Supporting Document LNS Configuration

Inhalt

1 General

This document describes the scripts used for configuring a CISCO L2TP Network Server (LNS).

1.1 Appendix A: Load Balancing between POPs

For more details, please refer to document [13] Technical Specification Connectivity.

1.2 Appendix B: Examples of LNS and BGP Configurations

The ISP must configure its LNS router to enable it to transmit L2TP. The configurations below are only examples: FWS declines all responsibility for the correctness of this information.

1.2.1 LNS Basic

```
! Configuration for a basic LNS to connect to BBCS
! 27.4.2002
!
! only absolutely necessary features and config statements included
! The router should be configured and protected according to the (I)SP's policy
!
! IOS release 12.2(7) and newer provides the possibility for MTU adaptive, which dynamically
! assigns the MTU as negotiated between PPPoX client and LAC per every individual PPP session.
! (1492 for PPPoE, 1500 for PPPoA)
! PPP clients are locally authenticated without any AAA server.
!
! IP addresses need to be adapted for the real-life,
! IP addresses for the L2TP tunnels need to be out of the (I)SP's public address range
!
! IOS used in this example:
! IOS (tm) 7200 Software (C7200-IS-M), Version 12.2(7), RELEASE SOFTWARE (fc1)
! cisco 7204VXR (NPE400) processor (revision A) with 114688K/16384K bytes of memory.
!
!
hostname LNS-A
!
! users are localy administered, no AAA server in this example
aaa new-model
aaa authorization network default local
!
! usernames and passwords for ppp clients
username usr1@lnsa.ch password pwd1
username usr2@lnsa.ch password pwd2
username usr3@lnsa.ch password pwd3
username usr4@lnsa.ch password pwd4
username usr5@lnsa.ch password pwd5
!
enable secret cisco

ip cef
!
! this enables the whole show
vpdn enable
!
! statements for the local L2TP tunnel settings
! the tunnelname (local name statement) is seen on the Swisscom LAC and should allow to easily
! identify the (I)SP and LNS
vpdn-group lnsa
! Default L2TP VPDN group
 accept-dialin
  protocol l2tp
```

```
  virtual-template 1
 local name (I)SPa.zh01
 l2tp tunnel password tunnel_pw
!
! the interface to bind the L2TP tunnel
interface Loopback0
 ip address 172.16.101.1 255.255.255.255
!
! L2TP packets are sourced by loopback0
vpdn source-ip 172.16.101.1
!
!
! the interface towards the internet
! "ip tcp adjust-mss 1400" allows to intercept TCP syn packets and change the TCP MSS size on the
!fly.
! As a result TCP packets get smaller and once the L2TP headers are added still fit unfragmented
! on the FastEthernet interface towards IPSS, thus allowing much higher throughput and saving
! CPU resources.
! This should also solve other MTU issues with PC's behind PPPoE Routers.
! ip tcp mss is currently not in 12.2(7). 12.2.8T already supports it.
!
interface FastEthernet0/0
ip tcp adjust-mss 1400
 ip address 172.16.1.2 255.255.255.0
!
!
! interface towards IPSS
interface FastEthernet4/0
 ip address 172.16.60.2 255.255.255.0
 duplex full
!
! each PPP subscriber gets a virtual-access interface cloned out of virtual-template 1
! keepalives are important to detect ungracefully disconnected PPP peers
! subscribers get there addresses out of a local ip-pool
! MTU automatically adjusted for PPPoA or PPPoE
! no need to specify CHAP here, as this is already enforced by the LAC
!
interface Virtual-Template1
 ip unnumbered Loopback0
 keepalive 11
 peer default ip address pool pool_(I)SPa
 ppp mtu adaptive
 ppp ipcp dns <dns1> <dns2>
!
ip local pool pool_(I)SPa 2.2.2.1 2.2.2.254
ip classless
!
! route towards IPSS to reach all LAC's
ip route 138.187.22.0 255.255.254.0 172.16.60.1
!
line con 0
 password cisco
line aux 0
line vty 0 4
 password cisco
!
end
```

