Class 5 - Understanding the kickstart file[[1]](#footnote-0)

The Red Hat **Kickstart** installation method[[1]](https://en.wikipedia.org/wiki/Kickstart_(Linux)#cite_note-Anaconda/Kickstart_definition_from_the_Fedora_project-1) is used primarily (but not exclusively) by the Red Hat Enterprise Linux operating system to automatically perform unattended operating system installation and configuration. Red Hat publishes [**Cobbler**](https://en.wikipedia.org/wiki/Cobbler_(software))as a tool to automate the Kickstart configuration process.

Kickstart is normally used at sites with many such Linux systems, to allow easy installation[[2]](https://en.wikipedia.org/wiki/Kickstart_(Linux)#cite_note-Complete_Kickstart:_How_to_Save_Time_Installing_Linux-2) and consistent configuration of new computer systems.

Kickstart configuration files can be built three ways:

1. By hand.
2. By using the GUI system-config-kickstart tool.
3. By using the standard Red Hat installation program [**Anaconda**](https://en.wikipedia.org/wiki/Anaconda_(installer))**.**

Anaconda will produce an anaconda-ks.cfg configuration file at the end of any manual installation. This file can be used to automatically reproduce the same installation or edited (manually or with system-config-kickstart).[[2]](#footnote-1)

First, be aware of the following issues when you are creating your kickstart file:

* While not strictly required, there is a natural order for sections that should be followed. Items within the sections do not have to be in a specific order unless otherwise noted. The section order is:
  1. Command section – You must include the required options.
  2. The %packages section
  3. The %pre, %pre-install, %post, %onerror, and %traceback sections – These sections can be in any order and are not required.
  4. The %packages, %pre, %pre-install, %post, %onerror, and %traceback sections are all required to be closed with %end
* Omitting any required item will result in the installation program prompting the user for an answer to the related item, just as the user would be prompted during a typical installation. Once the answer is given, the installation will continue unattended unless it finds another missing item.
* One installation source command from the list of commands in the method proxy command must be specified for the fully automated kickstart installation. This is required even for Fedora – the closest mirror can’t be chosen by the kickstart file.
* Lines starting with a pound sign (#) are treated as comments and are ignored.

The kickstart file may appear long and complicated, but it is not so complicated when looked at in sections. Trial and error installation is a fine way to work toward the kickstart file that will serve your purposes best. I do not memorize the sections nor the commands in the file. I look up parameters when I want a particular functionality at installation time.

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| With a basic understanding of the kickstart file and the power of its final section to install packages, download and run scripts, modify files, etc; you could do various things such as:  Change the package configuration to install machines with very different functionality. For example:   * A web server * A Database server * A GUI workstation for interactive work * A Cobbler server   The overall objective to install and configure a machine as automatically as possible.  Think about using kickstart to automatically re-create your Cobbler server. |

Command section of the kickstart file:

The first section of the kickstart contains a series of commands to direct the process. There are a large number of available commands that can be included in this section. You can see full list of commands and their usage in the [official kickstart documentation.](http://pykickstart.readthedocs.io/en/latest/kickstart-docs.html#chapter-3-kickstart-commands-in-red-hat-enterprise-linux)

The kickstart file used in the class contains the commands. These commands can appear in any order in this section.

* **install** - Declares that this is an installation. There are other types such as update.
* **text** - Do the installation in text mode not GUI mode
* **firstboot --disable** - Do run the first boot script to prompt the user for initialization information the first time the machine is booted
* **keyboard 'us'** - Set the keyboard type and layout to the ‘us’ style.
* **rootpw** --isencrypted **password** - Set the root password and tell kickstart that the **password** supplied is in an encrypted format. The default option is --plaintext..
* **user** - Create a user account. There are many options. We are using the basic:
  + user **--groups**=wheel,student **--name**=student **--password**=Password **--iscrypted** --gecos="Student"
  + The GECOS field is information about the account.  
    For example:

--gecos=”Douglas Johnson (University of Colorado)”

* **lang** - Set the system default language
* **firewall** - Manipulate the firewall settings.
  + We simply disable it for ease of installation and configuration. In a production system we would not disable the firewall.
* **auth --enableshadow --passalgo=sha512 -** Defines where the passwords are stored and how theyare encrypted.
  + --enableshadow means use /etc/shadow to stores passwords. This file is only readable by root.
  + sha512 is an encryption algorithm
* **selinux --disabled** - Disable SELINUX
* **url --url=$tree** - Defines location (source) of the installation media. This particular value ($tree) is a keyword for Cobbler which means get the installation media source infromation from the system definition. In our case, this is the media that was imported using “cobbler import”. There are many other methods to get the installation media.
* **network** - Configure the network
* **reboot** - Reboot the machine when the installation is complete.
* **timezone Asia/Jerusalem** - Set the time zone.
* **autopart --type=lvm** - Defines how the system drive will be partitioned. We are using the default with a **Logical Volume** (lvm). Later we will specifically identify the drive and design a partition/file system layout.
* **clearpart --all --initlabel --drives=sda** - Use the drive known as /dev/sda and clear the boot sector and partition table,
* **services --enabled="chronyd"** - Enables the ssystem service (daemon) to run when the computer starts. This process chronyd is used to keep the system clock(time) very well synchronized using the Internet.

Below is the text from the kickstart file that we are using.

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| Please: Do not try to memorize the contents of the kickstart file |

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| # Kickstart file create: Tue Mar 6 07:32:48 MST 2018 for htcXXX.najah.edu  # platform=x86, AMD64, or Intel EM64T  # version=DEVEL  #------------------------------------------------------------------------  # Install OS instead of upgrade  #  install  #------------------------------------------------------------------------  # Keyboard layout  #  keyboard 'us'  #------------------------------------------------------------------------  # Root password:  # openssl passwd -1  # IMPORTANT: Encrypted password DOES NOT have quotes  rootpw --iscrypted You\_Must\_Put\_Encrypted\_Password\_Here  #  #------------------------------------------------------------------------  # Create the student account  # IMPORTANT: Encrypted password DOES NOT have quotes  #  user --groups=wheel,student --name=student --password=You\_Must\_Put\_Encrypted\_Password\_Here --iscrypted --gecos="Student"  #  #------------------------------------------------------------------------  # System language  #  lang en\_US  #------------------------------------------------------------------------  # Firewall configuration  #  firewall --disabled  #  #------------------------------------------------------------------------  # System authorization information  #  auth --enableshadow --passalgo=sha512  #  #------------------------------------------------------------------------  # Use text mode install  #  text  firstboot --disable  #  #------------------------------------------------------------------------  # SELinux configuration  #  selinux --disabled  #  #------------------------------------------------------------------------  # Installation media:  #  # This is a Cobbler specific directive  # See: Creating Profiles at https://www.ibm.com/developerworks/library/l-cobbler/  # Lots of details: http://cheetahtemplate.org/  # The souce for Cobbler is a special directive that Cobbler will fill in from the definition for this host  #  url --url=$tree  #  #------------------------------------------------------------------------  # Network information  #  # Replace the values in the line below with the ones for your client  #  network --bootproto=static --gateway=GATEWAY --ip=IP\_ADDRESS --nameserver=DNS\_NAMESERVER --netmask=NETMASK --hostname=HOSTNAME --noipv6  #  #------------------------------------------------------------------------  # Reboot after installation  #  reboot  #  #------------------------------------------------------------------------  # System timezone  #  timezone Asia/Jerusalem  #------------------------------------------------------------------------  # System bootloader configuration  #  bootloader --append=" crashkernel=auto" --location=mbr --boot-drive=sda  #------------------------------------------------------------------------  # Partition clearing information  autopart --type=lvm  clearpart --all --initlabel --drives=sda  #------------------------------------------------------------------------  # System services  #  services --enabled="chronyd" |

