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Introducing the Intel® Debugger

The Intel® Debugger (IDB) is a full-featured symbolic source code application debugger that helps programmers:

- debug programs
- disassemble and examine machine code and examine machine register values
- debug programs with shared libraries
- debug multithreaded applications

A GUI and command-line interface are available on systems based on IA-32 or Intel® 64 architecture running Linux* OS.

A command-line interface is available on the following systems:

- Systems based on the IA-32 architecture running Mac OS* X
- Systems based on the Intel® 64 architecture running Mac OS X
- Systems based on IA-64 architecture running Linux OS

The debugger features include:

- C/C++ language support
- Fortran language support including Fortran 95/90
- Assembler language support
- Access to the registers your application accesses
- Bitfield editor to modify registers
- MMU support
The Intel® Debugger facilitates developing parallelism into applications based on the parallel C++ language extensions of the Intel® C++ compiler or the Intel® OpenMP® runtime environment. The Intel® Debugger offers the following parallel debugging features:

- **Thread data sharing analysis**, to detect accesses to identical data elements from different threads.

**NOTE.** Thread data sharing detection is limited to applications that use the parallel language extensions of the Intel® C++ Compiler. To analyze threading errors in other applications, it is recommended to use the Intel® Thread Checker. The Intel® Thread Checker includes a patented advanced error detection engine for finding data races and deadlocks.

- A smart breakpoint to stop program execution on re-entrant function calls from different threads.
- A mode for simulating serial execution of OpenMP® code, which is useful for debugging OpenMP code. You can enable or disable the creation of additional worker threads in OpenMP parallel loops dynamically.
- A set of OpenMP runtime information views for advanced OpenMP program state analysis.
- An SSE (Streaming SIMD Extensions) register view with extensive formatting and editing options for debugging parallel data using the SIMD (Single Instruction, Multiple Data) instruction set.

**NOTE.** The Intel Debugger is designed for and tested on Intel processors. Incompatible or proprietary instructions supported by non-Intel processors might cause the analysis capabilities of this product to function incorrectly. Attempts to analyze code not supported by Intel processors could result in failures in this product.

**See Also**
- Related Information
- Notational Conventions

**Related Information**

The Release Notes contain product features or changes in the product that may not be documented elsewhere. Release Notes are included in the product installation.
## Notational Conventions

<table>
<thead>
<tr>
<th>Convention</th>
<th>Explanation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Italic</em></td>
<td>Italic is used for emphasis, the introduction of new terms, denotation of terms, placeholders, titles of manuals.</td>
<td><em>Do not</em> close the project without saving. The filename consists of the <em>basename</em> and the <em>extension</em>. The expression <em>and/or</em> denotes an inclusive choice between two or more items. The bitmap is <em>width</em> pixels wide and <em>len</em> pixels high. For more information, refer to the <em>Intel® Linker Manual</em>.</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>Text in boldface denotes elements of the graphical user interface.</td>
<td>The <strong>Cancel</strong> button of the <strong>Start</strong> dialog box</td>
</tr>
<tr>
<td>Monospace</td>
<td>Monospace indicates filenames, directory names and pathnames, commands and command-line options, function names, methods, classes, data structures in body text, source code.</td>
<td><em>ippsapi.h</em> *alt*include ecl -O2</td>
</tr>
<tr>
<td><strong>Monospace italic</strong></td>
<td>Italic monospace indicates source code parameters, arguments, or other placeholders.</td>
<td>Use the <strong>CreateObj()</strong> function to ... printf(&quot;hello, world\n&quot;);</td>
</tr>
<tr>
<td><strong>Monospace italic</strong></td>
<td>Italic monospace indicates source code parameters, arguments, or other placeholders.</td>
<td><em>ippiMalloc</em> ( int <em>width</em>, int* <em>pStep</em>);</td>
</tr>
<tr>
<td>Convention</td>
<td>Explanation</td>
<td>Example</td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Monospace bold</strong></td>
<td>Bold monospace indicates what you type as input on a command line or emphasizes parts of source code.</td>
<td><code>[c:] dir</code></td>
</tr>
<tr>
<td>[ ]</td>
<td>Items enclosed in brackets are optional.</td>
<td><code>Fa[c]</code> Indicates Fa or Fac.</td>
</tr>
<tr>
<td>{</td>
<td>Braces and vertical bars indicate the choice of one item from a selection of two or more items.</td>
<td>`X{A</td>
</tr>
<tr>
<td>&quot;[ &quot; ]&quot;</td>
<td>Writing a metacharacter in quotation marks negates the syntactical meaning stated above; the character is taken as a literal.</td>
<td><code>&quot;[&quot; X &quot;]&quot; [ Y ]</code> denotes the letter X enclosed in brackets, optionally followed by the letter Y.</td>
</tr>
<tr>
<td>...</td>
<td>The ellipsis indicates that the previous item can be repeated several times.</td>
<td><code>filename ...</code> Indicates that one or more filenames can be specified.</td>
</tr>
<tr>
<td>,...</td>
<td>The ellipsis preceded by a comma indicates that the previous item can be repeated several times, separated by commas.</td>
<td><code>word ,...</code> Indicates that one or more words can be specified. If more than one word is specified, the words are comma-separated.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Indicates a menu item inside a menu.</td>
<td><em>File &gt; Close</em> indicates to select the <strong>Close</strong> item from the <em>File</em> menu.</td>
</tr>
</tbody>
</table>
Preparing the Debugging Environment

When you start the debugger, it captures the environment of the shell that launches the debugger. When you debug an MPI application, the debugger uses the environment of the leaf debugger’s shell, capturing this environment when you launch the debugger. The shell’s environment variables include PATH, LD_LIBRARY_PATH, SHELL and HOME.

To modify the captured environment, use the set environment command. To display the captured environment, use the show environment command.

Changes you make to the captured environment only affect debuggees that are started after you make the change. They have no effect on the debugger itself until you restart the debugger.

To see the list of environment variables, use the printenv shell command before starting the debugger.

See Also
set environment (gdb mode only)
show environment (gdb mode only)

Configuring the Debugger

Configuring Default Startup Actions Using Initialization Files

You can use an initialization file to execute specific commands when the debugger starts up. For example, you can create an initialization file to load a debuggee as soon as the debugger starts.
You can have an initialization file in your home directory as well as in your project directory.
You can connect to the target in the initialization file in your home directory, and use the
project initialization file to open a specific executable file and set a breakpoint.

When you start the debugger, it reads .gdbinit. The debugger first looks for the
initialization file in your home directory, and then in the current directory.

**Example**
The following .gdbinit file is stored in the project directory. It does the following:

1. Opens the executable `app_name`:
   
   ```
   idb file app_name
   ```

2. Sets a breakpoint at `main`:
   
   ```
   break main
   ```

3. Runs `app_name`:
   
   ```
   run
   ```

Here is the full sample .gdbinit file:

```
file app_name
break main
run
```

**How the Debugger Finds Source Files**
The debugger searches for a source file (`dir_name/base_name`) using the following
algorithm:

1. If `dir_name` is mapped to another source directory (`mapped_dir_name`), look for
   `mapped_dir_name/base_name`.

2. If Step 1 fails to find a readable file:
   a. Case 1: If `dir_name` is absolute, look for `dir_name/base_name`.
   b. Case 2: If `dir_name` is relative, for each entry `use_dir` in `use_list`, look for
      `use_dir/dir_name/base_name`. The debugger attempts to use the directories in
      `use_list` in the order in which they appear.

3. If Step 2 fails, for each entry `use_dir` in `use_list`, look for `use_dir/base_name`.
   The debugger attempts to use the directories in `use_list` in the order in which they
   appear.

4. If Step 3 fails, the debugger cannot find any source file.

The debugger uses the first-found readable file as the source file.
Specifying Source Directories

You can change the source path information that the symbol file specifies. The debugger assumes that all source files are stored in the same directory as they were at compile time.

See Also

directory (gdb mode only)
use (idb mode only)

Specifying Source Path Substitution Rules

The debugger assumes that all source files are stored in the same directory as they were at compile time. If the sources are placed in different directories, you can add a source path substitution rule. This rule will replace the source directory paths automatically.

TIP. To modify a source path substitution rule, select it and click the Modify… button.

See Also

Specifying Source Directories
map source directory (idb mode only)
set substitute-path (gdb mode only)

TIP. To modify a shared library path substitution rule, select it and click the Modify… button.

Preparing a Program for Debugging

Preparing Your Source Code

You do not need to make changes to the source code to debug the program. However, it is recommended to make the following items part of your source code:
— An initial stall point, if you cannot stop the process easily from within the debugger.
— Assertions sprinkled liberally through the sources to help locate errors early.

See Also
Preparing the Compiler and Linker Environment
Debugging Optimized Code

Preparing the Compiler and Linker Environment

Debugging information is put into .o files by compilers. The level and format of information is controlled by compiler options.

With the Intel® C++ or Fortran Compiler, use the -g option. For example:

```
% icc -g hello.c
...
% icpc -g hello.cpp
...
```

With the GNU* Compiler Collection, (GCC) use the -g option. On some older versions of GCC, this option might generate DWARF-1. If so, use the -gdwarf-2 option. For example:

```
% gcc -gdwarf-2 hello.c
...
% g++ -gdwarf-2 hello.cpp
...
```

See your compiler's documentation for more details.

The debugging information is propagated into the a.out (executable) or .so (shared library) by the ld command.

If you are debugging optimized code, using -g automatically adds -O0.

See the Debugging Optimized Code section of this manual and the appropriate compiler documentation for information about -g and related extended debug options and their relationship to optimization.

See Also
Preparing Your Source Code
Debugging Optimized Code
Debugging Optimized Code

The debugger can help debug an optimized program that is compiled with the `-g` option. However, some of the information about the program may be inaccurate. In particular, the locations and values of variables are often not correctly reported, because the common forms of debug information do not fully represent the complexity of the optimizations provided by the `-O1`, `-O2`, `-O3` and other optimization options.

To avoid this limitation, compile the program with an Intel® compiler, specifying both the `-g` and `-debug extended` options, in addition to the desired `-O1`, `-O2` or `-O3` optimization option. This causes the generation of more advanced, but less commonly supported debug information, which enables the following:

- Giving correct locations and values for variables, even if they are in registers or at different locations at different times. Note the following:
  - Some variables may be optimized away or converted to data of a different type, or their location may not be recorded at all points in the program. In these cases, printing a variable will yield `<no value>`.
  - Otherwise, the values and locations will be correct, though registers have no address, so a `print &i` command may print a warning.
  - Most variables and arguments are undefined during function prologues and epilogues, though a `break main` command will usually stop the program after the prologue.

- Shows inline functions in stack traces, identified by the `inline` keyword. Note the following:
  - Only the function at the top of the stack and functions that make regular (non-inline) calls show instruction pointers, because other functions share a hardware-defined stack frame with the inline functions that they called.
  - The return instruction will only return control to a function that made a non-inline call using a call instruction, because inline calls have no defined return address.
  - The `up`, `down`, and `call` commands work as usual.

- Allows you to set breakpoints in inlined functions.

The following limitation exists:

Optimization often causes the instructions for a source line to be generated in an order that does not match the order of the source; the instructions for a line may be mixed in with instructions from other source lines as well. When stepping through such code, the program will tend not to stop at each source line in turn, but rather it will stop each time a change in source line occurs.

See Also

Preparing Your Source Code
Preparing the Compiler and Linker Environment
Starting and Exiting the Debugger

Starting the Debugger

On systems based on IA-32 or Intel® 64 architecture running Linux* OS, the debugger runs in GUI mode by default. You can also start the debugger in command line mode on these systems by specifying idbc instead of idb in the command line.

On all other systems, the debugger only runs in command line mode.

**NOTE.** The idb command is enabled when you run the script that sets up the compiler environment as described in the Getting Started document for the compiler.

To start the debugger:

Enter the following command in a shell:

```bash
idb
```

The debugger starts running.

**See Also**

Exiting the Debugger

Starting the Debugger in Command Line Mode

The following information applies only to systems based on IA-32 or Intel® 64 architecture running Linux* OS.

By default, the debugger starts in GUI mode. You can also run the debugger without the GUI, in command line mode.
NOTE. The `idbc` command is enabled when you run the script that sets up the compiler environment as described in the *Getting Started* document for the compiler.

To start the debugger in command line mode, enter the following in a shell:

```
idbc
```

The debugger starts running.

To view a list of options for this command, enter the following command in a shell:

```
idbc --help
```

**See Also**

Exiting the Debugger

**Exiting the Debugger**

To exit the debugger:

- Select **File > Exit**.
- Enter `quit`.

The debugger and all output files are closed.

**See Also**

`quit`
About Session Handling

You can save information about a debugging session and subsequently restore it. When you save a session, the debugger saves the following information.

- Source directory paths
- Substitute source directory paths
- Shared library substitution paths
- Environment variables that you changed for a debug session
- Debugger variables
- Debuggee arguments
- Breakpoints and watchpoints

In addition to enabling you to manually save a session, the debugger implicitly uses the following elements of the previous session's settings when you open the same debuggee without restarting the debugger:

- code breakpoints
- data breakpoints
- environment variables

This is true whether you open the debuggee with the GUI or the GDB mode file command. You can even use a recompiled debuggee, as long as its name and path are the same.

The debugger does not implicitly use these settings when you detach and reattach to the debuggee process, because it doesn’t recognize whether the process is the same debuggee.
Reloading a Debuggee Without Previous Session Settings

Because the debugger implicitly uses the previous session’s breakpoints, watchpoints and environment variables, when you want to reload and restart the debuggee executable without these settings, you must explicitly remove them.

To restart debugging an executable you are already debugging without any of the existing settings:
1. Load the executable.
2. Run the executable.

See Also
About Session Handling

Saving a Session

To save a session:
1. Select File > Save Session....
   The Save Session dialog box appears.
2. In the Name field, enter a name for the session file.
3. Click OK.

The debugger saves the session information.

Alternatively, you can use the idb session save command as follows:

idb session save session_file

See Also
idb session save (gdb mode only)
Restoring a Session

**To restore a saved session:**
1. Select **File > Load Session**....
   - The **Load Session** dialog box appears.
2. Select the session file you want to restore.
   Alternatively, you can use the `idb session save` command as follows:
   ```
   idb session restore session_file
   ```

**See Also**
- `idb session restore (gdb mode only)`

About Session Handling in Command-line Mode

The debugger variable `$sessiondir` is set to the directory in which the debugger saves session files:
- `$HOME/.idb/sessions/` in command line mode.
- `$PWD/workspace/sessions/` in GUI mode, where `$PWD` is the working directory in which the GUI was started.

You cannot change this directory.

**To identify this directory, use the following command:**
```
print $sessiondir
```

**See Also**
- Saving a Session
- Restoring a Session
Working With Thread and Process Sets

Working With Thread and Process Sets: Overview

When many processes are running, it can be annoying or impractical to enumerate all the processes when you need to focus on specific processes.

When defining stopping threads and thread filters for code breakpoints, you need to define sets of threads.

You can specify a set of processes or threads in a compact form, where a set includes one or more ranges. You can execute normal operations on process sets, and debugger variables can store both sets and ranges for manipulation, reference, or inspection.

See Also
- Process and Thread Set Notation
- Storing Process and Thread Sets in Debugger Variables
- Process and Thread Set Operations
- Changing the Current Process Set
- Predefined Thread Sets
- Viewing Threads and Thread Sets
- Synchronizing a Set of Threads

Process and Thread Set Notation

The operating system assigns each process a process ID (pid). The debugger assigns each currently running thread an ID.
The debugger does not reuse thread IDs. For example, suppose there are five threads running, with IDs from 1-5. If you kill thread 3, and then create a new one, the new one has the ID 6, not 3.

NOTE. Brackets ([]) are part of the process set syntax, so this topic shows optional syntactic items enclosed in curly braces ({}).

Specifying Process and Thread Sets

A set of processes or threads comprises one or more contiguous ranges of process or thread IDs, separated by commas.

To specify a process set, use the following notation:

\[[ \text{range} \{,\ldots\} ]\]

To specify a thread set, use the following notation:

t:\[ \text{range} \{,\ldots\} \]

You can express an empty set with empty brackets:

\[
\]

You can specify process and thread sets using expressions, wildcards and by merging thread sets.

Example

The following example contains the first three threads in the current process.

t:\[1,2,3]\n
The following example specifies a thread set using an expression:

t:\[1:3+\text{foo}()\]

The following example specifies a merged thread set:

t:\[*\] - t:\[1\]

The following example contains all the threads in the current process.

t:\[*\]

The following example contains all the threads in the current process except threads 1 and 6.

t:\[2:5, 7:]}

See Also

* Working With Thread and Process Sets: Overview
* Storing Process and Thread Sets in Debugger Variables
### Specifying a Range of Processes or Threads

To specify a consecutive range of processes or threads, use one of the following notations:

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Specifies all processes or threads.</td>
</tr>
<tr>
<td>expression</td>
<td>If <code>expression</code> evaluates to, or can be coerced into an integer <code>p</code>, then the set contains the thread or process with ID <code>p</code> only. If <code>expression</code> evaluates to a range <code>r</code>, then the set is the same as <code>r</code>.</td>
</tr>
<tr>
<td>{ expression } : { expression }</td>
<td>Specifies a contiguous range of processes or threads. For example, <code>[10:12]</code> specifies the processes associated with pids 10, 11, and 12, while <code>t:[10:12]</code> specifies the threads with IDs 10, 11, and 12.</td>
</tr>
</tbody>
</table>

---

**NOTE.** The debugger ignores a range whose lower bound is greater than its upper bound.

Both the lower bound and the upper bound are optional, so you can specify ranges as follows:

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>:n</td>
<td>All processes or threads whose ID is no greater than <code>n</code>. For example, <code>[:5]</code> refers to all processes whose pid is less than or equal to 5.</td>
</tr>
<tr>
<td>n:</td>
<td>All processes or threads whose pid is no less than <code>n</code>. For example, <code>t:[20:]</code> refers to all processes whose ID is greater than or equal to 20.</td>
</tr>
<tr>
<td>:</td>
<td>All processes or threads.</td>
</tr>
</tbody>
</table>
Storing Process and Thread Sets in Debugger Variables

You can store process and thread sets in debugger variables using the `set` command. For example:

```
(idb) set $set1 = [:7, 10, 15:20, 30:]
(idb) print $set1
[:7, 10, 15:20, 30:]
```

You can use the `print` command and `show process set` commands to inspect the process set stored in a debugger variable.

If you do not specify the set name, or if you specify `all`, the debugger displays all the process sets that are currently stored in debugger variables, as the continued example shows:

```
(idb) set $set2 = [8:9, 5:2, 22:27]
'5:2' is not a legal process range. Ignored.
(idb) show process set $set2
$set2 = [8:9, 22:27]
(idb) show process set *
$set1 = [:7, 10, 15:20, 30:]
$set2 = [8:9, 22:27]
```

The following example sets a variable, `$myset2`, to a thread set that includes threads 3, 10-20, 50 and the value of `$myset1`.

```
(idb) set $myset2 = t:[3, 10:20, 50:] + $myset1
```

See Also

- About Debugger Variables
- Working With Thread and Process Sets: Overview
- Process and Thread Set Notation
- Process and Thread Set Operations
- Changing the Current Process Set
- Predefined Thread Sets
- Viewing Threads and Thread Sets
- `print`
- `set` (idb mode only)
- `show process set`
Process and Thread Set Operations

You can use the following operations on process and thread sets:

<table>
<thead>
<tr>
<th>Table 5-1</th>
<th>Set Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>Represents</td>
</tr>
<tr>
<td>+</td>
<td>Set union</td>
</tr>
<tr>
<td>-</td>
<td>Difference</td>
</tr>
<tr>
<td>unary -</td>
<td>Negation</td>
</tr>
</tbody>
</table>

Example

The following example demonstrates these three operations:

(idb) `set $set1 = [10:10, 15:18, 20:]`
(idb) `set $set2 = [10:16, 19]`
(idb) `set $set3 = $set1 + $set2`
(idb) `print $set3`
[*]
(idb) `print $set3 - $set2`
[:9, 17:18, 20:]
(idb) `print -$set2`
[:9, 17:18, 20:]

Predefined Thread Sets

By default, the debugger includes the following set of debugger variables that enables you to easily access several thread sets. You can use these variables to define your own thread sets:

$allthreads All existing debuggee threads.
### Viewing Threads and Thread Sets

**To view the contents of a thread set:**

Use the `info threads` command.

**See Also**

- Predefined Thread Sets
- `info threads (gdb mode only)`

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>$currentlockstepthreads</code></td>
<td>The threads that have the same program counter as the current thread.</td>
</tr>
<tr>
<td><code>$currentopenmpteam</code></td>
<td>This does not apply to Mac OS X. In OpenMP, a parallel region creates a thread team. When the current thread is a member of a thread team, then <code>$currentopenmpteam</code> is set to all the threads that are in the same innermost team as the current thread.</td>
</tr>
<tr>
<td><code>$currentthread</code></td>
<td>The current thread. When an event occurs, the debugger sets the current thread to the eventing thread. To make a thread the current thread, double-click it in the Threads window or use the <code>thread</code> command.</td>
</tr>
<tr>
<td><code>$frozenthreads</code></td>
<td>The threads that are currently frozen.</td>
</tr>
<tr>
<td><code>$lasteventingthread</code></td>
<td>The thread that triggered the last debug event. A debug event is a breakpoint, syncpoint, signal raising or exception.</td>
</tr>
<tr>
<td><code>$uninterruptedthreads</code></td>
<td>The threads that are marked as uninterrupted.</td>
</tr>
</tbody>
</table>

**See Also**

- Working With Thread and Process Sets: Overview
- Process and Thread Set Notation
- Storing Process and Thread Sets in Debugger Variables
- Process and Thread Set Operations
- Changing the Current Process Set
- Viewing Threads and Thread Sets
- thread
Synchronizing a Set of Threads

Use thread syncpoints to synchronize a set of threads. When any thread in a thread set reaches a thread syncpoint, the debugger holds that thread, ignoring any attempt to step or continue execution, until all other threads in the thread set reach the thread syncpoint. When all threads in the thread set reach the thread syncpoint, they remain stopped until you continue the process.

If you manually stop execution before all threads in the thread set have reached the thread syncpoint, the debugger continues to hold all threads in the thread set until all of them reach the thread syncpoint.

To synchronize a set of threads:

Set a thread syncpoint.

See Also

Process and Thread Set Notation
idb synchronize (gdb mode only)

Changing the Current Process Set

You can change the current process set using the focus command.

See Also

focus (idb mode only)

Debugging Multi-Threaded Applications

Finding Bugs in OpenMP* and Serial Code

This topic does not apply to Mac OS*

To determine whether a bug is caused by concurrency or whether it occurs within an algorithm, it is useful to serialize execution for OpenMP* parallel code regions and to restrict execution of these code regions to a single thread per region. You can serialize the code regions dynamically, so you do not need to recompile or restart the OpenMP* application.
NOTE. When you enable serialization while the program is executing a parallel region, this region is not serialized — only subsequent regions are. When you disable serialization, only regions subsequent to the current location are set back to parallel. To serialize a selected region, it is useful to set breakpoints before and after the region. This helps you to enable serialization before the selected region is executed, and disable it before other parallel regions are executed. With this selective serialization, the rest of the application can remain parallel, which reduces execution time.

