

Getting Started with CADNexus

The purpose of this guide is to help you get up and running with the CAPRI runtime package quickly with the least amount of effort.

Applicable CAPRI Versions
3.14+

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1. Getting Started with Windows (x32 and x64)

Before beginning the installation process ensure that your CAD system or geometry kernel is installed and configured properly. CAD runtime licenses are required for the parametric CAD systems but not geometry kernels such as OpenCASCADE.

CADNexus' CAPRI CAE Gateway can be installed on Windows platforms using an installer package. The installer allows the user to select CAD system options, client-server components, CAPRI applications and documentation. It also sets up environment variables. Administrative privileges are required to properly install and setup the environment. If you do not have administrative access, the environment setup has to be performed manually. For additional information on manually setting up environment variables see Section 1.1 and Appendix C CAD Specific Environment Variables.

Please note that only one version of a CAD system can be installed. For example, a user may select CatiaV5 R18 or R19, but not both. A user may install multiple or all the CAD system options supported by CADNexus.

The CAD systems and revisions supported in this CAPRI version are given below.

CAD System	x32	x64
CatiaV5 Rev 17	/B17	/B17
CatiaV5 Rev 18	/B18	/B18
CatiaV5 Rev 19	/B19	/B19
CatiaV5 Rev 20	/B20	/B20
Pro/E Wildfire 3.0	/WF3	/WF3
Pro/E Wildfire 4.0	/WF4	/WF4
Pro/E Wildfire 5.0	/WF5	/WF5
SolidWorks 2008	/SW2008	/SW2008
SolidWorks 2009	/SW2009	/SW2009
SolidWorks 2010	/SW2010	/SW2010
UG NX 5	/NX5	/NX5
UG NX 6	/NX6	/NX6
UG NX 7	/NX7	/NX7
UG NX 7.5	/NX75	/NX75
OpenCASCADE 6.2	/OC62	Not Supported
OpenCASCADE 6.3	/OC63	Not Supported

The installer can be run in two modes: a) wizard mode where the user is guided through the installation process (section 2.1) and b) Command Line Mode where command line input is used to choose various components and options such as the silent install option (section 2.2).

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Environment and registry variables may be found in the CAPRIVars.bat file (or CAPRIVars_backup.txt if the user chose not to have the installer set environment variables) created by the installer.

1.1 Installing and Running CAPRI without Setting Registry Values: CAPRIVars.bat

In order to operate, CAPRI queries the runtime environment for information derived from its installation location and for information about installed CAD systems. This information can be

- stored permanently in the global runtime environment, i.e. the registry, environment variables, executable path, or
- stored in configuration files or launch scripts that set up the runtime environment on the fly at runtime.

The CAPRI Windows installer has two options in wizard mode; "default" and "no environment variables added". The default option adds

- the CAPRI bin and lib directories to the executable path
- sets several registry keys
- sets several CAD related environment variables
- creates a file, CAPRIVars_backup.txt, which records the changes made to the global runtime environment.

This information allows a CAPRI executable, e.g. bin/master.exe, to run from a command line prompt. The "no environment variables" option does not change the global executable path or add/modify environment variables. It does however write basic CAPRI installation entries in the registry. It does create the CAPRIVars.bat initialization file in the installation directory. Note that the /NOREG option available when the installer is used in the command line mode results in no registry items being written to the registry and the CAPRIVars.bat file is moved to CAPRIVars_backup.txt.

- If the CAPRIVars.bat file is run from a dos prompt, it will make the changes to the runtime environment that allow CAPRI to run.

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- CAPRIvars.bat is read when CAPRI is initialized. All of the information in the file is added to the CAPRI runtime environment with the exception of the executable path.
- CAPRIvars.bat can be called from other Windows script files. These files can be used to launch CAPRI applications. See bin/master.bat for an example.

It is possible to move CAPRIvars.bat to an alternate location/filename. The environment variable "capriEnvFile" can be used to indicate an initialization file stored in an alternate location and this file can have configuration information for different versions or installations of CAPRI.

Contents of the initialization file:

CAPRI-CatiaV5_Check

Can be set to "ON", "OFF", or left unset. Determines whether the CatiaV5 part integrity checker is run when a Catia model is loaded. Default is "ON".

CAPRIshell

Can be set to "ON", "OFF", or left unset. Determines whether SHELL bodies are loaded. Default is "OFF".

CAPRIwire

Can be set to "ON", "OFF", or left unset. Determines whether WIRE bodies are loaded. Default is "OFF".

CATEnvCAPRI

Set to the location of the Catia Environment file. CAPRI references this when it loads a Catia file. The environment file is typically generated by the CAPRI installer.

GV_SPEC_COL

Set to the location of a graphics resource file used by master and tessviewer.

PATH

Executable path.

PRO_COMMAND

Set to the location of the Pro Engineer startup script.

PRO_COMM_MSG_EXE

Set to the location of the Pro Engineer messaging utility.

ProEtriDLL

Set to the location of the ProE triangulation DLL.

