

Cadds2vrml Technical Reference

CADD5® 5 15.0

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Preface

Cadds2vrm Technical Reference tells you how you can convert Explicit and Parametric CADDs parts to the VRML (Virtual Reality Modeling Language) format. Cadds2vrm is a standalone executable that functions independent of CADDs. You can also convert a PVS (Project Visualization System) file to a VRML format file using cadds2vrm.

Related Documents

The following documents may be helpful as you use *Cadds2vrm* Technical Reference:

- The Virtual Reality Modeling Language ISO/IEC DIS 14772-1

Book Conventions

The following table illustrates and explains conventions used in writing about CADDs applications.

Convention	Example	Explanation
Menu selections and options	List Section option, Specify Layer field	Indicates a selection you must make from a menu or property sheet or a text field that you must fill in.
User-selected graphic location	X, d ₁ or P1	Marks a location or entity selection in graphic examples.
User input in CADDs text fields and on any command line	<code>cvaec.hd.data.param</code> <code>tar -xvf /dev/rst0</code>	Enter the text in a CADDs text field or on any command line.
System output	<code>Binary transfer complete.</code>	Indicates system responses in the CADDs text window or on any command line.
Variable in user input	<code>tar -cvf /dev/rst0 filename</code>	Replace the variable with an appropriate substitute; for example, replace filename with an actual file name.

Convention	Example	Explanation
Variable in text	tagname	Indicates a variable that requires an appropriate substitute when used in a real operation; for example, replace tagname with an actual tag name.
CADDs commands and modifiers	INSERT LINE TANTO	Shows CADDs commands and modifiers as they appear in the command line interface.
Text string	"SRFGROUPA" or 'SRFGROUPA'	Shows text strings. You must enclose text string with single or double quotation marks.
Integer	n	Supply an integer for the <i>n</i> .
Real number	x	Supply a real number for the <i>x</i> .
#	# mkdir /cdrom	Indicates the root (superuser) prompt on command lines.
%	% rlogin remote_system_name -l root	Indicates the C shell prompt on command lines.
\$	\$ rlogin remote_system_name -l root	Indicates the Bourne shell prompt on command lines.

Window Managers and the User Interface

According to the window manager that you use, the look and feel of the user interface in CADDs can change. Refer to the following table:

Look and Feel of User Interface Elements

User Interface Element	Common Desktop Environment (CDE) on Solaris and HP	Window Manager Other Than CDE on Solaris, HP, and Windows
Option button	ON — Round, filled in the center OFF — Round, empty	ON — Diamond, filled OFF — Diamond, empty
Toggle key	ON — Square with a check mark OFF — Square, empty	ON — Square, filled OFF — Square, empty

Online User Documentation

Online documentation for each book is provided in HTML if the documentation CD-ROM is installed. You can view the online documentation in the following ways:

- From an HTML browser
- From the Information Access button on the CADDs desktop or the Local Data Manager (LDM)

Please note: The LDM is valid only for standalone CADDs.

You can also view the online documentation directly from the CD-ROM without installing it.

From an HTML Browser:

1. Navigate to the directory where the documents are installed. For example,
/usr/ap1/cadds/data/html/htmldoc/ (UNIX)
Drive:\usr\ap1\cadds\data\html\htmldoc\ (Windows)
2. Click `mainmenu.html`. A list of available CADDs documentation appears.
3. Click the book title you want to view.

From the Information Access Button on the CADDs Desktop or LDM:

1. Start CADDs.
2. Choose Information Access, the *i* button, in the top-left corner of the CADDs desktop or the LDM.
3. Choose DOCUMENTATION. A list of available CADDs documentation appears.
4. Click the book title you want to view.

