Overview for Framed Route

Framed Route allows you to route customer additional networks (behind CPE) through customer broadband connection in ISG. Framed Route has relevance only when CPE acts as routed CPE and NAT is disabled. The broadband IPoE/PPPoE connection for CPE is created at ISG and the network behind CPE must be routed through CPE IPoE/PPPoE session in ISG. A per-user static route is downloaded to IPoE/PPP users through the Framed-Route RADIUS attribute during login.

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Benefits of using Framed Route

Framed Route allows a large number of customer networks to reach via framed routes through a single ISG session.

Framed Route is supported on both IPoE and PPPoE sessions.

There is no limit enforced to the number of framed routes per session.

You don't have to configure or enable Framed Route through command line interface as it is downloaded from RADIUS.

Restrictions for Framed Route

General Restriction

Framed Route cannot be applied through a RADIUS COA.

IPoE Specific Restrictions

No support for routed session.

Dual stack is not supported.

ISG does not expect next hop information in Framed-Route AVP. ISG will replace Next hop information with CPE IP.

If CPE already has an IP address assigned, then RADIUS server should always provide CPE IP in Framed-IP-Address AVP in Access-Accept.

Configuring Framed Route

There is no manual configuration required to enable Framed Route through command line interface as it is downloaded from RADIUS.

Following are samples of the framed route configuration from RADIUS:

Framed-route configuration A

```
Cleartext-Password := "cisco”
         Service-Type = Framed-User,
         Framed-IP-Address = 40.0.0.1,
         Framed-Route += "131.1.1.0 255.255.255.0",
         Cisco-AVPair += "subscriber:accounting-list=List1"
```

Framed-route configuration B

```
Cleartext-Password := "cisco"
         Service-Type = Framed-User,
         Framed-Route = "131.1.2.0 255.255.255.0",
         Framed-Route += „131.1.3.0/24",

         Cisco-AVPair += "subscriber:accounting-list=List2"
```

Verifying Framed Route

Use the **show subscriber session** command to verify the subscriber session output when Framed Route is installed:

```
Device# show subscriber session 1 detailed
Type: DHCPv4, UID: 1, State: authen, Identity: 000a.000b.000c
IPv4 Address: 10.0.0.1
Session Up-time: 21:31:36, Last Changed: 21:31:38
Switch-ID: 4098

Features:
Static Routes:
Class-id  Configuration Status           Source
0          This feature is enabled       Peruser
```

Use the **show ip static route** command to verify the static route configuration when Framed Route is installed:

```
Device# show ip static route
Codes: M - Manual static, A - AAA download, N - IP NAT, D - DHCP,
       G - GPRS, V - Crypto VPN, C - CASA, P - Channel interface processor,
       B - BootP, S - Service selection gateway
       DN - Default Network, T - Tracking object
       L - TL1, E - OER, I - iEdge
       D1 - Dot1x Vlan Network, K - MWAM Route
       PP - PPP default route, MR - MRIPv6, SS - SSLVPN
       H - IPe Host, ID - IPe Domain Broadcast
       U - User GPRS, TE - MPLS Traffic-eng, LI - LIIN
       IR - ICMP Redirect
Codes in []: A - active, N - non-active, B - BFD-tracked, D - Not Tracked, P - permanent
```

```
Static local RIB for default
50.0.0.0/24 is subnetted, 1 subnets
        50.0.1.0[1/0] via 10.0.0.1
60.0.0.0/24 is subsetted, 1 subnets
        60.0.1.0[1/0] via 20.0.0.1
```

Troubleshooting Framed Route

Use the following debug commands if you have any configuration issues:

- **debug subscriber feature name static-routes**{**error** | **event**}- Enables debugging of the static-route feature.
- **debug subscriber**{**error** | **event** | **feature**}- Enables debugging of subscriber sessions.
- **debug ip subscriber all**- Enables debugging of IP subscribers.
- **debug ppoe**{**errors** | **events**}- Enables debugging of PPPoE subscribers.

Feature Information for Framed Route

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Framed Route

Feature Name	Releases	Feature Configuration Information
IPoE with Framed Route	Cisco IOS XE Everest 16.4.1	Framed Route allows to route customer additional networks (behind CPE) through customer broadband connection in ISG. IPoE with Framed Route has relevance only when CPE acts as routed CPE and NAT is disabled. The following commands were modified: **show ip static route**,**show subscriber session**.