The packages section:

This section starts with the directive **%packages** and ends with the directive **%end.**

The lines define specific packages or groups of packages that are installed during the installation. The **@** symbol at the beginning of the line indicates a group of packages. For example **@core** is a collection of packages that create the minimal **installation**. You can try running the following command to see a list of **package groups:**

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| yum group list |

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| Warning: The list of packages printed out above are not always referenced by the same name during the kickstart installation. |

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| If you want to install a package group, it must be enclosed in quotes on the command line:  yum group install 'PHP Support' |

Once you are able to run Cobbler install, you should play with installing different packages both at the command line and by using kickstart.

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| How would install all the packages that make up your GUI Cobbler Server using kickstart? |

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| %packages  @core  chrony  kexec-tools  %end |

Password policy section:

This section defines the policy for passwords on the system for particular accounts and/or groups of account. We use the policy for all accounts.

* **minlen -** The minimum length of a password
* **minquality -** A quality or strength check for the password
* **notstricy**
* **nochanges**
* **notemp**y - You can not have an empty password

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| #------------------------------------------------------------------------  # Define password policies for the system  # See: https://anaconda-installer.readthedocs.io/en/latest/  # https://anaconda-installer.readthedocs.io/en/latest/kickstart.html  #  %anaconda  pwpolicy root --minlen=6 --minquality=50 --notstrict --nochanges --notempty  pwpolicy user --minlen=6 --minquality=50 --notstrict --nochanges --notempty  pwpolicy luks --minlen=6 --minquality=50 --notstrict --nochanges --notempty  %end |

Post Installation commands:

The commands in this section are run after the installation has finished but before the machine reboots. All the commands that we used to “**bootstrap**” the machine can be done **automatically** at **installation time**. You can use almost any command that you would use on the command after the machine reboots to configure the machine **automatically**.

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| This is a very powerful section for configuring a machine during installation. |

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| #-----------------------------------------------------------------------------------  # Post installation commands  # After the installation completes, run these commands  # This looks a lot like how we set up the first machine  #  %post --log=/root/ks-post.log  curl -o /etc/hosts http://172.16.9.180/software/AnNajah-Files/hosts  curl -o /root/bootstrap.tar.gz <http://htc180.najah.edu/software/bootstrape/bootstrap.tar.gz>  curl -o /root/cobbler-files.tar.gz http://htc180.najah.edu/software/bootstrape/cobbler-files.tar.gz  mkdir -p /root/install/startup  tar -C /root/install -xzvf /root/bootstrap.tar.gz  tar -C /root/install -xzvf /root/cobbler-files.tar.gz  /root/install/startup/InstallRepos  /root/install/startup/InstallPackages  yum clean all  yum y update  #  # Make sure that the ssh port is open on the firewall  #  firewall-cmd --add-port=22/tcp --permanent  #  # Turn off selinux  # You did this by editing the file  # This is how you can do it from the command line  #  /usr/bin/sed s/SELINUX=enforcing/SELINUX=disabled/ /etc/selinux/config > /tmp/config; mv /tmp/config /etc/selinux/config  #  # Install lsb - Linux Standard Base  # See: https://en.wikipedia.org/wiki/Linux\_Standard\_Base  #  yum -y install \*lsb\* |

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| # This is a Cobbler specific directive  # See: Creating Profiles at https://www.ibm.com/developerworks/library/l-cobbler/  # Lots of details: http://cheetahtemplate.org/  #  $SNIPPET('kickstart\_done')  reboot  %end |

1. http://pykickstart.readthedocs.io/en/latest/kickstart-docs.html [↑](#footnote-ref-0)
2. https://en.wikipedia.org/wiki/Kickstart\_(Linux) [↑](#footnote-ref-1)