From the Documentation CD-ROM:

1. Mount the documentation CD-ROM.
2. Point your browser to:
CDROM_mount_point/htmldoc/mainmenu.html (UNIX)
CDROM_Drive:\htmldoc\mainmenu.html (Windows)

Online Command Help

You can view the online command help directly from the CADDs desktop in the following ways:

- From the Information Access button on the CADDs desktop or the LDM
- From the command line

From the Information Access Button on the CADDs Desktop or LDM:

1. Start CADDs.
2. Choose Information Access, the *i* button, in the top-left corner of the CADDs desktop or the LDM.
3. Choose COMMAND HELP. The Command Help property sheet opens displaying a list of verb-noun combinations of commands.

From the Command Line: Type the exclamation mark (!) to display online documentation before typing the verb-noun combination as follows:

```
#01#!INSERT LINE
```

Printing Documentation

A PDF (Portable Document Format) file is included on the CD-ROM for each online book. See the first page of each online book for the document number referenced in the PDF file name. Check with your system administrator if you need more information.

You must have Acrobat Reader installed to view and print PDF files.

The default documentation directories are:

- `/usr/apl/cadds/data/html/pdf/doc_number.pdf` (UNIX)
- `CDROM_Drive:\usr\apl\cadds\data\html\pdf\doc_number.pdf` (Windows)

Resources and Services

For resources and services to help you with PTC (Parametric Technology Corporation) software products, see the *PTC Customer Service Guide*. It includes instructions for using the World Wide Web or fax transmissions for customer support.

Documentation Comments

PTC welcomes your suggestions and comments. You can send feedback electronically to `doc-webhelp@ptc.com`.

This chapter presents the following key topics:

- Overview of Cadds2vrm1

Overview of Cadds2vrml

Cadds2vrml is a standalone executable that is executed outside CADDSS environment. The input to the Cadds2vrml command line interface is a CADDSS part/assembly with options and the output is the VRML file for each CADDSS part or assembly.

Platform Specific Information

The cadds2vrml and the cadds2pvs commands are supported on both the UNIX and the Windows NT platforms. For details on the cadds2pvs command see Appendix A, “Cadds2pvs Command Syntax.”

Applications of the Cadds2vrml Utility

You can use the cadds2vrml in a number of applications as listed below:

- Publishing
- Documentation
- Visualization

Supported Geometry

Cadds2vrml supports both Explicit and Parametric geometries. While converting the CADDSS geometries to VRML format you can

- specify to output entities on echoed layers as well. The default output is all layers.
- choose to read the layer information from the selected adrawing, in case your input is an assembly. Layer colors can be selected from the specified adrawing and entities are output in the VRML file with color information.

Cadds2vrml Functionality

Cadds2vrml converts CADDSS tessellation data into one or more VRML files. If you input an assembly to Cadds2vrml, then each part is converted into a standalone VRML file with one master VRML file referencing the VRML files as inlined files.

Your input to the cadds2vrml executable is the part name or assembly name. It first looks for a PVS (Project Visualization System) format (gbf / gaf) file and

converts it to the corresponding vrm1 format. For details on the PVS see Appendix A, “Cadds2pvs Command Syntax”. The VRML file will be created with the .vrm1 extension. If the PVS format files are not present, cadds2vrm1 reads from the _pd and _fd files and creates the corresponding VRML file.

The .vrm1 file extension is generated automatically. The output file name is the name that you provide with the -o option along with the .vrm1 extension. If your input to the cadds2vrm1 command is an assembly, then the -o option indicates the directory <dir> in which the individual VRML files generated for each component are stored. The names in this case will be <dir>/component_instance.vrm1 that is <dir>/c_i.vrm1.

Please note: You can create tessellated data for a CADDs part using the update_gr script. This script can be used directly on the command line. Use update_gr -h to display help on this script.

Cadds2vrml Command Syntax

This chapter details the cadds2vrml command syntax.

- Cadds2vrml Command

Cadds2vrml Command

The cadds2vrml command translates user specified geometries within to vrml format. The geometry can be Parametric or Explicit and the command can be issued from the commandline.

The cadds2vrml command has several options that are described in the following section. There is no GUI for the command.

