cadence®

Cadence Conversion Tool Box User Guide

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Preface

The Cadence® Conversion Toolbox provide utilities for converting different types of design data from one format or organization to another.

This user guide is aimed at developers and designers of integrated circuits and assumes that you are familiar with:

- The Virtuoso design environment and application infrastructure mechanisms designed to support consistent operations between all Cadence® tools.
- The applications used to design and develop integrated circuits in the Virtuoso design environment, notably, the Virtuoso Layout Suite, and Virtuoso Schematic Editor.
- The Virtuoso design environment technology file.
- Component description format (CDF), which lets you create and describe your own components for use with Layout XL.

This preface contains the following topics:

- Scope
- Licensing Requirements
- Related Documentation
- Additional Learning Resources
- Customer Support
- Feedback about Documentation
- Typographic and Syntax Conventions

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Scope

Unless otherwise noted, the functionality described in this guide can be used in both mature node (for example, IC6.1.8) and advanced node and methodologies (for example, ICADVM20.1) releases.

Label	Meaning
(ICADVM20.1 Only)	Features supported only in ICADVM20.1 advanced nodes and advanced methodologies releases.
(IC6.1.8 Only)	Features supported only in mature node releases.

Licensing Requirements

For information on licensing in the Virtuoso design environment, see the *Virtuoso Software Licensing and Configuration Guide*.

Related Documentation

What's New and KPNS

- *Virtuoso Design Environment What's New*
- *Virtuoso Design Environment Known Problems and Solutions*

Installation, Environment, and Infrastructure

- *Technology File and Display Resource File User Guide*
- *Technology File and Display Resource File SKILL Reference Manual*
- *Component Description Format User Guide*
- *Cadence SKILL IDE User Guide*
- *Virtuoso Design Environment User Guide*
- *Cadence Library Path Editor User Guide*

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- *Cadence Design Framework II Configuration Guide*
- *Cadence Installation Guide*
- *User Interface SKILL Function Reference*
- *SKILL Language User Guide*
- *SKILL Language Reference*

Additional Learning Resources

Video Library

The Video Library on the Cadence Online Support website provides a comprehensive list of videos on various Cadence products.

To view a list of videos related to a specific product, you can use the *Filter Results* feature available in the pane on the left. For example, click the *Virtuoso Layout Suite* product link to view a list of videos available for the product.

You can also save your product preferences in the Product Selection form, which opens when you click the *Edit* icon located next to *My Products*.

Virtuoso Videos Book

You can access certain videos directly from Cadence Help. To learn more about this feature and to access the list of available videos, see Virtuoso Videos.

Rapid Adoption Kits

Cadence provides a number of Rapid Adoption Kits that demonstrate how to use Virtuoso applications in your design flows. These kits contain design databases and instructions on how to run the design flow.

To explore the full range of training courses provided by Cadence in your region, visit Cadence Training or write to training_enroll@cadence.com.

Note: The links in this section open in a separate web browser window when clicked in Cadence Help.

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Help and Support Facilities

Virtuoso offers several built-in features to let you access help and support directly from the software.

- The Virtuoso *Help* menu provides consistent help system access across Virtuoso tools and applications. The standard Virtuoso *Help* menu lets you access the most useful help and support resources from the Cadence support and corporate websites directly from the CIW or any Virtuoso application.
- The Virtuoso Welcome Page is a self-help launch pad offering access to a host of useful knowledge resources, including quick links to content available within the Virtuoso installation as well as to other popular online content.

  The Welcome Page is displayed by default when you open Cadence Help in standalone mode from a Virtuoso installation. You can also access it at any time by selecting *Help – Virtuoso Documentation Library* from any application window, or by clicking the *Home* button on the Cadence Help toolbar (provided you have not set a custom home page).

For more information, see Getting Help in *Virtuoso Design Environment User Guide.*

Customer Support

For assistance with Cadence products:

- Contact Cadence Customer Support

  Cadence is committed to keeping your design teams productive by providing answers to technical questions and to any queries about the latest software updates and training needs. For more information, visit https://www.cadence.com/support.
- Log on to Cadence Online Support

  Customers with a maintenance contract with Cadence can obtain the latest information about various tools at https://support.cadence.com.

