Contents

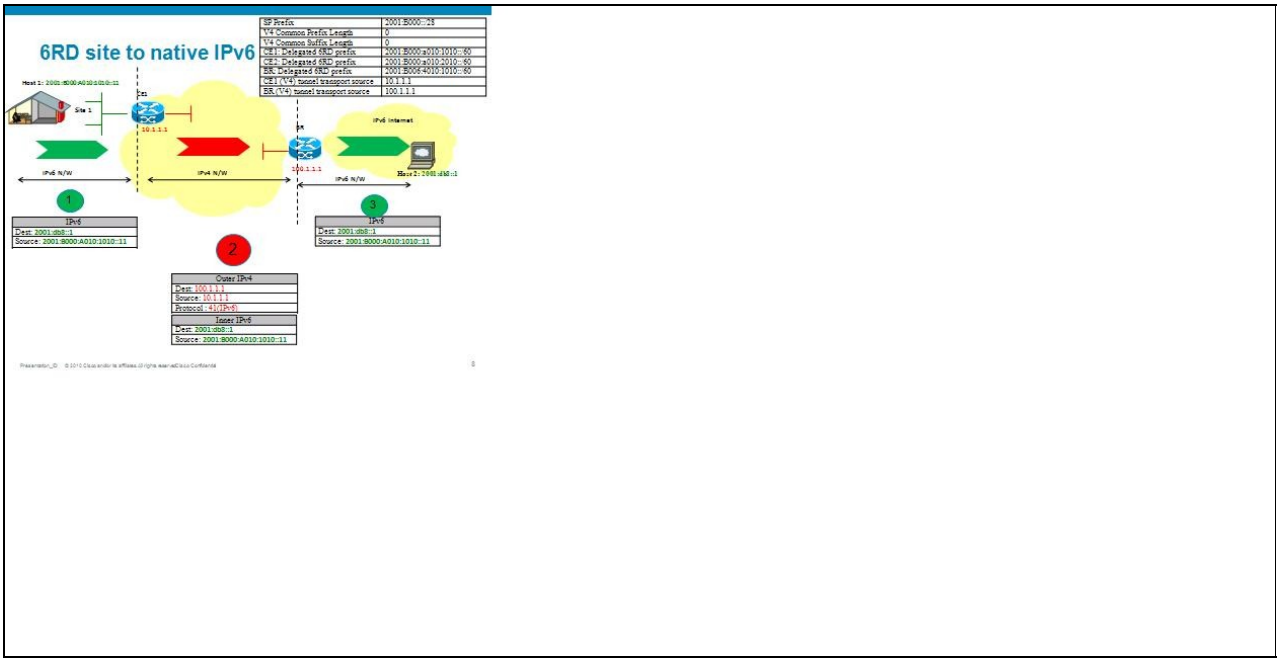
- 1 Introduction
- 2 Design
- 3 Configuration
- 4 Show running-config
- 5 Show command for displaying 6rd statistics (encapsulated/decapsulated packet counters)
- 6 Serviceapp4 statictics
- 7 Serviceapp6 statictics
- 8 IPv4 Routes
- 9 IPv6 Routes
- 10 Related Information
- 11 Subcategory Tag

Introduction

6RD (IPv6 Rapid Deployment) is a mechanism that allows a Service Provider to provide a unicast IPv6 service to customers over its IPv4 network. It is defined by RFC5969.

Design

The setup would consist of a CRS-1 with a CGSE PLIM for 6rd, an incoming and outgoing SPA for routing traffic into and out of the CGSE as the CGSE doesnot have any physical interfaces.



Configuration

Step 1: Bring up the CGSE PLIM (The CGSE will remain in FAILED state until the initial config shown below is done and a card reload is done) Define the SVI (service Virtual Interface) Infra interface (for control path) interface ServiceInfra1

```
ipv4 address 3.1.1.2 255.255.255.252
service-location 0/0/CPU0
```

```
logging events link-status
```

Define the cgn service location hw-module service cgn location 0/0/CPU0

Reload the card hw-module location 0/0/CPU0 reload WARNING: This will take the requested node out of service. Do you wish to continue?[confirm(y/n)] y

Wait for 15 mins for the card to come up to OK state.

6rd Config Parameters : Create CGN instance, one per CGSE service cgn demo

```
service-location preferred-active 0/0/CPU0
```

An IPv4 SVI is created to carry IPv4 pkt into the CGSE for Decapsulation and is handed over to native IPv6 via IPv6 SVI. Service-type should be ?tunnel v6rd? interface ServiceApp4

```
ipv4 address 1.1.1.1 255.255.255.252
service cgn demo service-type tunnel v6rd
logging events link-status
```

An IPv6 SVI is created to carry IPv6 pkt into the CGSE for Encapsulation and is handed over to IPv4 N/W via IPv4 SVI. Service-type should be ?tunnel v6rd? interface ServiceApp6

```
ipv6 address 5000::1/126
service cgn demo service-type tunnel v6rd
logging events link-status
```

Configure 6rd instance (string ?6rd1? in this Example.). There can be 64 6rd instances per CGSE/Chassis. Configure 6rd Prefix, BR source IPv4 address & unicast IPv6 address in a single commit. ?address-family? cmd will bind IPv4 & IPv6 Serviceapp interface to a particular 6rd instance ?6rd1?, for transmitting/receiving 6rd traffic.

