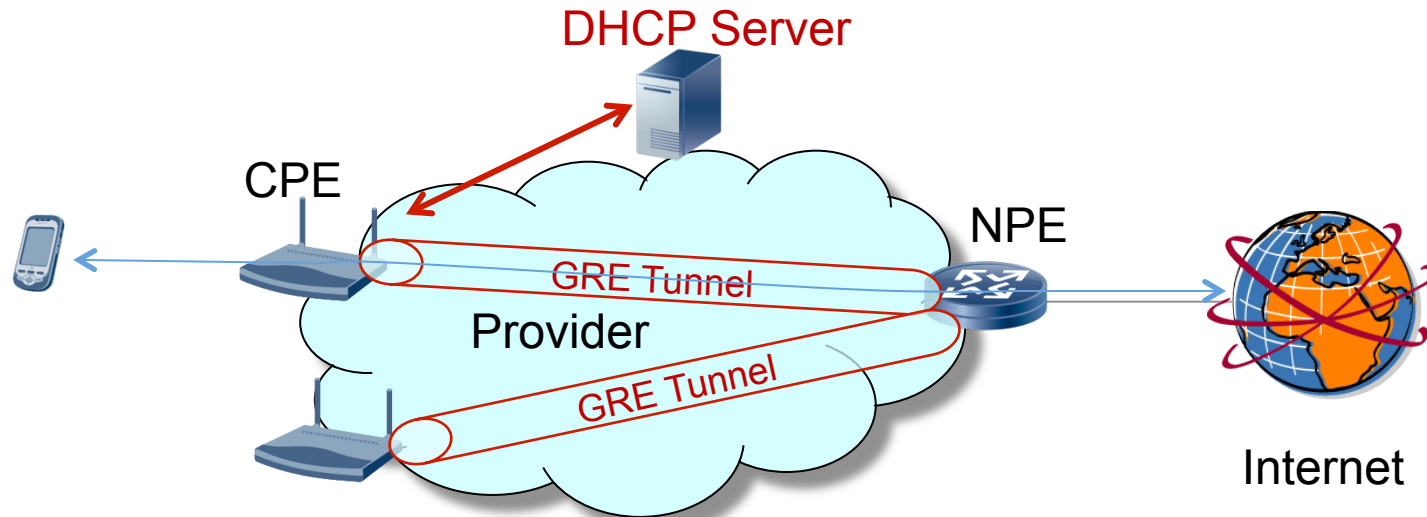


Dynamic Stateless GRE Tunnel

Li Xue

Dayong Guo

Problem Statement

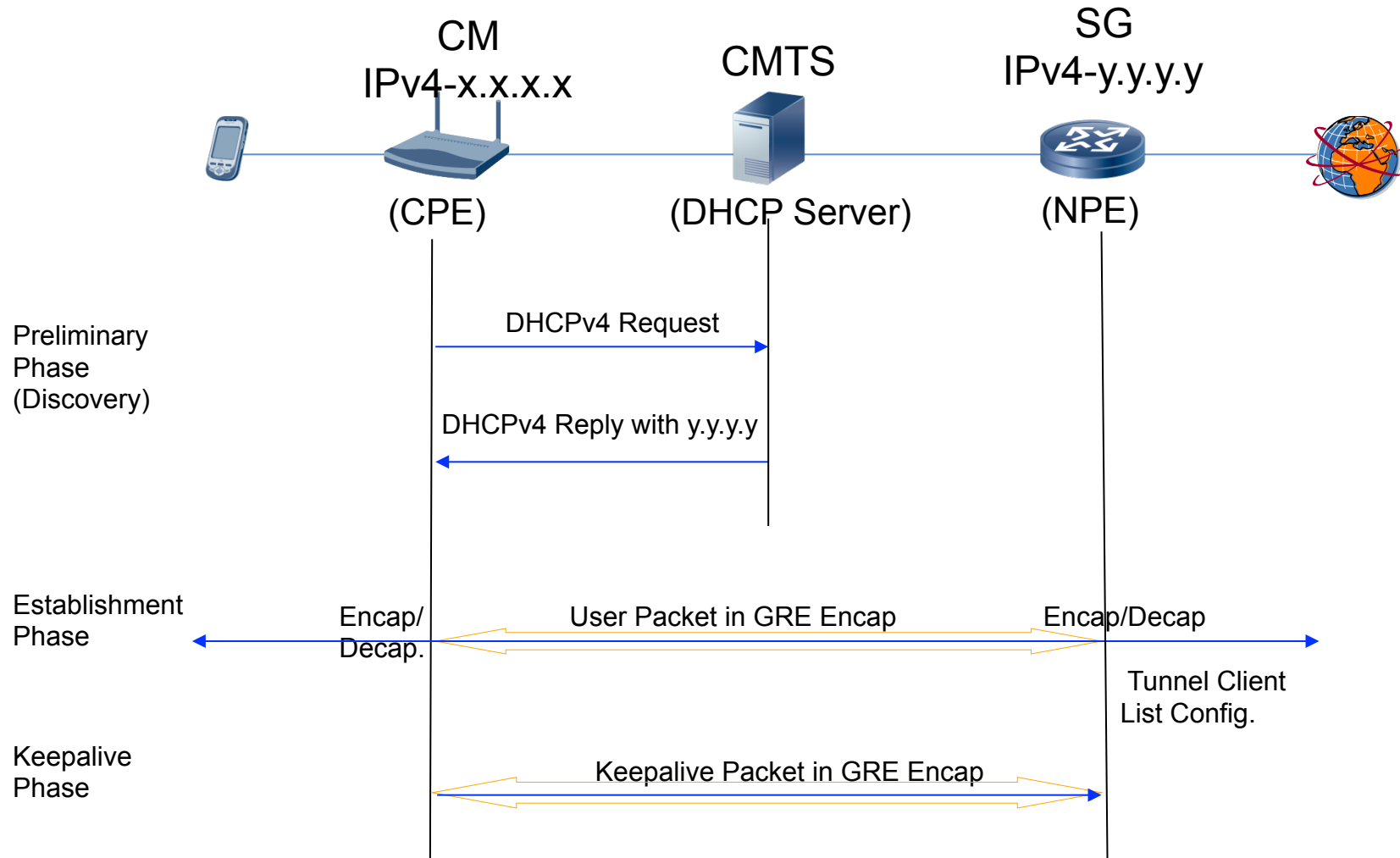


- In MSO or mobile hotspot scenario, the GRE tunnels between CPEs and the NPE are established to carry user data.
- Auto-configuration and dynamic management are required for large numbers of CPEs to discover the address of NPE and for NPE to configure GRE tunnel.
- DHCP(v6) option is extended to support NPE discovery

Dynamic GRE Tunnel

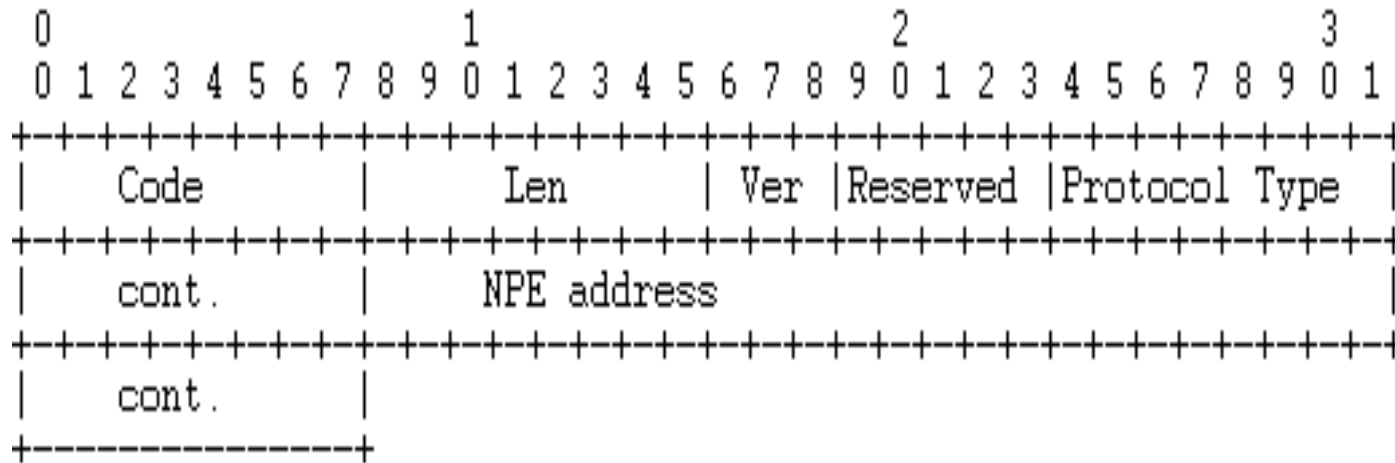
- **NPE discovery on CPE**
 - To set up a GRE tunnel, a CPE send a DHCP Request to get the NPE address and other tunnel parameters such as GRE Key, Version, Protocol Type
 - The DHCP GRE Discovery (GD) Option is defined in the following page.
- **Establishment Phase**
 - For CPE, the GRE tunnel is set up after receiving DHCP GD Option.
 - When NPE receives the packet with GRE encapsulation with a new client address, the NPE can records the assigned UE's address, which is the inner address of GRE encapsulated packet .
- **Keepalive Phase**
 - If there is no data packet for a period of time, the NPE will tear down the tunnel and release the resource.

