# Option Extensions for DHCPv4
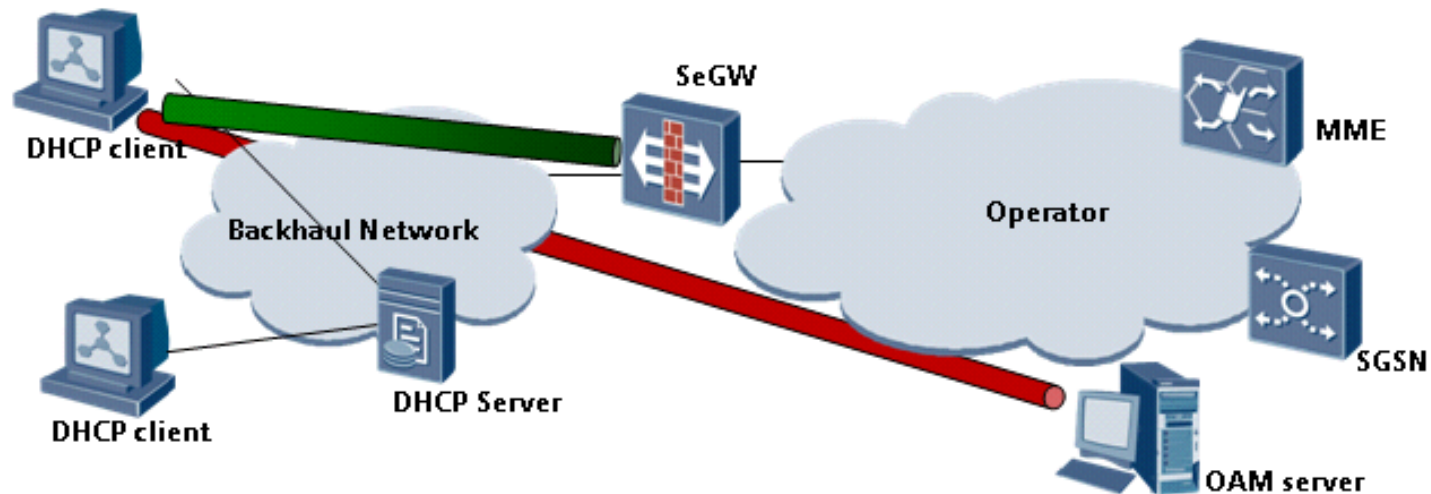
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# Background and Scenarios

- **During the boot procedure, some DHCP clients need to be configured with security configuration, such as, IPsec tunnel establishment. So some security configuration information are needed to be allocated by DHCP server.**



Some configuration parameters and control information can be carried in DHCP options which are defined in [RFC2132], [RFC3046], [RFC3118], [RFC4030], etc.

# Requirements

- **But no such security configuration option exists in the current RFC 2132, etc. Most of these parameters that make up the security information are common across most clients and servers, having a standardized set of options and procedures would be a huge benefit to interoperability.**
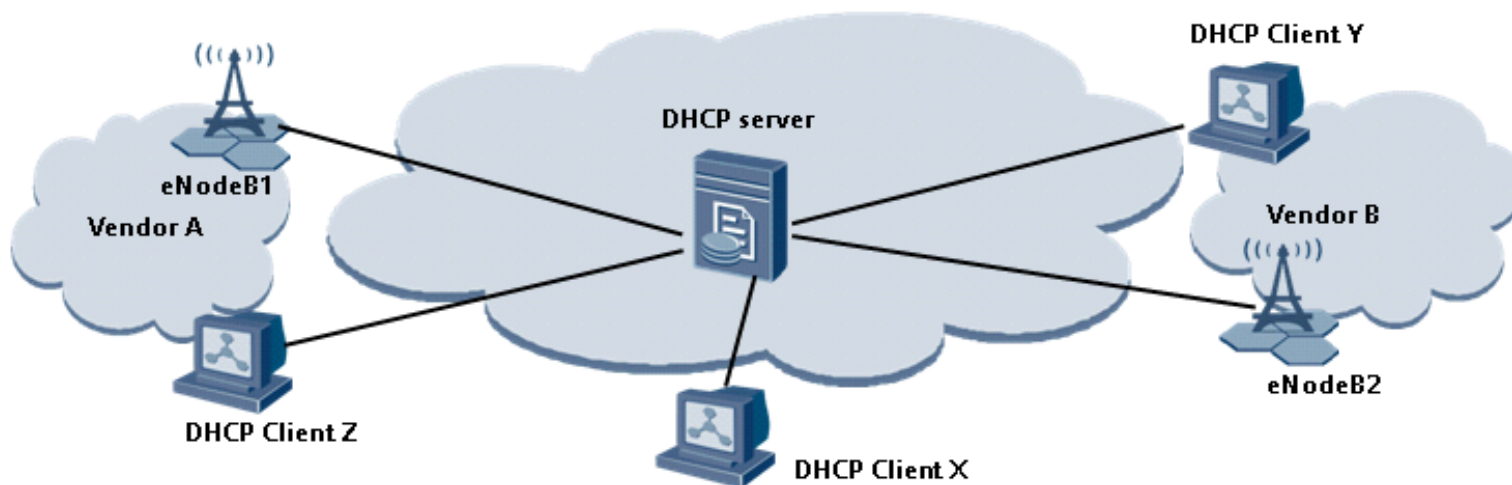


