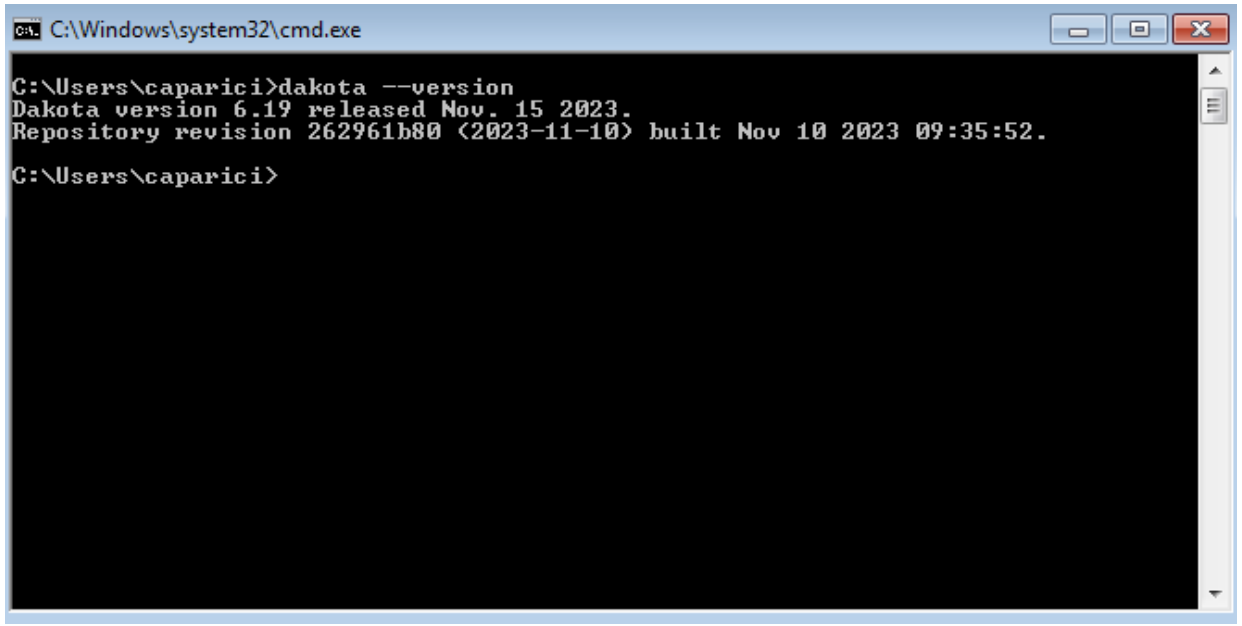
Workshop – Installing Sandia Dakota on Windows and Red Hat Linux 7

AN MSC NASTRAN UNCERTAINTY QUANTIFICATION TUTORIAL

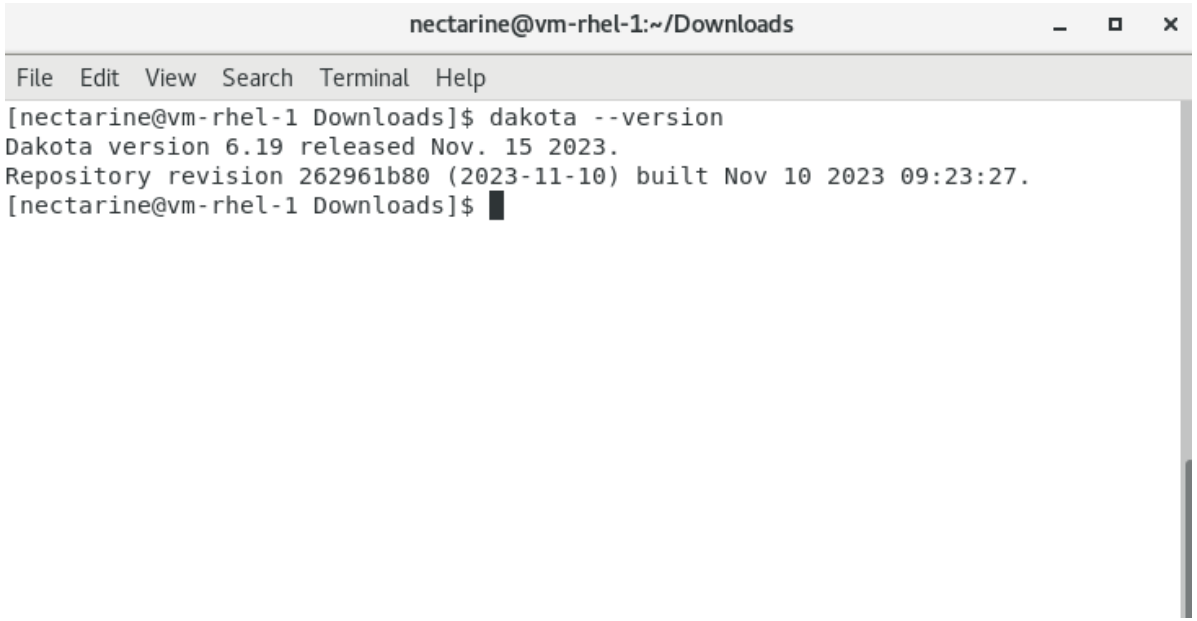
Questions? Email: christian@ the-engineering-lab.com

Goal: Install Sandia Dakota on Windows and Red Hat Linux 7

Windows



Red Hat Linux 7



Contact me

- Nastran SOL 200 training
- Nastran SOL 200 questions
- Structural or mechanical optimization questions
- Access to the SOL 200 Web App

christian@ the-engineering-lab.com

Tutorial

SOL 200 Web App Capabilities

The Post-processor Web App and HDF5 Explorer are free to MSC Nastran users.

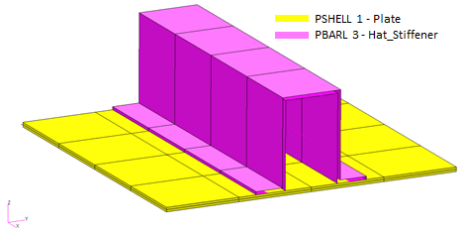
Compatibility

- Google Chrome, Mozilla Firefox or Microsoft Edge
- Windows and Red Hat Linux
- Installable on a company laptop, workstation or server. All data remains within your company.