Procedure



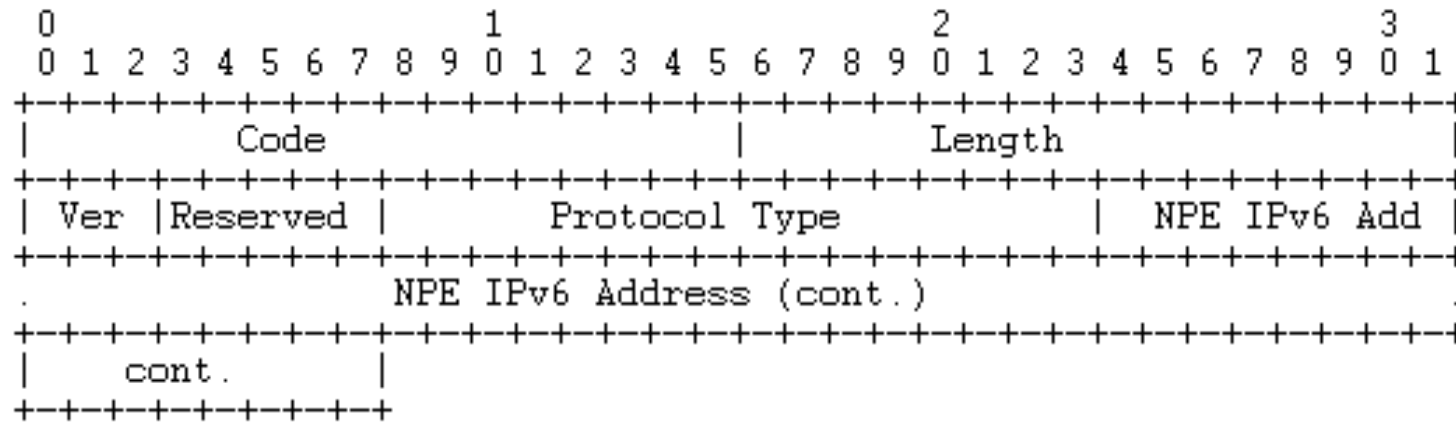
Dynamic Stateless GRE Tunnel in MSO WLAN Network

DHCPv4 GRE Discovery Option



- **Code:** TBD
- **Ver:** The version number of GRE protocol, contained in GER header.
- **Reserved:** This field is reserved for future use.
- **Protocol Type:** The Protocol Type Field contains the protocol type of the payload packet.
- **NPE Address:** NPE IPv4 Address, the endpoint of GRE tunnel.

DHCPv6 GRE Discovery Option

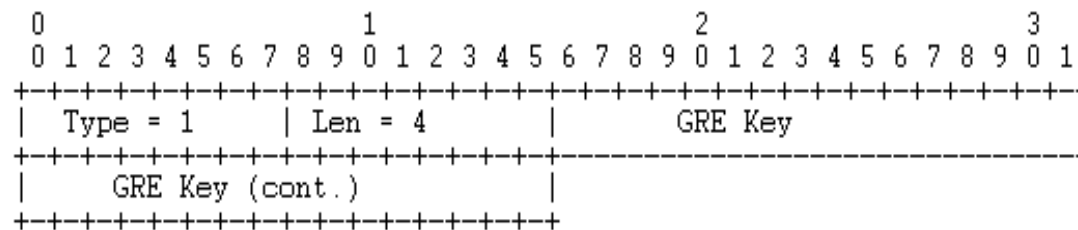


- **Code:** TBD
- **Ver:** The version number contained in GER header.
- **Reserved:** This field is reserved for future use.
- **Protocol Type:** The Protocol Type Field contains the protocol type of the payload packet.
- **NPE Address:** NPE IPv6 Address, the endpoint of GRE tunnel.

GRE Key

- DHCPv4 GRE Key Sub-Option (Optional)

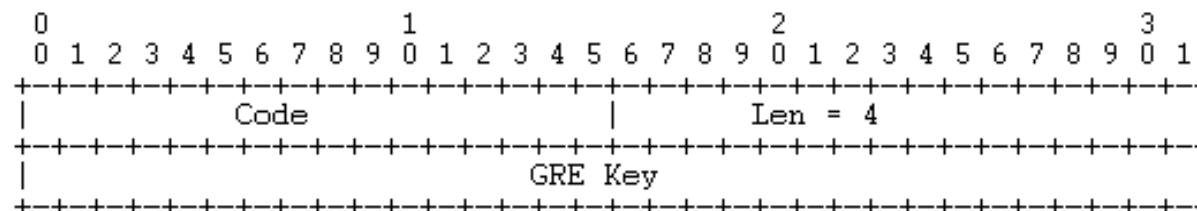
- Code: TBD



- DHCPv6 GRE Key Option (Optional)

- Code: TBD

- Optionally, DHCPv6 GRE Key Option is encapsulated in DHCPv6 GRE Discovery Option



GRE Key: GRE Key is generated from RFC2890. If the client receives the GRE Key Sub-Option, the Key **MUST** be inserted into the GRE encapsulation header

Thanks