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SWaddInDLL

Set to the location of the Solidworks triangulation DLL.

1.2 Installation and Uninstallation Using the Installer in Wizard Mode

You can install CAPRI by launching the installer either by double-clicking on the .exe file or executing it from a command line. The installer allows you to enter your CAPRI key during installation. You may skip the key entry step for manual entry later. See CAPRIKey Installation section below.

To uninstall CAPRI, run the Uninstall.exe located in the CAPRI installation folder, or use the uninstall option in the **Start->All Programs->CADNexus** menu items.

Check your environment using the *set* command at a command line window. The following variable should be set. The value depends on your installation.

GV_SPEC_COL=pathtoGV_SPEC_COL

See Section 1.1 and Appendix C for more information on CAPRI and CAD-specific environment variables. Your PATH environment variable should have entries for the CAPRI bin and CAPRI lib folders. If you installed CAPRI in the default installation location the path entries are

C:\Program Files\CADNexus\CAPRIV3.xx\bin

and

C:\Program Files\CADNexus\CAPRIV3.xx\lib

for version 3.xx.

1.3 Installation Using the Windows Installer in Silent Mode

In a command line window

prompt>*yourinstallerlocation/CADNexus_3.1x_WIN32.exe*

The installer can be invoked in silent mode with the following options:

/S Startup in silent mode
/Dir= Installation folder (must be in quotes if there is a space in the path)
/CAD Install specific CAD System back-end (see the
CADNexus_Installer_Guide_Windows_vx.xx for details)

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/Client Install Client
/Server Install Server
/Apps Install basic CAPRI applications
/Docs Install basic CAPRI documentation
/NOREG Install without writing to registry
/CAPRIkey= Set CAPRIkey environment variable on installation
/Intern= Values include: B17, B18, B19, B20, NX5, NX6, NX7, NX75, WF3, WF4, WF5. Install Intern application for CatiaV5R17, R18, R19, NX5, NX6, NX75, Pro/ENGINEER Wildfire 3, 4 and 5. Intern choice must correspond to CAD system back-end choice.

Example: To install CatiaV5 R19, Pro/E Wildfire 4.0, Client, Server in C:\CADNexus, in silent mode issue the command:

```
>> InstallerLocation\CADNexus_3.14_x32.exe /S /Dir=C:\CADNexus /B19 /WF4 /Client /Server
```

To uninstall in the silent mode, issue the command:

```
>> InstallLocation\Uninstall.exe /S
```

You may also use the /NOREG flag with the silent uninstaller to prevent interaction with the registry:

```
>>InstallLocation\Uninstall.exe /S /NOREG
```

1.4 CAPRI Key Installation on Windows

If you chose not to install your CAPRI key during the installation process in wizard or command line mode go to **Start->Control Panel->System** then click on the Advanced tab. You will see the System Properties window just like in Figure 1. In step 1, click on environment variables button. In step 2 click on New depending on whether you have administrative privileges on your machine or not. In step 3, enter CAPRIkey for the value name (case sensitive) and cut and paste the key sent to you by CADNexus for the value itself and hit OK.

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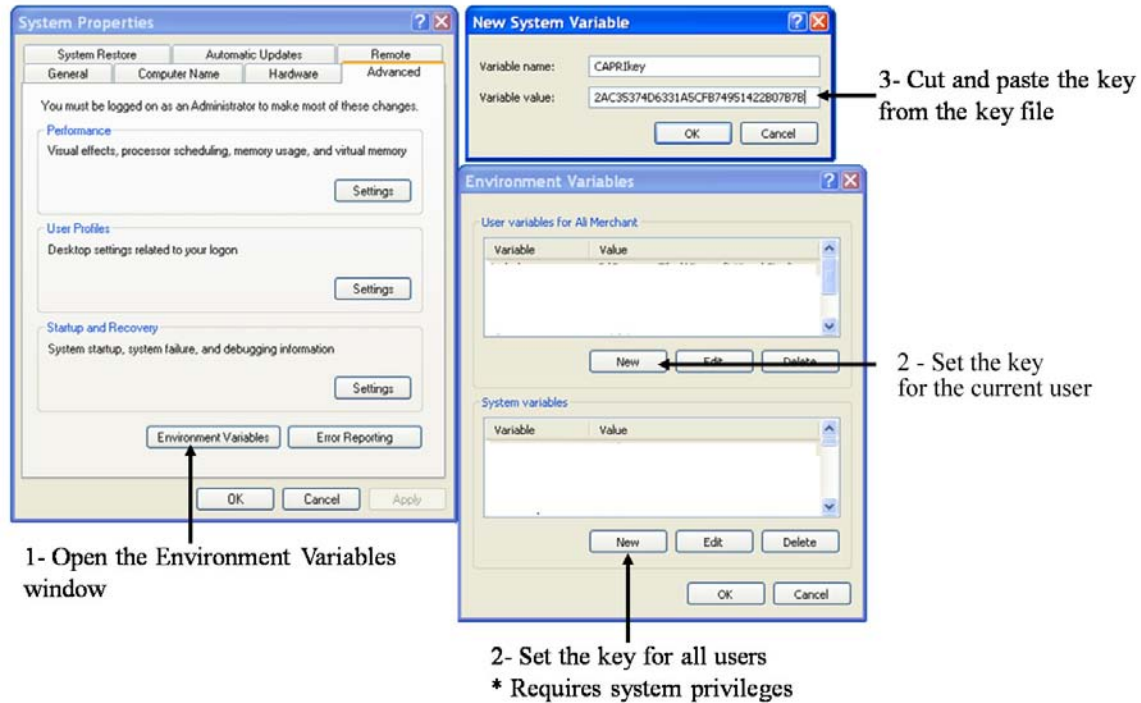