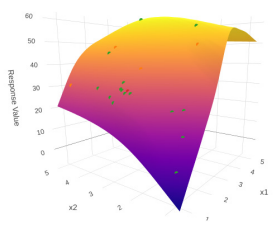
Benefits

- REAL TIME error detection. 200+ error validations.
- REALT TIME creation of bulk data entries.
- Web browser accessible
- Free Post-processor web apps
- +80 tutorials

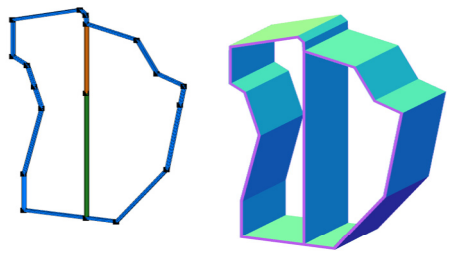
Web Apps



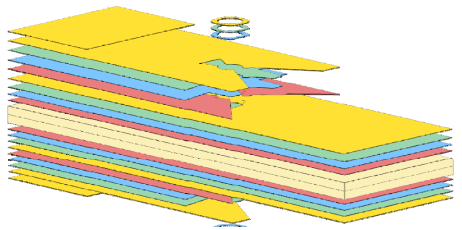
Web Apps for MSC Nastran SOL 200
Pre/post for MSC Nastran SOL 200. Support for size, topology, topometry, topography, multi-model optimization.



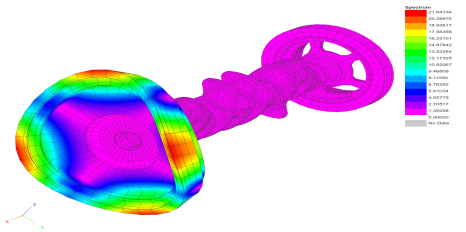
Machine Learning Web App
Bayesian Optimization for nonlinear response optimization (SOL 400)



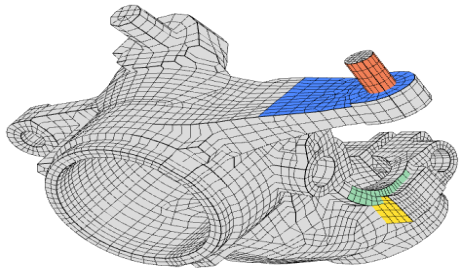
PBMSECT Web App
Generate PBMSECT and PBRSECT entries graphically



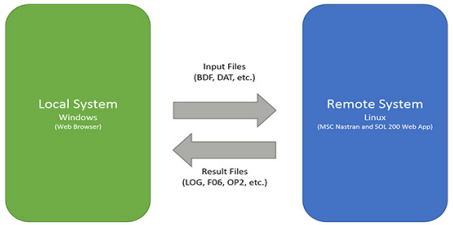
Ply Shape Optimization Web App
Optimize composite ply drop-off locations, and generate new PCOMPG entries



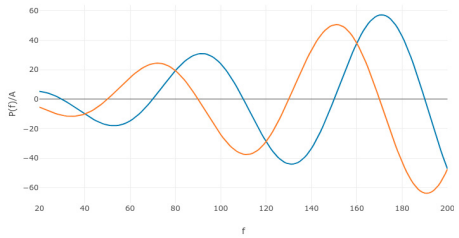
Post-processor Web App
View MSC Nastran results in a web browser on Windows and Linux



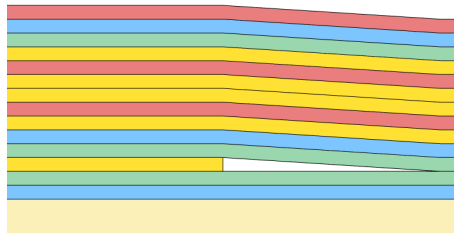
Shape Optimization Web App
Use a web application to configure and perform shape optimization.



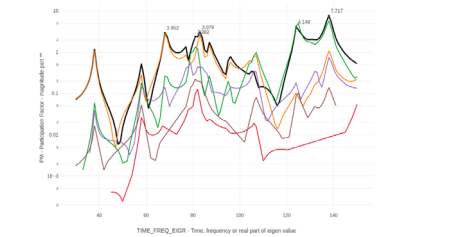
Remote Execution Web App
Run MSC Nastran jobs on remote Linux or Windows systems available on the local network



Dynamic Loads Web App
Generate RLOAD1, RLOAD2 and DLOAD entries graphically



Stacking Sequence Web App
Optimize the stacking sequence of composite laminate plies



