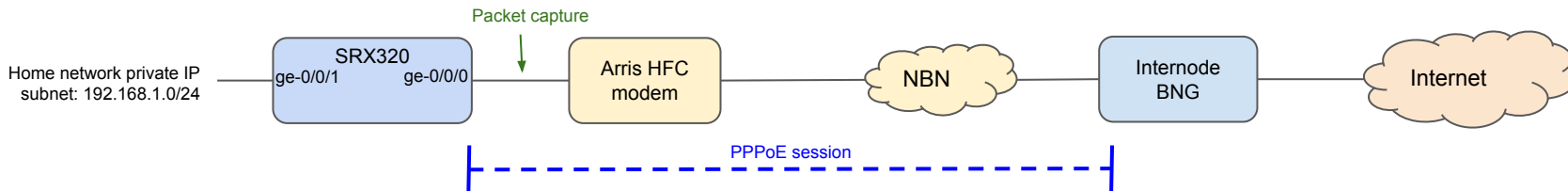


SRX320

configuration for PPPoE session with Internode ISP
via NBN with HFC

Junos version 18.4R3-S5.4

SRX 320 junos 18.4R3-S5.4 - PPPoE client - ISP: Internode - NBN: HFC



Default Jweb wizard SRX320 PPPoE config:

show configuration interfaces pp0

```
apply-macro "Quick Setup Connection";
unit 0 {
  ppp-options {
    chap {
      default-chap-secret "$9$mfXXX..t"; ## SECRET-DATA
      local-name "user@internode.on.net";
      passive;
    }
    pap {
      default-password "$9$ykXXX...k"; ## SECRET-DATA
      local-name "user@internode.on.net";
      local-password "$9$NXXX...6"; ## SECRET-DATA
      passive;
    }
  }
  pppoe-options {
    underlying-interface ge-0/0/0.0;
    idle-timeout 180;
    auto-reconnect 5;
    client;
  }
  family inet {
    negotiate-address;
  }
}
```

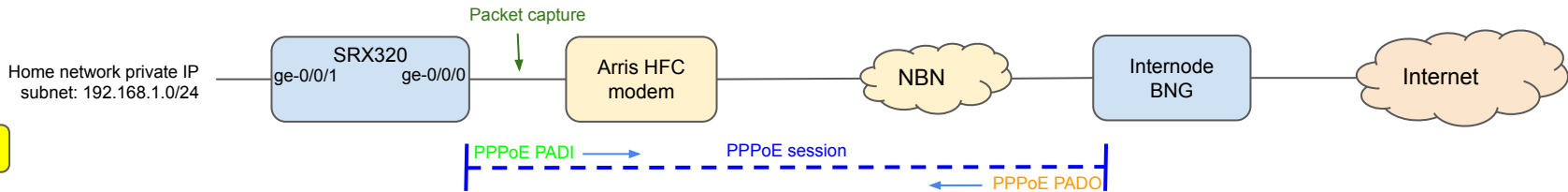
show configuration interfaces ge-0/0/0

```
unit 0 encapsulation ppp-over-ether;
```

Issues with the default Jweb SRX320 config for Internode BNG via NBN:

- **NBN expects C-VLAN tag = 2.**
Untagged frame are discarded by NBN. The PPPoE PADI packet doesn't reach the ISP BNG
Fix: tag the interface ge-0/0/0 with vlan-id 2
- **Wrong QoS settings:**
By default SRX320 sends PPPoE PADI as "Network control" packet. QoS: PCP= CS6. NBN will drop any packet with QoS marking different than:
 - TC4 (PCP = 0). Internet traffic (Best effort)
 - TC1 (PCP = 5). Voice traffic if applicable**Fix:** Use the following command to force "host-outbound" traffic to set the PCP to 0:
`set class-of-service host-outbound-traffic ieee-802.1 default be`
- **SRX320 PADI "End-of-List" tag (detail on the next two slides)**
Wireshark trace shows:
 - PADI contains "End-of-List" tag which is not supported by some BNG servers.As a result, BNG responds with a PADO without the "Circuit ID" in the "Vendor Specific" PPPoE tag and then rejects the PAP authentication even though the correct username and password are provided.
Fix: Use the following command prevent the SRX320 sending the "End-of-list" tag in the PADI message:
`set interface pp0.0 pppoe-options ignore-eol-tag`
- **DHCP server settings.**
By default, SRX320 DHCP server doesn't propagate the DNS server address received by BNG to its DHCP clients(on the private lan).
Fix: Use the following command to propagate the DNS server address to DHCP clients:
`set address-assignment pool junosDHCPPool family inet dhcp-attributes propagate-ppp-settings pp0.0`

SRX 320 - PPPoE session without the "ignore-eol-tag" option - Session fails PAP authentication



```

> Frame 17: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
> Ethernet II, Src: f4:bf:a8:52:1d:c6 (f4:bf:a8:52:1d:c6), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 2
▼ PPP-over-Ethernet Discovery
  0001 ... = Version: 1
  ... 0001 = Type: 1
  Code: Active Discovery Initiation (PADI) (0x09)
  Session ID: 0x0000
  Payload Length: 14
▼ PPPoE Tags
  Host-Uniq: 0000
0000  ff ff ff ff ff ff f4 bf a8 52 1d c6 81 00 00 02  .....R.....
0010  38 63 11 09 00 00 00 0e 01 03 00 02 00 00 01 01  .c.....
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
0030  00 00 00 00 00 00 00 00 00 00 00 00  .....
  
```

Wireshark parsing of PPPoE Tags is incorrect

PPPoE Tags parsing (based on RFC 2516):

0103: Host-uniq
0002: length: 2 bytes
0000: Host-uniq value = 0000

0101: Service-Name
0000: Length 0 bytes

0000: End-of-list
0000: Length 0 bytes

Not Supported by some BNG servers

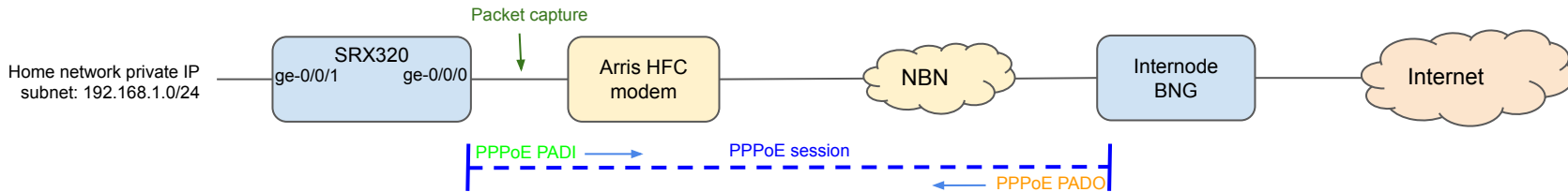
Total : 14 bytes

```

> Frame 18: 77 bytes on wire (616 bits), 77 bytes captured (616 bits) on interface 0
> Ethernet II, Src: Cisco_f7:44:d4 (78:bc:1a:f7:44:d4), Dst: f4:bf:a8:52:1d:c6 (f4:bf:
> 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 2
▼ PPP-over-Ethernet Discovery
  0001 ... = Version: 1
  ... 0001 = Type: 1
  Code: Active Discovery Offer (PADO) (0x07)
  Session ID: 0x0000
  Payload Length: 53
▼ PPPoE Tags
  Host-Uniq: 0000
  AC-Name: nme-apt-col-bras204
  AC-Cookie: 60a13ed1ca4155cf5e3c
  
```

No Circuit-Id Field. (there should be one)
It's a consequence of not being able to parse the "End-of-list" Tag in the PADI message