To serialize an OpenMP* parallel region:
1. Go to the code region you want to serialize.
2. Set a breakpoint at the line preceding the region and another breakpoint at the line following the region.
   This step helps you to serialize this particular code region.
3. Run or rerun the application.
   The application stops at the first breakpoint.
4. Enable serialization: Enter `idb set openmp-serialization on`.
5. Continue debugging.
   The application stops at the next breakpoint. Only a single thread executed the region.

All subsequent OpenMP* parallel regions are executed by multiple threads until you enable serialization again.

NOTE. You must enable serialization at the first breakpoint and disable serialization at the second breakpoint each time you want to run this same region serially.

See Also
- `idb set openmp-serialization (gdb mode only)`
- `idb show openmp-serialization (gdb mode only)`

**Viewing OpenMP* Information**

This topic does not apply to Mac OS* X
The debugger enables you to view the following information about an OpenMP application:

### Table 5-2 Viewing OpenMP* Information

<table>
<thead>
<tr>
<th>Information</th>
<th>Use this command</th>
</tr>
</thead>
<tbody>
<tr>
<td>threads</td>
<td><code>idb info thread (gdb mode only)</code></td>
</tr>
<tr>
<td>tasks</td>
<td><code>idb info task (gdb mode only)</code></td>
</tr>
<tr>
<td>barriers</td>
<td><code>idb info barrier (gdb mode only)</code></td>
</tr>
<tr>
<td>taskwaits</td>
<td><code>idb info taskwait (gdb mode only)</code></td>
</tr>
<tr>
<td>locks</td>
<td><code>idb info lock (gdb mode only)</code></td>
</tr>
<tr>
<td>teams</td>
<td><code>idb info team (gdb mode only)</code></td>
</tr>
<tr>
<td>parent/child relationship</td>
<td><code>idb info openmp thread tree (gdb mode only)</code></td>
</tr>
</tbody>
</table>

#### Detecting Thread Data Sharing Events

Multiple threads accessing the same data element can cause intermittent data corruption issues. With the Intel® Debugger, you can detect and analyze these thread data sharing events as part of a normal debugging session.

**To detect thread data sharing events:**

1. Enter the following sequence of commands:
   
   a. `(idb) idb sharing on`  
      This command enables detection of data sharing events.
   
   b. `(idb) idb sharing stop on`  
      This command stops the debuggee whenever a data sharing event occurs. This behavior is on by default, if you haven’t specified `idb sharing stop off`, then you can skip this step.
   
   c. `(idb) run`
   
   d. `(idb) idb sharing event expand`  
      This command displays detailed information for data sharing detection events.

The debugger executes your instrumented application and stops it when a data sharing event occurs. All thread data sharing events that occur during program execution appear when you enter `idb sharing event expand`.

**NOTE.** If you do not want the application to stop at a data sharing event, enter `idb sharing stop off`. 

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Excluding Thread Data Sharing Events from Detection

It can be useful to prevent the debugger from detecting particular thread data sharing events, such as when the event displayed is a false positive result. You can filter the thread data sharing analysis for different access types and exclude them from further detection.

To exclude data sharing events from further detection:
1. Enter one of the following commands:
   - `idb sharing filter add file filename`
     This command tells the debugger to ignore data sharing events in the named file.
   - `idb sharing filter add function function_name`
     This command tells the debugger to ignore data sharing events in the named function.
   - `idb sharing filter add range start_address, end_address`
     This command tells the debugger to ignore data sharing events in the address range you specify.
   - `idb sharing filter add variable variable [, size]`
     This command tells the debugger to ignore data sharing events on the specified variable.

A re-entrant call occurs when more than one thread accesses an expression at the same time. You can have the Intel® Debugger break the code execution at these re-entrant calls.

To break execution on a re-entrant call, enter the following command:

(idb) `idb reentrancy specifier`

This command enables re-entrancy detection on a line number, function or address.
When reentrancy detection is enabled, the debugger breaks code execution at these re-entrant calls.
See Also

idb reentrancy (gdb mode only)

Debugging Massively Parallel Applications

Intel IDB supports debugging of message passing interface (MPI) applications launched by
• mpirun, an MPI launcher from mpich, a public domain implementation of MPI.
• prun, a parallel launcher of Resource Management System* (RMS) from Quadrics*.
• mpiexec, the MPI launcher in the Intel® MPI Library

Debugging Massively Parallel Applications: Overview

The biggest challenge of debugging massively parallel applications is coping with large
quantities of output from debuggers controlling the parallel application's processes. The
Intel® Debugger helps you manage this output by aggregating similar output into groups.
The debugger aggregates output by using the following two strategies:

• It condenses identical output messages into a single output message. When the
debugger displays an aggregated message, the debugger prefixes the message with a
range of user process IDs, to which this output applies. The processes in that range
are not necessarily consecutive. The debugger aggregates all processes with the same
output into a single and final output message. For example, in the following message,
[0-41] is the process range:

[0-41] Linux Application Debugger for Itanium®-based applications,
Version XX

• Outputs that have different hexadecimal digits, but are otherwise identical, are
condensed by aggregating the differing digits into a range. For example, in the
following message, [0-41] is the process range, and [0;41] is the value range:

[0-41]>2 0x120006d6c in
feedback(myid=[0;41],np=42,name=0x11ffe018="mytest") "mytest.c":41

Another challenge of debugging massively parallel applications is using a debugger to
control all of the application's processes, or process subsets, in a consistent manner. The
Intel debugger provides you with this control through a single user interface.

At the startup of a parallel debugging session:
1. The debugger detects the topology of your application and attaches a debugger to each of your application's processes.

2. The debugger builds an n-nary tree with the debuggers as root and leaves with special processes called aggregators in the middle. You can specify the tree's branching factor and the aggregator time delay.

The root debugger is responsible for starting your parallel application and serves as your user interface. The aggregators perform output consolidation as described previously. The leaf debuggers control and query your application processes.

The branching factor is the factor used to build the n-nary tree and determine the number of aggregators in the tree. For example, for 16 processes:
- Using a branching factor of 8 creates 3 aggregators
- Using a branching factor of 2 creates 15 aggregators

You can set the value of the $parallel_branchingfactor variable from its default value of 8 to a value equal to or greater than 2 in the debugger initialization file.

When you delete $parallel_branchingfactor from the initialization file, the branching factor used in the startup mechanism is the default value.

Aggregator delay specifies the time that aggregators wait, when not all of the expected messages have been received, before they aggregate and send messages down to the next level.

You can change the value of the $parallel_aggregatordelay variable from its default value of 3000 milliseconds in the debugger initialization file. For more information, see Parallel Debugging Tips.

When you delete $parallel_aggregatordelay from the debugger initialization file, the aggregator delay used in the startup mechanism is the default value.

**NOTE.** You can only change the values that are set for $parallel_branchingfactor and $parallel_aggregatordelay when you start the debugger, in the debugger initialization file. After the debugger has started, you cannot change these values.

**NOTE.** By default, the debugger uses rsh to create the leaf debugger and aggregator processes in the tree structure. To use a different remote shell to create those processes, set the environment variable IDB_PARALLEL_SHELL to the path of the desired shell. Make sure that every node in your cluster has the access privilege to all other cluster nodes for proper setup of the tree structure.
Before You Begin Debugging an MPI Application

Before you begin, ensure that the environment variable IDB_HOME is set to the debugger’s install directory.

If you use MPICH, ensure that the script mpirun_dbg.idb that comes with the debugger is in the /bin/ directory of the MPICH installation.

If you use Intel® MPI 3.0, ensure that the environment variable MPIEXEC_DEBUG is defined so that MPI processes suspend their execution to wait for the debuggers to attach to them.

See Also
Starting an MPI Debugging Session
Attaching to an Existing MPI Job

Starting an MPI Debugging Session

To start a new MPI job under the debugger’s control:

— If you use MPICH, enter the following command in a shell:
  mpirun -dbg=idb -np number_of_processes [ other_MPICH_options ]
  executable_filename [ application_arguments ]

— If you use Intel® MPI 3.0
  mpiexec -idb -n number_of_processes [ other_Intel_MPI_options ]
  executable_filename [ application_arguments ]

— If you use prun
  idb [ idb_options ] -parallel `which prun` -n number_of_processes
  -N Number_of_nodes [ other_prun_options ] application [ application_arguments ]

When the debugger starts your parallel application, it detects and attaches to all of your application's processes. At this point, your application stops before executing any user code and the debugger displays a prompt.

You can now set any necessary breakpoints and use the continue command to continue the execution of your application.

See Also
Before You Begin Debugging an MPI Application
Attaching to an Existing MPI Job
Attaching to an Existing MPI Job

To attach the debugger to an existing MPICH job enter the following command in a shell:

```
idb -pid spawner_pid -parallelattach spawner_filename
```

`spawner_pid` is the ID of the process that spawned all the processes in the job. You can use the Linux command `ps -xf` to find the ID of this process. `spawner_filename` is the name of the spawner executable.

**NOTE.** The debugger does not currently support attaching for prun and the Intel® MPI Library.

See Also

Before You Begin Debugging an MPI Application

Starting an MPI Debugging Session

Using Commands in a Parallel Debugging Session

You can use most debugger commands just as you would when debugging a non-parallel application. Most commands are passed on to the leaf debuggers and you see aggregated output from them in your user interface. However, there are a few important exceptions.

All commands are sent to the leaf debuggers for parallel debugging except for the following:

- Local commands: commands that are not sent to the leaf debuggers, but rather are processed by the local debugger for parallel debugging
- Remote and local commands: commands that sent to the leaf debuggers and also processed by the local debugger for parallel debugging
- Disabled commands: commands that are disabled for parallel debugging

The following table shows the debugger commands that are local only, both remote and local, and those that are disabled:

<table>
<thead>
<tr>
<th>Local</th>
<th>Both Remote and Local</th>
<th>Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>export (idb mode only)</td>
<td>attach</td>
</tr>
<tr>
<td>alias (idb mode only)</td>
<td>output (gdb mode only)</td>
<td>detach</td>
</tr>
<tr>
<td>define (gdb mode only)</td>
<td>pwd (gdb mode only)</td>
<td>file (gdb mode only)</td>
</tr>
<tr>
<td>Local</td>
<td>Both Remote and Local</td>
<td>Disabled</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>edit (idb mode only)</td>
<td>quit</td>
<td>idb freeze (gdb mode only)</td>
</tr>
<tr>
<td>expand aggregated message</td>
<td>set (idb mode only)</td>
<td>idb set openmp-serialization (gdb mode only)</td>
</tr>
<tr>
<td>help</td>
<td>set environment (gdb mode only)</td>
<td>idb show openmp-serialization (gdb mode only)</td>
</tr>
<tr>
<td>history (idb mode only)</td>
<td>set variable (gdb mode only)</td>
<td>idb stopping threads (gdb mode only)</td>
</tr>
<tr>
<td>playback input (idb mode only)</td>
<td>setenv (idb mode only)</td>
<td>idb synchronize (gdb mode only)</td>
</tr>
<tr>
<td>record (idb mode only)</td>
<td>sh (idb mode only)</td>
<td>idb target threads (gdb mode only)</td>
</tr>
<tr>
<td>set editing (gdb mode only)</td>
<td>shell (gdb mode only)</td>
<td>idb thaw (gdb mode only)</td>
</tr>
<tr>
<td>set height (gdb mode only)</td>
<td>show convenience (gdb mode only)</td>
<td>idb uninterrupt (gdb mode only)</td>
</tr>
<tr>
<td>set max-user-call-depth (gdb mode only)</td>
<td>show environment (gdb mode only)</td>
<td>load (idb mode only)</td>
</tr>
<tr>
<td>set prompt (gdb mode only)</td>
<td>unset (idb mode only)</td>
<td>patch (idb mode only)</td>
</tr>
<tr>
<td>set width (gdb mode only)</td>
<td>unset environment (gdb mode only)</td>
<td>printenv (idb mode only)</td>
</tr>
<tr>
<td>show aggregated message</td>
<td>unsetenv (idb mode only)</td>
<td>rerun (idb mode only)</td>
</tr>
<tr>
<td>show commands (gdb mode only)</td>
<td></td>
<td>run</td>
</tr>
<tr>
<td>show editing (gdb mode only)</td>
<td></td>
<td>set args (gdb mode only)</td>
</tr>
<tr>
<td>show height (gdb mode only)</td>
<td></td>
<td>target core (gdb mode only)</td>
</tr>
<tr>
<td>show max-user-call-depth (gdb mode only)</td>
<td></td>
<td>unload (idb mode only)</td>
</tr>
<tr>
<td>show process set</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Working with Aggregated Messages

The root debugger collects the outputs from the leaf debuggers and presents you with an aggregated output. In most cases, this aggregation works fine, but it can be an impediment if you want to know the exact output from certain leaf debuggers.

To remedy this, the debugger assigns a unique message ID number to each aggregated message and saves the message in the message ID list. You can use the following commands to inspect the message list and expand its entries:

- show aggregated message
- expand aggregated message

See Also
expand aggregated message
show aggregated message
Parallel Debugging Tips

**Tip 1. Obtaining Better Aggregate Outputs**

If the debugger outputs are not aggregated as you would expect them to be, you can increase the value of the `$parallel_aggregatordelay` debugger variable, whose value is the expiration time, in milliseconds, for each of the aggregators when the aggregators have not received all the expected messages. Because the default value of the `$parallel_aggregatordelay` is 3000 milliseconds, you should not normally have a problem with the aggregation delay.

**See Also**

`$parallel_aggregatordelay`

**Tip 2. Synchronizing Processes**

If the processes become unsynchronized in the debugging session, such as in a case where you use the `focus` command on a subset of the total set, and then use a `next` or some other command to advance execution, the easiest way to get the processes back together is to continue to a location where all processes have to go. The following example shows how the output from processes is not identical because different processes are at different locations in the program. Using the GDB mode `until` or the IDB mode `cont` to command synchronizes the processes and aggregates the messages.

**Example**

```
(idb) next
(idb) [4:5,12] stopped at [int feedbackToDebugger(int, int, char*):17 0x120006bf4]
    [0:3,6:11] [3] stopped at [int feedbackToDebugger(int, int, char*):15 0x120006bf0]
        [4:5,12] 17 int pathSize = 1000;
        [0:3,6:11] 15 int i = 0;

(idb) l
(idb) [0:3,6:11] 16 char path[1000];
    [4:5,12] 18 char hostname[1000];
    [0:3,6:11] 17 int pathSize = 1000;
    [4:5,12] 19 int hostnameSize = 1000;
    [0:3,6:11] 18 char hostname[1000];
    [4:5,12] 20
```
```
int hostnameSize = 1000;
volatile int debuggerAttached = 0;
volatile int debuggerAttached = 0;
gethostname(hostname,hostnameSize);
gethostname(hostname,hostnameSize);
getcwd(path,pathSize);
strcat(path,"/");
strcat(path,name);
strcat(path,"/");
strcat(path,name);
// Print myid pid into idbAttach.myid
sprintf(filename,"idbAttach.%d",myid);
// Print myid pid into idbAttach.myid
sprintf(filename,"idbAttach.%d",myid);
if (file == NULL) {
    file = fopen(filename,"w");
    sprintf(filename,"idbAttach.%d",myid);
    if (file == NULL) {
        fprintf(stderr,"smg98: can't open %s for
%s\n",filename, "w");
    }
    fprintf(stderr,"smg98: can't open %s for
%s\n",filename, "w");
}

fprintf(file," %ld %ld %s %s\n", myid, getpid(), hostname, path);
fclose(file);
```
until 36
[0:13] stopped at [int feedbackToDebugger(int, int, char*):36 0x120006cb8]
[0:13] 36 fprintf(file," %ld %ld %s %s\n", myid, getpid(), hostname, path);

until (gdb mode only)
cont (idb mode only)

Tip 3. Finding Source Files in a Parallel Debugging Session

The debugger is not able to display source code if it cannot find the source file in the directory specified in the application binary file, or in the directory in which the binary resides.

Specifying the -I option in the command line fixes the problem. When launching a debugging session using the mpirun command, this option should follow the -idbopt option.

Alternatively, applying the use command or the map source directory command to all the leaf debuggers can overcome the problem as well.

Example
(idb) w
Source file not found or not readable, tried...
   ./cpi.c
   /usr/users/smith/idb-sandbox/test/src/common/Funct/bin/cpi.c

(Cannot find source file mpirun.c)

(idb) use /usr/proj/debug/idb/test/src/common/Funct/src

[0:7] Directory search path for source files:
   . /usr/users/smith/idb-sandbox/test/src/common/Funct/bin
   /usr/proj/debug/idb/test/src/common/Funct/bin

(idb) w

[0:7] 20
[0:7] 21 double f(double);
[0:7] 22
[0:7] 23 int main(int argc, char *argv[])
[0:7] 24 {
[0:7] 25     int done = 0, n, myid, numprocs, i;
[0:7] 26     double PI25DT = 3.141592653589793238462643;
[0:7] 27     double mypi, pi, h, sum, x;
[0:7] 28     double startwtime = 0.0, endwtime;
[0:7] 29     int namelen;

Parallel Debugging Example

The following command starts a parallel debugging session on an Intel® MPI job with 8 processes.

% mpiexec -idb -n 8 cpi

Intel(R) Debugger for applications running on Intel(R) 64, Version X
Attaching to program: /usr/bin/python, process 17717
Reading symbols from /usr/bin/python...(no debugging symbols found)...done.

[New Thread 182902515936 (LWP 17717)]
__select_nocancel () in /lib64/tls/libc-2.3.2.so
Info: Optimized variables show as <no value> when no location is allocated.
Continuing.
MPIR_Breakpoint () at /tmp/vgusev.xtmpdir.svsmpi020.1167/mpi2.32e.svsmpi020.20080917/dev/src/pm/mpd/mtv.c:100

No source file named /tmp/vgusev.xtmpdir.svsmpi020.1167/mpi2.32e.svsmpi020.20080917/dev/src/pm/mpd/mtv.c.

(idb)

The following is a message from processes 0 to 7.

[0:7] Intel(R) Debugger for applications running on Intel(R) 64, Version X
%1 [0:7] Attaching to program: ~/test/cpi, process [17729;17737]
[0:7] Reading symbols from ~/test/cpi...done.

The following aggregated message contains messages with differing portions, and 2 is the message ID. In this case, the LWP ID's are different from process to process.

%2 [0:7] [New Thread 182908720320 (LWP [17729;17737])]
[3,5] syscall () in /lib64/tls/libc-2.3.2.so
[0:2,4,6:7] MPIR_WaitForDebugger () at /tmp/vgusev.xtmpdir.svsmpi020.1167/mpi2.32e.svsmpi020.20080917/dev/src/mpi/debugger/dbginit.c:139
(idb)
[0:7] stopped at [int main(int, char**)]:22 0x0000000000000000
[0:7] 22 MPI_Comm_size(MPI_COMM_WORLD,&numprocs);

(idb)
[0:7] 18 char processor_name[MPI_MAX_PROCESSOR_NAME];
[0:7] 19 int gate = 0;
[0:7] 20
[0:7] 21 MPI_Init(&argc,&argv);
[0:7] > 22 MPI_Comm_size(MPI_COMM_WORLD,&numprocs);
[0:7] 23 MPI_Comm_rank(MPI_COMM_WORLD,&myid);
[0:7] 24 MPI_Get_processor_name(processor_name,&namelen);
[0:7] 25
[0:7] 26 fprintf(stderr,"Process %d on %s\n",
The following command sets the current process set to include processes 4, 5, 6, and 7.

(idb) focus [4:7]
(idb) c
(idb)

The following prompt shows the current process set.


[4:7]

The following command sets the current process set to include processes 4, 5, 6, and 7.

(idb) focus [4:7]
(idb) c
(idb)
%7 [4:7] #0 0x00000000000400a41 in f (a=[0.125;0.155]) at ~/cchen
test/cpi.c:8
%8 [4:7] #1 0x00000000000400bf3 in main (argc=1, argv=0x7fbf7d7d8) at ~/test/cpi.c:52
(idb) focus [*]
(idb) n
(idb)
%9 [0:7] main (argc=1, argv=0x7fbff2a468) at ~/test/cpi.c
:52
[0:7] 52
sum += f(x);
(idb) where
(idb)
%10 [0:7] #0 0x00000000000400bf3 in main (argc=1, argv=0x7fbfe7d358) at ~/test/cpi.c:52
The following command displays all the aggregated messages saved in the message list.
(idb) show aggregated message
%1 [0:7] Attaching to program: ~/test/cpi, process [17729;17737]
%2 [0:7] [New Thread 182908720320 (LWP [17729;17737])]
%3 [0:7] Breakpoint 1, f
(a=[0.0050000000000000001;0.074999999999999997]) at ~/test/cpi.c:8
%4 [0:7] #0 0x00000000000400a41 in f
(a=[0.0050000000000000001;0.074999999999999997]) at ~/test/cpi.c:8
%5 [0:7] #1 0x0000000000400bf3 in main (argc=1, argv=0x7fbfe7d358) at ~/test/cpi.c:52
%6 [4:7] Breakpoint 1, f (a=[0.125;0.155]) at ~/test/cpi.c:8
%7 [4:7] #0 0x00000000000400a41 in f (a=[0.125;0.155]) at ~test/cpi.c:8
%8 [4:7] #1 0x0000000000400bf3 in main (argc=1, argv=0x7fbff7d7d8) at ~test/cpi.c:52
%9 [0:7] main (argc=1, argv=0x7fbff2a468) at ~/test/cpi.c:52
%10 [0:7] #0 0x00000000000400bf3 in main (argc=1, argv=0x7fbfe7d358) at ~/test/cpi.c:52
The following command expands the aggregated message with message ID 1.
(idb) expand aggregated message 1
%1 [0:7] Attaching to program: ~/test/cpi, process [17729;17737]
[0] Attaching to program: ~/test/cpi, process 17737
[1] Attaching to program: ~/test/cpi, process 17729
[7] Attaching to program: ~/test/cpi, process 17736
(idb) disable 1
(idb)
(idb) c
(idb)
    [0:7] Continuing.s
pi is approximately 3.1416009869231245, Error is 0.0000083333333314
wall clock time = 120.800664
    [0:7] Program exited normally.
(idb)
(idb) quit

Using the mpirun_dbg.idb Startup File

The latest MPICH distribution should come with the Intel Debugger startup file mpirun_dbg.idb. If it does not, or if you are using an older distribution of MPICH, you can create the startup file by saving the following script as mpirun_dbg.idb in the directory in which mpirun resides:

#!/bin/sh

cmdLineArgs=""
p4pgfile=""
p4workdir=""
prognamemain=""
p4ssport=""
processedCmdLineArgs=""

# Extract -p4ssport info from the string passed in via -cmdlineargs.
# function processCmdLineArgs()
{
    while [ 1 -le $# ] ; do
        arg=$1
        shift
        case $arg in
            -p4ssport)
                p4ssport="-p4ssport $1"
                shift
                ;;
        *
        )
            processedCmdLineArgs="$processedCmdLineArgs $arg"
            ;;
        esac
    done
}

while [ 1 -le $# ] ; do
    arg=$1
    shift
    case $arg in
        -cmdlineargs)
            cmdlineArgs="$1"
            shift
            ;;
        -p4pg)
            p4pgfile="$1"
            ;;
        esac
    done
shift

; ;
-p4wd)
p4workdir="$1"
shift

; ;
-progname)
prognamemain="$1"
shift

; ;
esac
done
#
#
# Need to `eval echo $cmdLineArgs` to undo evil quoting done in
# mpirun.args
#
processCmdLineArgs `eval echo $cmdLineArgs`
#
if [ -n "$IDB_HOME" ]; then
    ldbdir=$IDB_HOME
    idb=$ldbdir/idb
    if [ -f $ldbdir/idb.cat ] && [ -r $ldbdir/idb.cat ]; then
        if [ -n "$NLSPATH" ]; then
            nlsmore=$NLSPATH
        else
            nlsmore=""
        fi
        NLSPATH=$ldbdir/$nlsmore
    fi
else
    idb="idb"
fi
Debugging Parallel Applications

#
$idb -parallel $prognamemain -p4pg $p4pgfile -p4wd $p4workdir -mpichtv $p4ssport $processedCmdLineArgs
Supporting Multiple Processes

The debugger supports concurrently debugging multiple processes at the same time, but at any given time, it is only operating on a single process, known as the current process. The debugger variable $curprocess contains the ID for this process. Naming and switching the debugger between processes is described in Debugging Multiple Processes.

