# 00\_Baseline

In the remote lessons of the course Secure Information Networks, packettracer is used to do the larger tasks of the course in several different stages. This is the first part of the things that are done online.

At this stage, you get acquainted with the bottom net by finalizing it to working condition and conducting testing.

## Base file

Download the base file below, which you will work on according to the instructions below:

<https://www.dropbox.com/s/pxnqr7udjrjwclk/netw_sec_base_v3.pkt?dl=0>

Save the file to yourself and use this same file every future as the task progresses. BE SURE TO SAVE REGULARLY.

## IP networks used

|  |  |
| --- | --- |
| NETWORK | IPv4 |
| ISP CORE | 10.0.0.0/24 |
|  |  |
| CLOUD SERVICES | 1.0.0.0/24 |
| ISP - COMPANY A HQ | 3.0.0.0/24 |
| ISP - COMPANY B | 2.0.0.0/24 |
| ISP - REMOTE/BRANCH/HOME | 4.0.0.0/24 |
|  |  |
| COMPANY A HQ - CORE | 192.168.0.0/24 |
| COMPANY A HQ - INSIDE USERS (vlan1) | 192.168.1.0/24 |
| COMPANY A HQ - INSIDE SERVERS (vlan2) | 192.168.2.0/24 |
| COMPANY A HQ - DMZ | 192.168.3.0/24 |
| COMPANY A BRANCH | 192.168.4.0/24 |
|  |  |
| COMPANY B - INSIDE | 192.168.1.0/24 |
| COMPANY B - DMZ | 192.168.2.0/24 |
|  |  |
| HOME OFFICE | 192.168... |
| REMOTE OFFICE | 192.168... |

## IP settings of devices

|  |  |  |
| --- | --- | --- |
| DEVICE | INTERFACE | IPv4 ADDRESS |
| ISP1 | G0/0/0 | 1.0.0.1/24 |
| ISP1 | G0/0/1 | 10.0.0.1/24 |
| ISP2 | G0/0/0 | 2.0.0.1/24 |
| ISP2 | G0/0/1 | 10.0.0.2/24 |
| ISP2 | G0/0/2 | 3.0.0.1/24 |
| ISP3 | G0/0/0 | 4.0.0.1/24 |
| ISP3 | G0/0/1 | 10.0.0.3/24 |
| HQ\_ROUTER | G0/0/0 (internet) | 3.0.0.2/24 |
| HQ\_ROUTER | G0/0/1 (inside) | 192.168.0.1/24 |
| HQ\_ROUTER | G0/0/2 (dmz) | 192.168.3.1/24 |
| HQ\_S1 | Vlan1 (users) | 192.168.1.1/24 |
| HQ\_S1 | Vlan2 (servers) | 192.168.2.1/24 |
| HQ\_S1 | G1/0/1 | 192.168.0.2/24 |
| A\_BR\_ROUTER | G0/0/0 (inside) | 192.168.4.1/24 |
| A\_BR\_ROUTER | G0/0/1 (internet) | DHCP |
| ASA | later |  |
| MOLD | 0/0 | DHCP |
| MOLD | 0/1 | 192.168.0.1 |
| MX | later |  |

# Task

## Finishing the mesh

The bottom mesh is partially configured. To complete, make the following settings:

1. Set up ISP routers to use OSPF routing among themselves
2. Configure the IP settings of the interfaces for the HQ route according to the table, as well as static routing (default route and routes to the internal network)
3. Configure a static default path for HQ\_S1 routable switch
4. Configure the IP settings of the interfaces on the BR router according to the table
5. Fix the default gateway of the web server to 1.0.0.1

Test:

|  |  |  |
| --- | --- | --- |
| SOURCE | DESTINATION | TEST |
| PC4 | WWW | ping |
| PC4 | WWW | WWW |
| HQ-ROUTER | WWW | ping |
| BR-ROUTER | WWW | ping |
| BR-ROUTER | HQ-ROUTER | ping |

1. *If a test does not work, start a more systematic troubleshooting, find and fix the fault! It is worth moving* forward  *only after successfully* passing  *the tests .*

## Getting the head office's internet in order

Configure the head office (HQ) to "get the internet in order", i.e. those missing settings that allow connections to the web server from all terminals in the headquarters, as well as from the rest of the Internet, connections to the server in the DMZ area. Below are more detailed instructions and specifications:

1. Enable workstations to get IP settings from the server using the dhcp service. Tip: How do I redirect a dhcp query to another network?
2. To implement NAT on the router HQ-ROUTER, follow these steps:
   1. The USERS network uses a tree with addresses 3.0.0.128-254 as its public IP addresses
   2. The SERVERS network uses a tree with addresses 3.0.0.64-127 as its public IP addresses
   3. For the A\_DMZ\_SERVER server, a static NAT is made public address 3.0.0.10

Test:

|  |  |  |
| --- | --- | --- |
| SOURCE | DESTINATION | TEST |
| PC1 and PC2 | A\_INSIDE\_SERVER | DHCP |
| PC1 and PC2 | WWW | ping |
| A\_INSIDE\_SERVER | WWW | ping |
| A\_DMZ\_SERVER | WWW | ping |
| PC4 | A\_DMZ\_SERVER public | ping |

1. *If a test does not work, start a more systematic troubleshooting, find and fix the fault! It is worth moving* forward  *only after successfully* passing  *the tests .*

## Branch office's internet in order

Configure the branch office (BR) to "get the internet in order", that is, those missing settings that allow connections to the web server from all terminals of the head office. Below are more detailed instructions and specifications:

1. Create a DHCP tree for BR-ROUTER to automatically share IP settings with workstations
2. Implement NAT with BR-ROUTER so that all devices users the IP address of the BR-ROUTER public network interface as their public address.

Test:

|  |  |  |
| --- | --- | --- |
| SOURCE | DESTINATION | TEST |
| PC5 | BR-ROUTER | DHCP |
| PC5 | WWW | ping |
| PC5 | A\_DMZ\_SERVER | ping |

1. *If a test does not work, start a more systematic troubleshooting, find and fix the fault! It is worth moving* forward  *only after successfully* passing  *the tests .*

## Extras

It is worth carefully finishing the topology. The better you do it, the less there will be to do in the future in terms of the basic configuration.

1. Save configurations of all devices
2. Configure company COMPANY A access switches to be managed by selecting the appropriate IP addresses for them.

## ENDING

Save the file for yourself. You can continue future remote labs all the way from this situation (or make all the labs "in the pipe").

## Model confections (minimums)

! OSPF routing, must be configured for all three ISP routers and all those networks to which the router is connected, eg.

#ISP\_2:

router ospf 1

network 3.0.0.0 0.0.0.255 area 0

network 10.0.0.0 0.0.0.255 area 0

!static routing, configuring two static routes for HQ-ROuter:

ip route 192.168.1.0 255.255.255.0 192.168.0.2

ip route 192.168.2.0 255.255.255.0 192.168.0.2

Default static routes for HQ and HQ\_S1 devices.

! HQ:

ip route 0.0.0.0 0.0.0.0 3.0.0.1

! HQ\_S1:

ip route 0.0.0.0 0.0.0.0 192.168.0.1

! NAT, configured for headquarters and branch office.

! HQ:

int gi0/0/0

ip nat outside

int gi0/0/1

ip nat inside

int gi0/0/2

ip nat inside

! HQ USERS network nat:

access-list 1 permit 192.168.1.0 0.0.0.255

ip nat pool users 3.0.0.128 3.0.0.254 netmask 255.255.255.0 overload

ip nat inside source list 1 pool users

! HQ SERVERS network nat:

access-list 2 permit 192.168.2.0 0.0.0.255

ip nat pool servers 3.0.0.64 3.0.0.127 netmask 255.255.255.0 overload

ip nat inside source list 2 pool SERVERS

! hq static nat

ip nat inside source static 192.168.3.10 3.0.0.10

!BR:

access-list 1 permit any

ip nat inside source list 1 interface gi0/0/1 overload

! DHCP configurations for both HQ\_S1 and BR devices for slightly different purposes

! HQ\_s1 forwarding dhcp requests to the Inside server from the Users network:

int vlan 1

ip helper-address 192.168.2.10

! For BR, dhcp-puuli:

Service DHCP

ip dhcp pool br

network 192.168.4.0 255.255.255.0

default-router 192.168.4.1

ip dhcp excluded-address 192.168.4.0 192.168.4.7

Some confections as a model:

END