SRX 320 - PPPoE session with "ignore-eol-tag" option - session successful



```

▶ Frame 5: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
▶ Ethernet II, Src: f4:bf:a8:52:1d:c6 (f4:bf:a8:52:1d:c6), Dst: Broadcast (ff:ff:ff:
▶ 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 2
▼ PPP-over-Ethernet Discovery
  0001 .... = Version: 1
  .... 0001 = Type: 1
  Code: Active Discovery Initiation (PADI) (0x09)
  Session ID: 0x0000
  Payload Length: 10
▼ PPPoE Tags
  Host-Uniq: 0000
0000  ff ff ff ff ff ff f4 bf a8 52 1d c6 81 00 00 02  ....R.....
0010  88 63 11 09 00 00 00 0a 01 03 00 02 00 00 01 01  ..C.....
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ..
0030  00 00 00 00 00 00 00 00 00 00 00 00  ..
  
```

Wireshark parsing of PPPoE Tags is incorrect

PPPoE Tags parsing (based on RFC 2516):

0103: Host-uniq
 0002: length: 2 bytes
 0000: Host-uniq value = 0000

0101: Service-Name
 0000: Length 0 bytes

Total : 10 bytes

No "End-of-List Tag"

Circuit-Id Field present:
 Session completes successfully

```

▶ Frame 6: 102 bytes on wire (816 bits), 102 bytes captured (816 bits) on interface 0
▶ Ethernet II, Src: Cisco_f7:44:d4 (78:bc:1a:f7:44:d4), Dst: f4:bf:a8:52:1d:c6 (f4:bf:
▶ 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 2
▼ PPP-over-Ethernet Discovery
  0001 .... = Version: 1
  ... 0001 = Type: 1
  Code: Active Discovery Offer (PADO) (0x07)
  Session ID: 0x0000
  Payload Length: 78
▼ PPPoE Tags
  Host-Uniq: 0000
  Vendor id: 3561
  ▼ Vendor Specific PPPoE Tags
    Circuit ID: AVC400[REDACTED]
    AC-Name: nme-apt-col-bras204
    AC-Cookie: 60a13ed1ca4155cf5e3d39[REDACTED]
  
```

SRX 320 - PPPoE client - ISP: Internode - NBN: HFC - working config

SRX320 config:

```
al@al-320> show configuration interfaces ge-0/0/0
```

```
vlan-tagging;  
unit 0 {  
    encapsulation ppp-over-ether;  
    vlan-id 2;  
}
```

```
al@al-320> show configuration interfaces pp0
```

```
unit 0 {  
    ppp-options {  
        pap {  
            default-password "$9$yXXX..k"; ## SECRET-DATA  
            local-name "user@internode.on.net";  
            local-password "$9$NXXX...6"; ## SECRET-DATA  
            passive;  
        }  
    }  
    pppoe-options {  
        underlying-interface ge-0/0/0.0;  
        idle-timeout 180;  
        auto-reconnect 5;  
        client;  
        ignore-eol-tag;  
    }  
    family inet negotiate-address;  
}
```

```
al@al-320> show configuration class-of-service
```

```
host-outbound-traffic {  
    ieee-802.1 {  
        default be;  
    }  
}
```

```
al@al-320> show configuration access
```

```
address-assignment {  
    pool junosDHCPPool {  
        family inet {  
            network 192.168.1.0/24;  
            range junosRange {  
                low 192.168.1.220;  
                high 192.168.1.239;  
            }  
            dhcp-attributes {  
                router 192.168.1.1  
                propagate-settings ge-0/0/0.0;  
                propagate-ppp-settings pp0.0;  
            }  
        }  
    }  
}
```

