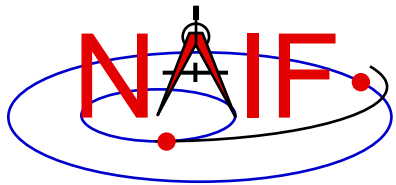


Navigation and Ancillary Information Facility

Getting, Installing and Verifying the SPICE Toolkit

February 2019



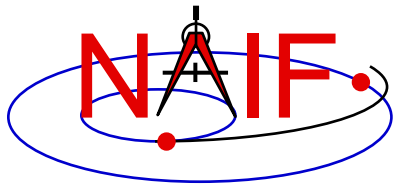
Getting Toolkit

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- **All instances of the SPICE Toolkit are freely available 24x7 from the NAIF WWW 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, or MATLAB**
 - **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), or
mice.tar.Z (or mice.zip)**
 - » **Installation script (if present) – import*.csh**
 - » **Accompanying documents - README, dscriptn.txt, whats.new**



Installing Toolkit

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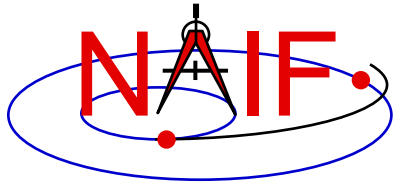
- To install the Toolkit, follow the directions given in the README. Normally this consists of the following (not applicable for PC Windows):

```
prompt> chmod u+x importSpice.csh
prompt> ./importSpice.csh
prompt> rm toolkit.tar
```

- For PCs running Windows, unzip the toolkit (or cspice or icy or mice) to expand the archive.

```
> unzip toolkit.zip
```

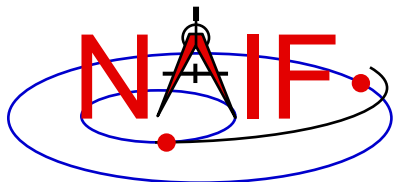
- You now have the expanded toolkit (or cspice or icy or mice) package. In it the APIs are already compiled into object modules, the needed libraries have been assembled, and the several Toolkit utility executables have been built. **In most cases you need NOT re-do any of this build work!** But read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



Configuring Your Computer

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- 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!

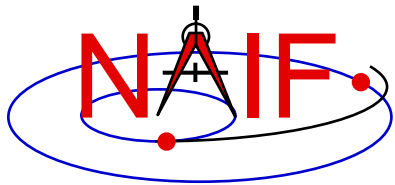


Checking It Out

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- **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:
`tobin cook_01.tsp`
 - » This should produce an output file named *cook_01.bsp*
 - Then try using *brief* to summarize the converted SPK kernel
`brief cook_01.bsp`

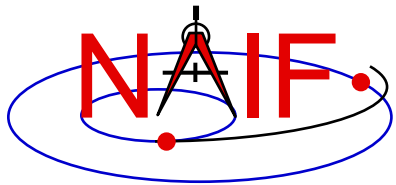
* According to modern SPICE conventions, the file name extensions seen above should be "xsp" and "xc." The "tsp" and "tc" extensions are kept for historical reasons.



Installation Problems?

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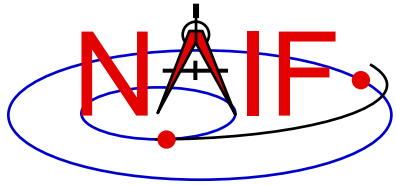
- **New versions of operating systems, compilers, and MATLAB and IDL processors are released rather frequently as compared to the frequency of new SPICE Toolkit releases**
 - Sometimes this results in incompatibility issues with SPICE
- **Sometimes a customer wants to use the Toolkit in an environment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

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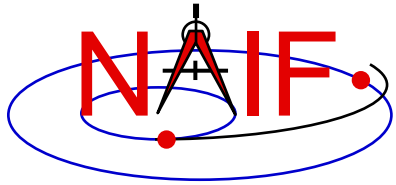
- **Problems may occur if your version of the operating system, compiler, or IDL or MATLAB is substantially newer or older than what NAIF used in making its build**
 - Try rebuilding the Toolkit using the script “makeall.csh” (or “makeall.bat”) located in the “top level” directory (toolkit or cspice 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**



Porting the Toolkit

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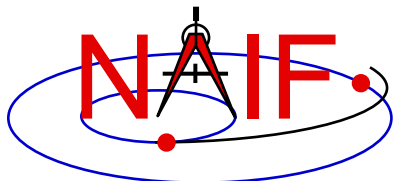
- **The packages provided on the NAIF server have been built and tested by NAIF using the particular environments shown at the end of this tutorial.**
- **If you try porting an instance of the Toolkit to an unsupported environment there are numeric and possibly compiler optimization issues that must be carefully dealt with.**
 - You should definitely run NAIF's test harness (e.g. `tspice`, for Fortran, or `tspice_c`, for `cspice/Mice/lcy`) as part of your porting confirmation process.



