

Broadband Network UP-Specific Information Suboption for the DHCP Relay Agent Option

draft-zhul-intarea-bnc-up-specific-suboption-00

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Scope of This Draft

Broadband Network UP-Specific Information Suboption

Format

- Broadband Network UP-Specific Information suboption Format

Relevant considerations

- SGRP-ID considerations
- UP-Identifier considerations

DHCP Relay Agent Behavior

- The DHCP relay agent is assumed by Broadband Network CP
- The Broadband Network UP-Specific Information suboption is added by the DHCP relay agent

DHCP Server Behavior

- DHCP Sever assigns addresses to the subscribers based on SGRP-ID and UP Identifier information

Motivation and Problem Statement

- In the CU separated broadband network architecture, UP's backup function **adds multiple UPs to the same UP backup group, forming a backup or load sharing relationship between multiple UPs.**
- A SGRP is a group of subscribers together that share same back-up state.
- The best practice is the same SGRP on a specific UP shall be assigned addresses from the same address segment.

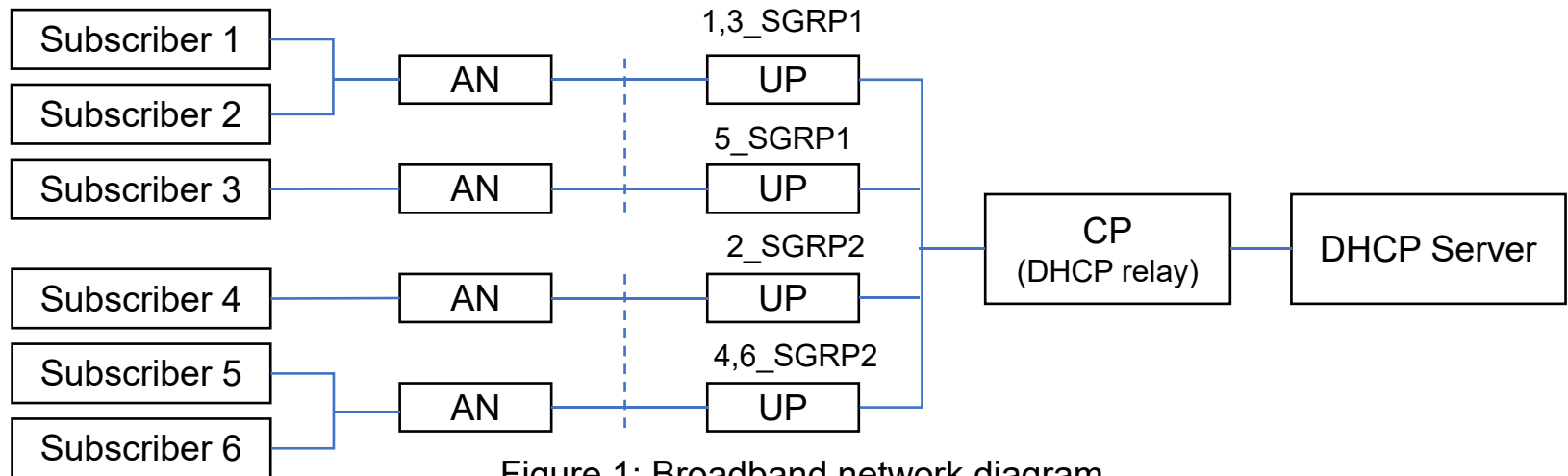


Figure 1: Broadband network diagram

Motivation and Problem Statement

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Since the DHCP server cannot know that subscribers are borne by which UPs, it may assign addresses from different address segments to subscribers on the same UP, which is not conducive to address aggregation on the UP.

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Add a suboption to the DHCP packet , enabling the CP to add SGRP information and UP information involved in the DHCP request message.

UP-Specific Information Suboption -- Format

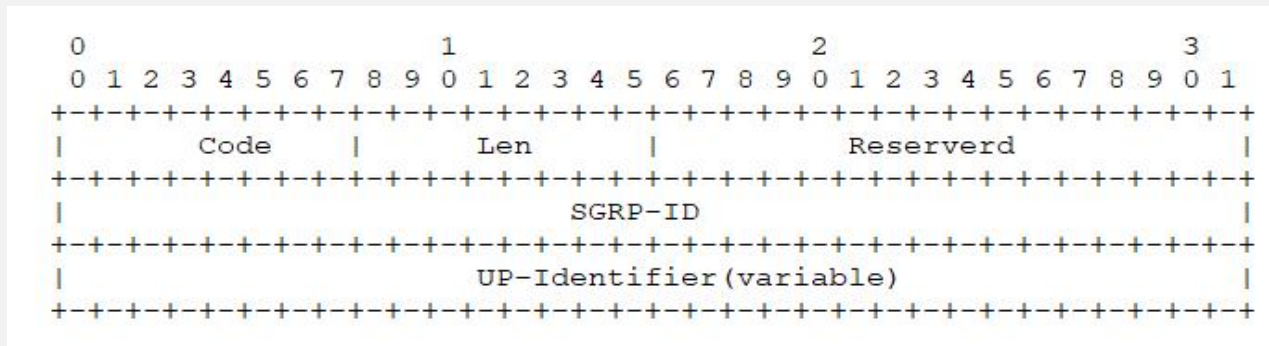


Figure 4: Broadband Network UP-Specific Information suboption Format

- **Code:** SubOpt, TBA
- **Len:** the number of octets in the sub-option (excluding the suboption ID and length fields)
- **Reserved:** Reserved fields, can be defined according to requirements in the future.
- **SGRP-ID:** the ID of SGRP, which is any integer value between 0 to $2^{32}-1$.
- **UP-Identifier:** the identifier of UP which is currently carrying the group of users and corresponding to the SGRP-ID.

UP-Specific Information Suboption -- Considerations

SGRP-ID considerations

- The SGRP-ID SHOULD be fixed.
- The CP (DHCP relay agent) SHOULD use a single identifier value consistently for a SGRP.
- The SGRP-ID used by a relay device SHOULD be committed to stable storage, unless the relay device can regenerate the value upon reboot.

UP-Identifier considerations

- The UP-Identifier SHOULD be fixed and unique.
- If the UP-Identifier configured in a relay agent is not unique within its administrative domain, resource allocation problems may occur as the DHCP server attempts to allocate the same resource to subscribers behind two different UPs, then UPs cannot implement ip prefix convergence.

DHCP Relay Agent Behavior

- The DHCP relay agent is assumed by the CP.
- The DHCP Relay Agent should be configured to include the Relay Agent Information option when relaying DHCP messages, in order to support the UP-specific information suboption.
- The SGRP-ID should be corresponding to the SGRP configuration parameters in the Broadband Network CP.
- The UP identifier can be the loopback address of UP or other identifiers

DHCP Server Behavior

- This suboption provides additional information to the DHCP server.
- If it is configured to support this suboption, the DHCP server may use this information to:
 - ❑ divide the address pool into a smaller block using the SGRP-ID and UP-Identifier as indexes
 - ❑ allocate an address in the address block indexed by the SGRP-ID and UP_Identifier.

Next steps

➤ **Security Considerations**

- Consider the impact of this suboption on network security

➤ **Solicit comments and refine the draft**

Thanks!

Questions and suggestions are welcomed