Figure 1. Steps to Manually Set CAPRIkey Environment Variable

1.5 Test Run

After installation, you can run a simple test to verify that your installation was successful. Simply go to **Start->All Programs**. You should see a CADNexus folder. Under the CADNexus folder is an additional folder with a name that contains the version of CADNexus you are using. Go into that folder and select “Application Prompt.” This starts a command line window with the environment set up appropriately.

In the command window change directory to Examples.

```
prompt>cd Examples
```

Next, following the template below, execute the *master* program using the command from Table 1 corresponding to your CAD system. Note that the *yourcadsystem* on the command line is case sensitive and that including the part extension (e.g. .prt, .sldprt, .BRep, .CATPart) is optional.

The template is

```
prompt>master yourcadsystem part
```

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Table 1 Executing *master* for CAD systems supported by CAPRI on Win

<i>CAD System</i>	<i>Command (at the command line)</i>	<i>Platform</i>
CATIAV5	prompt> master CatiaV5 NUT	Win32/Win64
UG NX	prompt>master UniGraphics disk	Win32/Win64
Pro/ENGINEER	prompt>master Pro/ENGINEER base	Win32/Win64
SolidWorks	prompt>master SolidWorks bracket	Win32/Win64
OpenCASCADE *	prompt>tessviewer OpenCASCADE LeverArm	Win32 only

* OpenCASCADE is a kernel and does not provide parametric data. Tessviewer is a better example.

Executing *master* you should see CAPRI windows come up similar to Figure 2 *unless you are using OpenCASCADE*. **Using *master* with OpenCASCADE will result in some model information being dumped to the CAPRI application window but CAPRI windows will not come up. Use *tessviewer.exe* instead.** Figure 2 shows the result of running *tessviewer.exe* with OpenCASCADE and a *brep* file. It may take several seconds as your CAD system is started in the background. Note that executing programs that use CAPRI will not interrupt existing CAD sessions. If it worked properly you are all set.

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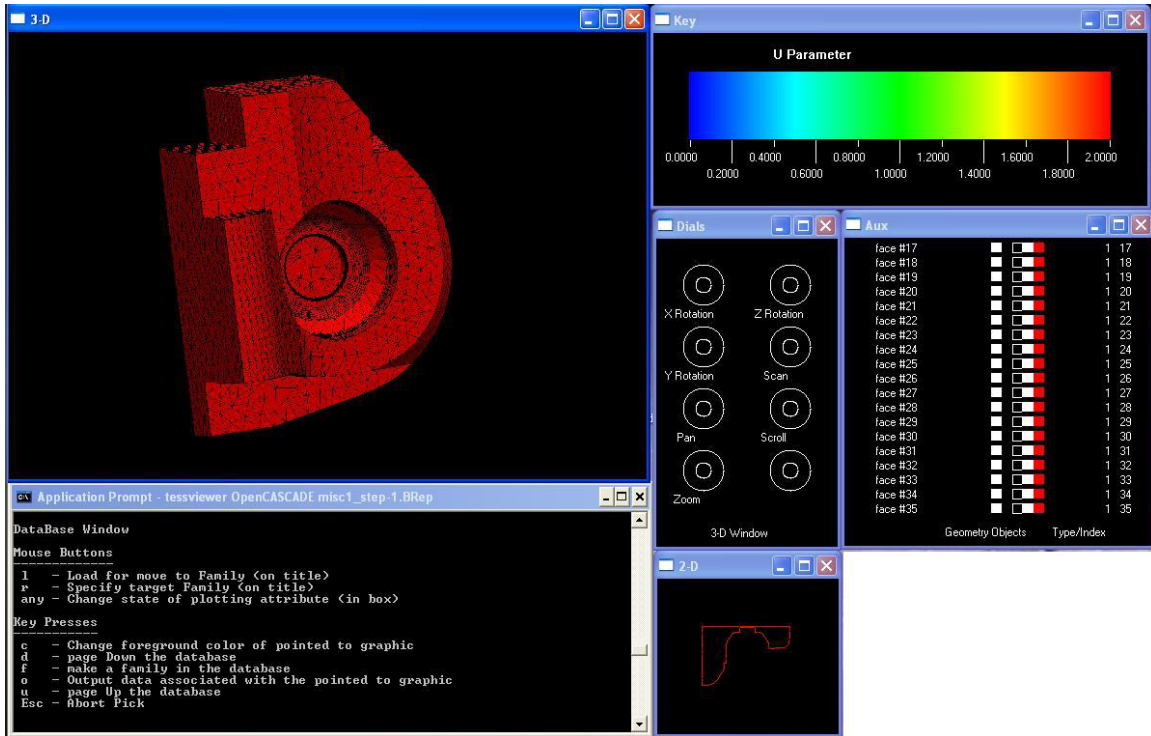


Figure 2. CAPRI Windows.