Feedback about Documentation

You can contact Cadence Customer Support to open a service request if you:

- Find erroneous information in a product manual
- Cannot find in a product manual the information you are looking for

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- Face an issue while accessing documentation by using Cadence Help

You can also submit feedback by using the following methods:

- In the Cadence Help window, click the *Feedback* button and follow instructions.
- On the Cadence Online Support Product Manuals page, select the required product and submit your feedback by using the *Provide Feedback* box.

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Typographic and Syntax Conventions

The following typographic and syntax conventions are used in this manual.

text	Indicates names of manuals, menu commands, buttons, and fields.
`text`	Indicates text that you must type exactly as presented. Typically used to denote command, function, routine, or argument names that must be typed literally.
`z_argument`	Indicates text that you must replace with an appropriate argument value. The prefix (in this example, *`z_`*) indicates the data type the argument can accept and must not be typed.
|	Separates a choice of options.
`{ }`	Encloses a list of choices, separated by vertical bars, from which you **must** choose one.
`[ ]`	Encloses an optional argument or a list of choices separated by vertical bars, from which you **may** choose one.
`[ ?argName` *`t_arg`* `]`	Denotes a *key argument*. The question mark and argument name must be typed as they appear in the syntax and must be followed by the required value for that argument.
`...`	Indicates that you can repeat the previous argument. Used with brackets to indicate that you can specify zero or more arguments. Used without brackets to indicate that you must specify at least one argument.
`,...`	Indicates that multiple arguments must be separated by commas.
`=>`	Indicates the values returned by a Cadence® SKILL® language function.
`/`	Separates the values that can be returned by a Cadence SKILL language function.

If a command-line or SKILL expression is too long to fit within the paragraph margins of this document, the remainder of the expression is moved to the next line and indented. In code excerpts, a backslash (\ ) indicates that the current line continues on to the next line.

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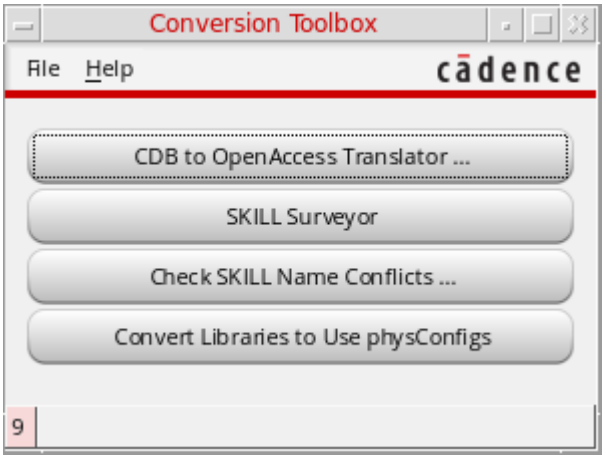
Getting Started

The Conversion Toolbox provides utilities for converting different types of design data from one format or organization to another. You can use the Conversion Toolbox to translate data from CDB to OpenAccess, create a non-proprietary snap-shot of your SKILL environment, and convert your schematic libraries and designs.

In CIW, choose *Tools – Conversion Tool Box*.

The Conversion Tool Box appears.



The following utilities are available:

Utility	Description
CDB to OpenAccess Translator	Opens the CDB to OpenAccess Translator (IC6.1.8 Only).

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Utility	Description
SKILL Surveyor	Opens the SKILL Tabulated Form so that you can create a non-proprietary snap-shot of your SKILL environment and report the Cadence functions called from your SKILL code (see Chapter 2, "SKILL Surveyor")
Check SKILL Name Conflicts	Opens the SKILL Name Checker form
Convert Libraries to Use physConfigs	Opens the Convert Libraries to Use Physical Configuration Views form so that you can convert your schematic libraries and designs (see Converting Schematic Libraries and Designs in the *Virtuoso Layout Suite XL User Guide*)

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SKILL Surveyor

The SKILL Surveyor provides access to the SKILL Tabulator from the Conversion Tool Box. To run the SKILL Surveyor, do the following:

1. In the Conversion Tool Box, click *SKILL Surveyor*.

   The SKILL Tabulator Form appears.