HDF5 Explorer Web App
Create graphs (XY plots) using data from the H5 file

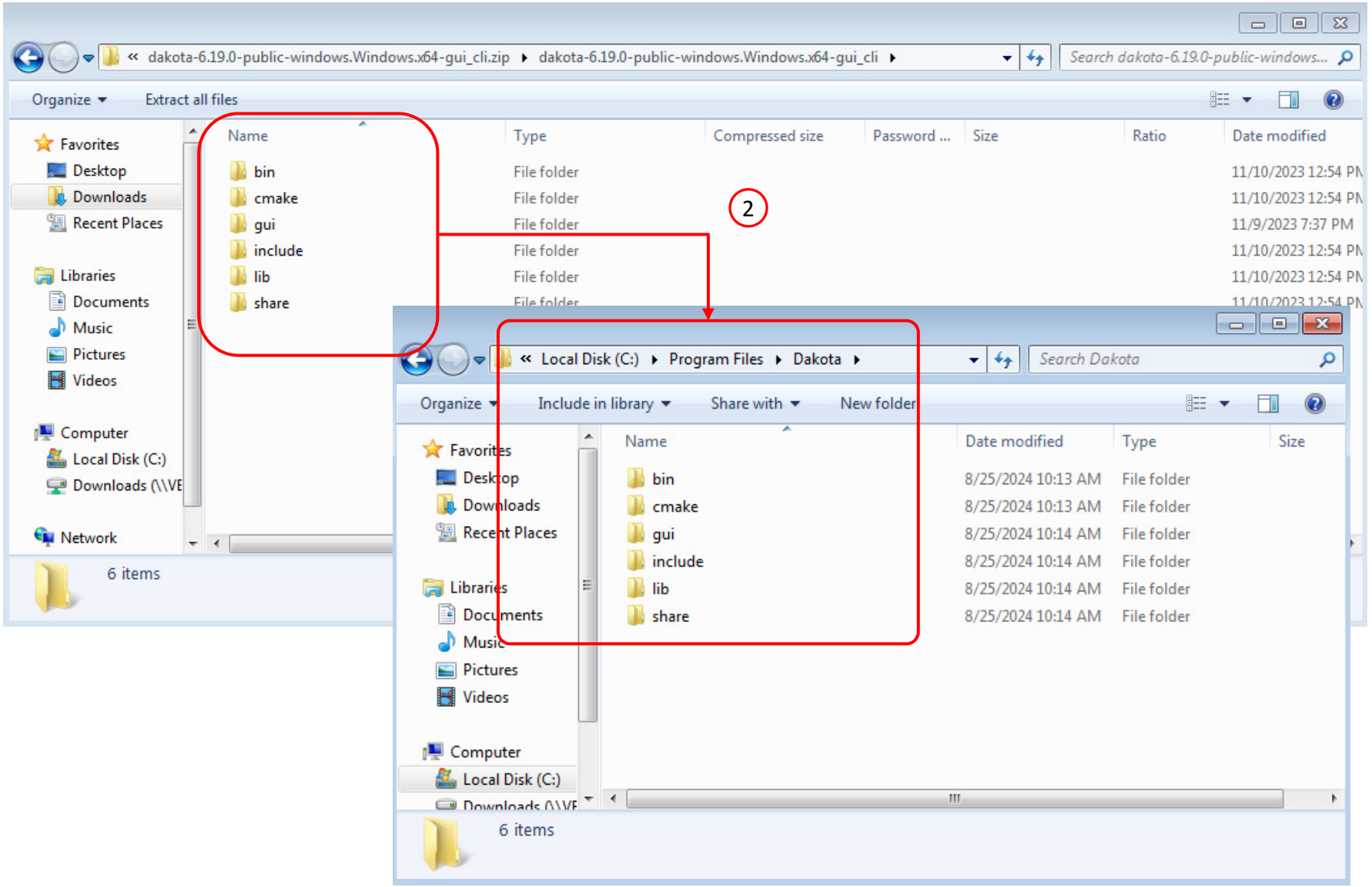
Installing Sandia Dakota on Windows

Download Dakota on Windows

1. Click the indicated link to download Dakota
2. Extract the contents of the ZIP file to: C:\Program Files\Dakota

- By default, the Windows operating system limits paths to 256 characters. The original file names are very long and may exceed the 256 character limit, so use a shorter path when possible, e.g. C:\Program Files\Dakota.

https://github.com/snl-dakota/dakota/releases/download/v6.19.0/dakota-6.19.0-public-windows.Windows.x64-gui_cli.zip (1)



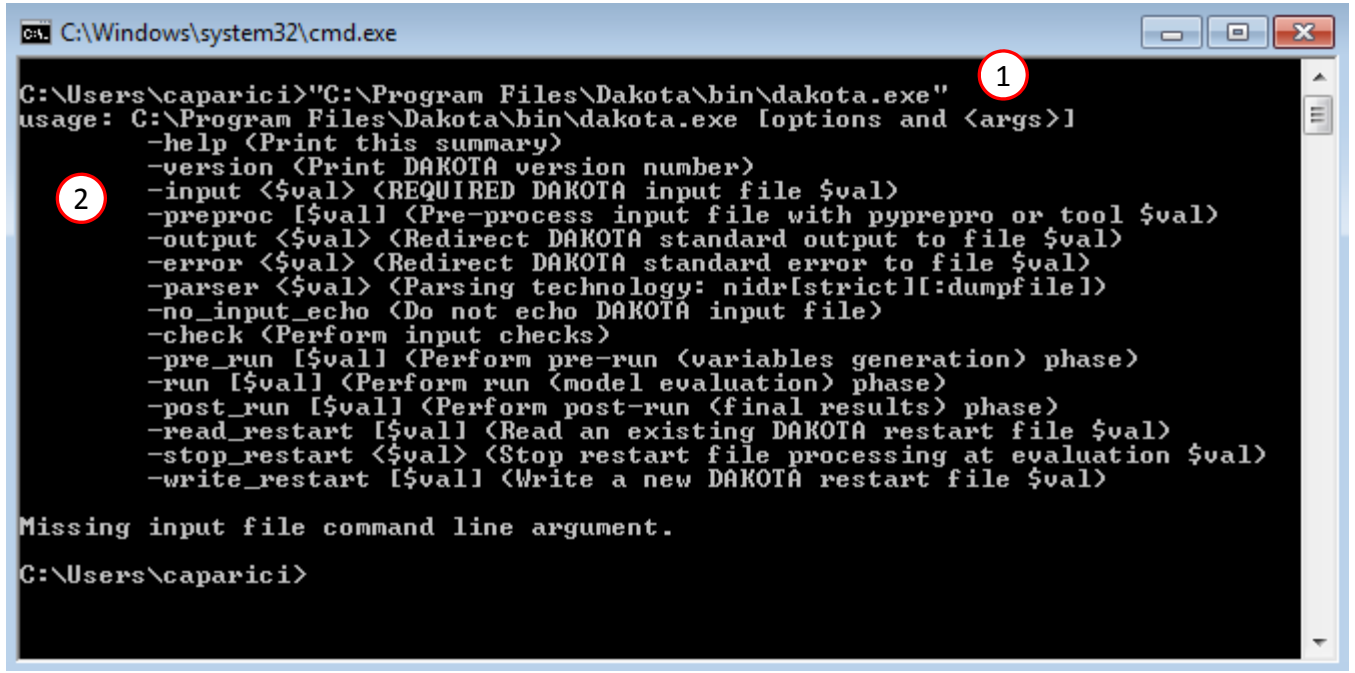
Test Dakota

1. Run this in the command prompt:

“C:\Program Files\Dakota\bin\dakota.exe“

2. Dakota is successfully configured if the output appears as shown, i.e. information regarding usage and options are displayed.

This is the end of installing Dakota on Windows.