If CAPRI windows do not come up, look at the Application Prompt window and you should see output from CAPRI giving an error or some description of why it could not operate properly. If possible, email a snapshot of your command window to support@cadnexus.com so that we can help to troubleshoot your installation issue.

You can also run other sample applications installed in your bin directory.

Console output of the master sample application is shown below using SolidWorks and bracket.sldprt from the Examples directory.

1.5.1 Console Output for Successful master Execution

```
C:\Program Files\CADNexus\CAPRIV3.10\Examples>master SolidWorks
bracket.sldprt
CAPRI Info: Dynamic Back-End Loader Ver 3.10
gi_uStart status = 0
CAPRI Info: Loading SolidWorks 15.4.0 Back-End Ver 3.10
File-> C:\PROGRA~1\CADNexus\CAPRIV3.10\lib\capriSW.dll
CAPRI Warning: Opening file-> bracket.capri (gi_readbound)
          No Boundary data found!

CAPRI Warning: Vol 1 - IO state = 0 (gi_fillbound)
CAPRI Warning: IO state = 0 (gi_closebound)

gi_uLoadModel status = 1
```

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```
Number of Models = 1, mfile = 0

gi_fMasterModel handle = 1
gi_fGetMModel status = 0
# parameters = 11, # branches = 18

Vol 1 ((null)): 36 Nodes, 54 Edges, 20 Faces, 0 Boundaries
  vol #1: dBox status = 0
  vol #1: gi_iGetDisplace status = 0
return from gv_init = 0
Dialbox found!
```

The important points to note in the above output are: 1) The dynamic back-end loader is started and the appropriate CAD system dynamic back-end is loaded, 2) the versions of the loader and the dynamic back-end match, 3) the file is found and opened indicating a successful load status (`gi_uLoadModel status`), 4) the graphics are started at which point the application windows will be visible.

Press **Esc** with the cursor in the 3D window to exit the application.

Please see `CADNexus_Demo_Applications.pdf` for a detailed discussion of CAPRI applications and windows.

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2 Getting Started with Linux (32 and 64)

Before beginning the installation process on Linux ensure that your CAD system or geometry kernel is installed and configured properly. CAD runtime licenses are required for the parametric CAD systems (not geometry kernels).

CADNexus' CAPRI CAE Gateway can be installed on Linux platforms using an installer package. The installer allows the user to select CAD system options, client-server components, CAPRI applications and documentation. It also sets up environment variables. Administrative privileges are required to properly install and setup the environment. If you do not have administrative access, the environment setup has to be performed manually. For additional information on manually setting up environment variables see Section 1.1 and Appendix C CAD Specific Environment Variables.

Please note that only one version of a CAD system can be installed. For example, a user may select Pro/E Wildfire 3.0 or 4.0, but not both. A user may install multiple or all the CAD system options supported by CADNexus.

The CAD systems and revisions supported in this CAPRI version are given below.

CAD System	li32	li64
Pro/E Wildfire 3.0	/WF3	Not Supported
UG NX 5	Not Supported	/NX5
UG NX 6	Not Supported	/NX6
UG NX 7	Not Supported	/NX7
UG NX 7.5	Not Supported	/NX75
OpenCASCADE 6.2	/OC62	Not Supported
OpenCASCADE 6.3	/OC63	Not Supported

The installer can be run in two modes: a) Wizard Mode where user intervention is required (Section 2.1) and b) Command Line Mode where command line input is used to choose various components and options such as the silent install option (Section 2.2.)

2.1 Installation Using the Installer in Wizard Mode

You can install CAPRI by launching the installer either by double-clicking on the .bin file or executing it from a command line or typing its name in a terminal window. The installer also allows you to enter your CAPRI key during installation.

To uninstall CAPRI, you can run *uninstall* located in the CAPRI installation directory.

Environment variables may be found in the caprienv.txt file created by the installer.

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Check your environment using the *env* command at a command line window. The following variables should be set. The values of these variables depend on your installation.

GV_SPEC_COL
LD_LIBRARY_PATH

Your PATH environment variable should have entries for the CAPRI bin and CAPRI lib folders.

2.2 Installation Using the Linux Installer on the Command Line

At a command prompt type