See Also
Debugging Multiple Processes
List of Predefined Debugger Variables

Debugging Multiple Processes

The debugger does not support debugging multiple processes with the GUI. Use the command-line interface instead.

The debugger can find and control more than one process at a time. The debugger can find and control a process for one of the following reasons:

- It created the process.
- It attached to the process.

At any one time, you can examine or execute only one of the processes that the debugger controls. The rest are stalled. You must explicitly switch the debugger to the process you want to work with, stalling the one it was controlling.

**To show the processes that the debugger controls:**

1. If you are not already in IDB mode, switch to IDB mode using the following command.
   
   (idb) $cmdset = "idb"

2. Enter the **process** or **show process** command.
   
   The debugger displays any processes it controls.
3. If you want to switch to GDB mode, use the following command:

   (idb) $cmdset = "gdb"

**To switch the debugger to a specific process:**

1. If you are not already in IDB mode, switch to IDB mode using the following command.

   (idb) $cmdset = "idb"

2. Enter the `process` command.

   The process you are switching away from remains stalled until either the debugger exits or until you switch to it and continue it.

3. If you want to switch to GDB mode, use the following command:

   (idb) $cmdset = "gdb"

---

**NOTE.** The `attach` command and the IDB mode command `load` switch the debugger to the process on which they operate.

---

**See Also**

- Starting the Debugger
- `process` (idb mode only)
- `show process set`
- `show process` (idb mode only)
- `attach`
- `load` (idb mode only)

---

**Supporting Multiple Call Frames, Threads, and Sources**

Processes contain one or more threads of execution. The threads execute functions. Functions are sequences of instructions that are generated by compilers from source lines within source files.

As you enter the debugger commands to manipulate your process, it would be very tedious to have to repeatedly specify which thread, source file, and so on, to which you want the command to be applied. To prevent this, each time the debugger stops the process, it reestablishes a static context and a dynamic context for your commands. The components of the dynamic context are dependent on this run of your program, while the components of the static context are independent of this run.

You can display the components of these contexts as debugger variables or by using other commands.
The static context consists of the following:

<table>
<thead>
<tr>
<th>Component</th>
<th>Command (GDB mode)</th>
<th>Command (IDB mode)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current program</td>
<td>info sharedlibrary</td>
<td>listobj</td>
</tr>
<tr>
<td></td>
<td>info file</td>
<td></td>
</tr>
<tr>
<td>Current file</td>
<td>print $curfile</td>
<td></td>
</tr>
<tr>
<td>Current line</td>
<td>print $curline</td>
<td></td>
</tr>
</tbody>
</table>

The dynamic context consists of the following:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>where</td>
<td>Current call frame</td>
</tr>
<tr>
<td>print $curprocess</td>
<td>Current process</td>
</tr>
<tr>
<td>print $curthread</td>
<td>Current thread</td>
</tr>
<tr>
<td>thread</td>
<td>The thread executing the event that caused the debugger to gain control of the process</td>
</tr>
</tbody>
</table>

The debugger keeps the components of the static and dynamic contexts consistent as the contexts change. The debugger determines the current file and line according to where the process stops, but you can change the dynamic context directly using the following commands:

- `frame` (GDB mode)
- `up` or `down`
- `func` (IDB mode)
- `process` (IDB mode)
- `thread`

You can unload the program using the `file` (GDB mode) or `unload` (IDB mode) command.

**See Also**

- `frame` (gdb mode only)
- `up`
- `down`
- `func` (idb mode only)
- `process` (idb mode only)
- `thread`

[List of Predefined Debugger Variables]
Command, Filename and Variable Completion

GDB mode supports the completion of commands, filenames, and variables. Start typing a command, filename or variable and press Tab. If there is more than one alternative, the debugger sounds a bell. Pressing Tab again causes the debugger to list the alternatives.

Using single and double quotes influences the set of possible alternatives. Use single quotes to fill in C++ names, which contains special symbols (" : ", ":", ":", ":", etc.). Use double quotes to tell the debugger to look for alternatives among file names.

User-defined Commands

The debugger supports user-defined commands.

GDB Mode:
Use the following commands to define and control user-defined commands:

- define
- set max-user-call-depth
- show max-user-call-depth

User-defined commands support if, while, loop_break, and loop_continue commands in their bodies. User-defined commands can have up to 10 arguments separated by whitespace. Argument names are $arg0, $arg1, $arg2, ..., $arg9. The number of arguments is held in $argc.

To define a new command:
1. Enter define commandname.
2. Enter each command line separately.
3. Enter end.

NOTE. The debugger does not support user-defined hooks or the following commands: document, help user-defined, and dont-repeat.

IDB Mode:
Use the alias command to define or display your own commands.

The definition can contain:
- The name of another alias, if the nested alias is the first identifier in the definition.
• A quoted string, specified with backslashes before the quotation marks. Two quotation marks cannot be together; they must be separated by a space or at least one character.

**See Also**
- alias *(idb mode only)*
- define *(gdb mode only)*
- set max-user-call-depth *(gdb mode only)*
- show max-user-call-depth *(gdb mode only)*

### Changing the Debugger Prompt

By default, the debugger prompt is *(idb)* . You can customize the debugger prompt by setting the `$prompt` debugger variable, or, in GDB mode, using the `set prompt` command.

**Example**

The following example changes the prompt by setting the `$prompt` debugger variable.

```plaintext
(idb) set $prompt = "newPrompt>> "
newPrompt>>
```

**See Also**
- set *(idb mode only)*
- set prompt *(gdb mode only)*

### Processing Debugger Commands

#### Processing Debugger Commands: Overview

The debugger processes commands as follows:

1. Prompts for input.
2. Obtains a complete line from the input file and performs:
   a. History replacement of the line
   b. Alias expansion of the line
3. Parses the entire line according to the parsing rules for the current language.
4. Executes the commands.
Entering and Editing Command Lines

The debugger reads lines from stdin. The debugger supports command line editing when processing stdin if stdin is a terminal and the debugger variable $editline is non-zero. If you are using the debugger's command-line mode, use the set command to change the setting, and set the terminal width to the correct value.

After editing, press Enter to send the line to the debugger.

- Use the left and right arrow keys to edit parts of the line.
- Use the up and down arrow keys to recall and edit earlier commands.

**NOTE.** When you use the up and down arrow keys, the debugger skips duplicate commands. To see a complete list of the commands you have entered, use the history command.

When input is recorded, the debugger copies each line from stdin to the file you select with the record input command.

The debugger scans each line from the beginning, looking for backslash (\) characters, which escape the subsequent character. If the line ends in an escaped newline, then another line is similarly processed from stdin and appended to the first one, with the escaped newline removed.

Whether or not command line editing is enabled, you can always use your terminal's cut-and-paste function to avoid excessive typing while entering input.

**See Also**
- List of Predefined Debugger Variables
- set height (gdb mode only)
- set width (gdb mode only)
- history (idb mode only)
- record (idb mode only)
History Replacement of the Line (IDB Mode Only)

You can access the debugger’s command history to execute repetitive commands more easily.

History in a command list is not limited by braces, but goes all the way back. For example:

```plaintext
(idb) print 1
1
(idb) stop at 182 { print 2; history 3 }
[#1: stop at "src/x_list.cxx":182 { print 2; history 3 }]
(idb) run
2
11: print 1
12: stop at 182 {print 2; history 3}
13: run
[1] stopped at [int main(void):182 0x08051603]
   182 List<Node> nodeList;
```

**NOTE.** Commands in breakpoint action lists are not entered into the history list.

See Also

*Scripting or Repeating Previous Commands*

Environment Variable Expansion

The debugger expands environment variables and the leading tilde (~) in the following cases:

- As part of a command in which a file name or a directory is expected.
- In the arguments to run or rerun (IDB mode).

As in any shell, you can group an environment variable name using a pair of curly braces ({}), and quote a dollar sign ($) by preceding it with a backslash (\).
The following table shows how various environment variables expand. It assumes that the home directory is `/usr/users/hercules` and the environment variable `BIN` is `/usr/users/hercules/bin`.

<table>
<thead>
<tr>
<th>Command with Environment</th>
<th>Variable Expands into</th>
</tr>
</thead>
<tbody>
<tr>
<td>load ~/a.out</td>
<td>load /usr/users/hercules/a.out</td>
</tr>
<tr>
<td>load $BIN/a.out</td>
<td>load /usr/users/hercules/bin/a.out</td>
</tr>
<tr>
<td>load $(BIN)2/a$b</td>
<td>load /usr/users/hercules/bin2/a$b</td>
</tr>
<tr>
<td>map source directory $BIN $(BIN)2</td>
<td>map source directory /usr/users/hercules/bin /usr/users/hercules/bin2</td>
</tr>
<tr>
<td>stop at &quot;$BIN/a.out&quot;:20</td>
<td>stop at &quot;/$usr/users/hercules/bin/a.out&quot;:20</td>
</tr>
<tr>
<td>run $BIN/a.out ~/core</td>
<td>run /usr/users/hercules/bin/a.out /usr/users/hercules/core</td>
</tr>
</tbody>
</table>

**Syntax of Commands**

**Syntax of Commands: Overview**

The debugger has different parsing rules for each of the different languages it supports. A line is processed according to the current language, even if executing the line will change the current language.

**Lexical Analysis**

For the debugger to parse the line, it must first turn the line into a sequence of tokens, a process called *tokenizing or lexical analysis*. Tokenizing is done with a state machine.

As the debugger starts tokenizing a line into a command, it starts processing the characters using the lexical state LKEYWORD. It uses the rules for lexical tokens in this state, recognizing the longest sequence of characters that forms a lexical token.

After the lexical token is recognized, the debugger appends it to the tokenized form of the line, perhaps changes the state of the tokenizer, and starts on the next token.
Grammar of Commands

Some pieces of the grammar were modified from a grammar originally written by James A. Roskind. Portions Copyright ©1989, 1990 James A. Roskind

Each command line must parse as one of the following:

<table>
<thead>
<tr>
<th>command list</th>
<th>A command list is a sequence of one or more commands that the debugger are executes one after the other.</th>
</tr>
</thead>
<tbody>
<tr>
<td>comment</td>
<td>A comment is a line that begins with a pound (#) character. The debugger ignores any text after an unquoted pound character. If the first non-whitespace character on a line is a pound character, the debugger ignores the whole line.</td>
</tr>
</tbody>
</table>

The difference between a blank command line and a command line that is a comment is that a blank line entered from the keyboard causes the debugger to repeat the previous command and the comment line does not. The debugger treats blank lines that you do not not enter directly in the console as comment lines.

Keywords within Commands

If the identifiers thread, in, at, and if occur within expression in the following commands, the debugger treats them as keywords unless they are enclosed within parentheses ()

- where expression
- stopi expression
- wheni expression

For example, if your program has thread defined as an integer, enter the following command to inspect the first thread levels of the stack:

(idb) where (thread)

Using Braces to Make a Composite Command

You can surround a list of commands with braces to make it work like a single command. Some parts of the debugger command language grammar require a braced command list either for readability, or to help the debugger understand your input.

Example

if (foo) { p "true" } else { print "false" }
while (bar()) {print "bar is still true"}
stop in rtn { p "in routine" }

Conditionalizing Command Execution

To conditionalize command execution, use the if [else] and while commands.

Example

The following example demonstrates using the if command.

(idb) set $c = 1
(idb) assign pid = 0
(idb) if (pid < $c) { print "Greater" } else { print "Lesser" }
Greater

The following example demonstrates using the while command to continue the execution of the debuggee until the _data field in currentNode is 5.

Notice that if the commands in the braced command list do not change the state of the debuggee process, such as the value of a variable or the PC register, then the while command can go into an infinite loop. In this case, press Ctrl+C to interrupt the loop, or enter n when you see the More (n if no)? prompt if your while command generates output and the paging is turned on.

(idb) stop at 167
[#1: stop at "src/x_list.cxx":167]
(idb) run
The list is:
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
   167     cout << "Node " << i ;
(idb)
(idb) while (currentNode->_data != 5) { print "currentNode->_data is ", currentNode->_data; cont }
currentNode->_data is  1
Node 1 type is integer, value is 1
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
   167     cout << "Node " << i ;
currentNode->_data is  2
Node 2 type is compound, value is 12.345
Giving Commands to the Debugger

parent type is integer, value is 2
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
  167    cout << "Node " << i ;
currentNode->_data is 7
Node 3 type is compound, value is 3.1415
  parent type is integer, value is 7
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
  167    cout << "Node " << i ;
currentNode->_data is 3
Node 4 type is integer, value is 3
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
  167    cout << "Node " << i ;
currentNode->_data is 4
Node 5 type is integer, value is 4
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
  167    cout << "Node " << i ;
(idb)
(idb) print currentNode->_data
5

See Also
if
while

About Debugger Variables

Debugger variables are pseudovariables that exist within the debugger instead of within your program. They have the following uses:

- Support some limited programming capabilities within the debugger command language
- Allow you to examine and change various debugger options
- Allow you to find out exactly what various debugger commands did
Debugger variables fall into one of the following categories:

<table>
<thead>
<tr>
<th>User-defined variables</th>
<th>You create these and can set them to a value of any type.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference variables</td>
<td>You modify these to change debugger behavior. You can only set a preference variable to a value that is valid for that particular variable.</td>
</tr>
<tr>
<td>Display/state variables</td>
<td>These variables display the parts of the current debugger state. You cannot modify them.</td>
</tr>
</tbody>
</table>

You can delete and redefine the predefined debugger variables in the same way you define your own variables.

If you delete a predefined debugger variable, the debugger uses the default value for that variable.

The following commands deal specifically with debugger variables:

- `set [variable]`
- `unset`
- `help "variable"

The debugger variable name should not exist anywhere in your program, or you may confuse yourself about which of the occurrences you are actually dealing with. The predefined debugger variables all start with a dollar sign ($), to help avoid this confusion. It is strongly recommended that you follow the same practice. In a future release, all user-defined debugger variables will be required to start with a dollar sign.

**NOTE.** If a debugger variable exists that shares a name with a program variable, and you print an expression involving that name, which of the two variables the debugger finds is undefined.

**See Also**

- `set variable (gdb mode only)`
- `set (idb mode only)`
- `unset (idb mode only)`
- [List of Predefined Debugger Variables](#)
Scripting or Repeating Previous Commands

Repeating Previous Commands

The debugger maintains a command history, so you can repeat commands that you have already entered in the debugger. This command history persists across debugging sessions.

**To repeat the last command line do one of the following:**

- Press the up arrow once, then press Enter.
- Enter two exclamation points (!!).
- Press Enter.
- Enter !-1.

**To repeat a command line entered during the current debugging session:**

Enter an exclamation point (!) followed by either the integer or the first part of the string associated with the command line.

For example, to repeat the seventh command used in the current debugging session, enter !7. To repeat the third most recent command, enter !-3. To repeat a command that started with `bp`, enter `!bp`.

---

**TIP.**

- Use a completely empty line to repeat the last command, as opposed to the last line, which could have been a comment or a syntactically invalid attempt at a command.
- Use command line editing to recall and modify commands you have already entered.
- It is often useful to have a text editor up and running while debugging, and use it to assemble short scripts that you can copy and paste to the debugger. Keep a separate text file that has such scripts in it, as well as other notes you want to keep. This provides continuity from one debugging session to the next, and from one day to the next.
- If you place commands in a file, you can execute them directly from the file rather than cutting and pasting them to the terminal.

---

**See Also**

- [History Replacement of the Line (IDB Mode Only)](#)
- [Viewing the Command History](#)
- ![ ](image)
Scripting Commands

You can record input and output to help you make command files and to help you see what has happened before. You can record input only, or input and output. Input includes user actions, including GUI actions and commands you enter in the console.

You can use the GUI to record input and output, or the following commands:

- record
- unrecord

See Also

playback input (idb mode only)
record (idb mode only)
source
unrecord (idb mode only)

Viewing the Command History

You can see all the commands you have already entered by using the `history` command.

To view the command history:

1. If you are not already in IDB mode, switch to IDB mode using the following command.
   
   (idb) set variable $cmdset = "idb"
   
   The debugger is now in IDB mode, so you can use the history command.
2. Enter the following command:
   
   (idb) history
   
   The debugger displays the command history.
3. If you want to switch to GDB mode, use the following command:
   
   (idb) set $cmdset = "gdb"

GDB Mode:

In GDB mode, the debugger reads the `.gdb_history` file by default.

To rename the history file:

Set the environment variable `GDBHISTFILE` to the name of the history file you want to use.

To turn history recording on and off:
Use the `set history save` command.

**To configure the history size:**

Use the `set history size` command or set the environment variable `HISTSIZE` to the size you want. The default history size is 256.

**See Also**

History Replacement of the Line (IDB Mode Only)

- `history (idb mode only)`
- `set history save`
- `set history size`

### Executing Shell or Command Prompt Commands

You can have the debugger execute a call to the operating system's `system` function. This function is documented in `system(3)`. The call results from the `shell (GDB mode)` or `sh (IDB mode)` commands.

**See Also**

- `shell (gdb mode only)`
- `sh (idb mode only)`
Click a command to see a detailed description.

