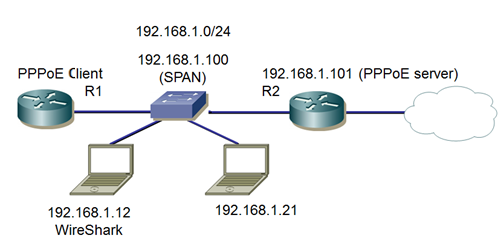
**PPPoE authentication**



.X .254

10.0.0.0/24

X={1, 2, 3, ...}

NAT

**Goal:** to verify authentication control via Point-to-Point Protocol over Ethernet (PPPoE). Router R2 will be used as PPPoE server and router R1 as PPPoE client.

**Description:** The PPPoE protocol describes a method of encapsulating PPP frames into Ethernet frames, or transferring PPP data over Ethernet. It allows Ethernet nodes (i.e. users/customers) to be authenticated solely by link layer mechanisms. In this exercise, Cisco routers will be used as both PPoE server and client.

Data exchange will be monitored through the switch (using the SPAN interface feature - this interface will no longer be usable for normal operation) by WireShark.

Virtual-Template1 should be used as the input interface for address translation in the PPPeE server, and the corresponding physical interface as the outgoing interface.

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**Tasks:**

* Ensure the default configuration of routers and switches
* Connect the network according to the specified scheme
* Configure the basic network parameters of the stations
* Configure the basic network parameters of the network elements (except router R1, whose configuration is described separately) for remote access
* Secure the switch and routers as follows
  + Secure the transition to privileged mode
    - Password stored as a hash
  + Secure access via the console
    - Password
  + Secure access through the virtual terminal
    - Password
    - Telnet protocol
    - SSH protocol
* Activate the SPAN function on the switch on the interfaces used
* Run the WireShark program on the PC and verify its functionality.

**Configuring Router R2 as a PPPoE server**

* Follow the procedure below

hostname PPPoE-Server

!

username hasim password 0 ali

!

bba-group pppoe global

virtual-template 1

!

interface GigabitEthernet0/0

ip address 192.168.1.101 255.255.255.0

pppoe enable group global

!

interface Virtual-Template1

mtu 1492

ip unnumbered GigabitEthernet0/0

peer default ip address pool POOLCL

ppp authentication chap

!

ip local pool POOLCL 192.168.1.201 192.168.1.209

**Configuring the R1 router as a PPPoE client**

* Follow the procedure below

hostname PPPoE-Client

!

interface GigabitEthernet0/0

no ip address

pppoe enable group global

pppoe-client dial-pool-number 1

!

interface Dialer1

ip address negotiated

ip mtu 1492

encapsulation ppp

dialer pool 1

dialer-group 1

ppp authentication chap callin

ppp chap hostname hasim

ppp chap password 0 ali

!

dialer-list 1 protocol ip permit

**Fragments of configurations for inspiration - they do not fully match the specification**

Default router configuration (when prompted do NOT save the configuration)

erase startup-config

reload

Default switch configuration (when prompted do NOT save the configuration)

erase startup-config

delete flash:vlan.dat

reload

Local access via switch or router console - password settings (class, cisco)

Switch# configure terminal

Switch(config)# enable password **class**

Switch(config)# line console 0

Switch(config-line)# password **cisco**

Show configuration and interfaces and their settings

Switch# show running-config

Switch# show mac-address-table

Router# show ip interface brief

Show information about neighbours (Cisco)

Switch# show cdp neighbor

IP address and default gateway - switch (for remote access)

Switch(config)# interface vlan 1

Switch(config-if)# ip address 192.168.1.100 255.255.255.0

Switch(config)# ip default-gateway 192.168.1.101

IP address and default path - router

Router(config)# interface GigabitEthernet 0/0

Router(config-if)# ip address 192.168.1.101 255.255.255.0

Router(config-if)# no shutdown

Router(config)# ip route 0.0.0.0 0.0.0.0 10.0.0.254

Password to enter privileged mode (stored as a hash)

Switch(config)# enable secret class

Verify and set the time

Switch# show clock

Switch# clock set 08:55:05 May 04 2016

Remote access - passwords (also set "enable" password, otherwise you cannot enter privileged mode)

Switch(config)# line vty 0 15

Switch(config-line)# password cisco

Switch(config-line# login

Verifying PPPoE functionality

Router# show ip dhcp bindings