```
>> InstallerLocation/CADNexus_3.14_LINUX32.bin
```

The installer can be invoked in silent mode with the following options:

--mode Silent	Startup in silent mode
--prefix	Installation folder (must be in quotes if there is a space in the path)
--CAD	Install specific CAD System back-end (see the CADNexus_Installer_Guide_Linux_vx.xx)
--CLIENT	Install Client
--SERVER	Install Server
--APPS	Install basic CAPRI applications
--DOCS	Install basic CAPRI documentation
--NOENV	Install without setting up environment variables
--CAPRIKEY	set CAPRIkey environment variable

2.3 CAPRI Key Installation

The CAPRIkey environment variable can be set with the key provided by CADNexus. It can be set at the command line or set in a shell file such as *.cshrc* or *.bash_profile* depending on the shell in use.

Example 1: csh

```
>>setenv CAPRIkey xxxxxxxxxxxxxxxxxxxxxxx
```

Example 2: bash

```
>>export CAPRIkey=xxxxxxxxxxxxxxxxxxxx
```

2.4 Run a Test

After installation, you can run a simple test to see if your installation process was successful. Since we are talking about Linux we will use the command line. Change directories to where you installed CAPRI. Depending on what shell you are using (bash or csh) do

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prompt> source source.bash

This sets up your environment appropriately. Be sure that you have set up your CAPRIkey environment variable properly.

In the command window change directory to Examples.

prompt>cd Examples

Next, following the template below, execute the *master* program using the command from Table 2 corresponding to your CAD system. Note that the *yourcadsystem* on the command line is case sensitive and that including the part extension (e.g. .prt, .sldprt, .BRep, .CATPart) is optional.

The template is

prompt>master *yourcadsystem part*

Table 2 Executing example applications for CAD systems supported by CAPRI on Linux

<i>CAD System</i>	<i>Command (at the command line)</i>	<i>Platform</i>
UG NX	prompt>master UniGraphics disk	L64
Pro/ENGINEER	prompt>master Pro/ENGINEER base	L32
OpenCASCADE	prompt>tessviewer OpenCASCADE LeverArm	L32

Notice that including the part extension is optional. UG NX and Pro/ENGINEER have the same part extension.

Executing master you should see CAPRI windows come up (see Figure 2 above) unless you chose OpenCASCADE. It may take several seconds as your CAD system is started in the background. Note that this will not interrupt existing CAD sessions. For OpenCASCADE and the other systems the CAPRI command window should show output indicating that it worked properly such as Edge Discretization and Face Tessellation counts. See the section 1.5.1 for an example of the console output for a successful execution of the master application.

Press **Esc** with the cursor in the 3D window to exit the application.

If CAPRI did not appear to function properly, look at the command window and you should see output from CAPRI giving an error or some description of why it could not

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operate. If possible, email a snapshot of your command window to techsupport@cadnexus.com so that we can help to troubleshoot your installation issue.

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3 Client/Server Mode (mixed O/S environment...or not)

Oftentimes it is desirable to run analysis and engineering tools in a Linux environment while accessing CAD geometry from Windows-based CAD systems. For this and other distributed computing scenarios CAPRI can be run in Client/Server mode. In this case, the server resides on the Windows machine running the CAD system and the client(s) run on the Linux machines.

Important: The CAPRI server currently loads all of the CAD system back-ends found in the user's path. If you install support for multiple CAD systems there will be multiple dynamic back-ends in the CAPRI lib folder, one for each CAD system installed e.g. CapriOC.dll for OpenCASCADE and CapriC5 for Catia. Remove any dynamic back-ends from the /lib folder or remove their location from the path that you do not want run by the server.

3.1 Starting a Client

CAPRI works in client/server mode when the environment variable capriSERVER is set on the client machine and a CAPRI server is running on a server machine. For example, the URL to the server can be set from the client machine as follows.

```
set capriSERVER=http://myserver:18081
```

“myserver” points to a server where a CAPRI server is running and will result in CAPRI calls being executed at the server machine. Note that the port number must match the one on the server side (see below).

Setting myserver to “localhost” will run CAPRI with the client and server on the same machine.

That is all that needs to be done! You must first have a server running to respond to the request.

3.2 Starting the Server on Windows

Start the server (on Windows) by going to **Start->All Programs->CADNexus->CAPRI CAE Gateway Vx.yz->Server Prompt**

This will start the CAPRI server with the appropriate environment settings, a default port of 18081 and a default message level of 1.

The server can also be started at a command prompt via:

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```
% CAPRIserver [[port] message-level]
```

Where `port` is the number used for the port to support the communication, and `message-level` is an integer which specifies the amount of verbosity in the messages to the screen and log file (*CAPRIserver.log*). The default value for `port` is 18081 and the default `message-level` is 1 (where -1 gives the least amount of information and 4 the most.)

You will know when the CAPRI server has successfully started when you see

```
Administrator Key = 24068A40380957E1
```

in the command window. Of course, the key value will be different. The admin key can be used to stop the server from the server Console application explained below. The same port number must be used to set the URL on the client side. A log file of the server activity is saved in a *CAPRIserver.log* file in the server execution directory (\CI-Ser.)

You can run the server in “serial mode” by setting the environment variable

```
CAPRIserial=on
```

before starting the server.