Backup

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- **Getting the Toolkit using command line FTP**



Command line FTP - 1

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```
prompt> ftp naif.jpl.nasa.gov
```

```
220- =====
220- |                               Jet Propulsion Laboratory                               |
220- |                               * * *   W A R N I N G   * * *                               |
220- |                               Property of the                                       |
220- |                               UNITED STATES GOVERNMENT                               |
220- |                                                                                       |
      etc.   etc.   etc.
```

```
Name (your.sight:your_name): anonymous
```

```
331 Please specify the password
```

```
Password: your_name@e.mail.address (won't be displayed)
```

```
230-
```

```
230-
```

```
Jet Propulsion Laboratory
```

```
230-
```

```
* * *   W A R N I N G   * * *
```

```
230-
```

```
Property of the UNITED STATES GOVERNMENT
```

```
230-
```

```
230-
```

```
This computer is funded by the United States Government and
operated by the California Institute of Technology in support of
ongoing U.S. Government programs and activities.  If you are not
authorized to access this system, disconnect now.  Users of this
system have no expectation of privacy.  By continuing, you consent
to your keystrokes and data content being monitored.
```

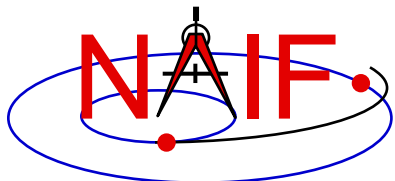
```
230-
```

```
230 Login successful.
```

```
ftp> cd pub/naif/toolkit/<FORTRAN or C or IDL or MATLAB>
```

```
250 Directory successfully changed.
```

```
ftp> dir
```



Command line FTP - 2

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```
ftp> dir
MacIntel_OSX_IFORT_32bit
MacIntel_OSX_IFORT_64bit
MacIntel_OSX_gfortran_32bit
MacIntel_OSX_gfortran_64bit
PC_Cygwin_gfortran_32bit
PC_Cygwin_gfortran_64bit
PC_Linux_IFORT_32bit
PC_Linux_IFORT_64bit
PC_Linux_g77_32bit
PC_Linux_gfortran_32bit
PC_Linux_gfortran_64bit
PC_Windows_IFORT_32bit
PC_Windows_IFORT_64bit
SunIntel_Solaris_SunFORTRAN_32bit
SunIntel_Solaris_SunFORTRAN_64bit
SunSPARC_Solaris_SunFORTRAN_32bit
```

FORTRAN

```
ftp> dir
MacIntel_OSX_AppleC_IDL8.x_64bit
PC_Linux_GCC_IDL8.x_32bit
PC_Linux_GCC_IDL8.x_64bit
PC_Windows_VisualC_IDL8.x_32bit
PC_Windows_VisualC_IDL8.x_64bit
SunIntel_Solaris_SunC_IDL8.x_64bit
SunSPARC_Solaris_GCC_IDL7.x_32bit
SunSPARC_Solaris_GCC_IDL7.x_64bit
SunSPARC_Solaris_SunC_IDL7.x_32bit
```

IDL

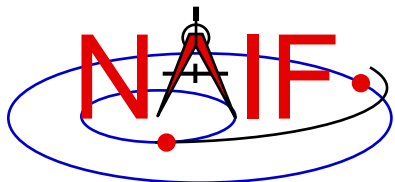
```
ftp> dir
MacIntel_OSX_AppleC_32bit
MacIntel_OSX_AppleC_64bit
PC_Cygwin_GCC_32bit
PC_Cygwin_GCC_64bit
PC_Linux_GCC_32bit
PC_Linux_GCC_64bit
PC_Windows_VisualC_32bit
PC_Windows_VisualC_64bit
SunIntel_Solaris_SunC_32bit
SunIntel_Solaris_SunC_64bit
SunSPARC_Solaris_GCC_32bit
SunSPARC_Solaris_GCC_64bit
SunSPARC_Solaris_SunC_32bit
SunSPARC_Solaris_SunC_64bit
```

C

```
ftp> dir
MacIntel_OSX_AppleC_MATLAB8.x_64bit
PC_Linux_GCC_MATLAB7.x_64bit
PC_Windows_VisualC_MATLAB8.x_64bit
SunSPARC_Solaris_SunC_MATLAB7.x_64bit
```

MATLAB

The environments available at the time you download the Toolkit may differ from those shown here. These were the supported environments as of Toolkit N0067.



Command line FTP - 3

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```
ftp> cd <environment>/packages
ftp> binary
200 Switching to Binary mode.
ftp> get toolkit.tar.Z
      ( or toolkit.zip
        or cspice.tar.Z or cspice.zip
        or icy.tar.Z or icy.zip
        or mice.tar.Z or mice.zip )
. . . .
ftp> ascii
200 Switching to ASCII mode.
ftp> get importSpice.csh
      ( or importCSpice.csh
        or importIcy.csh
        or importMice.csh )
      ( not applicable for the Windows environments )
ftp> get README
ftp> get dscriptn.txt
ftp> get whats.new
ftp> quit
```