The basic command is cadds2vrml followed by the name of the part that you want to convert into vrml. Following this you must specify the output filename. If you do not specify the output filename it will be sent to the standard output.

Command Syntax

```
cadds2vrml [-a adraw] [-c] [-C comp_id] [-d drawing] [-e] [-i]
[-o outputfile] [-P CVPATHxxx] [-s] [CADDSpartname ...]
[Assemblyname ...]
```

Description

Table 2-1

Option	Description
-a	Obtain layer color from selected assembly adrawing. Default is selected.
-c	Converts assembly components into separate VRML files of the form <code>dir/c_i.vrml</code> , where: <code>dir</code> is the directory portion from the <code>-o</code> argument (else <code>`pwd`</code>) <code>c_i</code> is the name of the component instance The <code>-o</code> file (or standard output) will receive any non-component output. This is the default
-C	This option processes only the specified component of the selected assembly.
-d	This option displays ECHO LAYER information for the selected drawing, rather than the entire drawing. Use <code>-d "drawing view"</code> to view specific layers. This option sets <code>-e</code>
-e	Restricts output to echoed layers only
-i	This option provides information for each object. This option overrides the <code>-s</code> option.
-o	Specifies output filename, instead of standard output. CVPATH is not used. The default output directory should be <code>cwd</code> .
-P	Use indicated CVPATHxxx name, rather than "CVPATH".
-s	This option will prevent the generation of the standard error progress report

Example 1

Consider that you have a part named `mypart` in your current working directory. This part directory should either contain the corresponding `gbf/gaf` files or should be complete with the `_pd` and the `_fd` files.

1. `cadds2vrm1 mypart`
2. This converts `mypart` and directs the output to the standard output.
3. `cadds2vrm1 -o cube mypart`

This reads the information from `mypart` and converts it to a VRML file `cube.wrl`. This converted file is placed in the current working directory

4. `cadds2vrm1 -o /usr1/parts/cube mypart`

This will place the converted file `cube.wrl` in the directory `/usr1/parts`

5. `cadds2vrm1 -e mypart`

This converts only the echoed layers of `mypart`.

Example 2

Consider that you have an assembly named `my_assembly` with drawings `my_adraw1` and `my_adraw2`.

1. `cadds2vrm1 -a my_adraw1 -c -d my_adraw2 my_assembly`

This converts the CAMU assembly `my_assembly` to the VRML format. The layer color is obtained from `my_adraw1` drawing. Echo layer information is obtained from `my_adraw2`. Each component of the assembly is output as a separate VRML file in this directory as `c_i.wrl`. Another file `my_assembly.wrl` is created. This has the instances of `c_i.wrl` inlined.

2. `cadds2vrm1 -c -C my_component_instance my_assembly`

This processes `my_component_instance` only.

Cadds2pvs Command Syntax

This appendix details the cadds2pvs command syntax.

- Cadds2pvs Command

Cadds2pvs Command

The `cadds2pvs` is a standalone executable that converts the CADDs tessellation data into a graphics ascii file or graphics binary file. This is a command line option.

Syntax

```
cadds2pvs [-a adraw] [-b] [-c] [-C comp_id] [-d drawing]
[-e] [-i] [-o outputfile] [-O] [-P CVPATHxxxx]
[-e] [-i] [-o outputfile] [-P CVPATHxxxx]
[-s] [-t tol] [-v tol] [-w]
[CADDspartname ...] [Assemblyname ...]
```

Description

The `cadds2pvs` converts CADDs tessellation data into a graphics ascii file or graphics binary file. The resulting file may then be used as input for the `CVpvs` command.