   Note: An asterisk (*) in front of a field label indicates a required field. You must type data in these fields. Accuracy is important because some of these fields are used to file PCRs.

2. Fill out the fields on the SKILL Tabulator form according to the field descriptions outlined in "SKILL Tabulator Form" on page 13.

3. Click *OK* or *Apply*.

   If the SKILL Surveyor can locate a valid mail command on your system (`mail` or `mailx` in `/usr/bin` or `/bin`), the Email Tabulated List of Functions form appears.

   If the SKILL Surveyor is not able to locate a valid mail command on your system, the Specify Alternative Mail Command Path form form appears.

4. Fill out the required form or forms and click *OK*.

The SKILL Tabulator creates a non-proprietary snap-shot of your SKILL environment and reports the Cadence functions called from your SKILL code. It ignores all user functions to preserve confidentiality.

The SKILL Tabulator generates three files:

- `skillTab.out` (list of functions defined and called and how many times called)
- `skillTab.info` (files where functions were called)
- `skillTab.defn` (files where functions were defined)

You can e-mail `skillTab.out` to Cadence Support for analysis. Cadence Support will e-mail the analysis results back to the e-mail address you type in the *Customer Email Address* field on the SKILL Tabulator form.

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The analysis provides the following information:

- All undefined functions (misspelled or dependencies): You called a function that neither you nor Cadence defined.
- All re-defined Cadence functions: You defined a function that Cadence also has defined in our code.
- All changed functions (most are positive improvements): You called a function that we changed between releases.
- All deleted functions (with replacements if available): You called a function that we deleted between releases.
- All functions that are safely supported: You called a function that we document and support.
- All functions that might be dangerous to use: You called a function that we have not documented or do not support.
- Advice on how to recover from any changes identified.

See also "Troubleshooting" on page 18.

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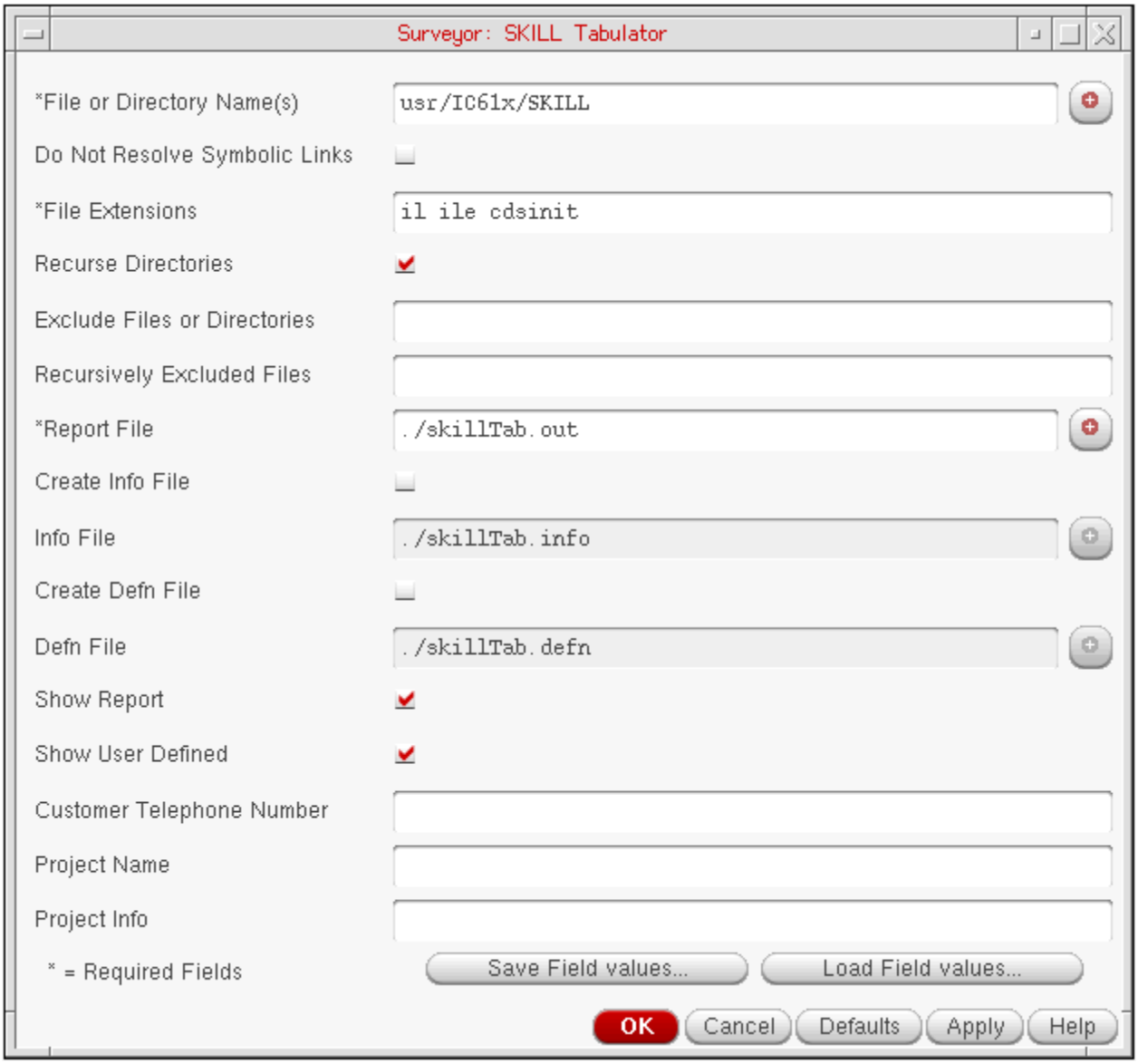
SKILL Tabulator Form

