

# Hands-on Lab: Scheduling Jobs using crontab



Estimated time needed: **20** minutes

## Objectives

After completing this lab you will be able to:

- List existing cron jobs
- Add a cron job
- Remove cron jobs

## About Skills Network Cloud IDE

Skills Network Cloud IDE (based on Theia and Docker) provides an environment for hands on labs for course and project related labs. Theia is an open source IDE (Integrated Development Environment), that can be run on desktop or on the cloud. To complete this lab, we will be using the Cloud IDE based on Theia running in a Docker container.

## Important Notice about this lab environment

Please be aware that sessions for this lab environment are not persisted. Every time you connect to this lab, a new environment is created for you. Any data you may have saved in the earlier session would get lost. Plan to complete these labs in a single session, to avoid losing your data.

## Exercise 1 - Understand crontab file syntax

**Cron** is a system daemon used to execute desired tasks in the background at designated times.

A crontab file is a simple text file containing a list of commands meant to be run at specified times. It is edited using the `crontab` command.

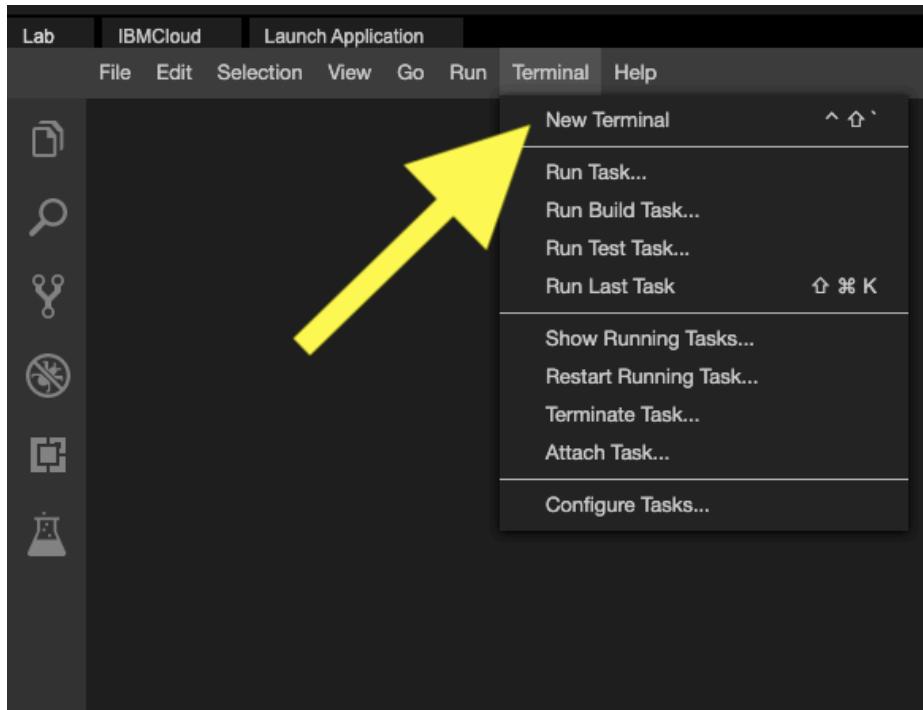
Each line in a crontab file has five time-and-date fields, followed by a command, followed by a newline character (`\n`). The fields are separated by spaces.

The five time-and-date fields cannot contain spaces and their allowed values are as follows:

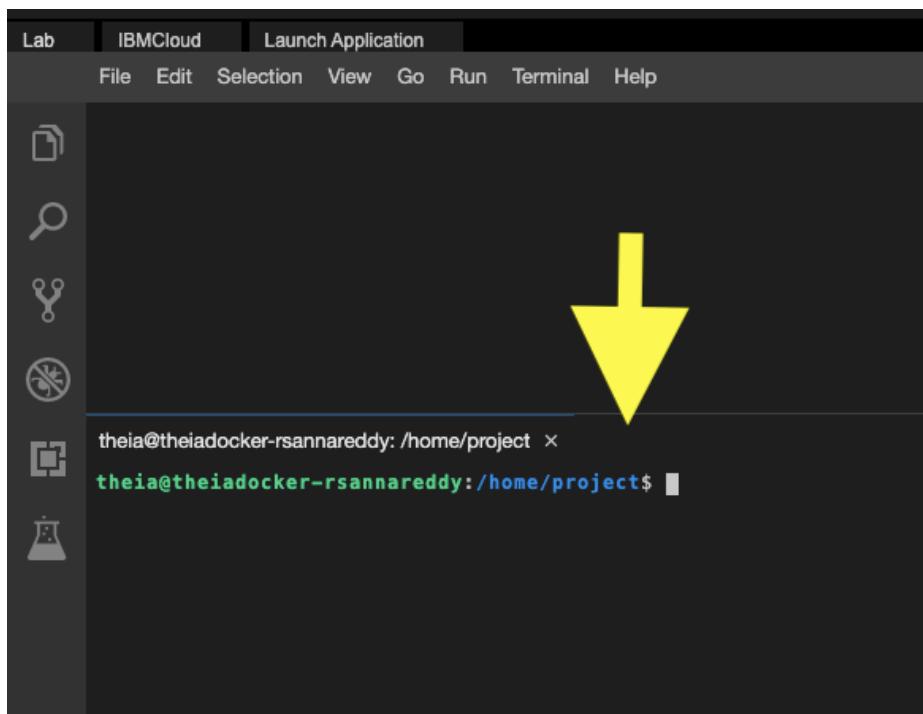
Field	Allowed values
minute	0-59
hour	0-23, 0 = midnight
day	1-31
month	1-12
weekday	0-6, 0 = Sunday