Table A-1

Options	Descriptions
-a	Obtain layer colors from selected assembly adrawing.
-b	Output graphic binary files (gbf) instead of ascii (gaf).
-c	Convert assembly components into separate files of the form <code>dir/c_i.x</code> , where <code>dir</code> is the directory portion from the <code>-o</code> argument (else <code>`pwd`</code>), <code>c_i</code> is the name of the component instance, and <code>x</code> is <code>gaf</code> or <code>gbf</code> . Any <code>'&'</code> characters in <code>c_i</code> are converted to <code>'~'</code> . The <code>-o</code> file (or standard output) will receive any non-component output
-C	Process this assembly component only. For example, 'bolt_4'. Prepend subassembly id names as 'piston_2_bolt_4'. You will likely use the <code>-c</code> option with <code>-C</code> .
-d	Obtain ECHO LAYER information from selected drawing, rather than arbitrary drawing. Use <code>-d "drawing view"</code> for view specific layers. This option sets <code>-e</code> .
-e	Restrict output to echoed layers only.
-i	Regardless of <code>-s</code> , provide info for each object.
-o	Output filename, instead of standard output. <code>CVPATH</code> not used.

Table A-1

Options	Descriptions
-O	Use Unique ID (UID) instead of miptr when generating the value for Object ID, decomposable into two components: the CADDs UID (lower 5 digits) and Part ID (digits to the left of the lower 5 digits; 42948 is the maximum permitted Part ID, and 99999 the maximum CADDs UID. Applicable only to parts which have a scalar entity with property ADBDATA attached. Has priority over option -U if both selected for a part containing a scalar with property ADBDATA, but -U is done if -O is not possible.
-P	Use indicated CVPATHxxx name, rather than "CVPATH".
-s	Silence a progress report on standard error.
-t	Eliminate every facet edge in a shell polygon whose sum of x,y,z components is less than the specified tolerance. The default is 1.0. It must be expressed in millimeters. Use 0 for no elimination. See -v option.
-U	Use Unique ID (UID) instead of miptr when generating the value for Object ID. An miptr gets reused as you use CADDs, but a UID does not get reused.
-v	Tolerance for flat or shell polygon vertices which should be identical. Default is 0.01. It must be expressed in millimeters. See -t option.
-w	Format ascii output with more whitespace. If required, options may be carefully condensed: cadds2pvs -bfpo assy.gbf -d 'ddraw top' -a default assy. See the man pages on `getopt(3C)` for more information. An Assembly name may be entered in place of a CADDs part name. When relative paths are used for Assembly and CADDs part names, you should define the CVPATH environment variable before running cadds2pvs. CVPATH will be used for locating assembly components. (See the -P option.) Any invalid option, such as -h, will provide help for this command.

General Usage of the Cadds2pvs Command

If multiple parts are provided as input to the cadds2pvs command, then only one text file is created.

Using the visualizer you can see some surfaces without selecting the View->Culling->Off option. For more details on this refer to *Optegra Visualizer for Workstations User Guide*.

When layer color discrimination is not available, the following message appears.

```
No layer/color discrimination (assigning
```

Process Internal to Cadds2pvs Command

This section describes some of the functionalities that are carried out internally when you specify the various options. The options that you specify are implemented internally using a formula. These are listed below.

Formula	Description
$\text{colornumber} = (\text{layernumber} \bmod 64) + 1$	Colors are assigned by the formula
$\text{object_id} = ((\text{PartSequenceNumber} + 0x8000) \ll 16) + \text{miptr}$	Object ids are generated by one of the following formulas
$\text{object_id} = ((\text{PartSequenceNumber} + 0x2000) \ll 18) + \text{UID}$	if neither option -O or -U is done;
$\text{object_id} = (\text{PartID} \ll 18) + \text{UID}$	if option -U is done;
PartID = third word of ADBDATA property of a scalar entity, identifying a part attached to Vault Info.	if option -O is done;

Examples

The following examples illustrates the various ways in which the cadds2pvs command can be used.

- Processing all cadds parts in the current directory using csh

```
foreach pd (*/_pd)
set part=`dirname $pd`
cadds2pvs -bso $part.gbf $part
echo Processed: $part
end
```

- Obtaining help for the cadds2pvs command

```
cadds2pvs -h |& more
```

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