Note: An asterisk (*) in front of a field label indicates a field into which you must enter data.



*File or Directory Name(s)

One or more space-separated SKILL file names or directory names containing the SKILL files to be tabulated. By default, the current directory from which you started the program appears in this field. This is a required field.

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Do Not Resolve Symbolic Links

You can use this option to enable the SKILL Tabulator to check the files that have no extension. (See *File Extensions* field description, next.)

By default, this check box is not marked: The SKILL Tabulator resolves symbolic links to check the files to which the links refer. For example:

```
% ls -l /usr/src/fileLn.il
/usr/src/fileLn.il -> actualFile
```

When the check box is not marked, the SKILL Tabulator checks `/usr/src/actualFile`.

You can mark this check box so that the SKILL Tabulator checks links without resolving them. In the example above, the SKILL Tabulator checks `/usr/src/fileLn.il`.

*File Extensions

Specifies one or more extensions of files to be tabulated (by default, `il ile cdsinit`). If you use extensions that differ from the usual `il ile cdsinit`, you must edit this field. Unless you mark the *Do Not Resolve Symbolic Links* check box (above), the SKILL Tabulator follows symbolic links and the extensions are checked against the file to which the links refer. This is a required field.

Recurse Directories

When you mark this check box, the SKILL Tabulator recursively searches all the files hierarchically under the directory path(s) you typed in the *File or Directory Name(s)* field. This check box is marked by default.

Exclude Files or Directories

Specifies files or directories to be excluded from tabulation in the current directory level of the directories specified in the *File or Directory Name(s)* field.

Recursively Excluded Files

Specifies zero or more files to be recursively excluded from tabulation in the current directory level as well as all the subdirectories of the directories you typed in the *File or Directory Name(s)* field.

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*Report File

Specifies the output file (by default, `./skillTab.out`) that will contain a report of Cadence and user-defined functions defined, called, and how many times they were called. This is a required field.

Create Info File
Info File

When you mark this check box, the *Info File* field becomes active and you can specify the name and location of an information file that the SKILL Tabulator creates containing a list of files where Cadence and user-defined functions were called.

Create Defn File
Defn File

When you mark this check box, the *Defn File* field becomes active and you can specify a definition file that the SKILL Tabulator creates containing a list of files where Cadence and user-defined functions were defined.

