UT 10.4
NETWORK TOOLS AND PROTOCOLS

Computer Systems
CFGS DAW

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Nomenclature

Throughout this unit different symbols will be used to distinguish important elements within the content. These symbols are:

Important

Attention

Interesting

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1. CURL

Curl is an open source command-line tool used to transfer data over various protocols such as HTTP, HTTPS, FTP, SMTP, and more. It is typically used to make requests to servers and retrieve data from them. Quoting from CURL webpage:

DICT, FILE, FTP, FTPS, GOPHER, GOPHERS, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, MQTT, POP3, POP3S, RTMP, RTMPS, RTSP, SCP, SFTP, SMB, SMBS, SMTP, SMTPS, TELNET and TFTP. curl supports SSL certificates, HTTP POST, HTTP PUT, FTP uploading, HTTP form based upload, proxies (SOCKS4, SOCKS5, HTTP and HTTPS), HTTP/2, HTTP/3, cookies, user+password authentication (Basic, Plain, Digest, CRAM-MD5, SCRAM-SHA, NTLM, Negotiate, Kerberos, Bearer tokens and AWS Sigv4), file transfer resume, proxy tunneling, HSTS, Alt-Svc, unix domain sockets, HTTP compression (gzip, brotli and zstd), etags, parallel transfers, DNS-over-HTTPS and more.

Curl is a powerful tool that supports a wide range of options and features, making it terribly popular among developers and system administrators. It can be used to download files, upload data, test APIs, and even perform complex operations such as sending custom headers, handling cookies, and more. Basic syntax for using curl is:

```
curl [options] [URL]
```

where [options] specify additional parameters such as headers, data, and authentication, and [URL] is the endpoint you want to send the request to.

Curl can be installed on most operating systems, including Windows, macOS, and Linux. It is also commonly used in scripts and automation workflows to automate various tasks that involve sending HTTP requests.

Some examples on how to use curl for HTTP requests could be:

```
# RETRIEVE CEEDCV Webpage
curl https://portal.edu.gva.es/ceedcv/es/inicio/
```

```
# POST a new post in jsonplaceholder[1]
curl -X POST -H "Content-Type: application/json" -d '{"title": "My New
Post", "body": "This is my new post!", "userId": 1}'
https://jsonplaceholder.typicode.com/posts
```

Checkout the official webpage of CURL for extra documentation:

https://curl.se/

1 https://jsonplaceholder.typicode.com/

2. WGET

Wget is a command-line tool used for downloading files from the internet. It is a non-interactive utility, meaning it can download files in the background without requiring any user input or interaction.

Wget is a versatile tool that supports various protocols such as HTTP, HTTPS, FTP, and more. It can download entire websites recursively, resume interrupted downloads, and even perform authentication if required. Wget also supports downloading files in the background, which is useful when working with large files or slow internet connections. Although it's not as versatile as curl among different protocols it has some advanced features on HTTP-FTP that make it very useful.

The syntax to use it is as it follows:

```
wget [options] [URL]
```

where [options] specify additional parameters such as output file, authentication, and recursive download options, and [URL] is the location of the file you want to download.

Some examples of WGET usage can be:

```
# RETRIEVE CEEDCV Home page
wget https://portal.edu.gva.es/ceedcv/es/inicio/
```

Or:

```
# RETRIEVE CEEDCV whole Webpage
wget --recursive https://portal.edu.gva.es/ceedcv/es/inicio/
```

Which will recursively download the entire CEED website, including all subdirectories and files.

3. DIG

dig (short for "domain information groper") is a command-line tool used to query DNS (Domain Name System) servers to retrieve information about domain names, IP addresses, and other DNS-related information.

Dig is a powerful tool that can be used for troubleshooting DNS-related issues, verifying DNS configurations, and obtaining detailed DNS records for a given domain name. It supports various types of DNS queries, including A records, MX records, CNAME records, and more.

The basic syntax for using dig is:

```
dig [options] [domain name]
```

where [options] specify additional parameters such as the type of DNS query and the DNS server to query (if different from the default), and [domain name] is the name of the domain you want to query.

An example of usage of dig can be:

```
dig www.google.es
```

4. RSYNC

Rsync (short for "remote synchronization") is a command-line tool used for transferring and synchronizing files and directories between two different locations, either locally or over a network.

Rsync is a can perform incremental backups, meaning that it only transfers the changes made to the files since the last synchronization. This makes it ideal for transferring large files or directories with a high degree of efficiency and minimizing the amount of data that needs to be transferred. That's the feature that makes it really useful, because is constantly watching the changes on files and updating their copies.

Rsync supports a wide range of options and features, including compression, encryption, and synchronization over SSH (Secure Shell) connections. It also supports both one-way and two-way synchronization, allowing you to update files and directories in both directions.

The basic syntax for using rsync is:

```
rsync [options] [source] [destination]
```

where [options] specify additional parameters such as compression and encryption options, [source] is the location of the files or directories to transfer, and [destination] is the location where the files or directories will be transferred.

Some example of it could be:

```
rsync /home/user/backups /home/user2/backupscopy
```