1.2.2 LNS Basic AAA

```
! Configuration for a basic LNS to connect to BBCS, users are administered on a AAA server
! 27.4.2002
!
! only absolutely necessary features and config statements included
! The router should be configured and protected according to the (I)SP's policy
!
```

```
! IOS release 12.2(7) and newer provides the possibility for MTU adaptive, which dynamically
! assigns the MTU as negotiated between PPPoX client and LAC per every individual PPP session.
! (1492 for PPPoE, 1500 for PPPoA)
! PPP clients are locally authenticated without any AAA server.
! PPP clients are authenticated on a RADIUS server.
! accounting data is sent to the same RADIUS server
!
! IP addresses need to be adapted for the real-life,
! IP addresses for the L2TP tunnels need to be out of the (I)SP's public address range
!
!
! IOS (tm) 7200 Software (C7200-IS-M), Version 12.2(7), RELEASE SOFTWARE (fc1)
! cisco 7204VXR (NPE400) processor (revision A) with 114688K/16384K bytes of memory.
!
!
hostname LNS-A
!
! authentication and accounting on AAA server in this example
aaa new-model
aaa authentication ppp default group radius
aaa accounting delay-start
aaa accounting network default start-stop group radius
radius-server host <radius_server> auth-port <radius_auth_port> acct-port <radius_acc_port> key
<key>
!
enable secret cisco

ip cef
!
! this enables the whole show
vpdn enable
!
! statements for the local L2TP tunnel settings
! the tunnelname (local name statement) is seen on the Swisscom LAC and should allow to easily
! identify the (I)SP and LNS

vpdn-group lnsa
! Default L2TP VPDN group
 accept-dialin
  protocol l2tp
  virtual-template 1
 local name (I)SPa.zh01
 l2tp tunnel password tunnel_pw
!
! the interface to bind the L2TP tunnel
interface Loopback0
 ip address 172.16.101.1 255.255.255.255
!
! L2TP packets are sourced by loopback0
vpdn source-ip 172.16.101.1
!
!
! the interface towards the internet
! "ip tcp adjust-mss 1400" allows to intercept TCP syn packets and change the TCP MSS size on the
fly.
! As a result TCP packets get smaller and once the L2TP headers are added still fit
! unfragmented on the FastEthernet interface towards IPSS, thus allowing much higher throughput
! and saving CPU resources.
! This should also solve other MTU issues with PC's behind PPPoE Routers.
! ip tcp mss is currently not in 12.2(7). 12.2.8T already supports it.
!
interface FastEthernet0/0
ip tcp adjust-mss 1400
 ip address 172.16.1.2 255.255.255.0
!
!
! interface towards IPSS
```

```
interface FastEthernet4/0
 ip address 172.16.60.2 255.255.255.0
 duplex full
!
! each PPP subscriber gets a virtual-access interface cloned out of virtual-template 1
! keepalives are important to detect ungracefully disconnected PPP peers
! subscribers get there addresses out of a local ip-pool
! MTU automatically adjusted for PPPoA or PPPoE
! no need to specify CHAP here, as this is already enforced by the LAC
!
interface Virtual-Template1
 ip unnumbered Loopback0
 keepalive 11
 peer default ip address pool pool_(I)SPa
 ppp mtu adaptive
 ppp ipcp dns <dns1> <dns2>
!
ip local pool pool_(I)SPa 2.2.2.1 2.2.2.254
ip classless
!
! route towards IPSS to reach all LAC's
ip route 138.187.22.0 255.255.254.0 172.16.60.1
!
line con 0
 password cisco
line aux 0
line vty 0 4
 password cisco
!
end
```

1.2.3 BGP Load Balancing

```
! Configuration for prepending the AS path for selected routes
!
!
router bgp 1234
…
neighbor 9.1.0.10 remote-as 65501
 neighbor 9.1.0.10 password ipss
 neighbor 9.1.0.10 timers 5 15
 neighbor 9.1.0.10 route-map more-as out
 no auto-summary
…
…
route-map more-as permit 10
 match ip address more-as
 set as-path prepend 65502
!
route-map more-as permit 20
…
…
ip access-list standard more-as
 permit 1.1.1.0  0.0.0.255
```