<table>
<thead>
<tr>
<th>Command Name</th>
<th>Short Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address / size format (idb mode only)</td>
<td>Dump memory in a range you specify.</td>
</tr>
<tr>
<td>/</td>
<td>? [string] (idb mode only)</td>
</tr>
<tr>
<td>!</td>
<td>Repeat a command in the command history.</td>
</tr>
<tr>
<td>^</td>
<td>Find, and optionally change a command in the command history.</td>
</tr>
<tr>
<td>#</td>
<td>Specify a comment.</td>
</tr>
<tr>
<td>advance (gdb mode only)</td>
<td>Run until the debuggee reaches a specific line number.</td>
</tr>
<tr>
<td>alias (idb mode only)</td>
<td>Define an alias for one or more commands.</td>
</tr>
<tr>
<td>assign (idb mode only)</td>
<td>Change a program variable.</td>
</tr>
<tr>
<td>attach</td>
<td>Connect to a running process.</td>
</tr>
<tr>
<td>awatch (gdb mode only)</td>
<td>Set a watchpoint on a specified expression.</td>
</tr>
<tr>
<td>backtrace (gdb mode only)</td>
<td>Print a backtrace of stack frames.</td>
</tr>
<tr>
<td>break (gdb mode only)</td>
<td>Set a breakpoint at a specified location.</td>
</tr>
<tr>
<td>call</td>
<td>Call a function in the debuggee.</td>
</tr>
<tr>
<td>catch (idb mode only)</td>
<td>Catch a signal.</td>
</tr>
<tr>
<td>catch unaligned (idb mode only)</td>
<td>Catch unaligned accesses.</td>
</tr>
<tr>
<td>class (idb mode only)</td>
<td>Show or change the current class scope.</td>
</tr>
<tr>
<td>Command Name</td>
<td>Short Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>clear (gdb mode only)</td>
<td>Delete a breakpoint at the specified location.</td>
</tr>
<tr>
<td>commands (gdb mode only)</td>
<td>Create commands to be executed when the specified breakpoint is reached.</td>
</tr>
<tr>
<td>complete (gdb mode only)</td>
<td>List all the possible completions for the beginning of a command.</td>
</tr>
<tr>
<td>condition (gdb mode only)</td>
<td>Specify a condition for a breakpoint.</td>
</tr>
<tr>
<td>cont (idb mode only)</td>
<td>Continue program execution.</td>
</tr>
<tr>
<td>continue (gdb mode only)</td>
<td>Continue program execution.</td>
</tr>
<tr>
<td>core-file (gdb mode only)</td>
<td>Specify a core file as a target, or specify not to use a core file.</td>
</tr>
<tr>
<td>define (gdb mode only)</td>
<td>Create a user-defined command.</td>
</tr>
<tr>
<td>delete (idb mode only)</td>
<td>Delete all or specific breakpoints.</td>
</tr>
<tr>
<td>delete breakpoint (gdb mode only)</td>
<td>Delete all or specific breakpoints.</td>
</tr>
<tr>
<td>delsharedobj (idb mode only)</td>
<td>Delete symbol information for a shared object.</td>
</tr>
<tr>
<td>detach</td>
<td>Detach the debugger from a running process.</td>
</tr>
<tr>
<td>directory (gdb mode only)</td>
<td>Add directories to the list of source directories.</td>
</tr>
<tr>
<td>disable</td>
<td>Disable one or more breakpoints.</td>
</tr>
<tr>
<td>disassemble (gdb mode only)</td>
<td>Disassemble and display machine instructions.</td>
</tr>
<tr>
<td>disconnect (gdb mode only)</td>
<td>Disconnect from all running processes and remove all breakpoints.</td>
</tr>
<tr>
<td>down</td>
<td>Move a number of frames down the stack and print them.</td>
</tr>
<tr>
<td>down-silently (gdb mode only)</td>
<td>Move a number of frames down the stack but do not print them.</td>
</tr>
<tr>
<td>dump (idb mode only)</td>
<td>List the parameters and local variables on the stack.</td>
</tr>
<tr>
<td>echo (gdb mode only)</td>
<td>Print a string.</td>
</tr>
<tr>
<td>edit (idb mode only)</td>
<td>Edit the current source file or a specified file.</td>
</tr>
<tr>
<td>enable</td>
<td>Enable one or more breakpoints.</td>
</tr>
<tr>
<td>exit (idb mode only)</td>
<td>Exit the debugger.</td>
</tr>
<tr>
<td>Command Name</td>
<td>Short Description</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>expand aggregated message</td>
<td>Expand the specified or most recent message.</td>
</tr>
<tr>
<td>export (idb mode only)</td>
<td>Set an environment variable or print all environment variables.</td>
</tr>
<tr>
<td>file (gdb mode only)</td>
<td>Load an executable file for debugging, or unload.</td>
</tr>
<tr>
<td>file (idb mode only)</td>
<td>Switch to the specified source file.</td>
</tr>
<tr>
<td>fileexpr (idb mode only)</td>
<td>Switch to the specified source file.</td>
</tr>
<tr>
<td>finish (gdb mode only)</td>
<td>Continue execution until the current function returns.</td>
</tr>
<tr>
<td>focus (idb mode only)</td>
<td>Change or display the current process set.</td>
</tr>
<tr>
<td>forward-search (gdb mode only)</td>
<td>Search forward in the source for a string or repeat last search.</td>
</tr>
<tr>
<td>frame (gdb mode only)</td>
<td>Show or change the current function scope.</td>
</tr>
<tr>
<td>func (idb mode only)</td>
<td>Show or change the current function scope.</td>
</tr>
<tr>
<td>goto (idb mode only)</td>
<td>Skip to a specific line number.</td>
</tr>
<tr>
<td>handle (gdb mode only)</td>
<td>Set signal handling actions.</td>
</tr>
<tr>
<td>help</td>
<td>Display help for debugger commands.</td>
</tr>
<tr>
<td>history (idb mode only)</td>
<td>Show the most recently used debugger commands.</td>
</tr>
<tr>
<td>idb directory (gdb mode only)</td>
<td>Add a directory to the list of source directories or reset the list.</td>
</tr>
<tr>
<td>idb freeze (gdb mode only)</td>
<td>Set the execution attribute of the specified threads to frozen.</td>
</tr>
<tr>
<td>idb info barrier (gdb mode only)</td>
<td>Shows information for existing barriers in an OpenMP application.</td>
</tr>
<tr>
<td>idb info lock (gdb mode only)</td>
<td>Shows information for existing locks in an OpenMP application.</td>
</tr>
<tr>
<td>idb info openmp thread tree (gdb mode only)</td>
<td>Display the threads in the process in a tree format.</td>
</tr>
<tr>
<td>idb info task (gdb mode only)</td>
<td>Display information for existing tasks in an OpenMP application.</td>
</tr>
<tr>
<td>idb info taskwait (gdb mode only)</td>
<td>Display information for any existing taskwait.</td>
</tr>
<tr>
<td>Command Name</td>
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<tr>
<td>idb info team (gdb mode only)</td>
<td>Display information for any existing team.</td>
</tr>
<tr>
<td>idb info thread (gdb mode only)</td>
<td>Show the specified threads in the process.</td>
</tr>
<tr>
<td>idb process (gdb mode only)</td>
<td>Show or specify a process.</td>
</tr>
<tr>
<td>idb reentrancy (gdb mode only)</td>
<td>Enable re-entrancy detection on a function.</td>
</tr>
<tr>
<td>idb session restore (gdb mode only)</td>
<td>Load a session file to restore a session’s debug settings.</td>
</tr>
<tr>
<td>idb session save (gdb mode only)</td>
<td>Save a session’s debug settings to a file.</td>
</tr>
<tr>
<td>idb set openmp-serialization (gdb mode only)</td>
<td>Enable or disable serial execution of parallel regions in an OpenMP* process.</td>
</tr>
<tr>
<td>idb set solib-path-substitute (gdb mode only)</td>
<td>Substitute a directory path when loading shared libraries.</td>
</tr>
<tr>
<td>idb sharing (gdb mode only)</td>
<td>Disable or enable data sharing event detection.</td>
</tr>
<tr>
<td>idb sharing event expand (gdb mode only)</td>
<td>Display detailed information for data sharing detection events.</td>
</tr>
<tr>
<td>idb sharing event list (gdb mode only)</td>
<td>Display a summary of all data sharing detection events.</td>
</tr>
<tr>
<td>idb sharing filter add file (gdb mode only)</td>
<td>Ignore data sharing events in the named file.</td>
</tr>
<tr>
<td>idb sharing filter add function (gdb mode only)</td>
<td>Ignore data sharing events in the named function.</td>
</tr>
<tr>
<td>idb sharing filter add range (gdb mode only)</td>
<td>Ignore data sharing events in an address range.</td>
</tr>
<tr>
<td>idb sharing filter add variable (gdb mode only)</td>
<td>Ignore data sharing events on the specified variable.</td>
</tr>
<tr>
<td>idb sharing filter delete (gdb mode only)</td>
<td>Delete data sharing detection filters.</td>
</tr>
<tr>
<td>idb sharing filter disable (gdb mode only)</td>
<td>Disable data sharing detection filters.</td>
</tr>
<tr>
<td>idb sharing filter enable (gdb mode only)</td>
<td>Enable data sharing detection filters.</td>
</tr>
<tr>
<td>idb sharing filter list (gdb mode only)</td>
<td>List all data sharing detection filters.</td>
</tr>
<tr>
<td>idb sharing filter toggle (gdb mode only)</td>
<td>Toggle data sharing detection filters.</td>
</tr>
<tr>
<td>idb sharing reset (gdb mode only)</td>
<td>Clear the data sharing event list.</td>
</tr>
<tr>
<td>idb sharing status (gdb mode only)</td>
<td>Show if data sharing detection is on or off.</td>
</tr>
<tr>
<td>idb sharing stop (gdb mode only)</td>
<td>Stop or continue the debuggee when a data sharing event occurs.</td>
</tr>
<tr>
<td>Command Name</td>
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</tr>
<tr>
<td><code>idb show openmp-serialization (gdb mode only)</code></td>
<td>Show if serialization of parallel regions in an OpenMP process is enabled.</td>
</tr>
<tr>
<td><code>idb show solib-path-substitute (gdb mode only)</code></td>
<td>Show the replacement directory for loading shared libraries.</td>
</tr>
<tr>
<td><code>idb stopping threads (gdb mode only)</code></td>
<td>Specify the threads that stop when a breakpoint is hit.</td>
</tr>
<tr>
<td><code>idb synchronize (gdb mode only)</code></td>
<td>Set a thread syncpoint at a location you specify.</td>
</tr>
<tr>
<td><code>idb target threads (gdb mode only)</code></td>
<td>Specify the threads that subsequent mover commands apply to.</td>
</tr>
<tr>
<td><code>idb thaw (gdb mode only)</code></td>
<td>Set the execution attribute of the specified threads to thawed.</td>
</tr>
<tr>
<td><code>idb uninterrupt (gdb mode only)</code></td>
<td>Set the execution attribute of the specified threads to uninterrupt.</td>
</tr>
<tr>
<td><code>idb unset solib-path-substitute (gdb mode only)</code></td>
<td>Remove a path substitution rule.</td>
</tr>
<tr>
<td><code>if</code></td>
<td>Conditionalize command execution.</td>
</tr>
<tr>
<td><code>ignore (gdb mode only)</code></td>
<td>Set the ignore count of the specified breakpoint or watchpoint to the specified value.</td>
</tr>
<tr>
<td><code>ignore (idb mode only)</code></td>
<td>Ignore the specified signal.</td>
</tr>
<tr>
<td><code>info args (gdb mode only)</code></td>
<td>Print the arguments of the current frame.</td>
</tr>
<tr>
<td><code>info breakpoints (gdb mode only)</code></td>
<td>Print information about one or more breakpoints.</td>
</tr>
<tr>
<td><code>info files (gdb mode only)</code></td>
<td>Print the names of the files in the debuggee.</td>
</tr>
<tr>
<td><code>info functions (gdb mode only)</code></td>
<td>Print names and types of functions.</td>
</tr>
<tr>
<td><code>info handle (gdb mode only)</code></td>
<td>Print available signals and signal setting information.</td>
</tr>
<tr>
<td><code>info line (gdb mode only)</code></td>
<td>Print start and end address of specified source line.</td>
</tr>
<tr>
<td><code>info locals (gdb mode only)</code></td>
<td>Print local variables of the selected function.</td>
</tr>
<tr>
<td><code>info program (gdb mode only)</code></td>
<td>Print information about the debuggee.</td>
</tr>
<tr>
<td><code>info registers (gdb mode only)</code></td>
<td>Print registers and their contents.</td>
</tr>
<tr>
<td><code>info share (gdb mode only)</code></td>
<td>Print the names of shared libraries.</td>
</tr>
<tr>
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</tr>
<tr>
<td>info sharedlibrary (gdb mode only)</td>
<td>Print the names of shared libraries.</td>
</tr>
<tr>
<td>info signals (gdb mode only)</td>
<td>Print signal setting information.</td>
</tr>
<tr>
<td>info source (gdb mode only)</td>
<td>Print information about the current source file.</td>
</tr>
<tr>
<td>info sources (gdb mode only)</td>
<td>Print names of all source files.</td>
</tr>
<tr>
<td>info stack (gdb mode only)</td>
<td>Print a backtrace of stack frames.</td>
</tr>
<tr>
<td>info target (gdb mode only)</td>
<td>Print the names of the files in the debuggee.</td>
</tr>
<tr>
<td>info threads (gdb mode only)</td>
<td>Print all threads.</td>
</tr>
<tr>
<td>info types (gdb mode only)</td>
<td>Print a description of types in the program.</td>
</tr>
<tr>
<td>info variables (gdb mode only)</td>
<td>Print names and types of all global variables.</td>
</tr>
<tr>
<td>info watchpoints (gdb mode only)</td>
<td>Print information about one or more watchpoints.</td>
</tr>
<tr>
<td>jump (gdb mode only)</td>
<td>Jump to the specified line number or address.</td>
</tr>
<tr>
<td>kill</td>
<td>Kill the current process.</td>
</tr>
<tr>
<td>list</td>
<td>Display lines of source code.</td>
</tr>
<tr>
<td>listobj (idb mode only)</td>
<td>List all loaded objects, including the main image and the shared libraries.</td>
</tr>
<tr>
<td>load (idb mode only)</td>
<td>Load an executable and core file for debugging.</td>
</tr>
<tr>
<td>map source directory (idb mode only)</td>
<td>Map one source directory to another one.</td>
</tr>
<tr>
<td>next</td>
<td>Step forward in source, over any function calls.</td>
</tr>
<tr>
<td>nexti</td>
<td>Step forward in assembler instructions, over any function calls.</td>
</tr>
<tr>
<td>output (gdb mode only)</td>
<td>Print the value of an expression.</td>
</tr>
<tr>
<td>patch (idb mode only)</td>
<td>Modify an executable by writing the value of an expression to a specific address or variable.</td>
</tr>
<tr>
<td>path (gdb mode only)</td>
<td>Add specified directory to search path.</td>
</tr>
<tr>
<td>playback input (idb mode only)</td>
<td>Execute commands from a file.</td>
</tr>
<tr>
<td>pop (idb mode only)</td>
<td>Remove frames from the call stack.</td>
</tr>
<tr>
<td>print</td>
<td>Print the value of an expression.</td>
</tr>
<tr>
<td>Command Name</td>
<td>Short Description</td>
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</tr>
<tr>
<td><code>printenv</code> (idb mode only)</td>
<td>Display the value of one or all environment variables.</td>
</tr>
<tr>
<td><code>printf</code></td>
<td>Display a complex structure with formatting.</td>
</tr>
<tr>
<td><code>printfi</code></td>
<td>Display the value as an assembly instruction.</td>
</tr>
<tr>
<td><code>printregs</code> (idb mode only)</td>
<td>Display the values of hardware registers.</td>
</tr>
<tr>
<td><code>printti</code> (idb mode only)</td>
<td>Interpret integer values as seconds since the epoch.</td>
</tr>
<tr>
<td><code>process</code> (idb mode only)</td>
<td>Show or change the current process.</td>
</tr>
<tr>
<td><code>ptype</code> (gdb mode only)</td>
<td>Print the type declaration of the specified type, or the last value in history.</td>
</tr>
<tr>
<td><code>pwd</code> (gdb mode only)</td>
<td>Display the current working directory.</td>
</tr>
<tr>
<td><code>quit</code></td>
<td>Exit the debugger.</td>
</tr>
<tr>
<td><code>readsharedobj</code> (idb mode only)</td>
<td>Read symbol information for a shared object.</td>
</tr>
<tr>
<td><code>record</code> (idb mode only)</td>
<td>Record debugger interactions to a file.</td>
</tr>
<tr>
<td><code>rerun</code> (idb mode only)</td>
<td>Restart the program.</td>
</tr>
<tr>
<td><code>return</code> (gdb mode only)</td>
<td>Remove frames from the call stack.</td>
</tr>
<tr>
<td><code>return</code> (idb mode only)</td>
<td>Continue execution until the current or specified function returns.</td>
</tr>
<tr>
<td><code>reverse-search</code> (gdb mode only)</td>
<td>Search backward in the source for a string or repeat last search.</td>
</tr>
<tr>
<td><code>run</code></td>
<td>Run the debuggee program.</td>
</tr>
<tr>
<td><code>rwatch</code> (gdb mode only)</td>
<td>Set a read watchpoint on the specified expression.</td>
</tr>
<tr>
<td><code>search</code> (gdb mode only)</td>
<td>Search forward in the source for a string or repeat last search.</td>
</tr>
<tr>
<td><code>set</code> (idb mode only)</td>
<td>Set a debugger variable to a value or show all debugger variables.</td>
</tr>
<tr>
<td><code>set args</code> (gdb mode only)</td>
<td>Specify arguments for the debuggee program.</td>
</tr>
<tr>
<td><code>set confirm</code> (gdb mode only)</td>
<td>Switch confirmation requests on or off.</td>
</tr>
<tr>
<td><code>set editing</code> (gdb mode only)</td>
<td>Enable or disable Emacs*-like control characters.</td>
</tr>
<tr>
<td><code>set environment</code> (gdb mode only)</td>
<td>Set an environment variable to a value.</td>
</tr>
<tr>
<td>Command Name</td>
<td>Short Description</td>
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</tr>
<tr>
<td>set height (gdb mode only)</td>
<td>Set the height of the screen.</td>
</tr>
<tr>
<td>set history save</td>
<td>Switch command-line history on or off.</td>
</tr>
<tr>
<td>set history size</td>
<td>Specify the size of the command-line history.</td>
</tr>
<tr>
<td>set language (gdb mode only)</td>
<td>Set the source language.</td>
</tr>
<tr>
<td>set listsize (gdb mode only)</td>
<td>Set the default number of source lines for the list command to display.</td>
</tr>
<tr>
<td>set max-user-call-depth (gdb mode only)</td>
<td>Set the maximum number of recursion levels a user-defined command may have.</td>
</tr>
<tr>
<td>set output-radix (gdb mode only)</td>
<td>Set the default numeric base for numeric output.</td>
</tr>
<tr>
<td>set print address (gdb mode only)</td>
<td>Set the debugger’s default to either print or not print the value of a pointer as an address.</td>
</tr>
<tr>
<td>set print elements (gdb mode only)</td>
<td>Set a limit on the number of array elements to print.</td>
</tr>
<tr>
<td>set print repeats (gdb mode only)</td>
<td>Limit the number of consecutive, identical array elements the debugger prints.</td>
</tr>
<tr>
<td>set print static-members (gdb mode only)</td>
<td>Print static members when showing a C++ object.</td>
</tr>
<tr>
<td>set prompt (gdb mode only)</td>
<td>Set a new string for the debugger prompt.</td>
</tr>
<tr>
<td>set substitute-path (gdb mode only)</td>
<td>Set a substitution rule for finding source files.</td>
</tr>
<tr>
<td>set variable (gdb mode only)</td>
<td>Set a debugger variable to a value.</td>
</tr>
<tr>
<td>set width (gdb mode only)</td>
<td>Set the width of the screen.</td>
</tr>
<tr>
<td>setenv (idb mode only)</td>
<td>Set the value of an environment variable.</td>
</tr>
<tr>
<td>sh (idb mode only)</td>
<td>Execute a shell command.</td>
</tr>
<tr>
<td>shell (gdb mode only)</td>
<td>Execute a shell command.</td>
</tr>
<tr>
<td>show aggregated message</td>
<td>Print the specified aggregated messages.</td>
</tr>
<tr>
<td>show architecture (gdb mode only)</td>
<td>Show the current architecture.</td>
</tr>
<tr>
<td>show args (gdb mode only)</td>
<td>Show arguments and input and output redirections.</td>
</tr>
<tr>
<td>show commands (gdb mode only)</td>
<td>Print commands in history.</td>
</tr>
<tr>
<td>show condition (idb mode only)</td>
<td>List information about pthreads condition variables.</td>
</tr>
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<tr>
<td><code>show convenience (gdb mode only)</code></td>
<td>Show a list of debugger variables and their values.</td>
</tr>
<tr>
<td><code>show directories (gdb mode only)</code></td>
<td>Show the list of source directories to search.</td>
</tr>
<tr>
<td><code>show editing (gdb mode only)</code></td>
<td>Show whether command line editing is on or off.</td>
</tr>
<tr>
<td><code>show environment (gdb mode only)</code></td>
<td>Show one or all environment variables.</td>
</tr>
<tr>
<td><code>show height (gdb mode only)</code></td>
<td>Show the height of the screen.</td>
</tr>
<tr>
<td><code>show language (gdb mode only)</code></td>
<td>Show the current source language.</td>
</tr>
<tr>
<td><code>show listsize (gdb mode only)</code></td>
<td>Show the default number of lines for the list command.</td>
</tr>
<tr>
<td><code>show lock (idb mode only)</code></td>
<td>List information about OpenMP* locks.</td>
</tr>
<tr>
<td><code>show max-user-call-depth (gdb mode only)</code></td>
<td>Show the maximum recursion level for user-defined commands.</td>
</tr>
<tr>
<td><code>show mutex (idb mode only)</code></td>
<td>Show information about pthreads mutexes.</td>
</tr>
<tr>
<td><code>show openmp thread tree (idb mode only)</code></td>
<td>Display the threads in the process in a tree format.</td>
</tr>
<tr>
<td><code>show output-radix (gdb mode only)</code></td>
<td>Show the default numeric base for numeric output.</td>
</tr>
<tr>
<td><code>show print address (gdb mode only)</code></td>
<td>Show whether the debugger is set to print or not print the value of a pointer as an address.</td>
</tr>
<tr>
<td><code>show print elements (gdb mode only)</code></td>
<td>Show the maximum number of array elements the debugger is set to print.</td>
</tr>
<tr>
<td><code>show print repeats (gdb mode only)</code></td>
<td>Show the current threshold of repeated identical elements that the debugger is set to print.</td>
</tr>
<tr>
<td><code>show print static-members (gdb mode only)</code></td>
<td>Show the current setting for printing static class members with the <code>print</code> command.</td>
</tr>
<tr>
<td><code>show process (idb mode only)</code></td>
<td>Show process information.</td>
</tr>
<tr>
<td><code>show process set</code></td>
<td>List information about one or all process sets.</td>
</tr>
<tr>
<td><code>show prompt (gdb mode only)</code></td>
<td>Show the current debugger prompt.</td>
</tr>
<tr>
<td><code>show source directory (idb mode only)</code></td>
<td>List information about directory mappings.</td>
</tr>
<tr>
<td><code>show team (idb mode only)</code></td>
<td>List information about OpenMP* teams.</td>
</tr>
<tr>
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</tr>
<tr>
<td>show thread (idb mode only)</td>
<td>List information about a thread.</td>
</tr>
<tr>
<td>show user (gdb mode only)</td>
<td>Show the definition of one or all user-defined commands.</td>
</tr>
<tr>
<td>show values (gdb mode only)</td>
<td>Show ten values of the value history.</td>
</tr>
<tr>
<td>show width (gdb mode only)</td>
<td>Show the width of the screen.</td>
</tr>
<tr>
<td>source</td>
<td>Execute commands from a batch file.</td>
</tr>
<tr>
<td>status (idb mode only)</td>
<td>Print info on all breakpoints and tracepoints.</td>
</tr>
<tr>
<td>step</td>
<td>Step forward in source, into any function calls.</td>
</tr>
<tr>
<td>stepi</td>
<td>Step forward in assembler instructions, into any function calls.</td>
</tr>
<tr>
<td>stop at (idb mode only)</td>
<td>Set a breakpoint at a line number or expression.</td>
</tr>
<tr>
<td>stop every (idb mode only)</td>
<td>Set a breakpoint on every function entry point or on every instruction.</td>
</tr>
<tr>
<td>stop in (idb mode only)</td>
<td>Set a breakpoint in a function.</td>
</tr>
<tr>
<td>stop memory (idb mode only)</td>
<td>Set a breakpoint on a region in memory.</td>
</tr>
<tr>
<td>stop pc (idb mode only)</td>
<td>Set a breakpoint when PC equals a specific address.</td>
</tr>
<tr>
<td>stop signal (idb mode only)</td>
<td>Set a breakpoint on a signal.</td>
</tr>
<tr>
<td>stop unaligned (idb mode only)</td>
<td>Set a breakpoint on unaligned accesses.</td>
</tr>
<tr>
<td>stop variable (idb mode only)</td>
<td>Set a breakpoint on a specific variable.</td>
</tr>
<tr>
<td>stopi (idb mode only)</td>
<td>Set a breakpoint at an instruction, or if a variable changes.</td>
</tr>
<tr>
<td>target core (gdb mode only)</td>
<td>Specify a core file as a target.</td>
</tr>
<tr>
<td>tbreak (gdb mode only)</td>
<td>Set a temporary breakpoint at specified location.</td>
</tr>
<tr>
<td>thread</td>
<td>Show or change the current thread.</td>
</tr>
<tr>
<td>unalias (idb mode only)</td>
<td>Remove an alias.</td>
</tr>
<tr>
<td>unload (idb mode only)</td>
<td>Unload an image or a core file from the debugger.</td>
</tr>
<tr>
<td>unmap source directory (idb mode only)</td>
<td>Remove a directory mapping.</td>
</tr>
<tr>
<td>unrecord (idb mode only)</td>
<td>Stop recording debugger input, output, or both.</td>
</tr>
<tr>
<td>Command Name</td>
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</tr>
<tr>
<td>unset (idb mode only)</td>
<td>Delete the specified debugger variable.</td>
</tr>
<tr>
<td>unset environment (gdb mode only)</td>
<td>Delete the specified environment variable.</td>
</tr>
<tr>
<td>unset substitute-path (gdb mode only)</td>
<td>Unset a source directory substitution rule.</td>
</tr>
<tr>
<td>unsetenv (idb mode only)</td>
<td>Delete the specified environment variable, or all.</td>
</tr>
<tr>
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<td>Run until a specific line.</td>
</tr>
<tr>
<td>unuse (idb mode only)</td>
<td>Remove the specified directories from the source path or set path to default.</td>
</tr>
<tr>
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<td>Move a specific number of frames up the stack and print them.</td>
</tr>
<tr>
<td>up-silently (gdb mode only)</td>
<td>Move a specific number of frames up the stack but do not print them.</td>
</tr>
<tr>
<td>use (idb mode only)</td>
<td>Add a directory to the source path, or show directories in the source path.</td>
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<tr>
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</tr>
<tr>
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</tr>
<tr>
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<td>Print the type of a variable.</td>
</tr>
<tr>
<td>when (idb mode only)</td>
<td>Set a breakpoint that executes a command list when it is hit.</td>
</tr>
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</tr>
<tr>
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</tr>
<tr>
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<td>Show all declarations of a specific expression.</td>
</tr>
<tr>
<td>which (idb mode only)</td>
<td>Show the full scope of an expression.</td>
</tr>
<tr>
<td>while</td>
<td>Execute the command list while the specified expression is not zero.</td>
</tr>
<tr>
<td>x (gdb mode only)</td>
<td>Print memory at the specified address.</td>
</tr>
</tbody>
</table>
address / size format  (idb mode only)

Dump memory in a range you specify.

