DHCP Option for CLF/NASS
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Abstract

This document defines a new dhcp option for Access Network Information discovery. The network terminal can get the Access Network Information, which it is attached, through this option. And the Access Network Information can be used for different purpose, such as in TISPAN NGN network the Access Network Information can be used to discover the CLF (Connectivity Session Location and Repository Function) of the NASS (Network Attachment Subsystem). This document defines the related dhcp option and option codes.
1. Introduction

In many cases, the Dynamic Host Configuration Protocol (DHCP) as defined in RFC 2131 is used to configure the customer premise host. For example, in TISPAN NGN functional architecture, DHCP is used to configure the TE (NGN terminal), such as DHCP option 120 is used to configure the P-CSCF address [RFC3361]. And also, more DHCP options are needed to carry other configuration parameters, such as access network information, that may contain the Access Network Identifier (ANID) or other information of the access network which the TE attached. But the existing DHCP options do not support carrying the access network information.

One of the requirement for the DHCP to carry access network information is as follows. In TISPAN NGN network, the TE need discover the access network identifier and inform the service control subsystem which access network it attached to.

The NASS, Network Attachment Subsystem, in ETSI NGN Functional Architecture has the following model [NASS]:

```
+---------------------------+     | Service Control Subsystem |
| and Applications          |     | e2                        |
|                           |     +-----------------------+
| e4                        |     | CLF                      |
| e3                        |     | RACS                     |
|----------------------------|     +-----------------------+
| e1                        |     | e2                       |
|----------------------------|     +-----------------------+
| e3                        |     | CLF                      |
|----------------------------|     +-----------------------+
| e4                        |     | RACS                     |
|----------------------------|     +-----------------------+
| e2                        |     | NACF                     |
|----------------------------|     +-----------------------+
| e3                        |     | UAAF                     |
|----------------------------|     +-----------------------+
| e4                        |     | PDBF                     |
|----------------------------|     +-----------------------+
| TE                        |     | CNG                      |
|----------------------------|     +-----------------------+
| ARF                       |     | AMF                      |
|----------------------------|     +-----------------------+
|----------------------------|     +-----------------------+
```

Definition:

NACF: Network Access Configuration Function is responsible for the IP address allocation to the TE. It may also distribute other network configuration parameters. DHCP servers are typical implementations of the NACF.

AMF: Access Management Function translates network access requests issued by the TE. It forwards the requests for allocation of an IP address and possibly additional network configuration parameters to/from the NACF.
In this architecture, a Service Control Subsystem may serve several access networks. The Service Control Subsystem need to communicate with the NASS of access network. The contact point of NASS is CLF. So the NACF should be able to provide to the TE an access network identifier. This information uniquely identifies the access network to which the TE is attached. When the TE accesses or registers to the Service Control Subsystem, it will carry the access network identifier obtained from NACF. With this information the Service Control system should be able to locate the CLF of NASS.

The transport of the access identifier depends on extension in existing DHCP protocols. This memo is an effort to define the DHCP option to carry the access network information, such as access network identifier (ANID) and CLF identifier (CLFID).

2. Terminology

The keywords "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

3. Access Network Information Option

This section defines the configuration option for the access network information. The new option is organized as a single DHCP option that contains one or more "sub-options". The initial sub-options are defined for TISPAN NGN architecture and general purpose. These include a "ANID" sub-option for access network identifier, and a "CLFID" sub-option for TISPAN CLF identifier. The format of the access network information option is:

```
| Code | Len | Access network Information Field |
+------|-----+---------------------------------|
| TBD  | N   | i1 | i2 | i3 | i4 | ... | iN |
```

The length N gives the total number of octets in the Access Network Information Field. The Access Network Information field consists of a sequence of SubOpt/Length/Value tuples for each sub-option, encoded in the following manner:
The initial assignment of Access Network Information Sub-options is as follows:

<table>
<thead>
<tr>
<th>Access Network Information Sub-option Code</th>
<th>Sub-Option Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Access Network ID Sub-option</td>
</tr>
<tr>
<td>2</td>
<td>CLF ID Sub-option</td>
</tr>
</tbody>
</table>

Notes: Generally, Access Network Identifier is suffice to indicate the attached access network. But in some case, more informations of the access network may be required by some services or applications. So more sub-option need to be defined to carry this informations. Such as in TISPAN NGN architecture, the service control subsystem may want to get the CLF address from TE directly, so a CLFID sub-option is defined.

3.1 Access Network ID Sub-option

The ANID sub-option contains a character string indicating the Access Network. The ANID sub-option has the following format:

```
+------+------+------+------+------+------+------+------+--...-+------+
|  1   |   n  |  c1  |  c2  |  c3  |  c4  |  c5  |  c6  | ... |
            +------+------+------+------+------+------+--...-+------+
```

An example case when the access network is "China-telecom-001" will be:

```
+--------------------------+-----------------------------+--------------------------+-----------------------------+
| 1 |17 |'c'|'h'|'i'|'t'|'e'|'l'|'e'|'c'|'o'|'m'|-'|0'|0'|1'|
            +--------------------------+-----------------------------+--------------------------+-----------------------------+
```

3.2 CLF ID Sub-option

The CLFID sub-option contains the CLF indentifier, which may be one or more IPV4 addresses or domain names of the CLF.

The coding of the CLFID is out of scope the draft.
4. IANA Considerations

The option code for this dhcp option MUST be assigned by IANA.

5 Normative References

[NASS] Draft ETSI ES 02021 V1.0.0 NGN Functional Architecture, Network Attachment Subsystem, Release 1


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