Show Report

You can mark this check box to cause the SKILL Tabulator to open the report file in a viewing window when the tabulation is done.

Show User Defined

You can mark this check box to cause the SKILL Tabulator to list the functions that are filtered by the local definition criterion in the output file.

*Company Name

Type your company name. This is a required field.

*Company Location

Type your company location using *`city, state`* format, such as `San Jose, CA`. This is a required field.

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*Customer Contact Name

Type your full name.

*Customer Email Address

Type your full e-mail address. Cadence uses this e-mail address to send the analysis results back to you. This is a required field.

Customer Telephone Number

Type your full telephone number, including area code or country code as required.

CDS Contact Name

Type the name of your Cadence contact.

CDS Contact Email Address

Type the full e-mail address of your Cadence contact.

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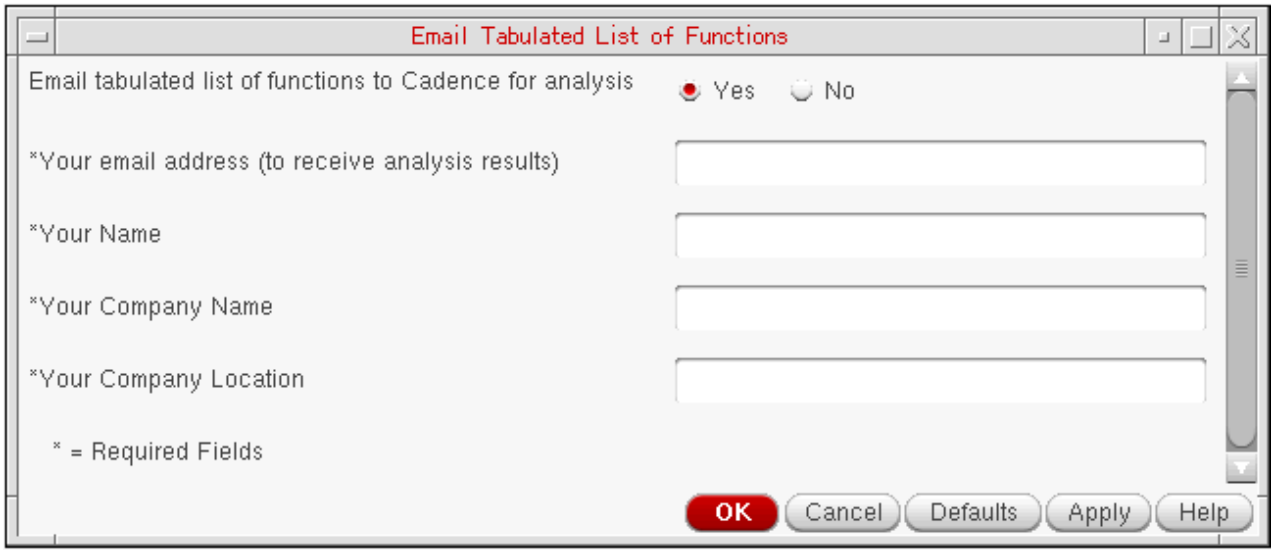
Email Tabulated List of Functions Form

This form appears when you click *OK* on the SKILL Tabulator form provided the SKILL Surveyor can locate a valid mail command on your system (`mail` or `mailx` in `/usr/bin` or `/bin`).

Note: If the SKILL Surveyor is not able to locate a valid mail command on your system, the Specify Alternative Mail Command Path form appears.



The settings on this form are as follows:

Setting	Description
Email tabulated list of functions to Cadence for analysis	Specifies whether to send the output report file (default: `./skillTab.out`) to Cadence Support for analysis.
Your email address to receive analysis results	Full e-mail address that Cadence should use to send the analysis results back to you. By default, the e-mail address you type in the *Customer Email Address* field on the SKILL Tabulator form appears in this field.

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Specify Alternative Mail Command Path Form

When you click *OK* on the SKILL Tabulator form, this form appears only if the SKILL Surveyor is not able to locate a valid mail command on your system (`mail` or `mailx` in `/usr/bin` or `/bin`).