Syntax

\[
\text{start_address} / \text{size format} \\
\text{start_address}, \text{end_address} / \text{format}
\]
Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>start_address</td>
<td>The start address for the range of memory.</td>
</tr>
<tr>
<td>end_address</td>
<td>The end address for the range of memory.</td>
</tr>
<tr>
<td>size</td>
<td>The number of memory values of the specified format to dump. This number is an integer constant. The default value is 1.</td>
</tr>
<tr>
<td>format</td>
<td>The numerical format in which the debugger displays memory values. Possible values are: d  Print a short word in decimal dd  Print a 32-bit (4-byte) decimal display D  Print a long word in decimal u  Print a short word in unsigned decimal uu  Print a 32-bit (4-byte) unsigned decimal display U  Print a long word in unsigned decimal o  Print a short word in octal oo  Print a 32-bit (4-byte) octal display O  Print a long word in octal x  (Default) Print a short word in hexadecimal xx  Print a 32-bit (4-byte) hexadecimal display X  Print a long word in hexadecimal b  Print a byte in hex c  Print a byte as a character s  Print a string of characters (a C-style string ending in null) C  Print a wide character as a character S  Print a null terminated string of wide characters f  Print a single-precision real number g  Print a double-precision real number L  Print a long double-precision real number i  Disassemble machine instructions</td>
</tr>
</tbody>
</table>

Description

This command dumps memory in a specified range. It also enables you to specify the numerical format in which the debugger prints the memory range.
Example
(idb) 0x81c146f / 1 u
0x081c146f: 60547
(idb) 0x81c146f / 4 u
0x081c146f: 60547 63716 33540 30089
(idb) 0x81c146f, 0x81c147f / u
0x081c146f: 60547 63716 33540 30089 64605

See Also
`disassemble` (gdb mode only)
`x` (gdb mode only)
Search in the source for a string, or repeat the last search.

**Syntax**

\[ / [\text{string}] \]

\[ ? [\text{string}] \]

\[ s \]

- `/` Tells the debugger to search forward.
- `?` Tells the debugger to search backward.
- `string` Specifies the string you want to search for.
  - If you do not specify `string`, the debugger repeats the most recent search.

**Parameters**

**Description**

This command searches forward or backward, starting at the current position in the current source file, for the specified character string. If you do not specify a string, the debugger repeats the most recent search.

The debugger interprets anything on the same line after the `/` as the search string, so do not quote the string.

When a match is found, the debugger lists the line number and the line. That line becomes the starting point for any further searches, or for a list command.

**TIP.** Pressing the Enter key repeats the most recent forward or backward search, using the same pattern. You do not need to specify `/` or `?`.

Note that the debugger performs alias expansion on the rest of the line before the `/`, possibly changing the search string. For example, suppose you have `j =` in your source code.

(idb) **alias zzz "/j"**

(idb) `zzz =`

`zzz` expands to `/j =` and finds the next instance of `j =` in the source code.
Examples

This example demonstrates three separate forward searches and their results.
(idb) \_firstNode
60 NODETYPE\* _firstNode;
(idb) /append
65 void append (NODETYPE\* const node)
(idb) /
145 void List<NODETYPE>::append(NODETYPE\* const node)

This example demonstrates three separate backward searches and their results.
(idb) ?append
145 void List<NODETYPE>::append(NODETYPE\* const node)
(idb) ?
65 void append (NODETYPE\* const node);
(idb) ?_firstNode
60 NODETYPE\* _firstNode;

See Also

forward-search (gdb mode only)
reverse-search (gdb mode only)
Repeat a command in the command history.

**Syntax**

```plaintext
!!
![-]step_number
!string
```

**Parameters**

- **step_number**: The number of steps backward or forward in the history.
  - When you include a minus (-), the debugger starts with the most recent command in the history and counts backwards.
  - When you do not include a minus, the debugger starts with the oldest command in the history and counts forward.

- **string**: The string that begins the line in the history that you want to repeat.

**Description**

The exclamation point (!!) repeats a command in the debugger's command history.

The debugger assembles lines in the history into a new, usable command according to the following rules:

- If the second character is also an exclamation point, the assembled line is replaced by the most recent entry from the history list. The debugger appends any remaining characters after the exclamation point to the assembled line.

- The debugger ignores spaces and tabs immediately following the exclamation point, and executes one of the following actions:
  - If the next character is a number, then the debugger reads the number as a decimal number, and replaces the assembled line with the line in the history list whose ID matches the number, where 1 is the oldest entry, 2 the second oldest, and so on.
  - If the next character is a minus (-) followed by a number, then the debugger reads the number as a decimal number, and replaces the assembled line with the line in the history list whose ID matches the number, where -1 is the most recent entry, -2 the second most recent entry and so on.
The debugger uses the rest of the line to find the most recent command that starts with those characters, and replaces the assembled line with that line from the history list. In the first two cases, any remaining characters after the exclamation point or digits are appended to the assembled line.

You cannot use exclamation points in command lists built with braces ({}), although you can use them in scripts. For example, the command line \{print 3; !!3\} does not parse.

**Examples**

To repeat the seventh command used in the current debugging session, enter `!7`.

To repeat the third most recent command, enter `!-3`.

To repeat a command that started with `bp`, enter `!bp`.

To repeat the previous command, enter `!!`.

`!!:$` designates the last parameter of the preceding command

`!fi:2` designates the second parameter of the most recent command starting with the characters `fi`.

**See Also**

Repeating Previous Commands

Viewing the Command History

history (idb mode only)
Find, and optionally change a command in the command history.

**Syntax**

`^ string1 [^ string2 [^ string3]]`

**Parameters**

<table>
<thead>
<tr>
<th>string1</th>
<th>The target string.</th>
</tr>
</thead>
<tbody>
<tr>
<td>string2</td>
<td>The replacement string. This string can have a zero length.</td>
</tr>
<tr>
<td>string3</td>
<td>The string to append.</td>
</tr>
</tbody>
</table>

**Description**

The caret (^) finds, and optionally changes a command in the debugger’s command history.

The debugger ignores leading spaces and tabs and assembles lines in the history into a new, usable command in the following manner:

1. The debugger extracts the following:
   - The string following the first caret, `string1`, the target string.
   - The string following the second caret, `string2`, the replacement string.
   - The string following the third caret, the string to append to the replacement string.

2. The debugger checks the most recent entry from the history list to see if it has an occurrence of the target string. If it does, the debugger appends `string3` to `string2`. If it does not, an error is reported.

The assembled line is now appended to the history list.

You cannot use carets in command lists built with braces ({}), although you can use them in scripts. For example, the command line `{print 3; ^3^4^}` does not parse, while the command line `{print 3; ^3^4^5}` does parse.

**See Also**

- *History Replacement of the Line (IDB Mode Only)*
Specify a comment.

**Syntax**

```plaintext
# string
```

**Parameters**

| string | A string ending with a newline. |

**Description**

The hash character (`#`) specifies a comment. The debugger ignores any text after an unquoted hash character.

When the first non-whitespace character on a line is a hash character, the debugger ignores the whole line.

Comments are useful in input files.
advance  (gdb mode only)

Run until the debuggee reaches a specific line number.

Syntax

advance  linenumber

Parameters

| linenumber  | The line number in source code at which the debuggee should stop. |

Description

This command advances the application until it reaches a specific line number in source code, or until a breakpoint, if a breakpoint comes earlier than `linenumber`.

This command does not skip over recursive function calls.

Example

```c
94 int factorial (int value)
95 {
96    if (value > 1) {
97        value *= factorial (value - 1);
98    }
99    return (value);
100 }
```

If the current location is line 96, issuing `advance 99` continues the program up to line 99.

See Also

until  (gdb mode only)
next
alias (idb mode only)

Define an alias for one or more commands.

Syntax

alias [alias_name]

alias [alias_name [(argument)] "string"]

Parameters

<table>
<thead>
<tr>
<th>alias_name</th>
<th>Name of the alias to display or define.</th>
</tr>
</thead>
<tbody>
<tr>
<td>argument</td>
<td>An argument for the alias.</td>
</tr>
<tr>
<td>string</td>
<td>Value to assign to the alias.</td>
</tr>
</tbody>
</table>

Description

This command defines an alias for one or more commands, or displays one or all existing aliases.

To display all existing aliases and their definitions, enter this command without any parameters.

To display the definition of a specific alias, specify the alias_name parameter.

To define a new alias, or redefine an existing alias, use the string parameter, and optionally include an argument in the alias with the argument parameter.

The definition can contain:

- The name of another alias, if the nested alias is the first identifier in the definition.
- A quoted string, specified with backslashes before the quotation marks. Two quotation marks cannot be together; they must be separated by a space or at least one character.

The debugger does not give a warning if the alias_name already has a definition as an alias. The new definition replaces the old one.

Invoke the alias by entering the alias name.

Examples

The following example shows how to define and use an alias:

(idb) alias cs
alias cs is not defined
(idb) alias cs "stop at 186; run"
The following example further modifies the `cs` alias to specify the breakpoint's line number when you enter the `cs` command:

```
(idb) alias cs (x) "stop at x; run"
(idb) cs(186)
[#2: stop at "x_list.cxx":186 ]
```

The following example demonstrates defining an alias with and without an argument, nesting an alias, and invoking an alias with an argument:

```
(idb) alias begin "stop in main; run"  # Define the alias "begin" to set a breakpoint in main, then run the application.
(idb) alias pv(x) "begin; print(x)"  # Define the alias "pv" to invoke "begin", then print an argument.
(idb) pv(i)  # Invoke "pv" with i as an argument.
```

The following two examples define aliases with definitions that contain quoted strings, and then display the definitions:

```
(idb) alias ada "ignore sigalrm; ignore sigfpe; set $lang="Ada";"
(idb) alias ada
ada ignore sigalrm; ignore sigfpe; set $lang="Ada";
```

```
(idb) alias x "set $lang="C++" "
(idb) alias x
x set $lang="C++"
```

Notice that in the first example there is a semicolon between the last two quotation marks. In the second example there is a space. The two quotation marks cannot be together. They must be separated by a space or character.

**See Also**

- `unalias` (*idb mode only*)
- `define` (*gdb mode only*)
assign  (idb mode only)

Change a program variable.

Syntax
assign target = ["filename"]value

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>target</strong></td>
<td>The variable, memory address, expression, or data member to be changed. This target can include a class name, object, pointer, or any other expression that describes how to access the memory that is to be assigned a value. Use the normal language syntax to specify the target. For example, if you are targeting a class member variable, use classname::variable.</td>
</tr>
<tr>
<td><strong>filename</strong></td>
<td>The name of the source code file that includes the variable you want change. You can include this parameter when you want to refer to a rescoped expression.</td>
</tr>
<tr>
<td><strong>value</strong></td>
<td>The new value for the variable, memory address, or expression.</td>
</tr>
</tbody>
</table>

Description

This command changes the value of a program variable, memory address, or expression that is accessible according to the scope and visibility rules of the language. The expression can be any expression that is valid in the current context.

For C++, use the assign command to modify static and object data members in a class, and variables declared as reference types, type const, or type static. You cannot change the address referred to by a reference type, but you can change the value at that address.

Do not use the assign command to change the PC. When you change the PC, no adjustment to the contents of registers or memory is made. Because most instructions change registers or memory in ways that can impact the meaning of the application, changing the PC is very likely to cause your application to calculate incorrectly and arrive at the wrong answer. Access violations and other errors and signals may result from changing the value in the PC.

Example

(idb) assign x = 0
(idb) assign p->s.f[i] = 1
(idb) assign A::B::m = 2
(idb) assign *((int *) 0x12345678) = 4

See Also

set variable (gdb mode only)
attach

Connect to a running process.

Syntax

**GDB Mode:**
attach processid

**IDB Mode:**
attach processid [filename]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>processid</td>
<td>The ID of the process to which you want to connect.</td>
</tr>
<tr>
<td>filename</td>
<td>IDB mode only. The name of the executable file of the process. You may omit filename only if the debugger has already loaded the file. If a file name is not specified, the debugger uses the current executable. If the executable contains symbolic debug information, the debugger reads it while attaching.</td>
</tr>
</tbody>
</table>

Description

This command attaches the debugger to a process that is already running. You may find this necessary when you are debugging your application from outside of the debugger and find a bug.

Once you attach the debugger to a process, the process continues execution until it raises a signal that the debugger intercepts, such as SEGV. If you have set the $stoponattach debugger variable, the process stops immediately.

Example

The following example loads the symbol file `a.out` and then attaches it to the process with process ID 8492.

**GDB Mode:**

```
(idb) file a.out
(idb) attach 8492
```

**IDB Mode:**

```
(idb) attach 8492 a.out
```
See Also

detach
disconnect (gdb mode only)
"$stoponattach" in Chapter 8
**awatch (gdb mode only)**

Set a watchpoint on a specified expression.

**Syntax**

```plaintext
awatch expr
```

**Parameters**

- `expr`: The expression on which to set the watchpoint.

**Description**

This command sets a watchpoint on the specified expression. When the debuggee reads the value of the specified expression or writes to it, it stops.

Watchpoints are also referred to as *data breakpoints*.

**See Also**

- `rwatch (gdb mode only)`
- `watch (gdb mode only)`
- `watch (idb mode only)`
**backtrace**  *(gdb mode only)*

Print a backtrace of stack frames.

**Syntax**

backtrace [full] [num]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>full</td>
<td>Instructs the debugger to print the values of the local variables.</td>
</tr>
<tr>
<td>num</td>
<td>The number of stack frames to print, starting from the most recent.</td>
</tr>
</tbody>
</table>

**Description**

This command prints a backtrace, which illustrates how your program arrived at its present position.

When you do not include any parameters, the debugger displays a backtrace of the entire call stack, for all frames in the stack, printing one line per frame.

To stop the backtrace, press the Pause key.

**Example**

The following example prints the last three frames in the call stack.

(idb) backtrace 3

#0 0x08051c7c in IntNode::printNodeData (this=0x805c500) at src/x_list.cxx:94

#1 0x0804af73 in List<Node>::print (this=0xbfffa330) at src/x_list.cxx:168

#2 0x08051a3c in main () at src/x_list.cxx:203

**See Also**

down
down-silently *(gdb mode only)*

info stack *(gdb mode only)*

up

up-silently *(gdb mode only)*
break  (gdb mode only)

Set a breakpoint at a specified location.

Syntax

break [{func | line | *addr}] [if cond] [thread thread]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>func</td>
<td>The name of a function.</td>
</tr>
<tr>
<td>line</td>
<td>A line number in a source code file.</td>
</tr>
<tr>
<td>addr</td>
<td>An address.</td>
</tr>
<tr>
<td>cond</td>
<td>A conditional expression. Execution stops when the debugger hits the specified location and this condition evaluates to TRUE.</td>
</tr>
<tr>
<td>thread</td>
<td>A thread ID.</td>
</tr>
</tbody>
</table>

Description

This command sets a breakpoint.

Whenever the program execution hits a breakpoint, the debugger suspends execution and waits for a command.

You can set a breakpoint at the entry of a particular function or at a source code line.

If you do not specify any parameters, the debugger sets the breakpoint at the next instruction to be executed.

Example

(idb) break 200
Breakpoint 2 at 0x805197a: file src/x_list.cxx, line 200.
(idb) continue
Continuing.
Breakpoint 2, main () at src/x_list.cxx:200
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);

See Also

clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
delete breakpoint (gdb mode only)
disable
enable
help
idb synchronize (gdb mode only)
ignore (gdb mode only)
info breakpoints (gdb mode only)
stop every (idb mode only)
tbreak (gdb mode only)
call

Call a function in the debuggee.

Syntax

call expression (parmlist)

Parameters

| expression | Expression denoting a function. |
| parmlist   | List of parameters. |

Description

Specify the function as if you were calling it from within the application. If the function has no parameters, specify empty parentheses (()).

For multithreaded applications, the debugger calls the function in the context of the current thread. For C++ applications, when you set the $overloadmenu debugger variable to 1 and call an overloaded function, the debugger lists the overloaded functions and calls the function you specify. For class methods, you also need to specify the class instance. For example:

call classInstance.methodName( parmlist )

When the function you call completes normally, the debugger restores the stack and the current context that existed before the function was called.

The call command executes the specified function with the parameters you supply and then returns control to the debugger prompt when the function returns. The call command discards the return value of the function. If you embed the function call in the expression parameter of a print command, the debugger prints the return value after the function returns.

While the program counter is saved and restored, calling a function does not shield the program state from alteration if the function you call allocates memory or alters global variables. If the function affects global program variables, for instance, those variables will be changed permanently.

NOTE. Functions compiled without the debugger option to include debugging information may lack important parameter information and are less likely to yield consistent results when called.
Example

In the following example, the call command results in the return value being discarded while the embedded call passes the return value of the function to the print command, which in turn prints the value.

(idb) call earth->distance()
(idb) print earth->distance()
149600

See Also

print
"$overloadmenu" in Chapter 8
catch (idb mode only)

Catch a signal.

Syntax

catch [signal_ID]

Parameters

signal_ID The signal for the debugger to catch and handle.

Description

This command catches and handles the specified signal. You can specify the signal by integer number or by standard signal name, with or without the prefix SIG. The catch command is equivalent to the breakpoint command stop signal: For example, the command catch ILL is similar to stop signal SIGILL.

The catch and stop signal commands differ in the following ways:

• The debugger doesn’t make an entry in the breakpoint table for a catch command.
• A catch for a signal that is already being caught does not create an additional breakpoint for that signal.

A catch command without any parameter lists all signals currently being handled.

Example

(idb) catch
INT, ILL, ABRT, FPE, SEGV, TERM, QUIT, TRAP, BUS, SYS, PIPE, URG, STOP, TTIN, TTOU, XCPU, XFSZ, PROF, USR1, USR2, VTALRM

See Also

catch unaligned (idb mode only)
ignore (idb mode only)
stop signal (idb mode only)
stop every (idb mode only)
catch unaligned  (idb mode only)

Catch unaligned accesses.

Syntax

```
catch unaligned
```

Parameters

None

Description

This command catches unaligned accesses. It is very similar to the `stop unaligned` command.

This command differs from a normal `catch` command in the following ways:

- `unaligned` is not the name of a signal.
- There is no corresponding signal number.
- `unaligned` is never listed by either the `catch` or `ignore` commands without a parameter.

Like other `catch` commands, the following rules apply:

- The debugger doesn’t make an entry in the breakpoint table for a `catch` command.
- Repeating the command does not create an additional breakpoint.

You cannot specify `unaligned` in a signal detector of a normal breakpoint definition.

The default is `catch unaligned`. To override the default and tell the debugger to ignore unaligned accesses, use the following command:

```
(idb) ignore unaligned
```

However, if a breakpoint was defined using an unaligned access detector, then it must be disabled using a `disable` or `delete` breakpoint command.

Unaligned accesses are automatically handled and quietly corrected on Linux* OS. The debugger cannot catch these events.

See Also

- `ignore (idb mode only)`
- `catch unaligned (idb mode only)`
- `delete (idb mode only)`
- `disable`
- `stop every (idb mode only)`
stop unaligned (idb mode only)
**class** (idb mode only)

Show or change the current class scope.

**Syntax**

```plaintext
class [name]
```

**Parameters**

- `name`: Name of a class. This parameter is optional only when there is a current class.

**Description**

This command lets you set the scope to a class in the program you are debugging. If you do not specify the class name, the command displays the current class context.

The new class context does not have to be a class on the current stack.

To set the scope to a function within a class, use the `func` command.

**NOTE.** You cannot have the scope set to a function and a class simultaneously. Setting the scope to a class moves the scope away from the function scope and vice versa. To return to the default (current function) scope, use the command `func 0`.

**Example**

This example shows how to use the class command to set the class scope to `List<Node>`.

This makes member function `append` visible so a breakpoint can be set in `append`.

```
(idb) stop in append
Symbol "append" is not defined.
append has no valid breakpoint address
[#1: stop in append] pending
(idb) class List<Node>
class List<Node> {
    class Node* _firstNode;
    List(void);
    void append(class Node* const);
    void print(void) const;
    ~List(void);
    (idb) stop in append
    [#2: stop in void List<Node>::append(class Node* const)]
```
See Also

func (idb mode only)
clear  (gdb mode only)

Delete a breakpoint at the specified location.

Syntax

```
clear [ { funcname | num } ]
```

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>funcname</td>
<td>The name of a function.</td>
</tr>
<tr>
<td>num</td>
<td>The number of a source code line.</td>
</tr>
</tbody>
</table>

Description

This command removes any breakpoints at the specified line number or function entry. If you do not specify any parameter, it removes the breakpoints from the next instruction to be executed.

Example

```
(idb) clear main
```

See Also

- break (gdb mode only)
- delete (idb mode only)
- delete breakpoint (gdb mode only)
- disable
- ignore (gdb mode only)
- info breakpoints (gdb mode only)
commands  (gdb mode only)
Create commands to be executed when the specified breakpoint is reached.

Syntax
commands breakpointnum
command_list
end

Parameters

<table>
<thead>
<tr>
<th>breakpointnum</th>
<th>ID of a breakpoint. Default: Most recently-created breakpoint.</th>
</tr>
</thead>
<tbody>
<tr>
<td>command_list</td>
<td>List of IDB commands, one command per line. If you do not include this parameter, the debugger removes an existing command list from the breakpoint.</td>
</tr>
</tbody>
</table>

Description
This command associates a list of debugger commands with the specified breakpoint. Whenever the breakpoint stops execution, the debugger executes these commands.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

To enter the list, write one command per line. End the list by typing a line that contains only the keyword end.

If the breakpoint already has a command list, this command list is overwritten by the new command list. You can enter an empty command list to remove a command list from a breakpoint.

Example
(idb) commands 4
Type commands for when breakpoint 4 is hit, one per line. End with a line saying just "end".
>print "the value of i is"
>print i
>disable 4
>end
See Also

break (gdb mode only)
condition (gdb mode only)
disable
enable
info breakpoints (gdb mode only)
**complete (gdb mode only)**

List all the possible completions for the beginning of a command.

**Syntax**

```
complete string
```

**Parameters**

| string | The beginning of the command to be completed. |

**Description**

This command lists all the possible completions for the beginning of a command.

**Example**

```
(idb) complete p
path
print
p
printdbx
printf
ptype
pwd
```

**See Also**

`help`
**condition (gdb mode only)**

Specify a condition for a breakpoint.