3.3 Stopping the Server on Windows

The simple approach to stop the CAPRI server is hit `Ctrl-C` with the Server command window selected or active. The safe approach is to use the server Console application executed by double-clicking on it in the \CI-Ser directory or from a command prompt as shown.

```
>>Console.exe serverURL:port [kill/list/stop] [key] [task]
```

The Console commands are explained below.

List displays the status of the running tasks at the server:

```
>>Console.exe http://localhost:18081 list
```

An example output is shown below.

Task	IP addr	Status	#Mdl
I7f000001P00019510	localhost	quiet	2 SolidWorks

Kill stops a client task. It requires either the administrator key of the client

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```
>>console http://localhost:18081 kill 3D99B059BCD3D1A0 I7f000001P00019510
```

The server will output a message: “Client coming down!”

Stop cleanly stops the server. This acts like control-C. It only responds to the admin key:

```
>>console http://localhost:18081 stop 09CB9179D48A867B
```

The server will output a message: “Server coming down...”

3.4 Starting and Stopping the Server on Linux

On Linux execute CAPRIServer with a port number from the command line to start the server. Control-C or the server Console may be used to stop the server.

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4 Summary of Included Applications

4.1 tessviewer

The application tessviewer can be used to load CAD geometry, automatically triangulate it, and view the result. To execute the application, type

```
>>tessviewer modelername partname
```

The *modelername* is case sensitive and can be CatiaV5, Pro/ENGINEER, UniGraphics, SolidWorks, or OpenCASCADE. Choose the *modelername* for the CAD system you have installed on your machine. *partname* does not need an extension but must be compatible with the modeler.

4.2 master

The program master can be used to examine the master model feature tree of a CAD model or assembly.

```
>>master modelername partname
```

See the CAPRIApplications.pdf document for more details.

4.3 Step2BRep

The Step2BRep6x applications allow you to take a STEP file and convert it to a BRep file using OpenCASCADE.

A usage example for Step2BRep using OpenCASCADE 6.2 is (using a geometry in the Capri/Examples directory)

```
>> Step2BRep62.exe misc1.step
```

The output is misc1.step-1.BRep. Similarly for OpenCASCADE6.1