To specify an alternative path to a mail command, do the following:

➤ In the *Enter an alternative mail command path* field, type an alternative path.

Troubleshooting

- Unable to mail the report file

  A command failure has occurred. For example, the `ilmail` script might be missing in `cds_root>/tools/bin`. Look in your terminal window for the corresponding error message.

- SKILL tabulation report file not found

  Possible causes are as follows:

  - You left the *Report File* field on the SKILL Tabulator form empty or you do not have write permission for the file path you specified.
  - The specified *Report File* file was accidentally removed. You can run the tabulation again to regenerate this file.
  - Bad SKILL files caused the tabulation run to fail. Refer to your log file (for example, `~/CDS.log`) for more information about the errors and make sure that all of your SKILL files have no syntax errors before running tabulation again.

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Using the SKILL Name Checker

As a context developer, you need to check for conflicts that arise when you define a function or variable in more than one context (name collisions).

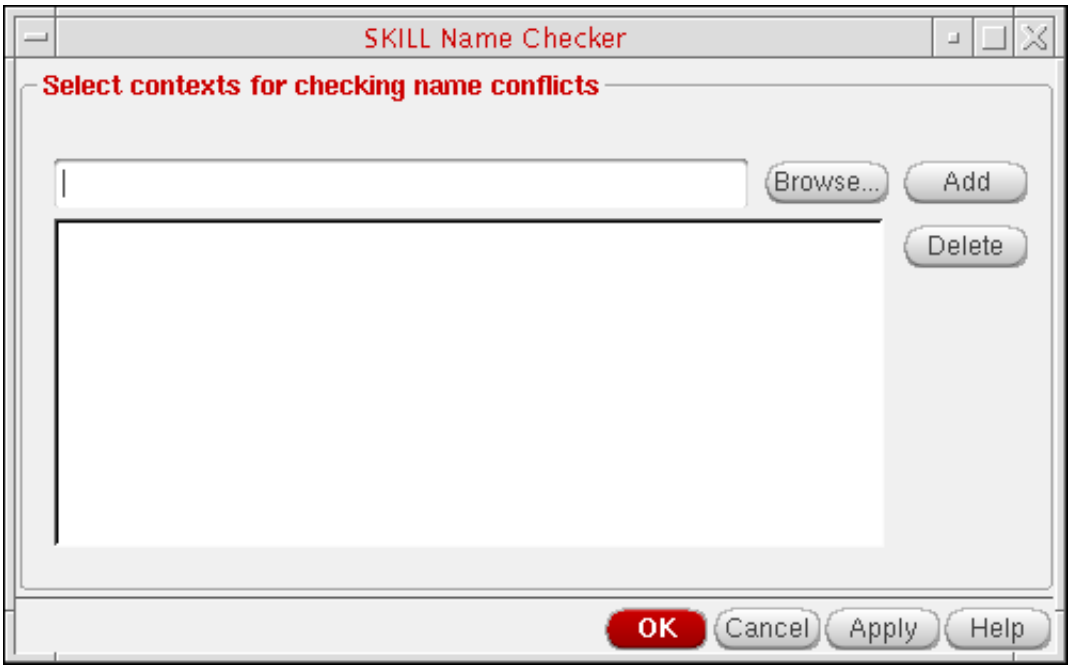
To check for name collisions in loaded contexts, do the following:

1. In the CIW, choose *Tools – Conversion Tool Box*.

   The Conversion Tool Box appears.

2. Click *Check SKILL Name Conflicts*.

   The SKILL Name Checker form appears.



3. Click *Browse*.

   A browser window appears.

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4. For each context file you want to add to the check, do the following:

   a. Navigate to and select a valid context file and click *Apply*.

   The file name appears in the field on the SKILL Name Checker form.

   b. On the SKILL Name Checker form, click *Add*.

   The file name moves from the field to the list area.

5. On the SKILL Name Checker form, click *OK*.

   Duplicate definitions appear in the SKILL Name Checker Results window as follows:

   `symbol '`*`functionName`* `already defined by context "`*`contextName`*`"`

   where *`functionName`* is the name of the function and *`contextName`* is the first context in which the program found *`functionName`*.

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