**Syntax**

```
condition breakpointnum [condexpr]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>breakpointnum</td>
<td>ID of a breakpoint.</td>
</tr>
<tr>
<td>condexpr</td>
<td>Expression denoting a logical condition. If you do not specify this parameter, the debugger removes the condition from the breakpoint, and the breakpoint becomes an unconditional breakpoint.</td>
</tr>
</tbody>
</table>

**Description**

This command specifies a condition for breaking execution at a breakpoint.

When the specified breakpoint is encountered during execution, the debugger evaluates the specified expression. If the value of the expression is TRUE, the debugger stops executing the application. Otherwise, the debugger ignores the breakpoint.

**See Also**

- break (gdb mode only)
- commands (gdb mode only)
- info breakpoints (gdb mode only)
**cont** *(idb mode only)*

Continue program execution.

**Syntax**

\[
\text{cont [in \textit{loc}]} \\
\text{cont [signal] [to source\_line]} \\
\text{n cont [signal]}
\]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{loc}</td>
<td>A function name. Instructs the debugger to continue until it arrives at this function.</td>
</tr>
<tr>
<td>\textit{signal}</td>
<td>An integer constant or a signal name. Default: 0</td>
</tr>
<tr>
<td>source_line</td>
<td>A line specifier.</td>
</tr>
<tr>
<td>\text{\textit{n}}</td>
<td>The number of times to repeat the \text{cont} command.</td>
</tr>
</tbody>
</table>

**Description**

This command without a parameter continues program execution until the debugger encounters a breakpoint, a signal, an error, or normal process termination. Specify a \textit{signal} parameter value to send an operating system signal to the process.

The \textit{signal} parameter can be either a signal number or a string name, such as \texttt{SIGSEGV}. When you do not include this parameter, the process continues execution without specifying a signal. If you specify a \textit{signal}, the process continues execution with that signal.

Use the \textit{in} argument to continue until the debugger arrives at the function \textit{loc}. The function name must be valid. If the function name is overloaded and you do not resolve the scope of the function in the command line, the debugger prompts you with the list of overloaded functions with that name from which to choose.

Use the \textit{to} argument to resume execution and then halt when the debugger arrives at the source line \textit{source\_line}. The form of the optional \textit{to} argument must be either:

- \texttt{quoted\_filename:line\_number}, which explicitly identifies both the source file and the line number where execution is to be halted.
- \texttt{line\_number}, a positive number that indicates the line number of the current source file where execution is to be halted.

You can repeat the \text{cont} command \textit{n} + 1 times by entering \text{n cont}. 
Example
In the following example, a cont command resumes process execution after it is suspended by a breakpoint.

(idb) list 195:7
> 195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
somethingToReturnTo++; }
196
197 IntNode* newNode2 = new IntNode(4);
198 nodeList.append(newNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
199
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201 nodeList.append(cNode2); {static int somethingToReturnTo;
somethingToReturnTo++; }
(idb) stop at 200
[#2: stop at "src/x_list.cxx":200]
(idb) cont
[2] stopped at [int main(void):200 0x0805197a]
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);

See Also
continue (gdb mode only)
continue  (gdb mode only)

Continue program execution.

Syntax
continue [number]

Parameters

number  The number of times to ignore a breakpoint at this location.

Description

This command continues program execution until the debugger encounters a breakpoint, a
signal, an error, or normal process termination.

The number parameter specifies the number of times to subsequently ignore a breakpoint
at this location.

Example

In the following example, a continue command resumes process execution after it is
suspended by a breakpoint.

(idb) list 195,+7
195  nodeList.append(new IntNode(3)); {static int somethingToReturnTo;
    somethingToReturnTo++; }
196
197  IntNode* newNode2 = new IntNode(4);
198  nodeList.append(newNode2); {static int somethingToReturnTo;
    somethingToReturnTo++; }
199
200  CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201  nodeList.append(cNode2); {static int somethingToReturnTo;
    somethingToReturnTo++; }
(idb) break 200
Breakpoint 2 at 0x805197a: file src/x_list.cxx, line 200.
(idb) continue
Continuing.
Breakpoint 2, main () at src/x_list.cxx:200
200 CompoundNode* cNode2 = new CompoundNode(10.123, 5);

See Also
cont (idb mode only)
until (gdb mode only)
**core-file**  *(gdb mode only)*

Specify a core file as a target, or specify not to use a core file.

**Syntax**

```
core-file [filename]
```

**Parameters**

- **filename**  filename of the target core file.

**Description**

This command specifies a core file as a target or tells the debugger not to use a core file. Specify the file name of the core file to use it as a target.

Core file debugging is not supported on Mac OS* X.

This command without a *filename* parameter tells the debugger not to use a core file.

When you specify a core file, this command is the same as `target core`.

The debugger uses the core file as the contents of memory. Core files usually contain only some of the address space of the process that generated them. The debugger accesses the executable for the rest.

**NOTE.** The debugger ignores the core file when your program is actually running under the debugger. So if you have been running your program and you want to debug a core file instead, you must kill the subprocess in which the program is running, by using the `kill` command.

**See Also**

- `kill`
- `target core (gdb mode only)`
define (gdb mode only)

Create a user-defined command.

Syntax

define [commandname]

Parameters

commandname Name of the command to create.

Description

This command creates a new command that you define.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

If a command with the name commandname already exists, the debugger prompts you to confirm the new definition.

The definition of a user-defined command may include:

- Commands.
- if, while, loop_break, and loop_continue commands.
- Up to 10 arguments separated by whitespace. Argument names are $arg0, $arg1, $arg2, ..., $arg9. The number of arguments is held in $argc.

To define a new command, enter define commandname, followed by each command on a separate line, and finally, enter end.

Example

The following example defines a new command, multiply, that prints the product of two numbers.

(idb) define multiply
> print $arg0 * $arg1
>end

To use the multiply command to find the product of 2 and 3, enter:

(idb) multiply 2 3

See Also

User-defined Commands
set max-user-call-depth (gdb mode only)
show max-user-call-depth (gdb mode only)
alias (idb mode only)
show user (gdb mode only)
delete   (idb mode only)

Delete all or specific breakpoints.

Syntax
delete { all | ID,... }

Parameters

ID          The ID of the breakpoint to be deleted.

Description
This command deletes all breakpoints or the specified breakpoints.

Example
The following example deletes the breakpoints with the IDs 1 and 4. Use a comma to separate breakpoint IDs.
(idb) delete 1,4

See Also
disable
enable
status (idb mode only)
stop every (idb mode only)
clear (gdb mode only)
delete breakpoint (gdb mode only)
delete breakpoint  (gdb mode only)

Delete all or a specific breakpoint.

Syntax
delete breakpoint [ ID ]

Parameters

ID                      The ID of the breakpoint to be deleted.

Description
This command deletes all breakpoints if you do not specify an ID, or it deletes the specified
breakpoint if you do.

Example
The following example deletes the breakpoint with the ID 4.
(idb) delete breakpoint 4

See Also
break (gdb mode only)
clear (gdb mode only)
delete (idb mode only)
disable
ignore (gdb mode only)
info breakpoints (gdb mode only)
delsharedobj  (idb mode only)

Delete symbol information for a shared object.

**Syntax**

delsharedobj filename

**Parameters**

- `filename` File for which to remove the symbol information.

**Description**

This command deletes symbol table information for a shared object from the debugger. That information was previously loaded using the `readsharedobj` command.

**See Also**

- listobj  (idb mode only)
- readsharedobj  (idb mode only)
**detach**

Detach the debugger from a running process.

**Syntax**

**GDB Mode:**
detach

**IDB Mode:**
detach [pid,...]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pid</td>
<td>(IDB mode only.) The process IDs of the processes from which to detach.</td>
</tr>
</tbody>
</table>

**Description**

This command detaches the debugger from all running processes. When you detach, the debugger removes all breakpoints.

If you attached to a process using the `attach` command, the process continues to run, but the debugger can no longer identify or control it.

**IDB Mode:**

By default, the detach command detaches the debugger from the current process and, therefore, does not require a process ID. To detach a non-current process, specify the process ID.

**Example**

**GDB Mode:**

(idb) detach

**IDB Mode:**

(idb) detach 12345, 789

**See Also**

`attach`

`disconnect (gdb mode only)`
**directory (gdb mode only)**

Add directories to the list of source directories.

**Syntax**

directory [directory_name1[:…]]

**Parameters**

*directory_name*  
Name of the directory to be prepended to the list of source directories.

**Description**

This command deletes or adds directories to the list of source directories that the debugger uses to search for source and script files when opening an executable file.

The debugger maintains a list of source directories that it searches when opening an executable file.

To delete all directories that you have added to the list, use this command with no parameter.

To add one directory to the beginning of the list, specify *directory_name*.

To add multiple directories to the beginning of the list, specify *directory_name* separated by a colon (:) or whitespace.

When you specify a directory already in the list, the debugger moves that directory one position up in the list.

To get the full list of directories in the search list, use the `show directories` command.

**Example**

(idb) `show directories`
Source directories searched: .:/home/hal/
(idb)
(idb) `directory aa`
Source directories searched: aa:.:/home/hal/
(idb)
(idb) `directory cc:dd`
Source directories searched: cc:dd:aa:.:/home/hal/
(idb)
(idb) **directory ee:ff**
Source directories searched: ee:ff:cc:dd:aa:.:/home/hal/
(idb)
(idb) **directory aa**
Source directories searched: aa:ee:ff:cc:dd:.:/home/hal/

**See Also**
- Specifying Source Directories
- Specifying Source Path Substitution Rules
- idb directory (gdb mode only)
- show directories (gdb mode only)
- unuse (idb mode only)
- use (idb mode only)
disable

Disable one or more breakpoints.

**Syntax**

**GDB Mode:**
disable [breakpointnum_1 breakpointnum_2 ...]

**IDB Mode:**
disable { all | breakpointnum,... }

**Parameters**

| breakpointnum | The ID of a breakpoint. |

**Description**

This command disables one or more breakpoints until you enable them. When you set a breakpoint, it is enabled by default. When the debugger starts or resumes process execution, it first adapts the process so that it can detect when the specified events occur. You can disable a breakpoint so it does not interfere with determining when the process should next stop.

**IDB Mode:**

If you specify all, this command disables all breakpoints. Use a comma to separate breakpoint IDs.

**GDB Mode:**

If you don’t specify any parameter, this command disables all breakpoints. Use a space to separate breakpoint IDs.

**Example**

The following command disables the breakpoints with IDs 2 and 3.

**IDB Mode:**

(idb) disable 2,3

**GDB Mode:**

(idb) disable 2 3

**See Also**

break (gdb mode only)
clear (gdb mode only)
delete (idb mode only)
enable
stop every (idb mode only)
disassemble  (gdb mode only)

Disassemble and display machine instructions.

Syntax

disassemble [address] |[address1 address2]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>A program counter value. The debugger dumps the function around this value.</td>
</tr>
<tr>
<td>address1</td>
<td>A range of addresses to dump. address1 is inclusive, address2 is exclusive.</td>
</tr>
<tr>
<td>address2</td>
<td></td>
</tr>
</tbody>
</table>

Description

This command displays a range of memory as machine instructions.

To display the memory range of the function surrounding the selected frame’s program counter, use this command with no parameters.

To display the memory range of the function surrounding a specific program counter value, specify address.

To display a range of addresses, specify the first address in the range, address1, and the address immediately following the range, address2. Notice that address2 is not included in the range.
disconnect  (gdb mode only)

Disconnect from all running processes and remove all breakpoints.

Syntax
disconnect

Parameters
None.

Description
This command detaches the debugger from all running processes. When you detach, the debugger removes all breakpoints.

If you attached to a process using the attach command, the process continues to run, but the debugger can no longer identify or control it.

Example
(idb) disconnect

See Also
attach
detach
**down**

Move a number of frames down the stack and print them.

**Syntax**

down [ num ]

**Parameters**

num A non-negative numeric expression.

**Description**

This command moves to the stack frame num levels below the current frame. The default value for num is 1.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

When the current call frame changes, the debugger displays the source line corresponding to the last instruction executed in the function executing the selected call frame.

Use the down command without a parameter to change to the call frame located one level down the stack. Specify an expression that evaluates to an integer to change the call frame down the specified number of levels.

**IDB Mode:**

When large and complex values are passed by value to a routine on the stack, the output of the down command can be voluminous. You can set the control variable $stackargs to 0 to suppress the output of argument values in the down commands.

**Example**

(idb) down 1

#1 0x0804af73 in List<Node>::print (this=0xbfffa330) at src/x_list.cxx:168
168 currentNode->printNodeData();

**See Also**

down-silently (gdb mode only)

up

up-silently (gdb mode only)

$stackargs
down-silently  (gdb mode only)

Move a number of frames down the stack but do not print them.

Syntax

down-silently [ num ]

Parameters

| num | A non-negative numeric expression. |

Description

This command moves to the stack frame num levels below the current frame. The default value for num is 1. This command is the same as down, except that it does not display the new frame.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

See Also

down
up
up-silently (gdb mode only)
**dump**  (idb mode only)

List the parameters and local variables on the stack.

**Syntax**
dump [ {funcname}. ]

**Parameters**

<table>
<thead>
<tr>
<th>funcname</th>
<th>Name of an active function in the debuggee.</th>
</tr>
</thead>
</table>

**Description**

This command lists all parameters and local variables of the specified function. If you specify a period (.), the debugger lists all parameters and local variables of all active functions (all functions currently on the stack). If you specify no parameter, the debugger assumes the current function.

**Example**

(idb) dump
>0 0x08051a3c in main() "src/x_list.cxx":203
cNode=0x805c510
cNode1=0x805c528
cNode2=0x805c560
newNode=0x805c500
newNode2=0x805c550
nodeList=class List<Node> { ... }

**See Also**

info locals  (gdb mode only)
echo  (gdb mode only)
Print a string.

Syntax
echo string

Parameters

string The string to print.

Description
This command prints an expression.
This command only applies when you are using the debugger in command-line mode. It
has no effect when you are using the Console window in the GUI.
You can include nonprinting characters in the string using C escape sequences such as \n
to print a newline.
The debugger does not print a newline unless you specify one.
Typing a space does not require a backslash.
As in C, you can use a backslash at the end of text to continue the command onto
subsequent lines.

Example
The following example illustrates using a backslash at the end of text to continue the
command onto subsequent lines:
echo This text\n
occupies\n
multiple lines.\n
produces the same output as
echo This text\n
occupies\n
echo multiple lines.
**edit**  *(idb mode only)*

Edit the current source file or a specified file.

**Syntax**

```
edit [filename]
```

**Parameters**

- `filename` The name of the file to edit.

**Description**

This command invokes the editor defined by the `EDITOR` environment variable.

The debugger passes the editor the file name to edit using `filename`. If you do not specify `filename`, the editor opens the current file. If no current file exists, the editor opens without a file.

If the `EDITOR` environment variable is undefined, the debugger invokes the `vi` editor.

**Example**

The following example opens the file `chars.c` in the Emacs* editor:

```
(idb) sh printenv EDITOR
emacs
(idb) file
chars.c
(idb) edit
```

The following example opens the file `~/foo/bar.f` in the `nedit` editor:

```
(idb) sh printenv EDITOR
nedit
(idb) edit ~/foo/bar.f
```

**See Also**

- `file` *(idb mode only)*
- `sh` *(idb mode only)*
enable

Enable one or more breakpoints.

Syntax

**GDB Mode:**

`enable [breakpointnum_1 breakpointnum_2 ...]`

**IDB Mode:**

`enable { all | breakpointnum_1,... }`

Parameters

`breakpointnum_n` The ID of a breakpoint.

Description

This command enables one or more breakpoints until you disable them.

When you set a breakpoint, it is enabled by default. When the debugger starts or resumes process execution, it first adapts the process so that it can detect when the specified events occur. You can disable a breakpoint so that it is does not interfere with determining when the process should next stop.

**IDB Mode:**

If you specify `all`, this command enables all breakpoints. Use a comma to separate breakpoint IDs.

**GDB Mode:**

If you don’t specify any parameter, this command enables all breakpoints. Use a space to separate breakpoint IDs.

Example

The following command enables the breakpoints with IDs 2 and 3.

**IDB Mode:**

(idb) `enable 2,3`

**GDB Mode:**

(idb) `enable 2 3`

See Also

`break (gdb mode only)`
clear (gdb mode only)
delete (idb mode only)
disable
stop every (idb mode only)
exit  (idb mode only)
Exit the debugger.

Syntax
exit [exit_status]

Parameters

exit_status  An expression for the exit status.

Description
This command exits the debugger. This command is equivalent to quit.

See Also
quit
**expand aggregated message**

Expand the specified or most recent message.

**Syntax**

```
expand aggregated message [msg,...]
```

**Parameters**

- `msg`  
  A message ID.  
  Default: 0.

**Description**

This command is only useful when debugging massive parallel applications.

This command expands the specified messages. If you do not specify a message ID, the debugger expands the most recently added message.

The root debugger collects the outputs from the leaf debuggers and presents you with an aggregated output. In most cases, this aggregation works fine, but it can be an impediment if you want to know the exact output from certain leaf debuggers. To remedy this, the debugger assigns a unique message ID number to each aggregated message and saves the message in the message list.

You can control the length of the message list using the `$aggregatedmsghistory` debugger variable. If you set this variable to the default, 0, the debugger records as many messages as the system will allow.

**See Also**

- `show aggregated message`
- `$aggregatedmsghistory`
export (idb mode only)

Set an environment variable or print all environment variables.

Syntax

export [varname [ = value]]

Parameters

<table>
<thead>
<tr>
<th>varname</th>
<th>Name of the variable to be set or printed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value to assign to the variable.</td>
</tr>
</tbody>
</table>

Description

This command sets an environment variable or prints all environment variables. The export and setenv commands without any variables are equivalent.

setenv is similar to export, except that export requires the equal sign to set a value, while setenv does not.

Example

The following example sets the environment variable EDITOR to use vi editor.

(idb) export EDITOR /usr/bin/vi

See Also

printenv (idb mode only)
setenv (idb mode only)
set environment (gdb mode only)
**file** (gdb mode only)

Load an executable file for debugging, or unload.

**Syntax**

file [filename]

**Parameters**

| filename | The executable for the debugger to load. |

**Description**

This command loads an executable file to execute under debugger control.

This command reads the symbolic information for an executable file and the shared libraries it uses, if available. Objects compiled without debug information do not have symbols to load.

If you specify `filename`, the debugger loads the specified executable. Without a parameter, the debugger unloads the current executable file.

**Example**

(idb) **file /home/user/examples/x_list**
Reading symbols from /home/user/examples/x_list...done.

(idb) **info files**
Symbols from "/home/user/examples/x_list".
Unix child process:
Using the running image of child process 19438.
While running this, IDB does not access memory from...
Local exec file:
'/home/user/examples/x_list', file type <unknown>
0x8048000 - 0x8056e40 is .text
0x8057000 - 0x805deec is .data
0x805deec - 0x805dfb4 is .bss

Use the **file** command without any parameter to unload an executable file, as follows:

(idb) **file**
No executable file now.
No symbol file now.

See Also
load (idb mode only)
**file** *(idb mode only)*

Switch to the specified source file.

**Syntax**

```
file [filename]
```

**Parameters**

- `filename` The name of the file for which you want to set the scope.

**Description**

This command displays the name of the current file scope, or switches the file scope. Change the file scope to see source code for or to set a breakpoint in a function not in the file currently being executed.

To display the name of the current file scope, do not include `filename`. To change the name of the current file scope, include `filename`.

If the file name is not a literal, use the `fileexpr` command. For example, if you have a script that calculates a file name in a debugger variable or in a routine that returns a file name as a string, you can use `fileexpr` to set the file.

**Example**

The following example uses the `file` command to set the debugger file scope to a file different from the main program, and then stops at line number 26 in that file. This example also shows the `fileexpr` command setting the current scope back to the original file, which is `solarSystem.cxx`.

```
(idb) run
[1] stopped at [int main(void):114 0x080569f8]
114 unsigned int j = 1; // for scoping examples
(idb) file
/home/user/examples/solarSystemSrc/main/solarSystem.cxx
(idb) set $originalFile = "solarSystem.cxx"
(idb) list 36:10
36 Moon *enceladus = new Moon("Enceladus", 238, 260, saturn);
37 Moon *tethys = new Moon("Tethys", 295, 530, saturn);
38 Moon *dione = new Moon("Dione", 377, 560, saturn);
```
Moon *rhea = new Moon("Rhea", 527, 765, saturn);
Moon *titan = new Moon("Titan", 1222, 2575, saturn);
Moon *hyperion = new Moon("Hyperion", 1481, 143, saturn);
Moon *iapetus = new Moon("Iapetus", 3561, 730, saturn);

Planet *uranus = new Planet("Uranus", 2870990, sun);
Moon *miranda = new Moon("Miranda", 130, 236, uranus);

void Star::printBody(unsigned int i) const
{
    std::cout << "(" << i << " \") Star [" << name()
    << "]\), class [" << stellarClassName(classification())
    << "\") [" << (int)subclassifcation()) << "]\) << std::endl;
}

StellarClass Star::classification() const
{
    return _classification;
}

Moon *enceladus = new Moon("Enceladus", 238, 260, saturn);
Moon *tethys = new Moon("Tethys", 295, 530, saturn);
38 Moon *dione = new Moon("Dione", 377, 560, saturn);
39 Moon *rhea = new Moon("Rhea", 527, 765, saturn);
40 Moon *titan = new Moon("Titan", 1222, 2575, saturn);
41 Moon *hyperion = new Moon("Hyperion", 1481, 143, saturn);
42 Moon *iapetus = new Moon("Iapetus", 3561, 730, saturn);
43
44 Planet *uranus = new Planet("Uranus", 2870990, sun);
45 Moon *miranda = new Moon("Miranda", 130, 236, uranus);

See Also

fileexpr (idb mode only)
info files (gdb mode only)
list
fileexpr  (idb mode only)

Switch to the specified source file.

Syntax

fileexpr [expression]

Parameters

expression  The name of the file to which you want to switch.

Description

This command is similar to file, but instead of specifying a literal file name, you can specify an expression. For example, if you have a script that calculates a file name in a debugger variable or in a routine that returns a file name as a string, you can use fileexpr to set the file.

Example

(idb) set $originalFile = "solarSystem.cxx"
(idb) fileexpr $originalFile

See Also

file (idb mode only)
info files (gdb mode only)
list
finish  (gdb mode only)

Continue execution until the current function returns.

Syntax
finish

Parameters
None.

Description
This command continues execution of the current function until it returns to its caller.

The finish command is sensitive to your location in the call stack. Suppose function A calls function B, which calls function C. Execution has stopped in function C, and you enter the up command, so you are now in function B, at the point where it called function C. Using the finish command here returns you to function A, at the point where function A called function B. Functions B and C have completed execution.

Example
The following example finishes the append method and returns control to the caller.

(idb) continue
Continuing.
Breakpoint 1, List<Node>::append (this=0xbfffcbe0, node=0x805c540) at src/x_list.cxx:151
151 Node* currentNode = _firstNode;
(idb) finish
main () at src/x_list.cxx:195
195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo; somethingToReturnTo++; }

See Also
return  (idb mode only)
run
**focus** *(idb mode only)*

Change or display the current process set.

**Syntax**

```plaintext
focus [ {expr|all} ]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>expr</code></td>
<td>The expression of the set to which you want to change.</td>
</tr>
<tr>
<td><code>all</code></td>
<td>Sets the current set to the set that includes all processes.</td>
</tr>
</tbody>
</table>

**Description**

This command changes or displays the current process set.

The current process set is the set of processes that receive any commands you enter in the debugger.

To display the current process set, do not enter any parameters.

To change the process set to another set, specify the process set in `expr`.

To change the process set to the set that includes all processes, use the `all` parameter.

**See Also**

*Working With Thread and Process Sets*
forward-search  (gdb mode only)

Search forward in the source for a string or repeat last search.

Syntax
forward-search [string]

Parameters

string  The character string to search for.

Description
This command searches forward, starting at the current position, in the current source file for the specified character string. If you do not specify string, the debugger uses the string of the most recent search. For example, if you search for the string ptr using the command forward-search ptr, and then enter forward-search without specifying a string, the debugger searches for the string ptr.

The debugger interprets the rest of the line to be the search string, so you do not need to quote the string. The debugger executes alias expansion on whatever precedes this command on the same line, possibly changing the search string.

When the debugger finds a match, it lists the line number and the line. That line becomes the starting point for any further searches, or for a list command.

Example
(idb) forward-search _firstNode
69 NODETYPE* _firstNode;

In the following example, the second forward-search also searches for the next existence of 'ptr' on source file.
(idb) forward-search ptr
(idb) forward-search

See Also
reverse-search (gdb mode only)
search (gdb mode only)
frame  (gdb mode only)

Show or change the current function scope.

Syntax

frame [expr]

Parameters

expr  The frame to use as the starting point.

Description

This command shows or changes the current function scope.

The expr parameter can be a frame number or an address. Frame zero is the frame that is currently executing, frame one called frame zero, and so on. The frame with the highest number is for main.

You may find it useful to specify an address if a bug has damaged the stack frame chaining, making it impossible for the debugger to properly assign numbers to frames. You may also find it useful when your application switches between multiple stacks.

A running application maintains a call stack that contains information about its functions that have been called. Each item in the stack is a call frame, and each frame contains both the information needed to return to its caller and the information needed to provide the local variables of the function.