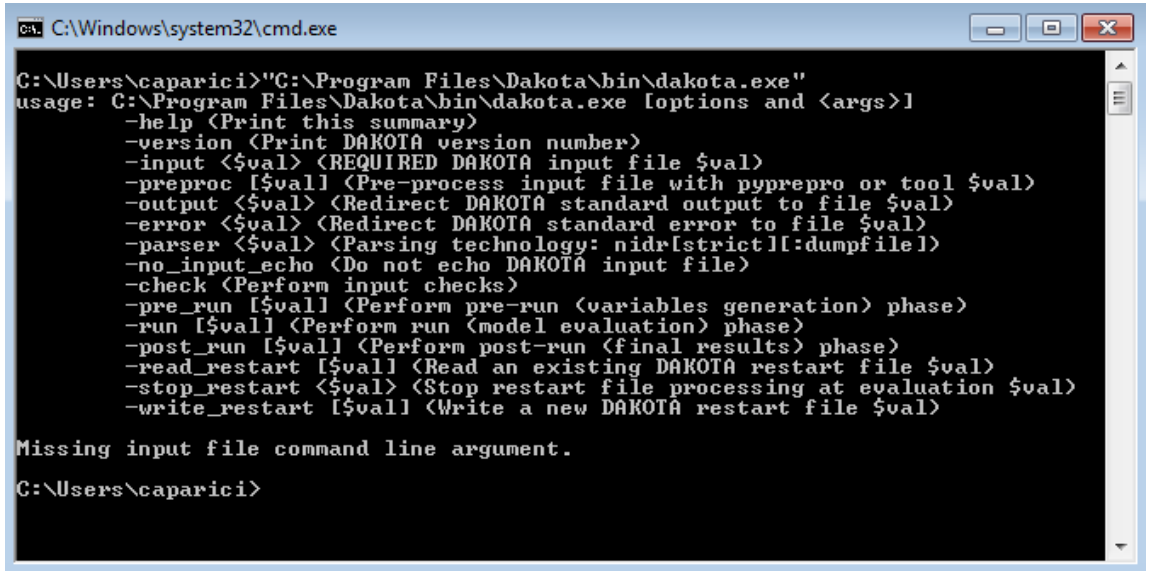


Comments

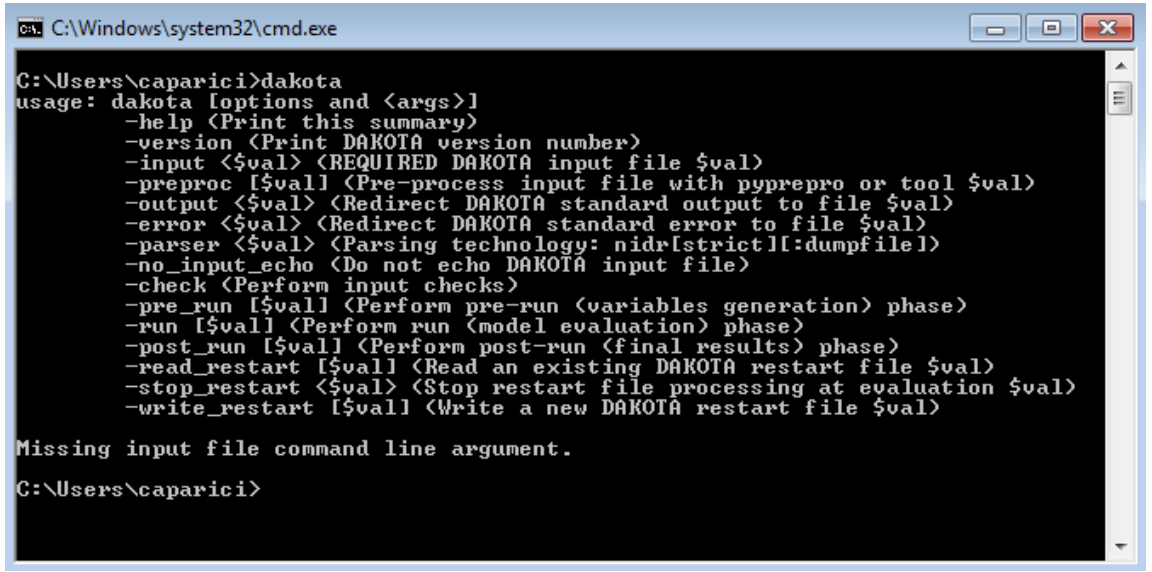
The SOL 200 Web App expects Dakota to be accessible in one of the following ways:

- "C:\Program Files\Dakota\bin\dakota.exe"
    - Dakota was placed in the default location C:\Program Files\Dakota\bin\
- dakota
    - The location of the dakota.exe file was added to the PATH environment variable.
    - The location of dakota.exe may be any non-default location

> "C:\Program Files\Dakota\bin\dakota.exe"



> dakota



Comments

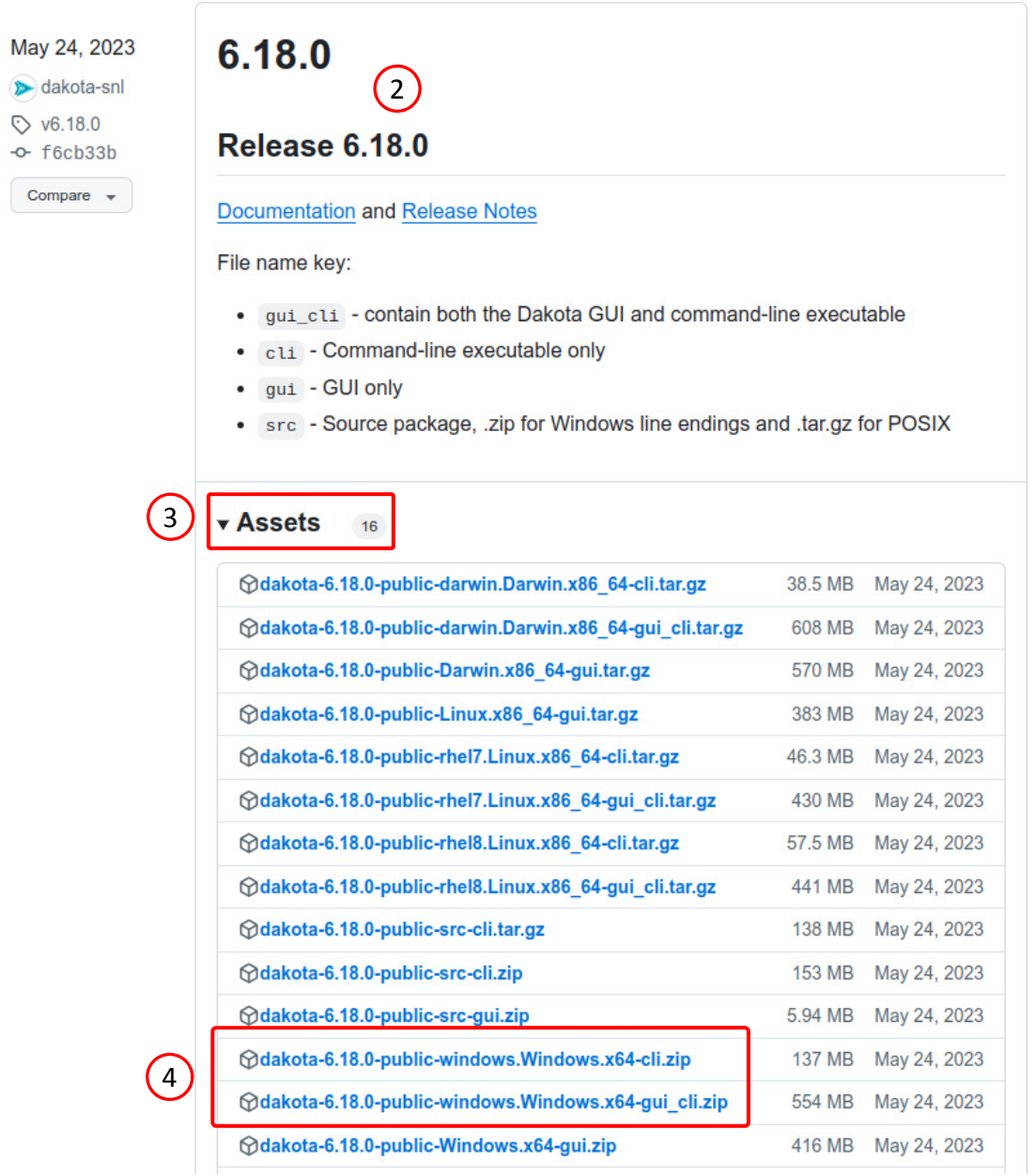
This exercise configured Dakota v6.19.0.

Other versions of Dakota may be installed.

