



LEIDEN UNIVERSITY MEDICAL CENTER

# Installing and updating software

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## *Updating*

First of all, run the update command to make sure we download the latest versions.

```
1 $ sudo apt-get update
```

Listing 1 : Retrieve version information.

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Once we know what can be upgraded, we can choose to upgrade all packages at once.

```
1 $ sudo apt-get upgrade
```

Listing 2 : Upgrade to the newest version.

## *Small packages*

In many cases, the package name is equal to the command we want to use:

First we install a program called “**sl**”.

```
1  $ sudo apt-get install sl
2  $ sl
```

Listing 3 : Insatllation of “sl”.

## *Searching for packages*

If we want to search for all packages that have anything to do with “alignment”:

```

1  $ apt-cache search alignment
2  bwa                - Burrows-Wheeler Aligner
3  samtools           - processing sequence alignments in SAM
4                      and BAM formats
5  seaview            - Multiple sequence alignment editor
6  sigma-align        - Simple greedy multiple alignment of
7                      non-coding DNA sequences
8  sim4               - tool for aligning cDNA and genomic DNA
9  wise               - comparison of biopolymers, commonly
10                      DNA and protein sequences
11  ...

```

Listing 4 : Searching packages.

## *Searching package content*

Suppose we know a command, but we do not know which package to install:

```
1 $ apt-cache search fastclip
```

Listing 5 : Failing installation.

This will return nothing (unlike our “**s1**” example).

## *Searching package content*

Get a list of packages that provide the file “**exonerate**”.

```
1  $ apt-file update
2  $ apt-file search fastaclip
3  exonerate: /usr/bin/fastaclip
```

Listing 6 : Search package content.

## *Searching package content*

Get a list of packages that provide the file “**exonerate**”.

```
1  $ apt-file update
2  $ apt-file search fastaclip
3  exonerate: /usr/bin/fastaclip
```

Listing 6 : Search package content.

Now we can install the package.

```
1  $ sudo apt-get install exonerate
```

Listing 7 : Install the right package.



## *Why manual installation?*

Reasons for manual installation:

- There is no package available.
- We want the latest (development) version.
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So, we essentially do the same as we do for Windows.

- Download an *archive* from the internet.
- Extract the content.

## *Archives*

Commonly used archiving programs:

- **tar** in combination with **gzip** or **bzip2**.
- **zip**.

Zip is commonly used for Windows and is easy to use for Linux.

```
1 $ unzip archivename.zip
```

Listing 8 : Unpack a zip archive.

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```
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```

Listing 8 : Unpack a zip archive.

```
1 $ zip -r archivename.zip directoryname
```

Listing 9 : Create a zip archive.

The option **-r** stands for *recursive*.

## *Archives*

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## Archives

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Method	Extension	Alternative
Gzip	<code>.tar.gz</code>	<code>.tgz</code>
Bzip2	<code>.tar.bz2</code>	

Table 1 : Extensions of compressed tar archives.

## *Archives*

Commonly used options for `tar`:

Option	Description
<code>-x</code>	Extract.
<code>-c</code>	Create.
<code>-z</code>	Use the <b>gzip</b> compression utility.
<code>-j</code>	Use the <b>bzip2</b> compression utility.
<code>-v</code>	Be verbose.
<code>-f &lt;filename&gt;</code>	The name of the archive.

Table 2 : Commonly used Tar options.



## *Example extraction*

Extraction of a `tar.gz` file (`tar` compressed with `gzip`):

```
1 $ tar -xzf myarchive.tar.gz
```

Listing 10 : Extract a compressed archive.

## *Example extraction*

Extraction of a **tar.gz** file (**tar** compressed with **gzip**):

```
1 $ tar -xzf myarchive.tar.gz
```

Listing 10 : Extract a compressed archive.

Creation of a **tar.gz** file (**tar** compressed with **gzip**):

```
1 $ tar -czvf myarchive.tar.gz directoryname
```

Listing 11 : Create a compressed archive.

## *Example extraction*

Extraction of a `tar.bz2` file (`tar` compressed with `bzip2`):

```
1 $ tar -xjvf myarchive.tar.bz2
```

Listing 12 : Extract a compressed archive.

## *Example extraction*

Extraction of a **tar.bz2** file (**tar** compressed with **bzip2**):

```
1 $ tar -xjvf myarchive.tar.bz2
```

Listing 12 : Extract a compressed archive.

Creation of a **tar.bz2** file (**tar** compressed with **bzip2**):

```
1 $ tar -cjvf myarchive.tar.bz2 directoryname
```

Listing 13 : Create a compressed archive.

## *Installing software: Manual installation*

If there are no *executables* available, we have to make them ourselves.

- Go to the Bowtie website.
- Click on the link in the “latest release” section.
- Click on the link that ends with **.src.zip**.
- Choose “save file”.
- Open a terminal.

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```

1  $ unzip bowtie-<version>-src.zip
2  $ cd bowtie-<version>
3  $ make
4  $ ./bowtie -h

```

Listing 14 : Compiling bowtie from source.

*About this part of the course*

- We are not going to cover the “easy” part (browsing the internet, sending mail, playing music, ...).
- We focus on the *command line*, since this is the most powerful interface to the tools we need.
- We are going to connect to other machines (servers that have more memory or computing power).



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<https://humgenprojects.lumc.nl/trac/humgenprojects/wiki/NGS-intro>