Note: ?Unicast address "Specifies unique IPv6 address for a particular CGSE. This will be used as source IPv6 address while replying to IPv6 ICMP queries destined for BR IPv6 anycast address

service cgn demo

```
service-type tunnel v6rd 6rd1
 br
  ipv6-prefix 2001:B000::/28
  source-address 100.1.1.1
  unicast address 2001:B006:4010:1010::1
 !
 address-family ipv4
  interface ServiceApp4
 !
 address-family ipv6
  interface ServiceApp6
```

Static route to divert the traffic towards CGSE which is destined for BR router static

```
address-family ipv4 unicast
 100.1.1.1/32 1.1.1.2  (Serviceapp4 NextHop)
```

Static route for packets destined to 6rd Prefix, routed to CGSE router static

```
 address-family ipv6 unicast
```

```
  2001:B000::/28 5000::2 (Serviceapp6 NextHop)
  2001:B006:4010:1010::/60 Null0
  2001:B006:4010:1010::/128 5000::2 (Serviceapp6 NextHop)
  2001:B006:4010:1010::1/128 5000::2 (Serviceapp6 NextHop)
```

This section provides information you can use to confirm your configuration is working properly.

Show running-config

show running-config service cgn demo service cgn demo

```
service-location preferred-active 0/0/CPU0
service-type tunnel v6rd 6rd1
 br
  ipv6-prefix 2001:B000::/28
  source-address 100.1.1.1
  unicast address 2001:B006:4010:1010::1
 !
 address-family ipv4
  interface ServiceApp4
 !
 address-family ipv6
  interface ServiceApp6
```

Show command for displaying 6rd statistics (encapsulated/decapsulated packet counters)

show cgn tunnel v6rd 6rd1 statistics

```
Tunnel 6rd configuration
Tunnel 6rd name: 6rd1
IPv6 Prefix/Length: 2001:B000::/28
Source address: 100.1.1.1
BR Unicast address: 2001:B006:4010:1010::1/128
Tunnel 6rd statistics
IPv4 to IPv6
Incoming packet count                    : 6090 (Total No of pkts Protocol 41 & non Prot 41)
Incoming tunneled packets count          : 6090 (Total No of 6rd Tunnel pkts Protocol 41)
Decapsulated packets                     : 6090
IPv6 to IPv4
Incoming packet count                            : 10149
Encapsulated packets count                       : 10149
IPv4 to IPv6
ICMP Translation Count                           : 0 ( ICMPv4 to ICMPv6 translated count )
Insufficient IPv4 payload drop count             : 0 ( Payload should carry IPv6 header)
No DB entry drop count                           : 0 ( 6rd Config is incomplete/missing )
Unsupported protocol drop count                  : 0 ( IPv4 protocol type is not 41 (IPv6) )
Invalid IPv6 source prefix drop count            : 0 ( IPv6 Src from RG doesn?t have 6rd prefix)
IPv6 to IPv4
No DB drop count                                 : 0 ( 6rd Config is not complete/missing)
Unsupported protocol drop count                  : 0 ( Non ICMP pkts destined to IPv6 BR Anycast/U
IPv4 ICMP
Incoming packets count                           : 0
Reply packets count                              : 0
Throttled packet count                           : 0 (ICMP throttling in CGSE 64 PKTS/Sec)
Nontranslatable drops                            : 0 (ICMPv4 error pkt (ipv4->TL) should be atleas
Unsupported icmp type drop count                 : 0 (As per draft-ietf-behave-v6v4-xlate-22)
IPv6 ICMP
Unsupported icmp type drop count                 : 0  (As per draft:ietf-behave-v6v4-xlate-22)
Throttled packet count                           : 0  (ICMP throttling in CGSE 64 PKTS/core)
```

```
IPv4 to IPv6
Security check failure drops                    : 0
Fragments dropped due to security check failure  : 0
```

Serviceapp4 statictics

show int serviceapp 4 accouting ServiceApp1

```
 Protocol              Pkts In         Chars In     Pkts Out        Chars Out
 IPV4_UNICAST             10149         12239275       6090           689459
```

Serviceapp6 statictics

show int serviceapp 6 accounting ServiceApp2

```
 Protocol              Pkts In         Chars In     Pkts Out        Chars Out
 IPV4_UNICAST            6090           689459         10149         12239275
```

IPv4 Routes

show route ipv4

```
Gateway of last resort is 0.0.0.0 to network 0.0.0.0
S    100.1.1.1/32 is directly connected, 00:55:02, ServiceApp4
C    10.1.1.0/24 is directly connected, 00:47:38, GigE0/1/1/3
L    10.1.1.2/32 is directly connected, 00:47:38, GigE0/1/1/3
C    1.1.1.0/30 is directly connected, 00:54:32, ServiceApp4
L    1.1.1.1/30 is directly connected, 00:54:32, ServiceApp4
```

IPv6 Routes

show route ipv6

```
S    2001:b000::/28 is directly connected,00:13:44, ServiceApp6
S    2001:b006:4010:1010::/60 is directly connected,00:19:24, Null0
S    2001:b006:4010:1010::/128 is directly connected,00:13:44, ServiceApp6
S    2001:b006:4010:1010::1/128 is directly connected,00:13:44, ServiceApp6
C    5000::/64 is directly connected,00:13:44, ServiceApp6
L    5000::1/128 is directly connected,00:13:44, ServiceApp6
C    2001:db8::/64 is directly connected,01:23:55, GigE0/1/1/4
L    2001:db8::2/128 is directly connected,01:23:55, GigE0/1/1/4
```

Related Information

Technical Support & Documentation - Cisco Systems

Subcategory Tag