Getting, Installing and Verifying the SPICE Toolkit

April 2023
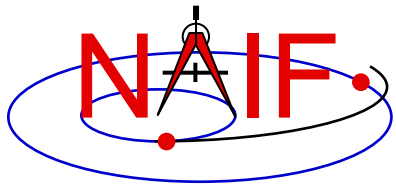
Getting the Toolkit

- **All official NAIF-supported instances of the SPICE Toolkit are freely available from the NAIF server**

  https://naif.jpl.nasa.gov/naif/toolkit.html

  - **No password or identification is needed**

- **To download a Toolkit package**
  - **Select language – FORTRAN, C, IDL, MATLAB or Java Native Interface**
  - **Select computer platform/OS/compiler combination**
    - » **Be careful to pick the right architecture: 64 or 32 bit**
  - **Download all toolkit package components**
    - » **Package file – toolkit.tar.Z (or toolkit.zip),**
      cspice.tar.Z (or cspice.zip),
      icy.tar.Z (or icy.zip),
      mice.tar.Z (or mice.zip),
      JNISpice.tar.Z (or JNISpice.zip)
    - » **Installation script (if present) – import*.csh**
   - » **Accompanying documents - README, dscriptn.txt, whats.new**
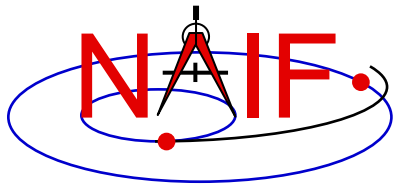
- **To install the Toolkit on Linux or Mac platform, follow the directions given in the README. Normally this consists of the following:**

```
prompt> chmod u+x importSpice.csh ( or chmod u+x import<language>.csh )
prompt> ./importSpice.csh    ( or ./import<language>.csh )
prompt> rm toolkit.tar   ( or rm <toolkit_name>.tar )
```

- **To install the Toolkit on a PC running Windows, do the following:**

    - **unzip the toolkit (or cspice or icy or mice) to expand the archive.**

```
prompt> unzip toolkit.zip
```

   - **You now have the expanded toolkit (or cspice or icy or mice or JNISpice) package. In it the APIs are already compiled into object modules, the needed libraries have been assembled, and the several Toolkit utility executables have been built. In most cases you need NOT re-do any of this build work! But read on about some special circumstances.**
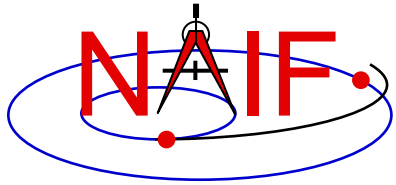
Configuring Your Computer

- **For some programming environments there are required additional steps to prepare for programming using SPICE.**

- **For some programming environments there are recommended additional steps to make program development easier.**

- **Read the "Preparing for Programming" tutorial and the "README" file found in the Toolkit download directory for more information!**
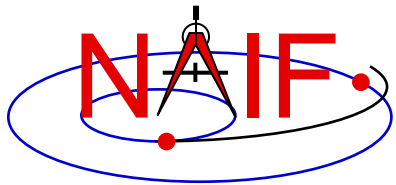
- ## Try an executable: tobin

  - **Use the Toolkit's *tobin* utility to convert the SPICE transfer format SPK files supplied with the Toolkit into binary format.**
  - **The available transfer format files, cook_01.tsp and cook_02.tsp, are found in the ../data directory***
    - » **For example try this:**

      prompt> tobin cook_01.tsp

    - » **This should produce an output file named `cook_01.bsp`**

  - **Then try using *brief* to summarize the converted SPK kernel**

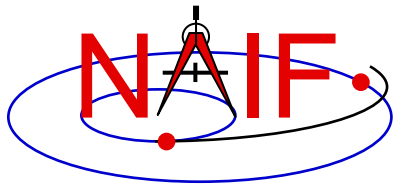   **prompt> brief cook_01.bsp**

* According to modern SPICE conventions, the file name extension ".tsp" seen above should be ".xsp". The ".tsp" extension is kept for historical reasons.
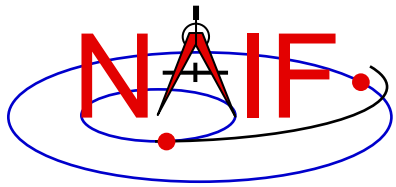
Installation Problems?

- **New versions of operating systems, compilers, and MATLAB and IDL processors are released rather frequently as compared to the frequency of new SPICE Toolkit releases**
  - **Sometimes this results in incompatibility issues with SPICE**

- **Sometimes a customer wants to use the Toolkit in an environment not (officially) supported by NAIF**
  - » **Example: Octave instead of Matlab**
  - » **Example: Ubuntu instead of Linux**
  - » **Example: clang instead of gcc**
  - **Porting a Toolkit to an unsupported environment might be straightforward, but could be problematic**

- **See the next charts for a bit more information regarding Toolkit installation issues**

Compatibility Issues

- **Problems may occur if your version of the operating system, compiler, or IDL or MATLAB is substantially newer or older than what NAIF used in making its build**
  - **First examine NAIF's "Bugs" webpage for any relevant info:**
    - » **https://naif.jpl.nasa.gov/naif/bugs.html**
  - **Then try rebuilding the Toolkit using the script "makeall.csh" (or "makeall.bat") located in the "top level" directory (toolkit or cspice or icy or mice)**

- **If this doesn't seem to work, contact NAIF, providing error messages observed and version numbers for your OS and your compiler or your MATLAB or IDL app**
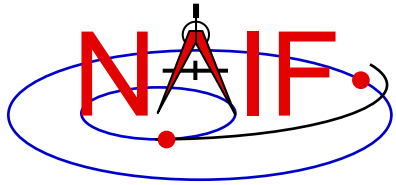
Navigation and Ancillary Information Facility

- **The packages provided on the NAIF server have been built and tested by NAIF using the particular environments shown at the end of this tutorial.**

- **If you try porting an instance of the Toolkit to an unsupported environment there are numeric and possibly compiler optimization issues that must be carefully dealt with.**

  – **You should definitely run NAIF's test harness (e.g. tspice, for Fortran, or tspice_c, for cspice/Mice/Icy) as part of your porting confirmation process.**

  – **Contact one of the NAIF team members for access to and instructions on running the appropriate tspice test harness.**

    » **https://naif.jpl.nasa.gov/naif/contactinfo.html**