```
>>Step2BRep61.exe misc1.step
```

The output is also misc1.step-1.BRep.

Disclaimer: OpenCASCADE and the STEP2BREP convertor are external to CAPRI and any limitations are not CAPRI issues.

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Appendix A. CAPRI Error Codes

-27 CAPRI_NOCLNTLIC -- No client license available

This code is returned when the number of clients connected to a server exceeds the number allowed by the CAPRI license.

-26 CAPRI_NOCADLIC -- No CAD license available

This code is returned when CAPRI encounters a license error when attempting to access a CAD system. This is not supported by all CAD kernels.

-25 CAPRI_NOLICENSE -- No Capri license available

This code is returned (usually by gi_uStart) when CAPRI is activated without a valid license.

-24 CAPRI_SHEETBODY -- Sheet body encountered

This code is returned when a sheet body is input to a function expecting a wire or solid body.

-23 CAPRI_WIREBODY -- Wire body encountered

This code is returned when a wire body is input to a function expecting a sheet or solid body.

-22 CAPRI_EXTERNAL -- Internal function called from external application

Some CAPRI functions, notably gi_pEntity, can only be called from CAPRI Intern applications. This code is returned when these functions are called from a standard (external) CAPRI application.

-21 CAPRI_MUSTRFRSH -- Instructs the client to refresh the model

In Client Server operation, this code is returned when a model is altered on the server side and must be refreshed on the client side.

-20 CAPRI_MUSTREL -- Instructs the client to release the model

In Client Server operation, the client status is set to this code when the server is brought down.

-19 CAPRI_NOTOWNER -- Returned when CAPRI does not have write permission on a part or model

Used by gi_uLoadModel in client server mode. It's possible that this is only referenced internally by CAPRI.

-18 CAPRI_COMMERR -- Returned by client when server is down

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Queries to a model located on a server will return this error when the server is down or unavailable.

-17 CAPRI_READONLY -- Modify operation attempted on read-only model

Functions which modify a model will return this code when the model is read-only

-16 CAPRI_INVALID -- Invalid code used as input

Returned when an integer input specifying a geometry or attribute type is not within the valid range.

-15 CAPRI_ROLLBACK -- Model rolled back to previous valid state

When model update fails in the master modeling API, this code will be returned to indicate that the model has been rolled back to a previous valid state.

-14 CAPRI_MODELLER -- Modeller is not loaded

Function attempted to load a model for which the modeller is not available.

-13 CAPRI_BADHANDLE -- Bad integer handle to associated data

Used by interpolation and some other utilities to indicate that the interpolation or other data handle is not associated with any data. Also returned by attribution when an attribute handle points to an attribute of an incorrect type, e.g. SetAttribute will return this code when attempting to set a real value to an integer attribute.

-12 CAPRI_NOTFOUND -- Object being queried can't be found

Returned by CAPRI functions when an object, e.g, file or cad entity, cannot be found.

-11 CAPRI_NODISCRET -- No associated discretization

Returned by functions that query the tessellation data associated to topology (edges, faces) or boundaries.

-10 CAPRI_OVERFLOW -- Returned when input exceeds the size of a buffer

-9 CAPRI_INUSE -- File write failed because the file is in use

Returned by functions like gi_uSaveModel when a file can't be written.

-8 CAPRI_RANGERR -- Access or write out side of allowed range

This code is returned when an invalid array index is encountered.

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-7 CAPRI_MODELERR -- Error in CAD System

This code is returned when a call to the CAD native API returns an error or exception.

-6 CAPRI_NOLOAD -- Attempt to read a CAD model file has failed

Returned by functions, like `gi_uLoadModel`, when the model read operation fails.

-5 CAPRI_INDEX -- Access or write out side of allowed range

This code is returned when an invalid entity index is encountered.

-4 CAPRI_UN SUPPORT -- Operation is unsupported

Some CAPRI functions are not supported on all CAD systems. This code is returned when requested operation is not supported or implemented on the CAD system hosting the model.

-3 CAPRI_MALLO C -- Memory allocation failure

Code returned when a memory allocation fails

-2 CAPRI_ALREADYON -- CAPRI is already active

Error code returned by `gi_uStart` if application attempts to initialize CAPRI twice.

-1 CAPRI_NOINIT -- CAPRI is not initialized

Returned by most CAPRI functions if called before CAPRI is initialized using `gi_uStart`

0 CAPRI_SUCCESS -- no errors encountered

Standard code returned when no error conditions are encountered.

1 CAPRI_OUTSIDE -- Point is outside of a face, edge or boundary

Returned by functions like `gi_qInFace` to indicate that the test point does not lie inside of the face boundary.

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Appendix B. CAPRI-Specific Environment Variables

<i>Variable</i>	<i>Value</i>	<i>Description</i>
capriEnvFile	Path to CAPRIvars.bat	Allows CAPRI to be run with environment variables specified in CAPRIvars.bat file. Note, the variable is case sensitive.
GV_SPEC_COL		Path to spec.col file. Usually in CAPRI installation directory
PATH		CAPRI lib and CAPRI bin directories should be appended to the path environment variable
CAPRIkey	Key string or path to key file	License key or file containing multiple keys
CAPRIshell	On Off	Read shells. By default it is Off and CAPRI reads solid bodies.
CAPRI tess	Off (default is On)	Turns off automatic/default tessellation
CAPRIwire	On Off	Read wires.
CAPRI savedb	On Off	If On, a .capri file is save when gi_uSaveModel() is called. Default is Off.
Tessellation Control Variables		
During Edge Discretization		
CAPRIedge	NoFace (default)	No Face, normal phase
CAPRIalign	On First	No Face normal phase and smaller chordal deviation criteria
During Face Tessellation		
CAPRIedge	NoFace (default)	No Face, normal phase
CAPRIalign	On First	On: Use alignment for insertions First: Use alignment for insertions then isotropic
CAPRIface	NoQuad	Don't Quad
CAPRIisocline	Xxx	setting this variable to any value quads only Faces

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		where the Edges align with isoclines
CAPRIedgeTol	(0.001 – 0.5)	Default value is 0.05. This is the ratio in Face parametric space to allow either u or v to vary to consider the bounding edge of an isocline.

Appendix C. CAD Specific Environment Variables

This appendix provides the reader with details about CAD-specific environment variables needed to run CAPRI. CAD systems included CATIAV5, NX, Pro/ENGINEER, SolidWorks, and the OpenCASCADE kernel. Generally, the installer sets all of the required variables unless the user specifies not to at installation time. This information is included for reference in cases where the user did not set environment variables during installation or needs to trouble-shoot a problem. We include the variables and their definitions.

C.1 CATIAV5 Environment Variables

CAPRI-CatiaV5_Check	(ON OFF) Does a validity check on solids. CAPRI will stop if there is a problem with the solid.
CATEnvCAPRI	Path to CAPRI CATIA Environment file (for B18 CAPRI_CATIA_P3.V5R18.B18.txt)

C.1.1 CATIA V5 PATH Requirements

The CATEnvCAPRI and the environment text file pointed to takes care of all runtime requirements. As an alternative you can include the path to the CATIA V5 installation bin directory in your PATH variable.

C.1.2 CATIA V5 Custom Installation

In some custom installations CAPRI will not start CATIAV5.

The environment can be tested without starting CAPRI by doing the following.