1. Click the indicated link
2. Navigate to the version of interest
3. Click Assets
4. Download one of the files whose name contains the following strings
   - .zip
   - Windows
   - *cli* or *gui_cli*

One ZIP file is needed. The string *cli* indicates the ZIP file contains the Dakota solver. The string *gui* indicates the ZIP file contains the GUI.

https://github.com/snl-dakota/dakota/releases

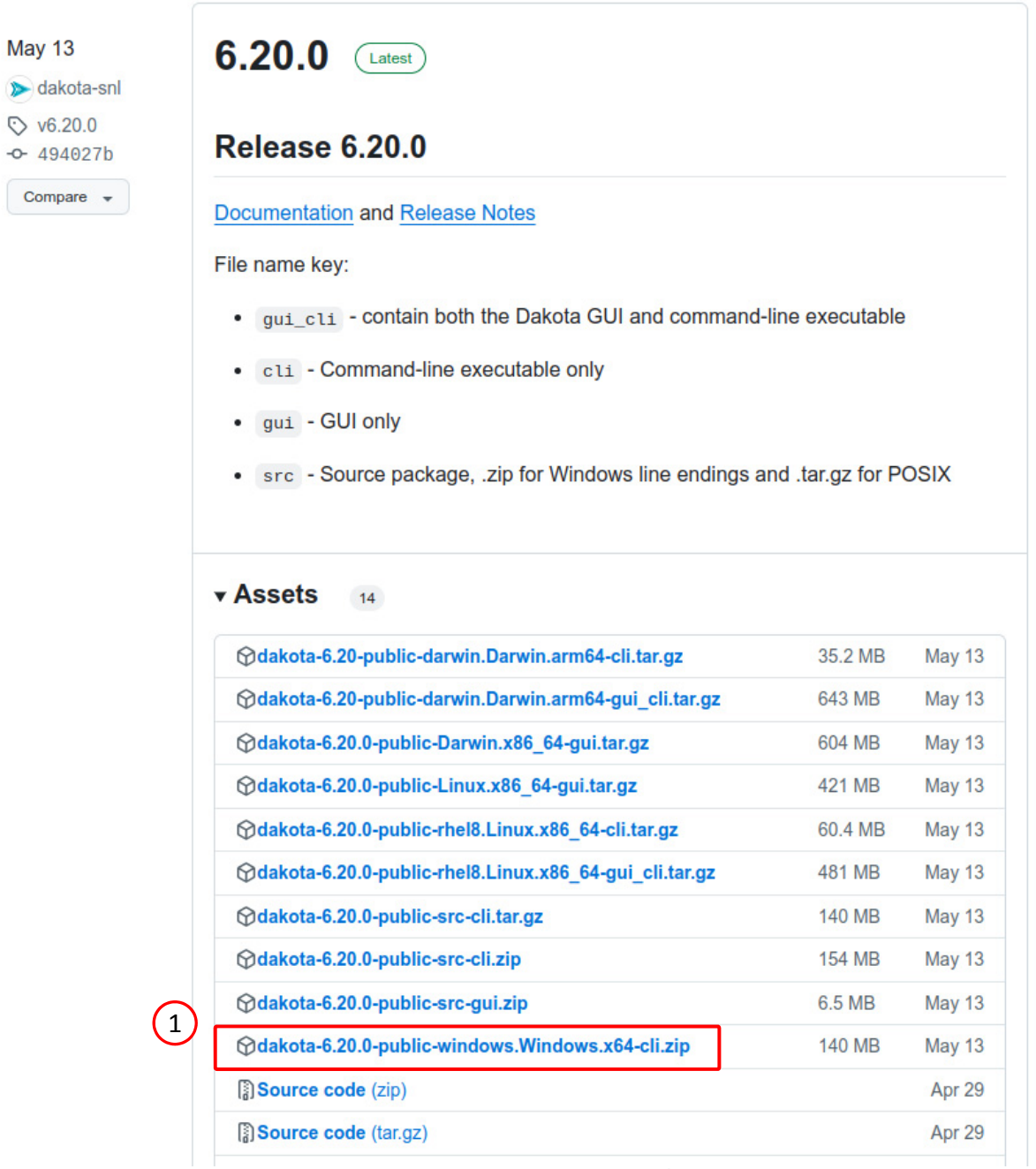


Comments

1. Note that different options (cli or gui) are available for each version. For example, version 6.20.0 only provides the solver (cli) for Dakota on Windows. There is no GUI (gui) option for Windows.

See file:

dakota-6.20.0-public-windows.Windows.x64-cli.zip

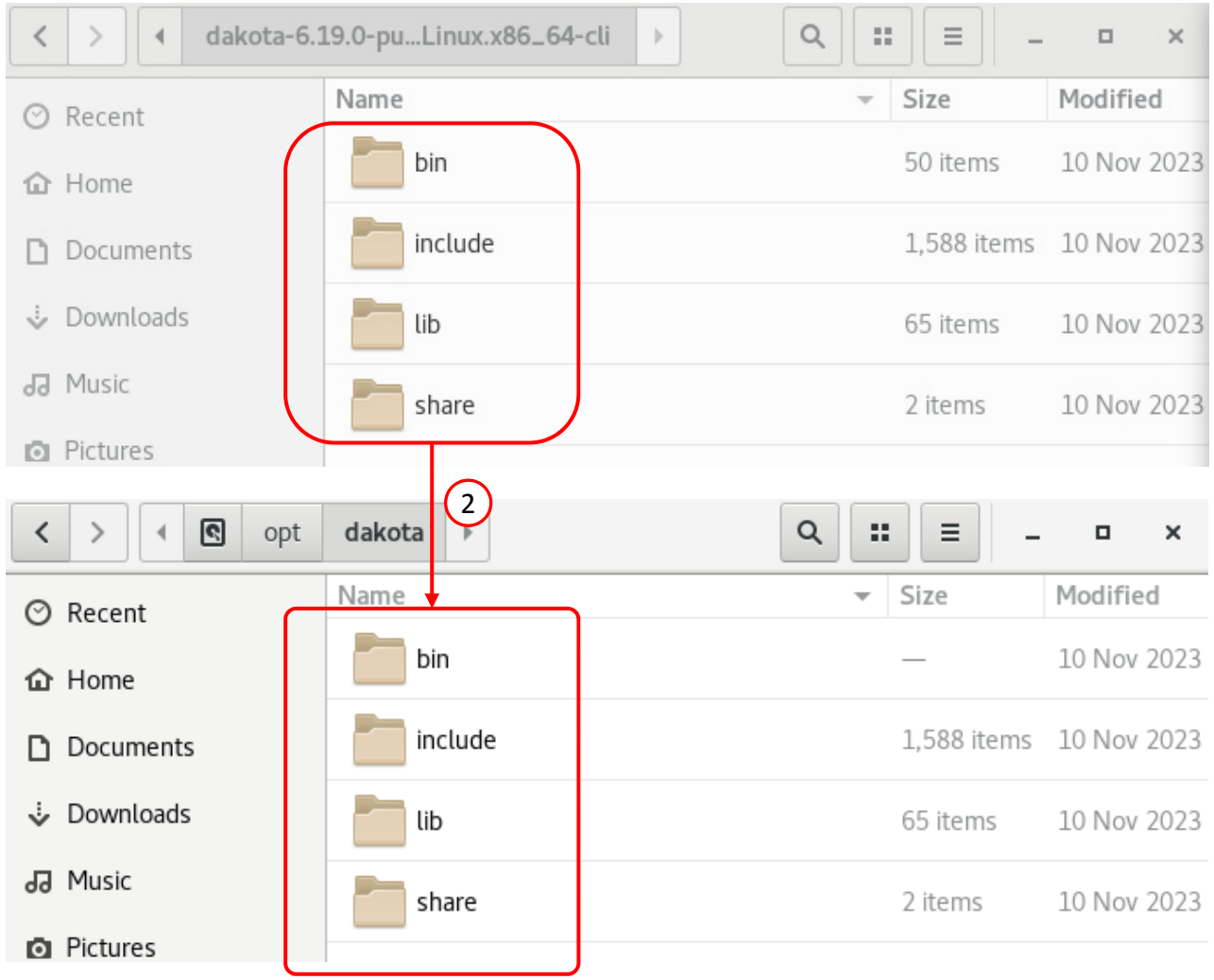


Installing Sandia Dakota on Red Hat Linux 7

Download Dakota on Windows

1. Click the indicated link to download Dakota
2. Extract the contents of the ZIP file to: /opt/dakota. Use the indicated commands.

https://github.com/snl-dakota/dakota/releases/download/v6.19.0/dakota-6.19.0-public-rhel7.Linux.x86_64-cli.tar.gz (1)



(2)

```
tar -xzf dakota-6.19.0-public-rhel7.Linux.x86_64-cli.tar.gz

sudo mv dakota-6.19.0-public-rhel7.Linux.x86_64-cli /opt/dakota
```

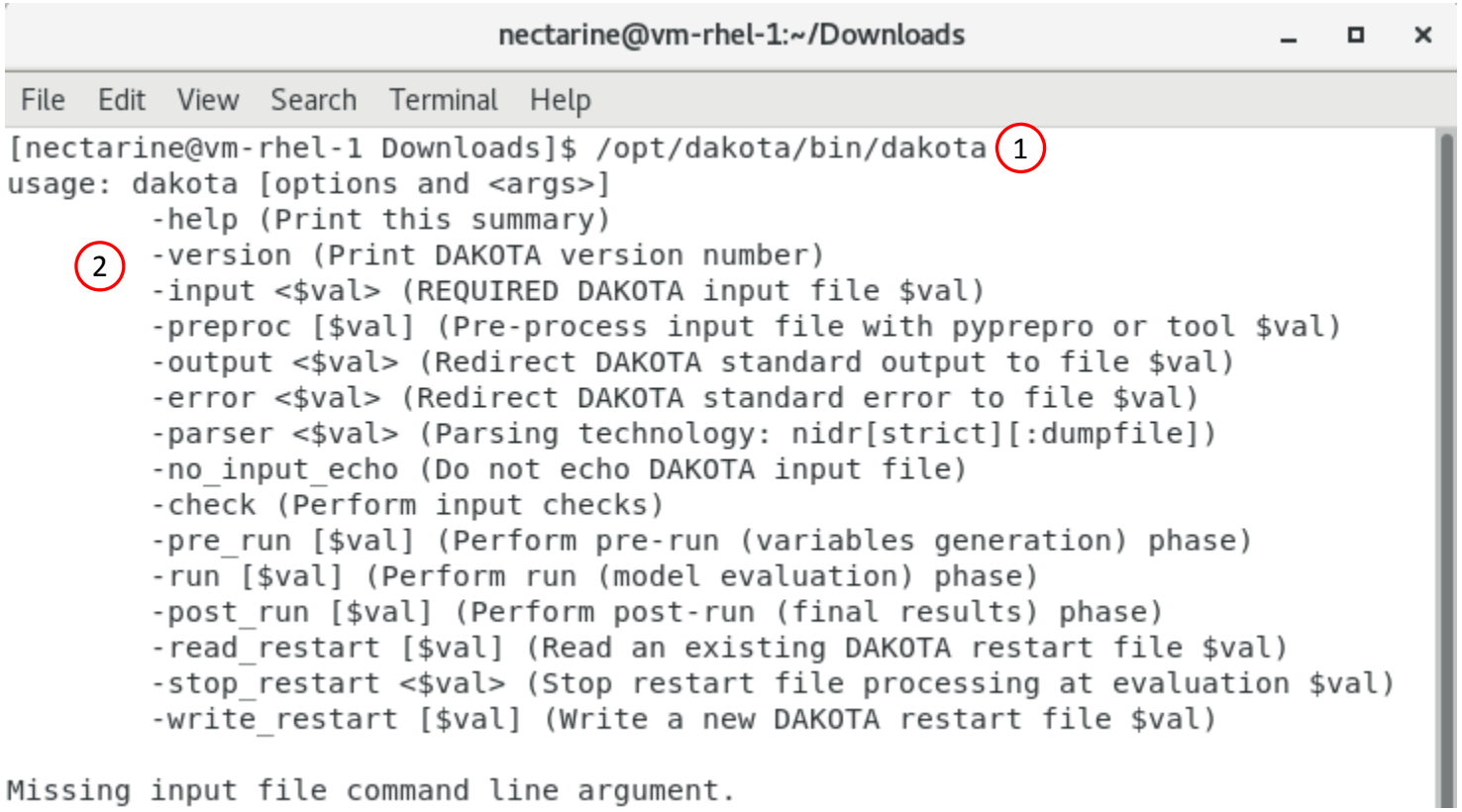
Test Dakota

1. Run this in the command prompt:

`/opt/dakota/bin/dakota`

2. Dakota is successfully configured if the output appears as shown, i.e. information regarding usage and options are displayed.

This is the end of installing Dakota on Red Hat Linux 7.