## Exercise 2 - List cron jobs

Open a new terminal, by clicking on the menu bar and selecting **Terminal->New Terminal**, as in the image below.



This will open a new terminal at the bottom of the screen as in the image below.



Run the commands below on the newly opened terminal.

The `-l` option of the `crontab` command prints the current crontab.

```
crontab -l
```

You may get a message `no crontab for theia` if your crontab is empty.

## Exercise 3 - Add a job in the crontab file

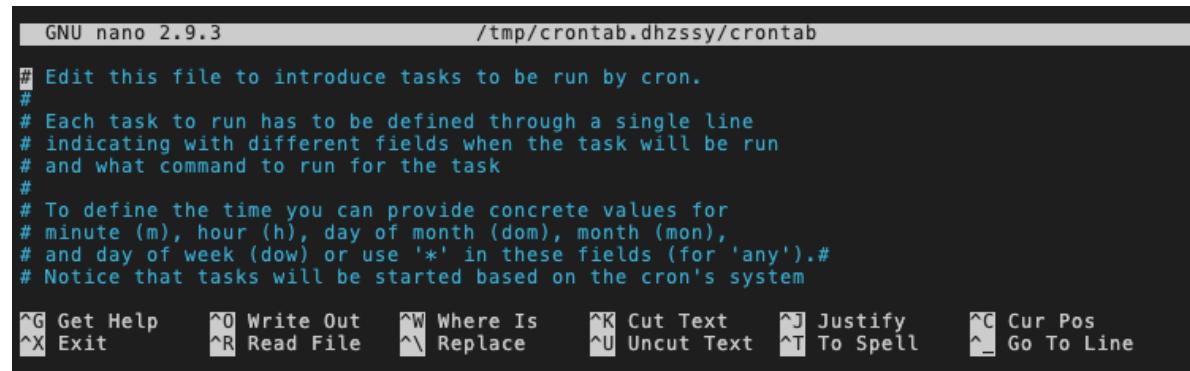
### 3.1. Add a job to crontab

To add a cron job, run the command below:

```
crontab -e
```

This will create a new crontab file for you (if you don't have one already). Now you are ready to add a new cron job.

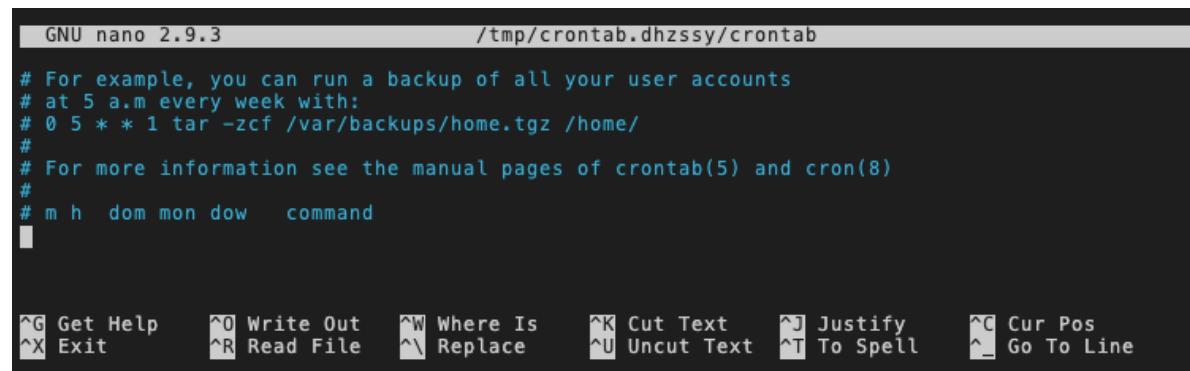
Your crontab file will be opened in an editor as shown in the image below:



The screenshot shows the nano 2.9.3 text editor interface. The title bar reads "GNU nano 2.9.3 /tmp/crontab.dhzssy/crontab". The main area contains the following text:

```
# Edit this file to introduce tasks to be run by cron.  
#  
# Each task to run has to be defined through a single line  
# indicating with different fields when the task will be run  
# and what command to run for the task  
#  
# To define the time you can provide concrete values for  
# minute (m), hour (h), day of month (dom), month (mon),  
# and day of week (dow) or use '*' in these fields (for 'any').#  
# Notice that tasks will be started based on the cron's system  
#  
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos  
^X Exit          ^R Read File   ^\ Replace      ^U Uncut Text   ^T To Spell    ^_ Go To Line
```

Scroll down to the end of the file using the arrow keys:



The screenshot shows the nano 2.9.3 text editor interface. The title bar reads "GNU nano 2.9.3 /tmp/crontab.dhzssy/crontab". The main area contains the following text:

```
# For example, you can run a backup of all your user accounts  
# at 5 a.m every week with:  
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/  
#  
# For more information see the manual pages of crontab(5) and cron(8)  
#  
# m h  dom mon dow   command  
  
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos  
^X Exit          ^R Read File   ^\ Replace      ^U Uncut Text   ^T To Spell    ^_ Go To Line
```

Add the below line at the end of the crontab file:

```
0 21 * * * echo "Welcome to cron" >> /tmp/echo.txt
```

```
GNU nano 2.9.3                               /tmp/crontab.sqvoQ6/crontab

# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command
0 21 * * * echo "Welcome to cron" >> /tmp/echo.txt
```

**^G Get Help      ^O Write Out      ^W Where Is      ^K Cut Text      ^J Justify      ^C Cur Pos  
^X Exit      ^R Read File      ^\ Replace      ^U Uncut Text      ^T To Spell      ^\_ Go To Line**

The above job specifies that the echo command should run when the minute is 0 and the hour is 21. It effectively means the job runs at 9.00 p.m every day.

The output of the command should be sent to a file /tmp/echo.txt.

Press **Ctrl + x** to save the changes.

Press **y** to confirm.

```
GNU nano 2.9.3                               /tmp/crontab.sqvoQ6/crontab

# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command
0 21 * * * echo "Welcome to cron" >> /tmp/echo.txt
```

Save modified buffer? (Answering "No" will DISCARD changes.)  
**Y Yes**  
**N No**      **^C Cancel**

Press Enter to come out of the editor.

Check if the job is added to the crontab by running the following command.

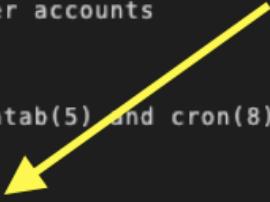
```
crontab -l
```

You should see the newly added job in the output.

```

# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h dom mon dow   command
0 21 * * * echo "Welcome to cron" >> /tmp/echo.txt
theia@theiadocker-rsannareddy:/home/project$ █

```



### 3.2. Schedule a shell script

Let us create a simple shell script that prints the current time and the current disk usage statistics.

Step 1: On the menu on the lab screen, use **File->New File** to create a new file:

Step 2: Give the file name as `diskusage.sh` and click 'OK'

Step 3: Save the following commands into the shell script:

```

#!/bin/bash
# print the current date time
date
# print the disk free statistics
df -h

```

Step 4: Save the file using the **File->Save** menu option.

Step 5: Verify that the script is working:

```

chmod u+x diskusage.sh
./diskusage.sh

```

The script should print the current timestamp and the disk usage stats.

Let us schedule this script to be run everyday at midnight 12:00 (when the hour is 0 on the 24 hour clock). We want the output of this script to be appended to `/home/project/diskusage.log`.

Edit the crontab:

```
crontab -e
```

Add the following line to the end of the file:

```
0 0 * * * /home/project/diskusage.sh >>/home/project/diskusage.log
```

Press **Ctrl + x** to save the changes.

Press **y** to confirm.

Press **Enter** to come out of the editor.

Check if the job is added to the crontab by running the following command:

```
crontab -l
```

You should see the newly added job in the output.

## Exercise 4 - Remove the current crontab

The **-r** option causes the current crontab to be removed.

**Caution:** This removes all your cron jobs. Be extra cautious when you use this command on a production server.

```
crontab -r
```

Verify if your crontab is removed:

```
crontab -l
```

## Practice exercises

**1. Create a cron job that runs the task `date >> /tmp/everymin.txt` every minute.**

- ▶ [Click here for Hint](#)
- ▶ [Click here for Solution](#)

## Summary

In this lab, you learned how to:

- List cron jobs using `crontab -l`
- Add cron jobs using `crontab -e`
- Remove your current crontab using `crontab -r`

## Authors

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