```
DS_HOME\intel_a\code\bin\CNEXT.exe -object none -env ENV_FILE -envdir ENV_FILE_LOC
```

ENV_FILE is the Catia environment file (default in CATEnv, CAPRI installation generates one using setcatenv.exe)

ENV_FILE_LOC is the location of the environment text file (default is CATEnv, CAPRI installation dir)

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If this fails then CAPRI will not start up.

C.1.3 CATIA V5 Installation in Managed Environments

In the CAPRI Catia environment file (ex. for R20: CAPRI_CATIA_P3.V5R20.B20.txt) that the installer generates when a Catia V5 back end is selected for installation there is the following entry:

```
CATUserSettingPath=CSIDL_APPDATA\DassaultSystemes\CATSettings
```

In some "managed" Catia environments this setting is overwritten when the user executes Catia because the contents of that folder are replaced by the server-based environment settings.

In Windows Start/All Programs/CADNexus/CAPRI CAE Gateway V3.14 there is a link to CADNEXUSCnext.bat which is installed in the CAPRI installation directory. The .bat file does the following and should resolve managed environment issues.

First, you must change the value in the CatEnvCAPRI file to the following:

```
CATUserSettingPath=CSIDL_APPDATA\DassaultSystemes_CADNEXUS\CATSettings
```

Then run CADNEXUSCnext.bat either by selecting in the Start Programs area or directly in the CAPRI installation folder.

The user should be prompted for license options. Select what you need. These new settings will get written to the new location and won't be overwritten when running CATIA.

C.2.0 NX Environment Variables

UGII_BASE_DIR	This environment variable must be assigned to the character string that specifies the path required to find the UG NX installation.
UGII_ROOT_DIR	Path to UGII folder, typically %UGII_BASE_DIR%\UGII
LD_LIBRARY_PATH	Linux This is a system level environment variable that tells the loader where to locate shared libraries. It points to the location of the shared library in the UG NX installation. Usually this is assigned as follows: LD_LIBRARY_PATH=\$UGII_BASE_DIR/UGII Windows This string must be placed in the PATH variable.

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	For example: “set PATH=%PATH%;%UGII_BASE_DIR%\UGII”
--	--

C.2.1 NX PATH Requirements

The UGII_BASE_DIR takes care of all runtime requirements as of CAPRI V3.05. Older versions require the complete path to the UGII folder to be in the user’s path variable on Windows or LD_LIBRARY_PATH on Linux. As of V3.05, if the UGII_BASE_DIR variable is not set then the complete path to the UGII folder must be set in the user’s path.

C.3 Pro/ENGINEER Environment Variables

ProEtriDll	Points to the location of <i>triangulate.dll</i> required for efficient tessellation and grouped queries in the Pro/ENGINEER async mode. If this environment is not set then <i>triangulate.dll</i> if found in the current directory will be used. Required on Windows and Linux.
PRO_COMM_MSG_EXE	Points to the location of the Pro/ENGINEER message module <i>pro_comm_msg</i> . This is located in Pro/ENGINEER installation directory under <i>i486_nt\obj</i> on Win32, <i>i486e_win64\obj</i> on Win64, and <i>i486_linux\obj</i> on Linux32 platforms.
PRO_COMMAND	Points to the location “proe” or “proeX” startup batch file in the Pro/ENGINEER bin folder. Typically, the configuration name is “proe” or “proe1”.

C.4 SolidWorks Environment Variables, Templates, and SWcapriAddIn

SWaddInDll	Points to the location of <i>SwcapriAddIn.dll</i> . The loadable module must be located so that SolidWorks can incorporate the AddIn into the running session. The complete path to this file must be specified by this environment variable. For example: “set SWaddInDLL=D:\CAPRI\lib\SWcapriAddIn.DLL”.
------------	---

SolidWorks Templates

If the following error is encountered during a CAPRI application initialization:

CAPRI Warning: Not able to INewDocument2 (gi_uStart)!
TemplatePart = C:\PROGRA~1\SOLIDW~1\data\templates\Part.prtdot

This means that the template has not been initialized. To resolve this problem go

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to Tools->Options in SolidWorks and select "Default Templates" for parts. Then just click on the "..." box next to Parts. This should also be done for assemblies.

Note on the SWcapriAddIn

If CAPRI starts a SolidWorks session and a CAPRI application exits prematurely, the SolidWorks AddIn process can continue to run in the background. This process can be terminated from the Windows Task Manager. Look for "SLDWORKS.exe" and terminate the process. This also applies to the CAPRIServer running SolidWorks.

C.5 OpenCASCADE Environment Variables

CASROOT	This environment variable must be assigned to the character string that specifies the path required to find the OpenCASCADE distribution.
LD_LIBRARY_PATH	<p>Linux This is a system level environment variable that must point to the location of the shared libraries in the OpenCASCADE distribution. "\$CASROOT/Linux/lib" must be appended to LD_LIBRARY_PATH for LINUX as long as other shared libraries are not currently specified.</p> <p>Windows This string must be placed in the PATH variable. For example: "set PATH=%PATH%;%CASROOT%\win32\bin"</p>

C.5.1 OpenCASCADE PATH Requirements

The path to the OpenCASCADE shared objects must be included in the PATH environment variable on Windows and LD_LIBRARY path on Linux.

If you receive OpenCASCADE shared objects or dlls from CADNexus they can be placed in the lib folder of your CAPRI installation and you do not need to set any OpenCASCADE-related environment variables such as CASROOT.

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