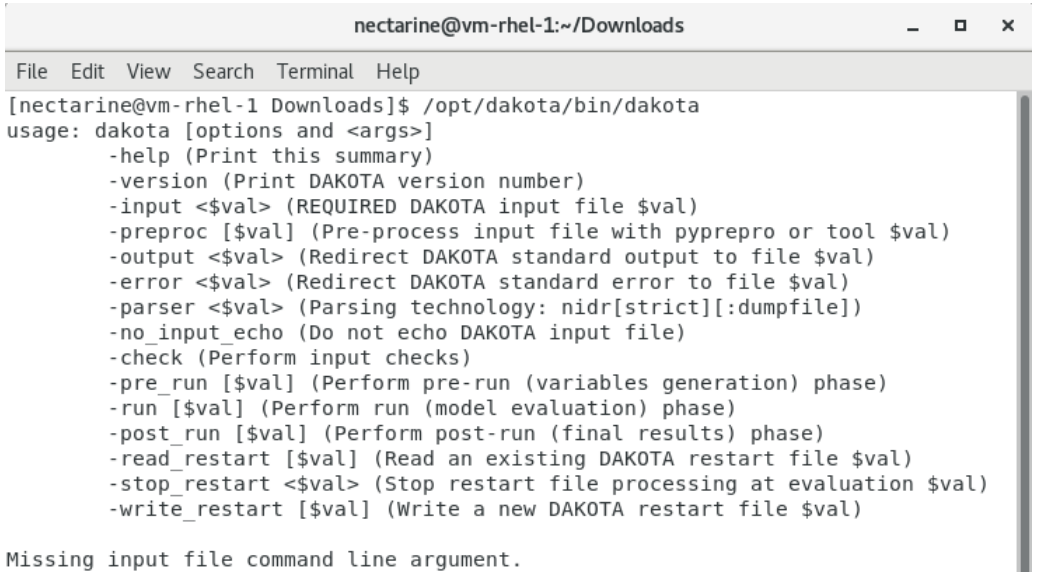


Comments

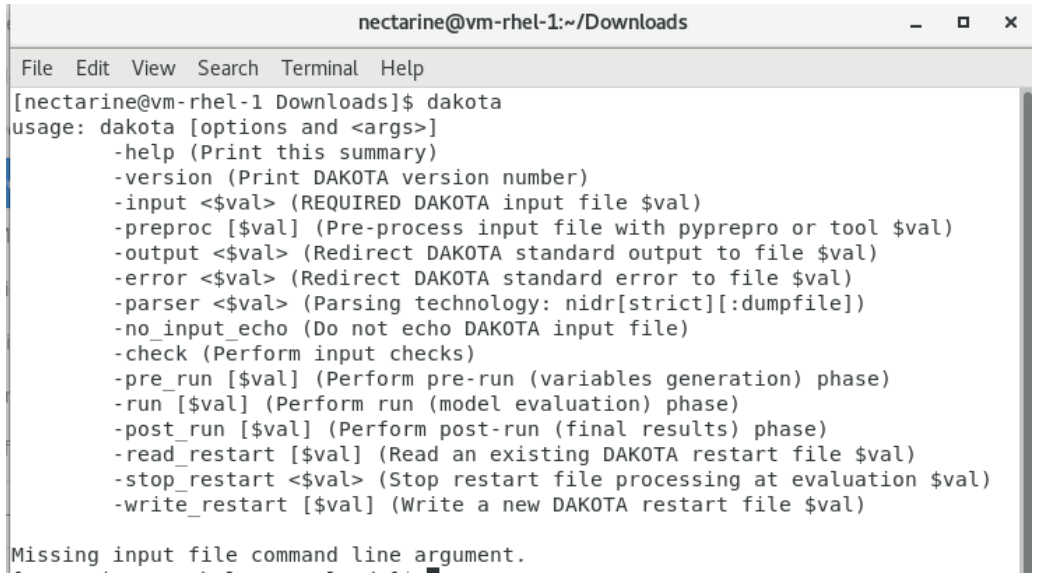
The SOL 200 Web App expects Dakota to be accessible in one of the following ways:

- /opt/dakota/bin/dakota
  - Dakota was placed in the default location /opt/dakota
- dakota
  - The location of the dakota executable file was added to the PATH environment variable.
  - The location of dakota may be any non-default location

$ /opt/dakota/bin/dakota



$ dakota



Comments

The PATH environment variable may be modified as follows.

1. Run

   sudo gedit ~/.bashrc

2. Append *:/opt/dakota/bin* to the PATH variable as shown.

Example 1

Before: export PATH=$PATH

After: export PATH=$PATH:/opt/dakota/bin

Example 2

Before: export PATH=$PATH:/msc/MSC_Nastran/20181/bin

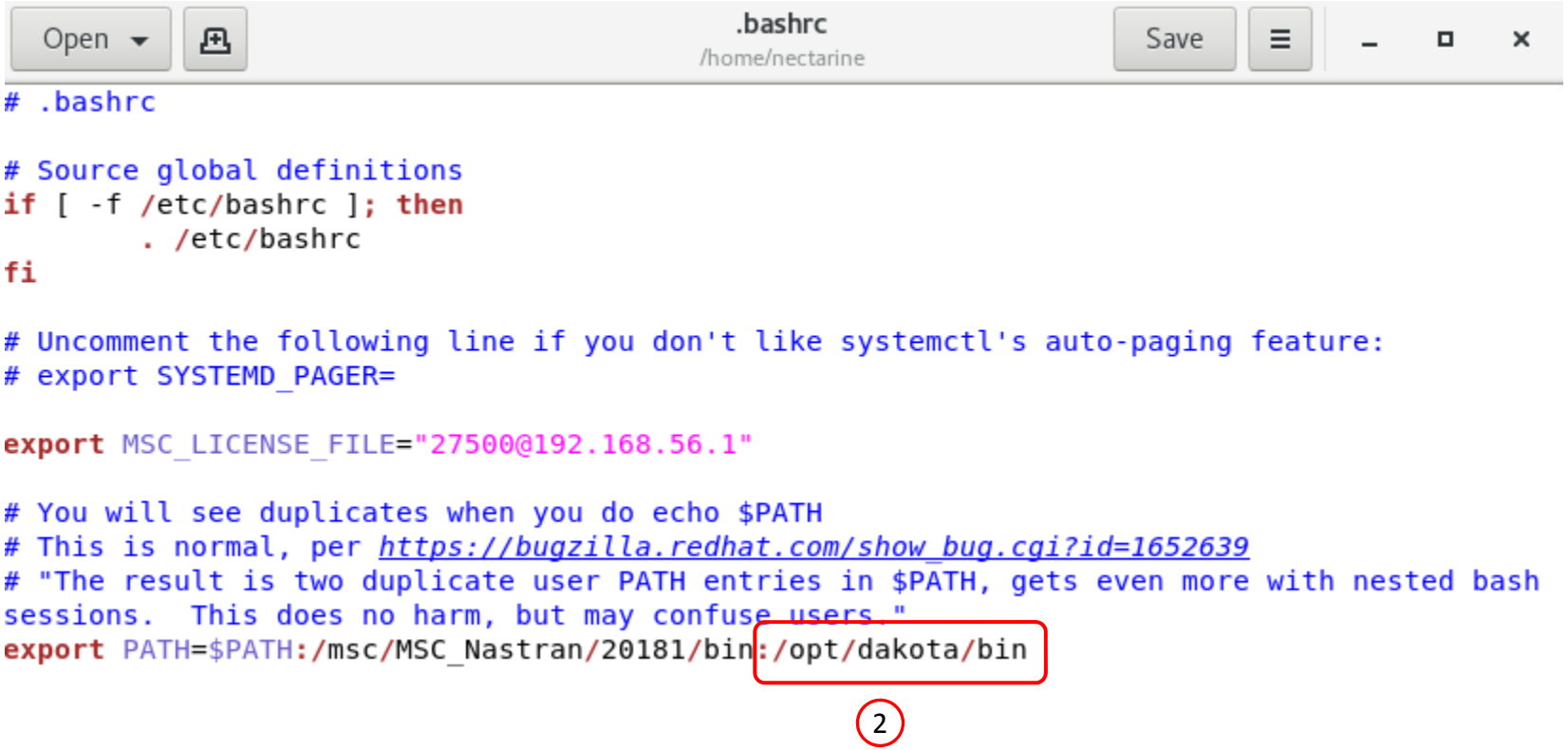
After: export PATH=$PATH:/msc/MSC_Nastran/20181/bin:/opt/dakota/bin