SRX320 Verification:

```
al@al-320> show ppp interface pp0.0 extensive
```

```
Session pp0.0, Type: PPP, Phase: Network  
LCP  
    State: Opened  
    Last started: 2020-09-22 00:24:47 EST  
    Last completed: 2020-09-22 00:24:47 EST  
    Negotiated options:  
    Authentication protocol: PAP, Magic number: 16009857,  
    Local MRU: 1492  
Authentication: CHAP State: Closed  
Authentication: PAP State: Success  
    Last started: 2020-09-22 00:24:47 EST  
    Last completed: 2020-09-22 00:24:47 EST  
IPCP  
    State: Opened  
    Last started: 2020-09-22 00:24:53 EST  
    Last completed: 2020-09-22 00:24:53 EST  
    Negotiated options:  
    Local address: 14.203.182.68, Remote address: 10.20.23.60,  
    Primary DNS: 203.12.160.35,  
    Secondary DNS: 203.12.160.36
```

```
al@al-320> show dhcp server binding
```

| IP address | Session Id | Hardware address | Expires | State | Interface |
|---------------|------------|-------------------|---------|-------|-----------|
| 192.168.1.224 | 5 | 40:4e:36:23:cb:40 | 85728 | BOUND | irb.0 |
| 192.168.1.223 | 4 | 88:e9:fe:24:08:03 | 85724 | BOUND | irb.0 |
| 192.168.1.222 | 3 | c0:ee:fb:ab:61:f9 | 85723 | BOUND | irb.0 |
| 192.168.1.221 | 2 | d4:20:b0:f7:63:e1 | 85718 | BOUND | irb.0 |

References:

- RFC 2516
- KB25653 (ignore-eol-tag)
<https://kb.juniper.net/InfoCenter/index?page=content&id=KB25653&actp=METADATA&act=login>
- KB32435 (propagate ppp settings - DNS)
https://kb.juniper.net/InfoCenter/index?page=content&id=KB32435&cat=SRX_550&actp=LIST

SRX 320 as DNS proxy (option)

SRX320 config:

```
al@al-320> show configuration system services
```

```
dns {
  dns-proxy {
    propagate-setting enable;
    interface irb.0;
  }
}
```

```
[edit access address-assignment pool junosDHCPPool
family inet]
```

```
al@al-320# show
network 192.168.1.0/24;
range junosRange {
  low 192.168.1.220;
  high 192.168.1.239;
}
dhcp-attributes {
  name-server {
    192.168.1.1;
    8.8.8.8;
  }
  router {
    192.168.1.1;
  }
}
propagate-settings geq-0/0/0.0;
propagate-ppp-settings pp0.0;
}
```

SRX320 Verification:

```
al@al-320> show system services dns-proxy statistics
```

```
DNS proxy statistics :
Status : enabled
IPV4 Queries received : 1055
IPV6 Queries received : 0
Responses sent : 1037
Queries forwarded : 526
Negative responses : 585
Positive responses : 452
Retry requests : 18
Pending requests : 0
Server failures : 110
Interfaces : irb.0
```

```
al@al-320> show ppp interface pp0.0 extensive
```

```
Session pp0.0, Type: PPP, Phase: Network
LCP
State: Opened
Last started: 2020-09-27 15:27:18 EST
Last completed: 2020-09-27 15:27:18 EST
Negotiated options:
  Authentication protocol: PAP, Magic number: 1601407808,
  Local MRU: 1492
Authentication: CHAP
State: Closed
Authentication: PAP
State: Success
Last started: 2020-09-27 15:27:18 EST
Last completed: 2020-09-27 15:27:18 EST
IPCP
State: Opened
Last started: 2020-09-27 16:57:53 EST
Last completed: 2020-09-27 16:57:53 EST
Negotiated options:
  Local address: 194.193.172.66, Remote address: 10.20.20.167
```

Notes:

With DNS proxy, clients send their DNS request to the SRX320 which act as DNS proxy.

Advantage of using the Gateway (192.168.1.1) as a DNS proxy is :

- Client with static IP address config can be configured with static DNS entry 192.168.1.1
- Gateway maintains a DNS cache available for all clients