

INFO-0045: Introduction to Computer Security

Project 1 - Firewalls

Part 1 - Drawing of the Network

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1 Drawing of the network

We can represent the described network by the following diagram:

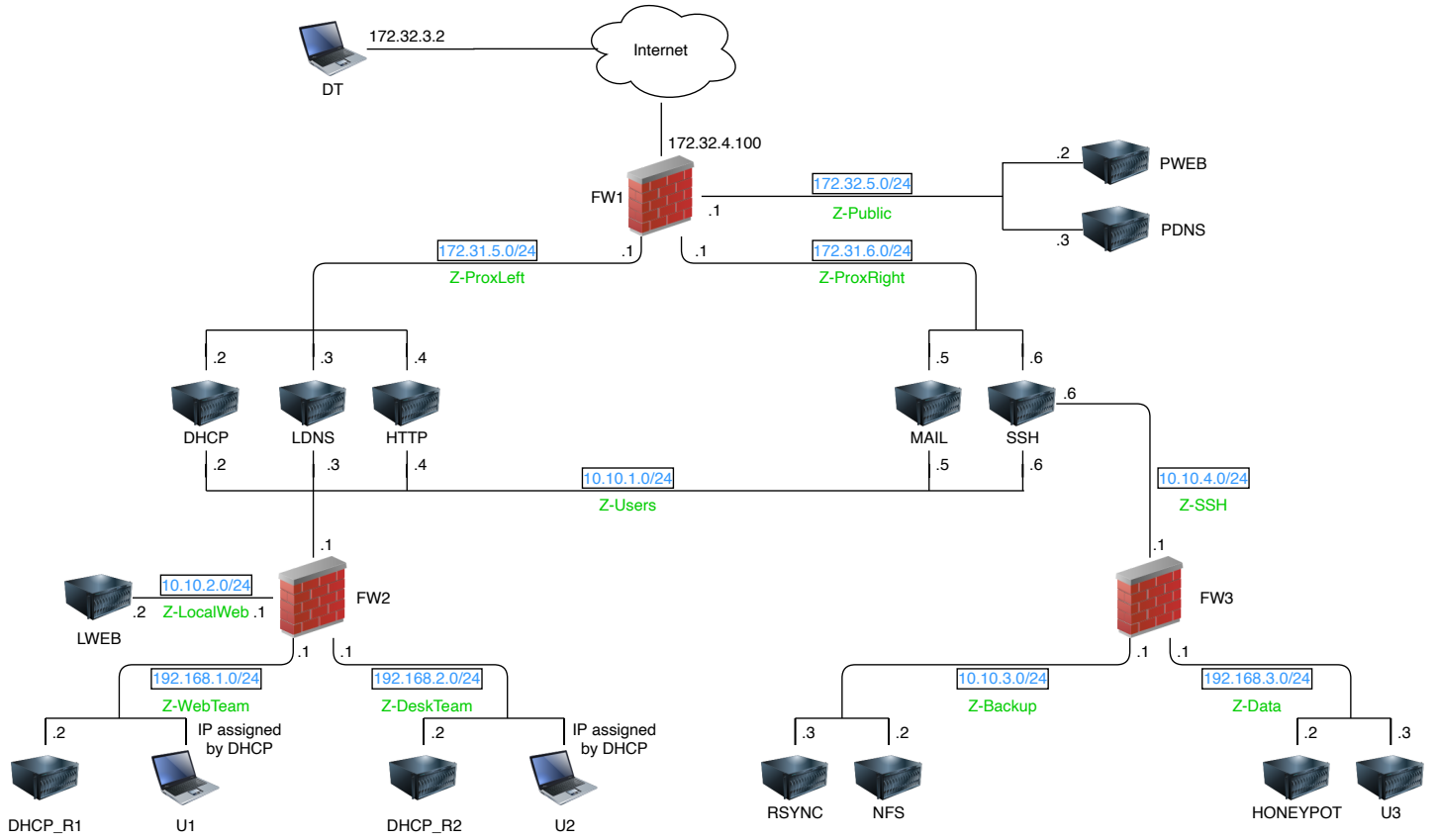


Figure 1: Network topology

2 Zones and their order per firewall

2.1 Zones

We have the following zones:

- Z-Public is the zone associated to devices that can be reach from the Internet. It corresponds to the subnet 172.32.5.0/24.
- Z-ProxLeft is the zone associated to the DHCP, LDNS, and HTTP(S) services. It corresponds to the subnet 172.31.5.0/24.
- Z-ProxRight is the zone associated to the mail (IMAP and SMTP) and SSH services. It corresponds to the subnet 172.31.6.0/24.
- Z-Users is the zone associated to the users of the network. It corresponds to the subnet 10.10.1.0/24.
- Z-LocalWeb is the zone associated to the local web server. It corresponds to the subnet 10.10.2.0/24.

- **Z-WebTeam** is the zone associated to the web team. It corresponds to the subnet 192.168.1.0/24.
- **Z-DeskTeam** is the zone associated to the desk team. It corresponds to the subnet 192.168.2.0/24.
- **Z-SSH** is the zone associated to the SSH relay. It corresponds to the subnet 10.10.4.0/24.
- **Z-Backup** is the zone associated to the backup servers. It corresponds to the subnet 10.10.3.0/24.
- **Z-Data** is the zone associated to the data servers. It corresponds to the subnet 192.168.3.0/24.

2.2 Order of zones per firewall

For firewall FW1, we have the following order of zones based on decreasing security level:

- 1) **Z-ProxLeft** because these services should not be reachable from outside except for the replies of HTTP(S) and DNS protocols.
- 2) **Z-ProxRight** because the mail server and ssh relay should receive connections from outside.
- 3) **Z-Public** because the servers inside this zone are intended for public use.

For firewall FW2, we have the following order of zones based on decreasing security level:

- 1) **Z-DeskTeam** because it should have the highest level of security.
- 2) **Z-WebTeam** because it should have the same restrictions as **Z-DeskTeam**. Yet, it also need access to the RSYNC server to backup web data and they need access to the FTP server of LWEB to modify web pages.
- 3) **Z-LocalWeb** because it should be accessible only by people from **Z-WebTeam** and **Z-DeskTeam**.
- 4) **Z-Users** because it should be accessible by anyone from **Z-WebTeam** and **Z-DeskTeam** because they need to access the proxies, the mail server, and the SSH relay.

For firewall FW3, we have the following order of zones based on decreasing security level:

- 1) **Z-Backup** because it is highly sensible. We definitely do not want anyone without proper permissions to access the servers inside it.
- 2) **Z-Data** because it should be accessible only by a few people or a few servers.
- 3) **Z-SSH** because it is under less restrictions than the previous zones.