3. Save the file

4. Close and reopen the terminal

5. Dakota may now be accessed with the shorthand form:

   dakota



Comments

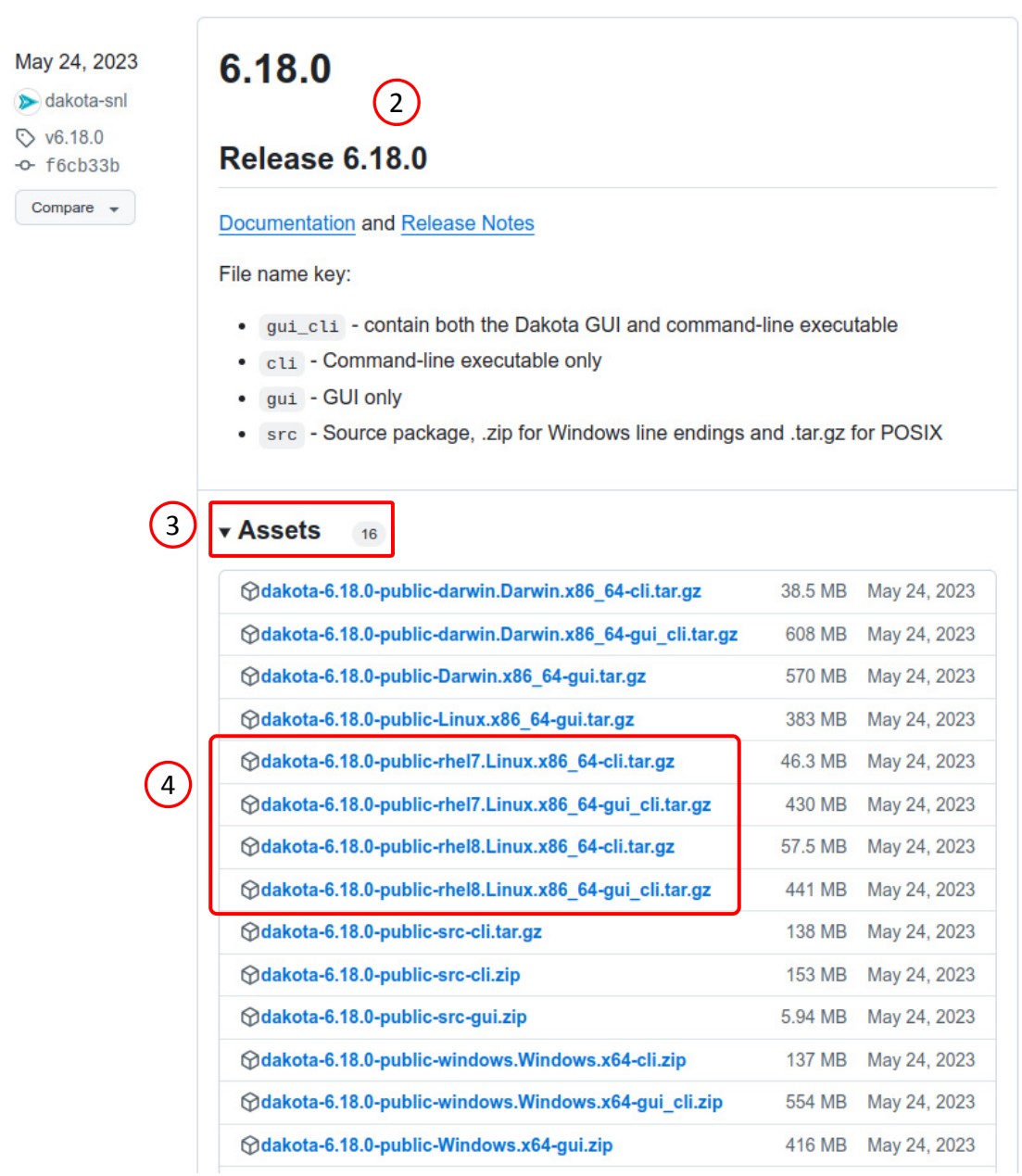
This exercise configured Dakota v6.19.0.

Other versions of Dakota for Red Hat Linux 7 or 8 may be installed.

1. Click the indicated link
2. Navigate to the version of interest
3. Click Assets
4. Download one of the files whose name contains the following strings
   - .tar.gz
   - *rhel7* or *rhel8*
   - *cli* or *gui_cli*

One tar.gz file is needed. The string *cli* indicates the ZIP file contains the Dakota solver. The string *gui* indicates the ZIP file contains the GUI. The string *rhel7* indicates compatibility with Red Hat Linux 7. The string *rhel8* indicates compatibility with Red Hat Linux 8.

https://github.com/snl-dakota/dakota/releases



Comments

1. Note that different options (CLI or GUI, RHEL 7 or 8) are available for each version. For example, version 6.20.0 only provides Dakota for Red Hat Linux 8, not 7. See file:

dakota-6.20.0-public-rhel8.Linux.x86_64-cli.tar.gz

dakota-6.20.0-public-rhel8.Linux.x86_64-gui_cli.tar.gz

If your operating system is not listed, you may compile your own version of Dakota using the source files that are available, e.g. dakota-6.20.0-public-src-cli.tar.gz .

Contact The Engineering Lab for assistance.

May 13

dakota-snl

v6.20.0

494027b

Compare

6.20.0 Latest

Release 6.20.0

Documentation and Release Notes

File name key:

- `gui_cli` - contain both the Dakota GUI and command-line executable
- `cli` - Command-line executable only
- `gui` - GUI only
- `src` - Source package, .zip for Windows line endings and .tar.gz for POSIX

▾ Assets 14

dakota-6.20-public-darwin.Darwin.arm64-cli.tar.gz	35.2 MB	May 13
dakota-6.20-public-darwin.Darwin.arm64-gui_cli.tar.gz	643 MB	May 13
dakota-6.20.0-public-Darwin.x86_64-gui.tar.gz	604 MB	May 13
dakota-6.20.0-public-Linux.x86_64-gui.tar.gz	421 MB	May 13
dakota-6.20.0-public-rhel8.Linux.x86_64-cli.tar.gz	60.4 MB	May 13
dakota-6.20.0-public-rhel8.Linux.x86_64-gui_cli.tar.gz	481 MB	May 13
dakota-6.20.0-public-src-cli.tar.gz	140 MB	May 13
dakota-6.20.0-public-src-cli.zip	154 MB	May 13
dakota-6.20.0-public-src-gui.zip	6.5 MB	May 13
dakota-6.20.0-public-windows.Windows.x64-cli.zip	140 MB	May 13
Source code (zip)		Apr 29
Source code (tar.gz)		Apr 29

1

End of Tutorial