Some scenarios require that the DHCP client should obtain a set of security information, which is configured in the DHCP server, even prior to the establishment of the security tunnel.

# New options

- **The options that we defined:**
  - Option X1: DHCP Security Specific Configuration option
  - Option X2: Proxy Server option
  - Option X3: Local Print Server option
  - Option X4: Local File Server option

# What we would need to do

- **For Option X1: DHCP Security Specific Configuration option**
  - Define a new option used between DHCP client and DHCP server to exchange security configuration
    - DHCP Security Specific Configuration option
  - Specify the minimum set of security-specific.
    - Client IP address
    - Security-GW ID
    - ACL Policy
    - Etc
- **Some other options are defined used in enterprise network**
  - Option X2: Proxy Server option
  - Option X3: Local Print Server option
  - Option X4: Local File Server option

# New options format

- **Option X1: DHCP Security Specific Configuration option**

| Option-code | Option-len | C-IP Address | Data-length1 |
|---|---|---|---|
| Client IP address Data | | | |
| Se-GW ID | Data-length2 | Se-GW ID Data | |
| Se-GW ID Data | | | |
| ACL policy | Data-length3 | ACL policyData | |
| ACL policy Data | | | |
| PKI IP Add | Data-length4 | PKI IP Address Data | |
| PKI IP address Data | | | |
| OAM IP Add | Data-length5 | OAM IP Address Data | |
| OAM IP address Data | | | |
| OCSP IP Add | Data-length6 | OCSP IP Address Data | |
| OCSP IP address Data | | | |
| RSV | | | |
| Private | | | |

Fig 1.The format of DHCP Security Specific Configuration option

# Attributes requirement

- **For Client IP address, Se-GW ID, ACL policy and OAM IP address**
    - If the DHCP client is required to securely boot, the address or FQDN of Security gateway for IPsec establishment is required.
    - If the security policy dictates, the ACL policy and multiple IP address of the DHCP client for different usage are also required.
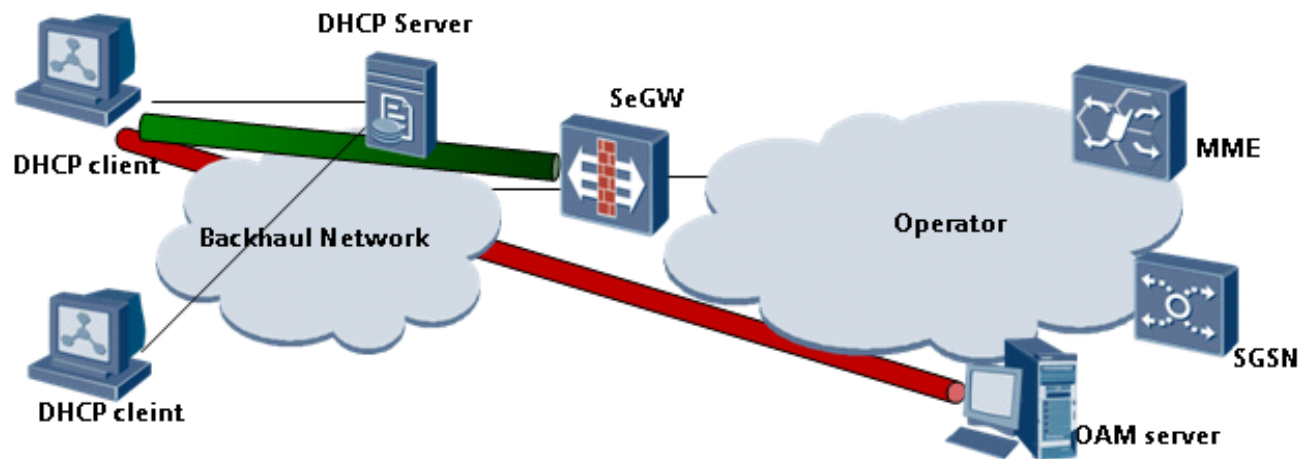
# Attributes requirement