When your program starts, the call stack has only one frame, that of the function main. Each function call pushes a new frame onto the stack, and each function return removes the frame for that function from the stack. Recursive functions can generate many frames.

See Also

func (idb mode only)
down
up
**func** *(idb mode only)*

Show or change the current function scope.

**Syntax**

```
func [func_name | num]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>func_name</code></td>
<td>The name of the function to which you want to change the function scope.</td>
</tr>
<tr>
<td><code>num</code></td>
<td>An integer, the debugger moves to the frame at level n.</td>
</tr>
</tbody>
</table>

**Description**

This command shows or changes the current frame.

To change the current frame to the call frame of a function in the call stack, specify the `func_name` parameter. If the function occurs more than once in the call stack, the most-recently entered call frame for that function becomes the current call frame.

To display the name of the current call frame's function, use the `func` command without any parameters.

To return to the current function scope, which is the default, use the command `func 0`.

If no frames are available to select, the debugger context is set to the static context of the named function. The current scope and current language are set based on that function. Types and static variables local to that function are now visible and can be evaluated.

To move the debugger to a specific frame level, specify that level with `num`. This is equivalent to entering `up n` at the level 0 function.

**NOTE.** You cannot have the scope set to a function and a class simultaneously. Setting the scope to a class moves the scope away from the function scope and vice versa. To return to the default (current function) scope, use the command `func 0`.

**Example**

Class B is a context outside B::doAFoobar. The following example sets the context at the function doAFoobar, a function member of the class B:

(idb) **func B::doAFoobar**
See Also

class (idb mode only)
down
up
frame (gdb mode only)
goto  (idb mode only)
Skip to a specific line number.

Syntax
goto line_number

Parameters

line_number The line number at which you want to resume execution.

Description
This command skips over the execution of a portion of source code to a specific line number.
Use this command with care or not at all.
Even if the code was compiled without optimization, the compiler may have reused registers and moved instructions such that source lines and actual instructions do not completely match up. So skipping instructions with this command may not lead to the result that you expect.

See Also
jump (gdb mode only)
**handle  (gdb mode only)**

Set signal handling actions.

**Syntax**

`handle signal_name [ handle_keyword ]`

**Parameters**

<table>
<thead>
<tr>
<th>signal_name</th>
<th>The name of the signal to handle.</th>
</tr>
</thead>
<tbody>
<tr>
<td>handle_keyword</td>
<td>The action to take on the signal. Must be one of the following:</td>
</tr>
<tr>
<td></td>
<td>• <em>stop</em>. The debugger should stop your program when this signal occurs. This implies the <em>print</em> keyword as well.</td>
</tr>
<tr>
<td></td>
<td>• <em>nostop</em>. The debugger should not stop your program when this signal occurs. It may still print a message telling you that the signal has occurred.</td>
</tr>
<tr>
<td></td>
<td>• <em>print</em>. The debugger should print a message when this signal occurs.</td>
</tr>
<tr>
<td></td>
<td>• <em>noprint</em>. The debugger should not mention the occurrence of the signal at all. This implies the <em>nostop</em> keyword as well.</td>
</tr>
<tr>
<td></td>
<td>• <em>pass</em>. The debugger should allow your program to handle this signal. Your program can handle the signal, or else it may terminate if the signal is fatal and not handled. <em>pass</em> and <em>noignore</em> have the same effect.</td>
</tr>
<tr>
<td></td>
<td>• <em>nopass</em>. The debugger should not allow your program to see this signal. <em>nopass</em> and <em>ignore</em> are synonyms.</td>
</tr>
<tr>
<td></td>
<td>• <em>ignore</em>. The debugger should not allow your program to see this signal. <em>nopass</em> and <em>ignore</em> are synonyms.</td>
</tr>
<tr>
<td></td>
<td>• <em>noignore</em>. The debugger should allow your program to see this signal; your program can handle the signal, or else it may terminate if the signal is fatal and not handled. <em>pass</em> and <em>noignore</em> have the same effect.</td>
</tr>
</tbody>
</table>

**Description**

This command defines how the debugger handles signals.
The debugger can detect any occurrence of a signal in your program. You can define in advance how the debugger should handle each kind of signal. Normally, the debugger is set up to let some signals like **SIGUSR1** be silently passed to the debuggee, but to stop your program immediately whenever an error signal happens. This command changes these settings.

**Example**

(idb) **info handle ILL**
Unrecognized or ambiguous flag word: "ILL".

(idb) **handle SIGILL nostop noprint**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Stop</th>
<th>Print</th>
<th>Pass to program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGILL</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Illegal instruction</td>
</tr>
</tbody>
</table>

(idb) **info handle SIGSEGV**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Stop</th>
<th>Print</th>
<th>Pass to program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGSEGV</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Segmentation fault</td>
</tr>
</tbody>
</table>

(idb) **info handle SIGALRM pass**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Stop</th>
<th>Print</th>
<th>Pass to program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGALRM</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Alarm clock</td>
</tr>
</tbody>
</table>

**See Also**

info handle (gdb mode only)
info signals (gdb mode only)
help

Display help for debugger commands.

**Syntax**

**GDB Mode:**
help [ topic ]
h [ topic ]

**IDB Mode:**
help [ topic | idb | command ]

**Parameters**

<table>
<thead>
<tr>
<th>topic</th>
<th>GDB Mode:</th>
<th>A command or a class of commands.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IDB Mode:</td>
<td>The command or topic for which you want to view help.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>idb</th>
<th>IDB Mode:</th>
<th>Displays a list of command classes.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>command</th>
<th>IDB Mode:</th>
<th>Lists all available debugger commands.</th>
</tr>
</thead>
</table>

**Description**

**GDB Mode:**
This command displays a list of command classes, or help for specific commands or classes of commands.

To see a list of command classes, do not include any parameters.
To see a list of commands in a specific class, specify a command class for `topic`.
To see help for a specific command, specify a command for `topic`.
To list all parameters for a command, use the `complete` command.

**IDB Mode:**
This command displays a list of help topics, help for a topic, or help for a specific command.

To see a list of help topics, do not include any parameters. The debugger displays all available topics and describes how to access them.
To see help for a specific topic, specify a topic for `topic`.
To see a list of available debugger commands, enter `help command`.
To see help for a specific command, specify a command for `topic`.
To see a list of function-oriented debugger commands, enter `help idb`.

See Also

`complete (gdb mode only)`
**history (idb mode only)**

Show the most recently used debugger commands.

**Syntax**

```
history [num]
```

**Parameters**

- `num` The number of commands to show, starting with the most recent.

**Description**

This command displays commands you have already entered.

To specify the number of commands to show, use the `num` parameter. The debugger displays that number of commands, starting with the most recent.

If you do not specify a number, the debugger displays the number of previous commands defined in the `$historylines` debugger variable. The default is 20.

**Example**

```
(idb) history 7
18: stop at 182
19: run
20: stop at 103
21: delete 1
22: cont
23: print "history_EXAMPLE START"
24: history 7
```

**See Also**

- Viewing the Command History
- `set history save`
- `set history size`
**idb directory (gdb mode only)**

Add a directory to the list of source directories or reset the list.

**Syntax**

```
idb directory [ directory ]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>directory</td>
<td>A single directory to be added to the list of source directories.</td>
</tr>
</tbody>
</table>

**Description**

This command is similar to the `directory` command. It differs in that:

- it does not ask for confirmation when resetting the list of source directories back to the default
- it only accepts a single `directory` parameter

**Example**

```
(idb) idb directory
(idb) idb directory foo/bar
```

Source directories searched: foo/bar

**See Also**

`directory (gdb mode only)`
**idb freeze  (gdb mode only)**

Set the execution attribute of the specified threads to **frozen**.

**Syntax**

`idb freeze [thread_set]`

**Parameters**

`thread_set`  A thread set.

**Description**

This command sets the execution attribute of the specified threads to **frozen**. If you do not specify any threads, the debugger uses the current thread.

A frozen thread does not resume when you resume executing a set of threads in the job.

To specify a thread set, use proper thread set notation. For example, to freeze thread 2, enter the following command:

```
(idb) idb freeze t:[2]
```

**Example**

```
(idb) idb freeze t:[1:5]
(idb) idb freeze $myset
```

**See Also**

`idb info thread (gdb mode only)`
`idb thaw (gdb mode only)`
`idb uninterrupt (gdb mode only)`

Working With Thread and Process Sets: Overview
idb info barrier  (gdb mode only)

Shows information for existing barriers in an OpenMP application.

**Syntax**

```sh
idb info barrier [ barrier_id, ... ]
```

**Parameters**

- `barrier_id` A barrier ID.

**Description**

An OpenMP barrier defines a point in an application that every thread of a particular set has to reach before thread execution continues.

This command displays the following information for any existing barriers, which you specify with `barrier_id`, in an OpenMP application:

- state
- the threads that reached the barrier
- the barrier's location
- a list of tasks the barrier is waiting for
- the source code that created the current barrier

If you do not specify `barrier_id`, this command shows all existing barriers in the OpenMP application.

**NOTE.** This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

**See Also**

- idb info lock (gdb mode only)
- idb info openmp thread tree (gdb mode only)
- idb info task (gdb mode only)
- idb info taskwait (gdb mode only)
- idb info team (gdb mode only)
- idb info thread (gdb mode only)
idb info lock  (gdb mode only)

Shows information for existing locks in an OpenMP application.

Syntax
idb info lock [ lock_id, ... ]

Parameters

lock_id  A lock ID.

Description

The OpenMP runtime library contains various lock routines that you can use for synchronization.

This command displays the following information for any existing locks, which you specify with lock_id, in an OpenMP application:

- state
- type
- the tasks or threads holding references to the lock
- The tasks or threads that are waiting for the lock
- the lock’s location
- the source code that created the current lock

If you do not specify lock_id, this command shows all existing locks in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)
idb info openmp thread tree  (gdb mode only)

Display the threads in the process in a tree format.

Syntax
idb info openmp thread tree

Parameters
None.

Description
This command displays the parent-child relationship among OpenMP tasks in a tree format. Each internal node in the tree is a task that has spawned other tasks. Tasks that have not spawned other tasks are displayed as leafnodes.

This command only displays current tasks and task teams, not destroyed tasks or task teams.

The debugger variable $threadlevel must be set to openmp to debug an OpenMP application. The debugger usually sets this variable automatically when you load an OpenMP application. Using this command causes an error message if $threadlevel is not set to openmp.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also
idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info task (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)
idb info task  (gdb mode only)

Display information for existing tasks in an OpenMP application.

Syntax

idb info task [ task_id, ... ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>task_id</td>
<td>A task ID.</td>
</tr>
</tbody>
</table>

Description

This command displays the following information for any existing task, which you specify with task_id, in an OpenMP application.

- type
- state
- the thread executing the task
- the parent task
- the spawned tasks
- a task’s location
- the source code that created the current lock

If you do not specify task_id, this command shows all existing tasks in the OpenMP application.

NOTE. This command is fully supported for OpenMP versions 3.0 and higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info taskwait (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)
idb info taskwait   (gdb mode only)

Display information for any existing taskwait.

Syntax

idb info taskwait [ taskwait_id, ... ]

Parameters

  taskwait_id   A taskwait ID.

Description

An OpenMP taskwait is a specific task barrier. It defines a point in an application that all
tasks generated by the current task or thread have to reach before thread execution
continues.

This command displays the following information for any existing taskwait, which you
specify with taskwait_id, in an OpenMP application.

  • the binding task
  • state
  • the thread that reaches the taskwait
  • the tasks the taskwait is waiting for
  • the taskwait's location

If you do not specify taskwait_id, this command shows all existing tasks in the OpenMP
application.

NOTE. This command is fully supported for OpenMP versions 3.0 and
higher. For older versions, this command has restricted functionality.

See Also

idb info barrier (gdb mode only)
idb info lock (gdb mode only)
idb info openmp thread tree (gdb mode only)
idb info task (gdb mode only)
idb info team (gdb mode only)
idb info thread (gdb mode only)
**idb info team** (gdb mode only)

Display information for any existing team.

**Syntax**

```
idb info team [ team_id, ... ]
```

**Parameters**

`team_id` A team ID.

**Description**

An OpenMP team is a set of one or more threads that are members of a parallel region. This command displays the following information for any existing teams, which you specify with `team_id`, in an OpenMP application:

- the parent team
- the number of threads in a team
- the team’s location

If you do not specify `team_id`, this command shows all existing teams in the OpenMP application.

**See Also**

- [idb info barrier (gdb mode only)](idb_info_barrier)
- [idb info lock (gdb mode only)](idb_info_lock)
- [idb info openmp thread tree (gdb mode only)](idb_info_openmp_thread_tree)
- [idb info task (gdb mode only)](idb_info_task)
- [idb info taskwait (gdb mode only)](idb_info_taskwait)
- [idb info thread (gdb mode only)](idb_info_thread)
idb info thread (gdb mode only)

Show the specified threads in the process.

**Syntax**

idb info thread [ thread_id, ... ]

**Parameters**

thread_id The ID of a thread.

**Description**

This command shows the following information for any threads you specify with thread_id:

- type
  - native
    A thread that the operating system created.
  - unknown
    In an OpenMP* process, the OpenMP* runtime library cannot determine the type of the thread.
  - initial
    In an OpenMP* process, the first thread in the process.
  - omp
    A thread that is created by the OpenMP runtime library.
  - foreign
    In an OpenMP* process, a thread that is not created by the OpenMP runtime library, such as the result of the application directly calling the thread creation function that the system thread library provided.
  - monitoring
    A thread that the OpenMP RTL created to monitor the execution of the OpenMP threads in the process.

- the IDs of the OS threads.
- the ID of the thread library.
- the execution attribute of the thread:
— **frozen**
  The thread does not resume when you resume executing a set of threads in the job.

— **thawed**
  The thread resumes when you resume executing a set of threads in the job.

— **uninterrupted**
  The thread continues running without being interrupted for events. It basically detaches the thread from the debugger's control.

- the current thread location.

If you do not specify `thread_id`, this command shows all existing threads.

**Example**

(idb) *idb info thread 1*

* 1 initial thread 46912509908752 (LWP 10606) [thawed] stopped at 0x401ed3 in main at /users/hal/openmp_sample/openmp.c:82

**See Also**

* idb info barrier (gdb mode only)*
* idb info lock (gdb mode only)*
* idb info openmp thread tree (gdb mode only)*
* idb info task (gdb mode only)*
* idb info taskwait (gdb mode only)*
* idb info team (gdb mode only)*
**idb process  (gdb mode only)**

Show or specify a process.

**Syntax**

idb process [ pid-expression | image-name ]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pid-expression</td>
<td>A process ID.</td>
</tr>
<tr>
<td>image-name</td>
<td>A binary image file name.</td>
</tr>
</tbody>
</table>

**Description**

This command shows or specifies a process using the process ID number or the name of the image.

If you do not specify any parameters, the debugger shows the current process.

The debugger sets the context of the current process to the process ID, `pid-expression`, or the process that runs the named binary image, `image-name`. If there is more than one process running the same binary image, the debugger warns you and leaves the process context unchanged.

**Example**

(idb) idb process

There is no current process.

You may start one by using the 'file' or 'attach' commands.

(idb) file ~/c_code/hello

Reading symbols from /home/hal/hello...done.

(idb) idb process

>localhost:6121 (/home/hal/hello) loaded.

(idb) detach ~/c_code/hello

(idb) idb process 6121
idb reentrancy  (gdb mode only)

Enable re-entrancy detection on a function.

Syntax
idb reentrancy { specifier | off | status }

Parameters

specifier  Specifies a line number, a function name, or * and an address. If it is a line number or an address, the debugger marks the function that encloses the line or address for detection.

off  Turns off function re-entrancy detection.

status  Displays the status of function re-entrancy detection.

Description
This command does not apply to Mac OS* X.

This command enables re-entrancy detection on a line number, function or an address.

A re-entrant call occurs when more than one thread accesses an expression at the same time. This command enables you to break code execution at these re-entrant calls.
idb session restore  (gdb mode only)

Load a session file to restore a session’s debug settings.

**Syntax**

idb session restore session_file

**Parameters**

session_file  The name of the session file.
If you don't specify a path, the file is stored in $sessiondir.
If you include a relative path, the path is relative to $sessiondir.
Default: idb_customizations.cmd

**Description**

This command loads a session file to restore a session’s debug settings.

If *session_file* includes an absolute path, the debugger does not use $sessiondir.

**NOTE.** It is recommended that only experienced users use relative paths. Unless you have a specific reason to do otherwise, you should only provide a file name and not a path.

**Example**

The following example loads the session file $sessiondir/lastsession.my.
(idb) idb session restore lastsession.my

The following example loads the session file $sessiondir/../test.
(idb) idb session restore ../test

The following example uses an absolute path to load the session file /tmp/test.my.
(idb) idb session restore /tmp/test.my

**See Also**

About Session Handling
Restoring a Session
About Session Handling in Command-line Mode
idb session save (gdb mode only)
idb session save (gdb mode only)

Save a session’s debug settings to a file.

**Syntax**

idb session save [ session_file ]

**Parameters**

- **session_file**
  
  The name of the session file. If you include a relative path, the path is relative to $sessiondir. Default: If you don’t specify this parameter, the session is stored in $sessiondir/idb_customizations.cmd.

**Description**

This command saves a session’s debug settings to a file. If *session_file* includes an absolute path, the debugger does not use $sessiondir.

**NOTE.** It is recommended that only experienced users use relative paths. Unless you have a specific reason to do otherwise, you should only provide a file name and not a path.

**Example**

The following example saves the session to $sessiondir/lastsession.my.

(idb) idb session save lastsession.my

The following example saves the session to $sessiondir/..../test.

(idb) idb session save ../test

The following example uses an absolute path to save the session to /tmp/test.my.

(idb) idb session save /tmp/test.my

**See Also**

idb session restore (gdb mode only)
idb set openmp-serialization (gdb mode only)

Enable or disable serial execution of parallel regions in an OpenMP* process.

Syntax
idb set openmp-serialization [ on | off ]

Parameters

| on | Enable serial execution. |
| off | Disable serial execution. |

Description
This command does not apply to Mac OS* X.
This command enables or disables serial execution of parallel regions in an OpenMP* process.
If you do not specify on or off, the debugger enables serial execution.

See Also
idb show openmp-serialization (gdb mode only)
idb set solib-path-substitute  (gdb mode only)

Substitute a directory path when loading shared libraries.

Syntax

```
idb set solib-path-substitute  dir_path  replacement_dir_path
```

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>dir_path</code></td>
<td>The shared library directory path specified in the debuggee.</td>
</tr>
<tr>
<td><code>replacement_dir_path</code></td>
<td>The directory that replaces <code>dir_path</code>.</td>
</tr>
</tbody>
</table>

Description

This command is only available when debugging a remote target. This command replaces a directory path that is specified in the debuggee’s binary when loading shared libraries. Use this command if you want the debugger to search for shared libraries in a non-standard location.

Example

The following command defines the local copy of the main image:

```
(idb) file ~/src/foo.exe
```

The following command defines the actual binary to run:

```
(idb) idb file-remote /usr/tmp/foo.exe
```

The following command tells the debugger that when the actual target specified in the binary is `/usr/lib/foo.so`, the debugger should look in `/tmp/shlib/foo.so`:

```
(idb) idb set solib-path-substitute /usr/lib /tmp/shlib
```

See Also

- `idb show solib-path-substitute  (gdb mode only)`
- `idb unset solib-path-substitute  (gdb mode only)`
idb sharing (gdb mode only)

Disable or enable data sharing event detection.

**Syntax**

```
idb sharing {off | on}
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off</td>
<td>Disables data sharing detection</td>
</tr>
<tr>
<td>on</td>
<td>Enables data sharing detection</td>
</tr>
</tbody>
</table>

**Description**

This command does not apply to Mac OS* X.

This command disables or enables data sharing event detection.

**See Also**

- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add function (gdb mode only)`
- `idb sharing filter add range (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter disable (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing filter toggle (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
- `idb sharing stop (gdb mode only)`
idb sharing event expand  (gdb mode only)

Display detailed information for data sharing detection events.

Syntax
idb sharing event expand [ event_id_list ]

Parameters

\texttt{event\_id\_list}  A list of IDs separated by spaces. For example:

\begin{verbatim}
1 2 3
\end{verbatim}

Description
This command does not apply to Mac OS* X.

This command displays detailed information for data sharing detection events. This command is similar to \texttt{idb sharing event list}, but more verbose.

If you do not specify an event ID, this command displays the last recorded event.

To view a list of events and their IDs, use the command \texttt{idb sharing event list}.

See Also
\begin{itemize}
  \item \texttt{idb sharing (gdb mode only)}
  \item \texttt{idb sharing event list (gdb mode only)}
  \item \texttt{idb sharing filter add file (gdb mode only)}
  \item \texttt{idb sharing filter add function (gdb mode only)}
  \item \texttt{idb sharing filter add range (gdb mode only)}
  \item \texttt{idb sharing filter add variable (gdb mode only)}
  \item \texttt{idb sharing filter delete (gdb mode only)}
  \item \texttt{idb sharing filter disable (gdb mode only)}
  \item \texttt{idb sharing filter enable (gdb mode only)}
  \item \texttt{idb sharing filter list (gdb mode only)}
  \item \texttt{idb sharing filter toggle (gdb mode only)}
  \item \texttt{idb sharing reset (gdb mode only)}
  \item \texttt{idb sharing status (gdb mode only)}
  \item \texttt{idb sharing stop (gdb mode only)}
\end{itemize}
**idb sharing event list**  (gdb mode only)

Display a summary of all data sharing detection events.

**Syntax**

`idb sharing event list`

**Parameters**

None.

**Description**

This command does not apply to Mac OS* X.

This command displays a summary of all data sharing detection events. This command is similar to `idb sharing event expand`, but less verbose.

**See Also**

`idb sharing (gdb mode only)`
`idb sharing event expand (gdb mode only)`
`idb sharing filter add file (gdb mode only)`
`idb sharing filter add function (gdb mode only)`
`idb sharing filter add range (gdb mode only)`
`idb sharing filter add variable (gdb mode only)`
`idb sharing filter delete (gdb mode only)`
`idb sharing filter disable (gdb mode only)`
`idb sharing filter enable (gdb mode only)`
`idb sharing filter list (gdb mode only)`
`idb sharing filter toggle (gdb mode only)`
`idb sharing reset (gdb mode only)`
`idb sharing status (gdb mode only)`
`idb sharing stop (gdb mode only)`
idb sharing filter add file  (gdb mode only)

Ignore data sharing events in the named file.

**Syntax**

```
idb sharing filter add file filename
```

**Parameters**

*filename*  
The name of the file whose sharing events you want to ignore.

**Description**

This command does not apply to Mac OS* X.

This command tells the debugger to ignore data sharing events in the named file.

**See Also**

idb sharing (gdb mode only)  
idb sharing event expand (gdb mode only)  
idb sharing event list (gdb mode only)  
idb sharing filter add function (gdb mode only)  
idb sharing filter add range (gdb mode only)  
idb sharing filter add variable (gdb mode only)  
idb sharing filter delete (gdb mode only)  
idb sharing filter disable (gdb mode only)  
idb sharing filter enable (gdb mode only)  
idb sharing filter list (gdb mode only)  
idb sharing filter toggle (gdb mode only)  
idb sharing reset (gdb mode only)  
idb sharing status (gdb mode only)  
idb sharing stop (gdb mode only)
**idb sharing filter add function (gdb mode only)**

Ignore data sharing events in the named function.

**Syntax**

