networks.

- Prevention of broadcasts between L3RA and L2RA

  - New sub-option 'unicast-address' added by L2RA. This is used by normal DHCP messages.

  - New option 'relay-agent-hw-addr' for LEASEQUERY messages. This is added by L2RA.

Layer 2 Relay Agent

STB

Local Loop

RG

Ethernet Aggregation Switch

L3 Relay Agent

DHCP Server

Service Provider's IP Network

STB

Access Concentrator L2 Relay Agent

Local Loop

RG

• Adds "giaddr"

• Forwards reply based on "giaddr" [Destination IP in DHCP reply]

• Adds option 82
• Does not populate 'giaddr'

• Forwards reply based on option 82

Extension of RFC 4388 to Layer 2 Access Networks

STB

RG

Local Loop

Ethernet Aggregation Switch

DHCP Server

L3 Relay Agent

Service Provider's IP Network

STB

Access Concentrator L2 Relay Agent

RG

Local Loop

• Add "giaddr"

• Forwards reply based on "giaddr" [Destination IP in DHCP reply]

• Adds option 82
• Forwards reply based on op
• Extract MAC/IP/Lease time info
  DHCP messages before forw
• This information can be used

  • Avoid MAC/IP Spoofing
  • Avoid Unknown MAC Flooding

• This information is lost when the box reboots.

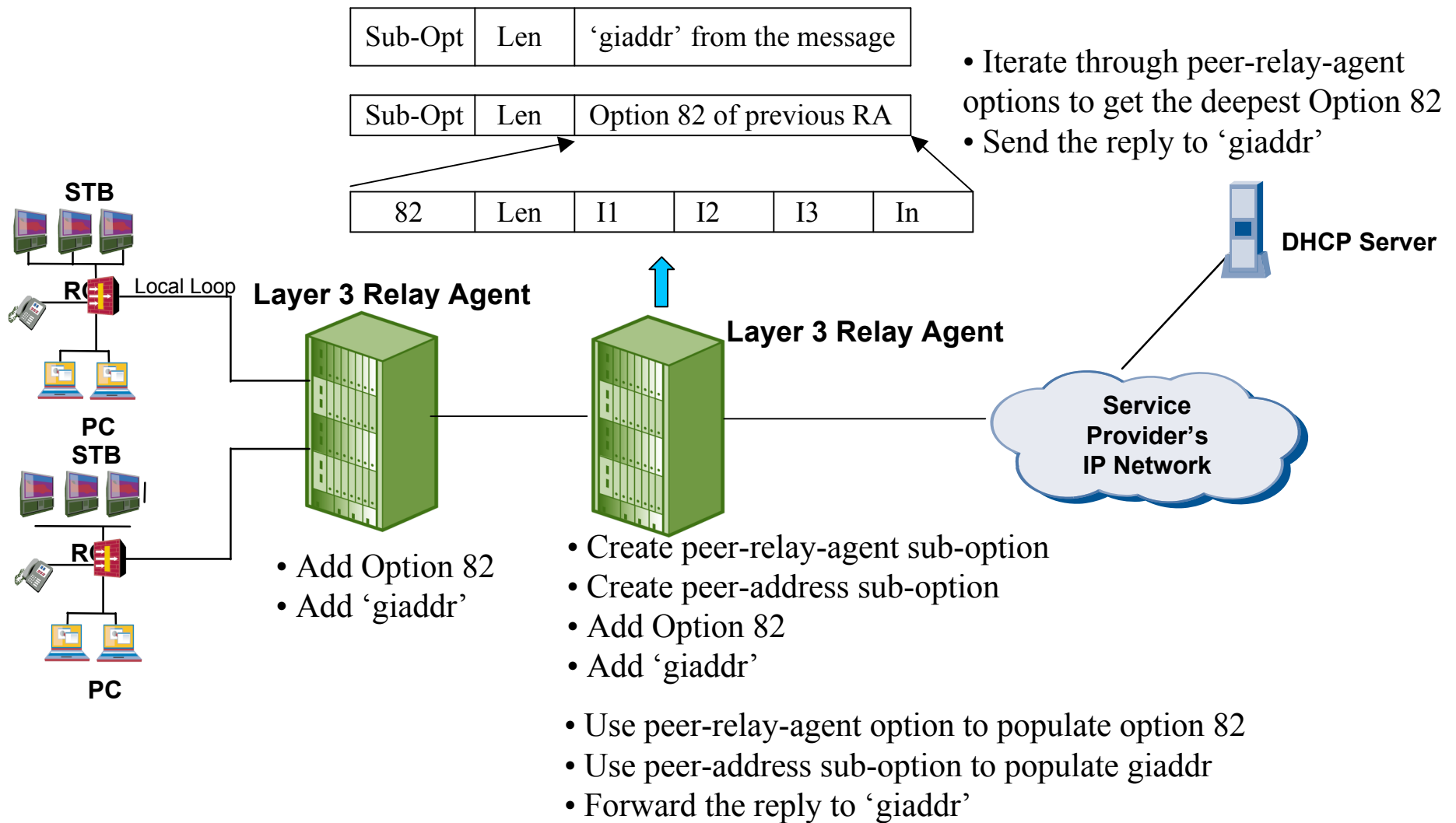• L2 RA generates a DHCP leasequery message to fetch this information from DHCP server

Changes made from earlier presentations

- Based on the comments received at WG meeting and in the mailing lists following changes were made

  - Combined 2 drafts "draft-joshi-dhcp-lease-query-ext-02.txt" & "draft-decnodder-dhc-rai-unicast-01.txt"

  - Added more text to describe Layer 2 Relay Agent functionality

  - Addressed some of the comments received in the mailing list

Relay Chaining in DHCPv4

- A network may contains more than one Relay Agent

  - One example is Layer 2 Access Networks

- Every Relay Agent needs to add certain information to the DHCP messages so that the reply can be forwarded back to the client using the same path.

- Two new sub-options are created in Relay Agent Information option to store peer-address and peer-relay-agent-information option.

- These sub-options are used when Relay Agent needs to forward the reply to the DHCP clients.

Relay Chaining in DHCPv4

Sub-Opt	Len	'giaddr' from the message

Sub-Opt	Len	Option 82 of previous RA

82	Len	I1	I2	I3	In

- Iterate through peer-relay-agent options to get the deepest Option 82
- Send the reply to 'giaddr'

STB

R Local Loop

Layer 3 Relay Agent

PC

STB

R

PC

Layer 3 Relay Agent

DHCP Server

Service Provider's IP Network

- Add Option 82
- Add 'giaddr'

- Create peer-relay-agent sub-option
- Create peer-address sub-option
- Add Option 82
- Add 'giaddr'

- Use peer-relay-agent option to populate option 82
- Use peer-address sub-option to populate giaddr
- Forward the reply to 'giaddr'

Next Step

- PoC implementation is done and verified.

- More review in WG mailing list.

- Working group item?