- **For PKI IP address and OSCP server IP address**
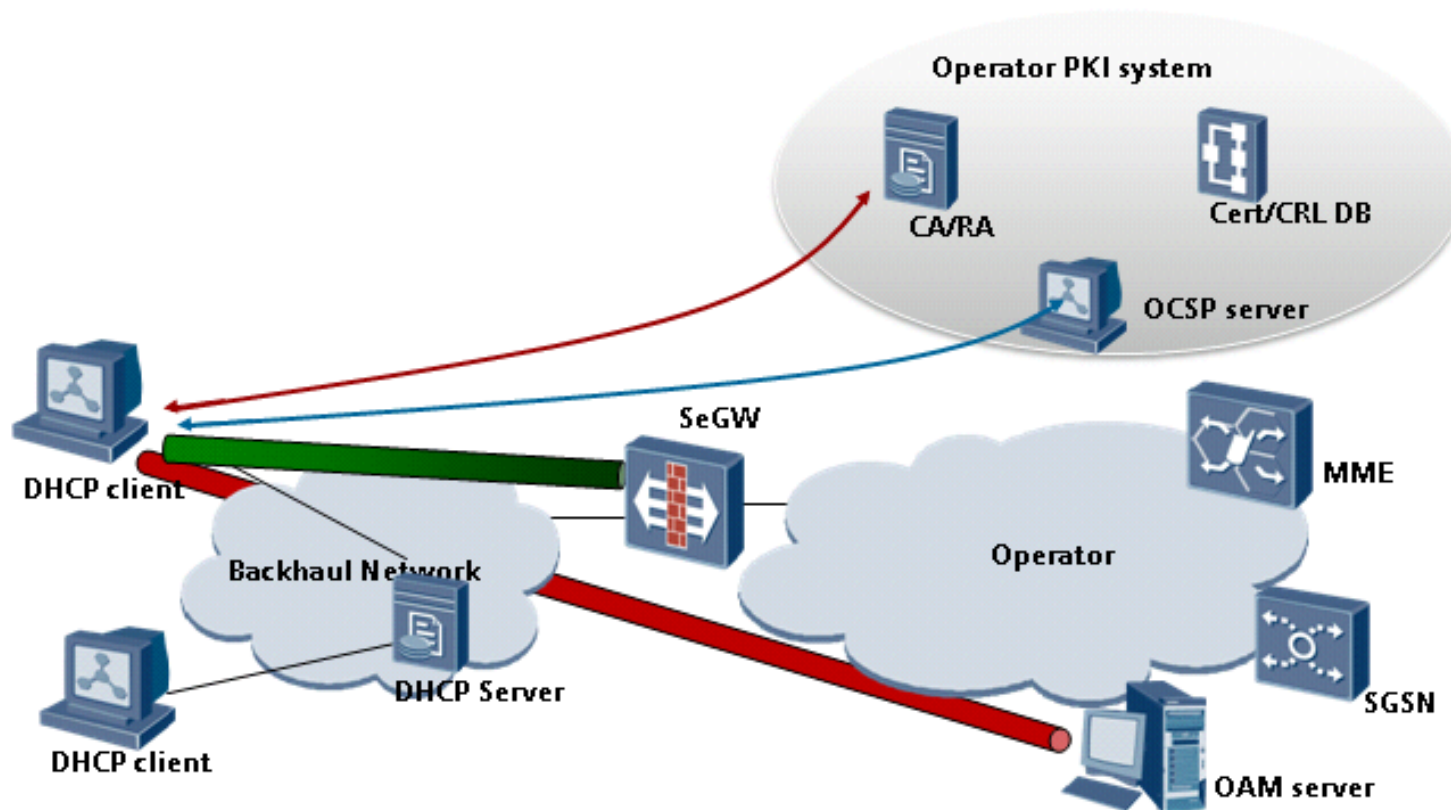
# Others options formats

- **Option X2**

```
Code    Len              Address 1              Address 2
+-----+----+----+----+----+----+----+----+----+--
| X2 |  n  | a1 | a2 | a3 | a4 | a1 | a2 | ...
+-----+----+----+----+----+----+----+----+----+--
```

Fig 2.The format of Proxy Server option

- **Option X3**

```
Code    Len              Address 1              Address 2
+-----+----+----+----+----+----+----+----+----+--
| X3 |  n  | a1 | a2 |  a3 | a4  | a1 | a2 |  ...
+-----+----+----+----+----+----+----+----+----+--
```

Fig 3.The format of Local Print Server option

- **Option X4**

```
Code    Len              Address 1              Address 2
+-----+----+----+----+----+----+----+----+----+--
| X4 |  n  | a1 | a2 | a3 | a4 | a1 | a2 | ...
+-----+----+----+----+----+----+----+----+----+--
```

Fig 4.The format of Local File Server option

# Thank you