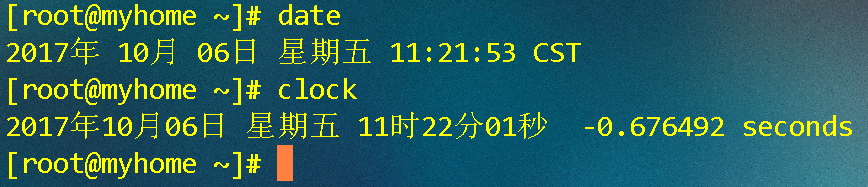
# Time and Date

## How to operate time and date on Linux?

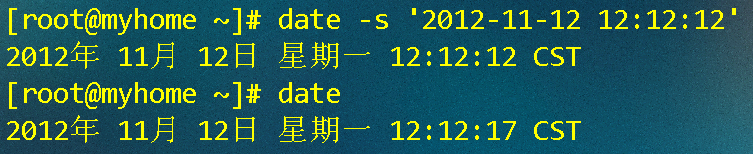
System has two clock on computer. One of them is RTC-Real Time Clock, which is based BIOS and mainboard, it will record real time while we shuted down computer. Another is System Clock, which is based CPU Tick, depending on Linux Kernel, it’s over when we shut down the system, in that case, it will read RTC time when we restart system. But the question is CPU Tick will be a little slower or faster than RTC Clock, so we need to sync time from RTC to System Clock.

System Clock represents time that is from 1970.1.1 0:00:00 to now , the total seconds will be calculated. By default, System Clock will not auto-sync with RTC Clock, so we have to sync them by ourself.

NTP –network time protocol, is a network protocol for clock synchronization between CPU clock and RTC clock. NTP is one of the oldest network protocol in the world, this protocol is described client-to-client model, but also used to peer-to-peer relationship. Implemention send and receive using UDP protocol or port 123. Command “ntpd” and “ntpdate” are used to sync time on Linux, so following words will study these commands.

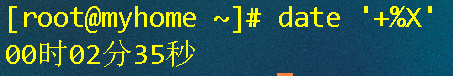
Command “date” is used to check System Clock, Command “clock” is used to check RTC Clock. 

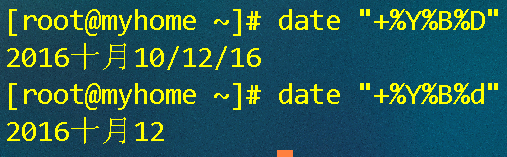
## Command: date

-s string: set date by string, format like “%Y%D%T…”

Common format: %H– hour, %M- minute, %X- equal to %H%M%S, %A- weekend, %B- month, %D- date/month/year, %d- date, %Y- year, %W- week in year, %j- day in year

Note: you have to use “+” to display date and time, if not, it means set date in some format.



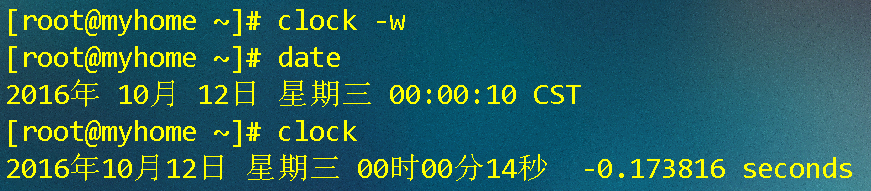


## Command: clock

Clock(hwclock): set or display hardware time , it’s a tool for hardware clock. You could use this command to set hardware time to system time, and vise verse.

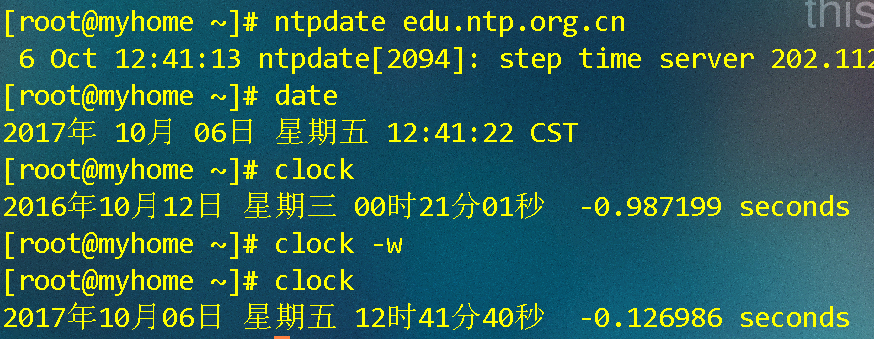
-r: show hardware time, this is default

-s: set system clock from hardware clock

-w: set hardware clock from system clock

## Command: Ntpdate + crood

This command sync system time from server, don’t use this command always, because it will interrupt other program, especially program need constant time.



there are some common time server list

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| |  |  |  | | --- | --- | --- | | 中国[China] | cn.ntp.org.cn | [58.220.207.226](本节点由\*[方糖科技](http://www.sugar-inc.cn/)\*赞助), [202.112.29.82] [202.108.6.95] [120.25.108.11] [182.92.12.11] [115.28.122.198] | | 中国教育网[China-EDU] | edu.ntp.org.cn | [202.112.31.197][202.112.29.82][202.118.1.130][202.118.1.81] (所有节点由\*[东北大学提供](http://ntp.neu.edu.cn/)\*赞助) | | 中国台湾[ChinaTaiwan] | tw.ntp.org.cn | [123.204.45.116] [103.18.128.60] | | 美国[America] | us.ntp.org.cn | [24.56.178.140] [216.218.254.202] [208.53.158.34] [66.228.42.59] | | 新加坡[Singapore] | sgp.ntp.org.cn | [103.11.143.248] [202.73.57.107] [128.199.134.40] [218.186.3.36] [188.166.245.58] | | 韩国[korea] | kr.ntp.org.cn | [211.233.40.78] [106.247.248.106] | | 德国[Germany] | de.ntp.org.cn | [131.188.3.220] [131.188.3.223] | | 日本[Japan] | jp.ntp.org.cn | [133.100.11.8] [106.187.100.179] [129.250.35.251] | |

Next, set “crood” to auto-update time every day

## Command: ntpd

Ntpd server has a auto-protest function, if the system time is far away from origin server time ,ntpd would not perform. So the best way is that start ntpdate server to update system time, and then perform ntpd server, it will sync time from system every 64 seconds, and adopt itself time slowly; each time ticks, ntpd will repeat this process.

Configuraion about linux time server and sync time and date , it will be a big job , time to future

## How to sync time and date from server on linux?

Use command “ntpdate” to sync time , but it will be used since system start, otherwise, use command “nptd” to sync time , “ntpd” is slowly to adjust time rather than “ntpdate” will modify time right now in that case ignoring all program and status on system , it endangers ,so don’t use “ntpdate” always. The best way is that use “ntpdate+crod” when system started, and use “ntpd” in other case.

## How to sync system time from RTC time on linux?

Use “clock -w” could sync system time from RTC time, and use “clock –u ” could sync RTC time from sync system time.