```
idb sharing filter add function function_name
```

**Parameters**

- `function_name` - The name of the function whose sharing events you want to ignore.

**Description**

This command does not apply to Mac OS* X.

This command tells the debugger to ignore data sharing events in the named function.

**See Also**

- `idb sharing (gdb mode only)`
- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add range (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter disable (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing filter toggle (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
- `idb sharing stop (gdb mode only)`
# idb sharing filter add range  (gdb mode only)

Ignore data sharing events in an address range.

**Syntax**

```plaintext
idb sharing filter add range start_address, end_address
```

**Parameters**

- **start_address**: The address at the start of the memory range.
- **end_address**: The address at the end of the memory range.

**Description**

This command does not apply to Mac OS* X.

This command tells the debugger to ignore data sharing events in the address range you specify.

**See Also**

- `idb sharing (gdb mode only)`
- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add function (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter disable (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing filter toggle (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
- `idb sharing stop (gdb mode only)`
idb sharing filter add variable  (gdb mode only)

Ignore data sharing events on the specified variable.

Syntax
idb sharing filter add variable variable [, size]

Parameters

<table>
<thead>
<tr>
<th>variable</th>
<th>A variable that you want to exempt from data sharing event detection.</th>
</tr>
</thead>
<tbody>
<tr>
<td>size</td>
<td>The size of a range of bytes, starting at variable, whose sharing events you want to ignore.</td>
</tr>
</tbody>
</table>

Description
This command does not apply to Mac OS* X.

This command tells the debugger to ignore data sharing events on the specified variable.

If you specify size, the debugger ignores data sharing events on size bytes starting at variable. Otherwise, the debugger uses the size of variable. For example:

Example
(idb) idb sharing filter add variable foo 8
(idb) idb sharing filter add variable *(struct X*)0xabcdabcd

See Also
idb sharing (gdb mode only)
idb sharing event expand (gdb mode only)
idb sharing event list (gdb mode only)
idb sharing filter add file (gdb mode only)
idb sharing filter add function (gdb mode only)
idb sharing filter add range (gdb mode only)
idb sharing filter delete (gdb mode only)
idb sharing filter disable (gdb mode only)
idb sharing filter enable (gdb mode only)
idb sharing filter list (gdb mode only)
idb sharing filter toggle (gdb mode only)
idb sharing reset (gdb mode only)
idb sharing status (gdb mode only)
idb sharing stop (gdb mode only)
idb sharing filter delete  (gdb mode only)

Delete data sharing detection filters.

Syntax

idb sharing filter delete [ filter_id_list ]

Parameters

filter_id_list  A list of IDs separated by spaces. For example:

    1 2 3

Description

This command does not apply to Mac OS* X.

This command deletes data sharing detection filters.

If you don’t specify a filter ID, this command deletes all filters.

To view a list of events and their IDs, use the command idb sharing filter list.

See Also

idb sharing (gdb mode only),
idb sharing event expand (gdb mode only),
idb sharing event list (gdb mode only),
idb sharing filter add file (gdb mode only),
idb sharing filter add function (gdb mode only),
idb sharing filter add range (gdb mode only),
idb sharing filter add variable (gdb mode only),
idb sharing filter disable (gdb mode only),
idb sharing filter enable (gdb mode only),
idb sharing filter list (gdb mode only),
idb sharing filter toggle (gdb mode only),
idb sharing reset (gdb mode only),
idb sharing status (gdb mode only),
idb sharing stop (gdb mode only)
**idb sharing filter disable  (gdb mode only)**

Disable data sharing detection filters.

**Syntax**

```
idb sharing filter disable [ filter_id_list ]
```

**Parameters**

`filter_id_list`  
A list of IDs separated by spaces. For example:

```
1 2 3
```

**Description**

This command does not apply to Mac OS* X.

This command disables data sharing detection filters.

If you don’t specify a filter ID, this command disables all filters.

To view a list of events and their IDs, use the command `idb sharing filter list`.

**See Also**

- `idb sharing (gdb mode only)`
- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add function (gdb mode only)`
- `idb sharing filter add range (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing filter toggle (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
- `idb sharing stop (gdb mode only)`
Idb sharing filter enable  (gdb mode only)

Enable data sharing detection filters.

Syntax
idb sharing filter enable [ filter_id_list ]

Parameters

  filter_id_list  A list of IDs separated by spaces. For example:
                   1 2 3

Description

This command does not apply to Mac OS* X.
This command enables data sharing detection filters.
If you don’t specify a filter ID, this command enables all filters.
To view a list of events and their IDs, use the command idb sharing filter list.

See Also

  idb sharing (gdb mode only),
  idb sharing event expand (gdb mode only),
  idb sharing event list (gdb mode only),
  idb sharing filter add file (gdb mode only),
  idb sharing filter add function (gdb mode only),
  idb sharing filter add range (gdb mode only),
  idb sharing filter add variable (gdb mode only),
  idb sharing filter delete (gdb mode only),
  idb sharing filter disable (gdb mode only),
  idb sharing filter list (gdb mode only),
  idb sharing filter toggle (gdb mode only),
  idb sharing reset (gdb mode only),
  idb sharing status (gdb mode only),
  idb sharing stop (gdb mode only)
idb sharing filter list  (gdb mode only)

List all data sharing detection filters.

Syntax
idb sharing filter list

Parameters
None.

Description
This command does not apply to Mac OS* X.

This command lists all data sharing detection filters.

See Also
idb sharing (gdb mode only)
idb sharing event expand (gdb mode only)
idb sharing event list (gdb mode only)
idb sharing filter add file (gdb mode only)
idb sharing filter add function (gdb mode only)
idb sharing filter add range (gdb mode only)
idb sharing filter add variable (gdb mode only)
idb sharing filter delete (gdb mode only)
idb sharing filter disable (gdb mode only)
idb sharing filter enable (gdb mode only)
idb sharing filter toggle (gdb mode only)
idb sharing reset (gdb mode only)
idb sharing status (gdb mode only)
idb sharing stop (gdb mode only)
**idb sharing filter toggle (gdb mode only)**

Toggle data sharing detection filters.

**Syntax**

```
idb sharing filter toggle [ filter_id_list ]
```

**Parameters**

- `filter_id_list`: A list of IDs separated by spaces. For example:

```
1 2 3
```

**Description**

This command does not apply to Mac OS* X.

This command toggles data sharing detection filters that you specify: It enables filters that are disabled, and disables filters that are enabled.

If you don’t specify a filter ID, this command toggles all filters.

To view a list of events and their IDs, use the command `idb sharing filter list`.

**See Also**

- `idb sharing (gdb mode only)`
- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add range (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
- `idb sharing stop (gdb mode only)`
idb sharing reset  (gdb mode only)

Clear the data sharing event list.

Syntax
idb sharing reset

Parameters
None.

Description
This command does not apply to Mac OS* X.
This command clears the data sharing event list.

See Also
idb sharing (gdb mode only)
idb sharing event expand (gdb mode only)
idb sharing event list (gdb mode only)
idb sharing filter add file (gdb mode only)
idb sharing filter add function (gdb mode only)
idb sharing filter add range (gdb mode only)
idb sharing filter add variable (gdb mode only)
idb sharing filter delete (gdb mode only)
idb sharing filter disable (gdb mode only)
idb sharing filter enable (gdb mode only)
idb sharing filter list (gdb mode only)
idb sharing filter toggle (gdb mode only)
idb sharing status (gdb mode only)
idb sharing stop (gdb mode only)
idb sharing status    (gdb mode only)

Show if data sharing detection is on or off.

Syntax
idb sharing status

Parameters
None.

Description
This command does not apply to Mac OS* X.
This command shows if data sharing detection is on or off.

See Also
idb sharing (gdb mode only)
idb sharing event expand (gdb mode only)
idb sharing event list (gdb mode only)
idb sharing filter add file (gdb mode only)
idb sharing filter add function (gdb mode only)
idb sharing filter add range (gdb mode only)
idb sharing filter add variable (gdb mode only)
idb sharing filter delete (gdb mode only)
idb sharing filter disable (gdb mode only)
idb sharing filter enable (gdb mode only)
idb sharing filter list (gdb mode only)
idb sharing filter toggle (gdb mode only)
idb sharing reset (gdb mode only)
idb sharing stop (gdb mode only)
**idb sharing stop (gdb mode only)**

Stop or continue the debuggee when a data sharing event occurs.

**Syntax**

```
idb sharing stop { on | off | status }
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>Stops the process. (default)</td>
</tr>
<tr>
<td>off</td>
<td>Continues the process.</td>
</tr>
<tr>
<td>status</td>
<td>Show if stop is on or off.</td>
</tr>
</tbody>
</table>

**Description**

This command does not apply to Mac OS* X.

This command stops or continues the debuggee when a data sharing event occurs.

By default, the debugger stops the debuggee when a data sharing event occurs.

**See Also**

- `idb sharing (gdb mode only)`
- `idb sharing event expand (gdb mode only)`
- `idb sharing event list (gdb mode only)`
- `idb sharing filter add file (gdb mode only)`
- `idb sharing filter add function (gdb mode only)`
- `idb sharing filter add range (gdb mode only)`
- `idb sharing filter add variable (gdb mode only)`
- `idb sharing filter delete (gdb mode only)`
- `idb sharing filter disable (gdb mode only)`
- `idb sharing filter enable (gdb mode only)`
- `idb sharing filter list (gdb mode only)`
- `idb sharing filter toggle (gdb mode only)`
- `idb sharing reset (gdb mode only)`
- `idb sharing status (gdb mode only)`
idb show openmp-serialization  (gdb mode only)

Show if serialization of parallel regions in an OpenMP process is enabled.

Syntax
idb show openmp-serialization

Parameters
None.

Description
This command does not apply to Mac OS* X.
This command shows if serialization of parallel regions in an OpenMP process is enabled. By default, it is enabled.

See Also
idb set openmp-serialization (gdb mode only)
**idb show solib-path-substitute**  (gdb mode only)

Show the replacement directory for loading shared libraries.

**Syntax**

```
(idb) idb show solib-path-substitute [ dir_path ]
```

**Parameters**

`dir_path`  The shared library directory path specified in the debuggee.

**Description**

This command shows the replacement directory path for the specified path in the target that the debugger uses to load shared libraries.

If you do not specify `dir_path`, the debugger shows all replacement directories.

**Example**

```
(idb) idb set solib-path-substitute /usr/lib /tmp/shlib
(idb) idb set solib-path-substitute /usr/hal/lib /tmp/hal/shlib
(idb) idb show solib-path-substitute
/usr/lib => /tmp/shlib
/usr/hal/lib => /tmp/hal/shlib
(idb) idb show solib-path-substitute /usr/lib
/usr/lib => /tmp/shlib
```

**See Also**

`idb set openmp-serialization (gdb mode only)`
`idb unset solib-path-substitute (gdb mode only)`
idb stopping threads  (gdb mode only)

Specify the threads that stop when a breakpoint is hit.

Syntax
idb stopping threads breakpoint_id [ thread_set ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>breakpoint_id</td>
<td>The ID of the breakpoint whose stopping threads you want to specify.</td>
</tr>
<tr>
<td>thread_set</td>
<td>A thread set. If you do not specify this parameter, all threads are stopping threads.</td>
</tr>
</tbody>
</table>

Description
This command specifies the threads that stop when a breakpoint is hit.
Execution stops in all the threads you specify when the breakpoint is triggered.
To specify stopping threads, use thread set notation.

See Also
info threads (gdb mode only)
Process and Thread Set Notation
idb synchronize (gdb mode only)

Set a thread syncpoint at a location you specify.

Syntax

\[
\text{idb synchronize \{func | line | *addr\}, thread_set [if cond]}\]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>func</code></td>
<td>The name of a function.</td>
</tr>
<tr>
<td><code>line</code></td>
<td>A line number in a source code file.</td>
</tr>
<tr>
<td><code>addr</code></td>
<td>An address.</td>
</tr>
<tr>
<td><code>thread_set</code></td>
<td>A thread set.</td>
</tr>
<tr>
<td><code>cond</code></td>
<td>A conditional expression. Execution stops when the debugger hits the specified location and this condition evaluates to TRUE.</td>
</tr>
</tbody>
</table>

Description

This command sets a thread syncpoint.

A syncpoint is an address in code. When a thread you want to synchronize reaches the syncpoint, the debugger stops that thread and freezes it. The syncpoint is hit when all the threads being synchronized have reached the syncpoint. The debugger thaws the threads being synchronized after the hit.

Syncpoints and breakpoints have the same attributes, except that when defining a breakpoint, you can optionally specify the threads that trigger it, whereas with a syncpoint, you specify the threads you want to synchronize.

When you specify `cond`, the debugger evaluates the condition every time a synchronized thread arrives at the syncpoint, in the context of that thread. If the condition evaluates to true, then the debugger stops the thread and freezes it. Otherwise, the debugger continues the thread.

The eventing thread of a syncpoint is the thread that arrives last at the syncpoint.

See Also

- Working With Thread and Process Sets: Overview
- clear (gdb mode only)
- delete breakpoint (gdb mode only)
- disable
- enable
ignore (gdb mode only)
info breakpoints (gdb mode only)
idb target threads  (gdb mode only)

Specify the threads that subsequent mover commands apply to.

Syntax

idb target threads target_thread_set

Parameters

  target_thread_set    A thread set.

Description

This command specifies the threads that subsequent mover commands apply to. Mover commands are commands that advance the application, such as step or continue.

A subsequent mover command completes when all the target threads have reached the destination the mover specifies. If you or an event interrupts the command before it completes, the command aborts.

If a target thread is frozen, the command aborts with an error message.

The debugger does not evaluate target_thread_set when you issue idb target threads. It does so before executing each subsequent mover command. For example:

(idb) set $foo = t:[1]
(idb) idb target threads $foo
(idb) step
(idb) set $foo = t:[2]
(idb) step

The first step command steps thread 1, while the second step command steps thread 2.

NOTE. The thread command specifies the thread to which non-mover commands apply, so it doesn’t interact with this command.

The default target thread set, the set that movers use before you issue idb target threads, contains the last eventing thread to match the current mover behaviors.

To specify thread sets, use thread set notation.
See Also

- `info_threads (gdb mode only)`
- `thread`
- `Process and Thread Set Notation`
idb thaw  (gdb mode only)

Set the execution attribute of the specified threads to thawed.

Syntax

idb thaw [thread_set]

Parameters

thread_set  A thread set.
                  Use the proper threadset notation idb freeze 2
to freeze thread 2. Instead, you need to say

    idb freeze t:[2]

You can say it's a "parameter restriction".

Description

This command sets the execution attribute of the specified threads to thawed. If you do not specify any threads, the debugger uses the current thread.

A thawed thread resumes when you resume executing a set of threads in the job.

To specify a thread set, use proper thread set notation. For example, to thaw thread 2, enter the following command:

    idb thaw t:[2]

See Also

idb freeze (gdb mode only)
idb info thread (gdb mode only)
idb uninterrupt (gdb mode only)
Working With Thread and Process Sets: Overview
**idb uninterrupt  (gdb mode only)**

Set the execution attribute of the specified threads to **uninterrupt**.

**Syntax**

```
idb uninterrupt [thread_set]
```

**Parameters**

- **thread_set**: A thread set.

**Description**

This command sets the execution attribute of the specified threads to **uninterrupt**. If you do not specify any threads, the debugger uses the current thread.

An uninterrupted thread continues running without being interrupted for events. It basically detaches the thread from the debugger's control.

To specify a thread set, use proper thread set notation. For example, to specify thread 2 with this command, enter the following command:

```
idb uninterrupt t:[2]
```

**See Also**

- **idb freeze (gdb mode only)**
- **idb info thread (gdb mode only)**
- **idb thaw (gdb mode only)**
- **Working With Thread and Process Sets: Overview**
idb unset solib-path-substitute  (gdb mode only)

Remove a path substitution rule.

Syntax

idb unset solib-path-substitute [ dir_path ]

Parameters

dir_path  The shared library directory path specified in the debuggee.

Description

This command removes a path substitution rule for dir_path that you set with idb set solib-path-substitute. If you do not specify dir_path, the debugger removes all replacements.

Example

(idb) idb show solib-path-substitute
/usr/lib => /tmp/shlib
/usr/hal/lib => /tmp/hal/shlib
(idb) idb unset solib-path-substitute /usr/lib
(idb) idb show solib-path-substitute
/usr/hal/lib => /tmp/hal/shlib

See Also

idb set openmp-serialization (gdb mode only)
idb show solib-path-substitute (gdb mode only)
if

Conditionalize command execution.

Syntax

**GDB Mode:**

if expr
cmdlist
[else]
cmdlist
end

**IDB Mode:**

if expr "{" cmdlist "}" [ else "{" cmdlist "}" ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>expr</td>
<td>The conditional expression.</td>
</tr>
<tr>
<td>cmdlist</td>
<td>The command list to be executed.</td>
</tr>
</tbody>
</table>

Description

This command defines the beginning of a conditional block.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

**GDB Mode:**

To define a conditional block, enter if expr, followed by each command in cmdlist on a separate line, an optional else clause, and finally, close the conditional block with end.

The debugger then evaluates the block.

**IDB Mode:**

In this command, the first cmdlist is executed if expr evaluates to a non-zero value. Otherwise, the cmdlist in the else clause is executed, if specified.

Example

**GDB Mode:**

(idb) p my_pid
$1 = -1
(idb) if my_pid == 0
  > print "is zero"
  > else
  > print "is not zero"
  >end
$2 = is not zero
(idb)

IDB Mode:
(idb) set $c = 1
(idb) assign pid = 0
(idb) if pid < $c { print "Greater" } else { print "Lesser" }
Greater

See Also
while
ignore  (gdb mode only)

Set the ignore count of the specified breakpoint or watchpoint to the specified value.

**Syntax**

ignore ID count

**Parameters**

<table>
<thead>
<tr>
<th>ID</th>
<th>ID of a breakpoint or watchpoint.</th>
</tr>
</thead>
<tbody>
<tr>
<td>count</td>
<td>The number of encounters to be ignored. This number must be zero or greater.</td>
</tr>
</tbody>
</table>

**Description**

This command sets the ignore count for the specified breakpoint or watchpoint.

Watchpoints are also referred to as *data breakpoints*.

As long as the ignore count of a breakpoint or watchpoint is positive, execution does not stop there. Whenever execution encounters such a breakpoint or watchpoint, its ignore count is decreased by 1 and execution continues.

**Example**

(idb) ignore 12 100

**See Also**

break (gdb mode only)
clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable
enable
info breakpoints (gdb mode only)
ignore (idb mode only)

Ignore the specified signal.

Syntax
ignore [signal]

Parameters

<table>
<thead>
<tr>
<th>signal</th>
<th>The signal to be ignored.</th>
</tr>
</thead>
</table>

Description

This command ignores the specified signal.

To refrain from catching or handling the specified signal and pass it to your program, include signal. This command is equivalent to deleting the breakpoint created by a catch command for that signal.

To list all signals currently being ignored, do not include a signal parameter.

Example

(idb) ignore SIGILL
(idb) ignore
RTMIN, RTMIN1, RTMIN2, RTMIN3, RTMIN4, RTMIN5, RTMIN6, RTMIN7, RTMAX, RTMAX7, RTMAX6, RTMAX5, RTMAX4, RTMAX3, RTMAX2, RTMAX1, HUP, KILL, ALRM, TSTF, CONT, CHLD, WINCH, POLL

See Also

catch (idb mode only)
info args  (gdb mode only)

Print the arguments of the current frame.

Syntax
info args

Parameters
None.

Description
The command prints the arguments of the selected frame, each on a separate line.
info breakpoints  (gdb mode only)

Print information about one or more breakpoints.

Syntax

info breakpoints [expr]

Parameters

expr  An expression denoting the ID of a breakpoint

Description

This command prints information about the specified breakpoint. If you do not specify a breakpoint ID, the debugger prints information about all breakpoints.

Example

(idb) info breakpoints

Num Type   Disp Enb   Address What
1 breakpoint keep y 0x08051603 in main at src/x_list.cxx:182
  breakpoint already hit 1 time(s)
2 breakpoint keep y 0x0804ae5a in List<Node>::append(Node const) at src/x_list.cxx:148
  breakpoint already hit 1 time(s)
3 watchpoint keep y _firstNode

See Also

break (gdb mode only)
clear (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable enable help ignore (gdb mode only)
status (idb mode only)
info files  (gdb mode only)

Print the names of the files in the debuggee.

Syntax

info files

Parameters

None.

Description

This command prints the names of the following files in the debuggee:

- the executable file
- the core dump files that the debugger is currently using
- the files from which the debugger loaded symbols

This command is equivalent to info target.

Example

(idb) info files
Symbols from "/site/spt/usr1/c_code/hello".
Child process:

  Using the running image of child process 5133.
  While running this, IDB does not access memory from...

Local exec file:

  '/site/spt/usr1/c_code/hello', file type <unknown>
  0x8048000 - 0x80485fc is .text
  0x80495fc - 0x8049740 is .data
  0x8049740 - 0x8049740 is .bss

See Also

info target (gdb mode only)
info functions    (gdb mode only)

Print names and types of functions.

Syntax

info functions [REGEXP]

Parameters

REGEXP            A regular expression.

Description

This command prints the names and types of defined functions. If you do not include a
regular expression, it prints the names and types of all defined functions. If you include a
regular expression, it prints the names and data types of all defined functions whose name
contains a match for the expression.

The debugger’s regular expression engine uses the Sun* Java* API class
java.util.regex. For more information see www.sun.com.

For example, info functions .*uname finds all functions whose names include uname,
info functions ^uname finds any functions whose names begin with uname. Use a
backslash to escape special regular expression characters, such as foo*().

Example

(idb) info functions
All defined functions:
File source/control.cpp:
Controller::Controller(void);
virtual float Controller::LimitingIO(float);
virtual void Controller::setDt(float);
virtual void Controller::setMax(void);
Controller::~Controller(void);
virtual float DController::calculate(float, float);
int runCplus(void);
char * table<char>::insert(char&, int);
table<char>::table(int);
table<char>::~table(void);
int * table<int>::insert(int&, int);
table<int>::table(int);
table<int>::~table(void);
<opaque>_Exit(...);
info handle  (gdb mode only)

Print available signals and signal setting information.

Syntax

info handle

Parameters

None.

Description

This command prints a list of available signals and the current settings for signal handling. You can change these settings with the handle command.

Example

(idb) info handle

Signal    Stop    Print    Pass to program Description
SIGHUP    No       No       Yes      Yes      Hangup
SIGINT    Yes      Yes      No       No       Interrupt
...

See Also

handle (gdb mode only)
info signals (gdb mode only)
info line  (gdb mode only)

Print start and end address of specified source line.

Syntax

info line num

Parameters

num  Source line for which you want the start and end address printed.

Description

This command prints the start and end address of the compiled code for the specified source line.

You can specify source lines in any of the formats described for the list command.

See Also

list
info locals  (gdb mode only)

Print local variables of the selected function.

Syntax
info locals

Parameters
None.

Description
This command prints the local variables of the selected function, each on a separate line. These variables are all declared as either static or automatic, and are accessible at the point of execution of the selected frame.

See Also
dump (idb mode only)
info program  (gdb mode only)

Print information about the debuggee.

Syntax
info program

Parameters
None.

Description
This command prints the following information about the status of the debuggee:
•  whether it is running
•  the process ID
•  at which address it stopped
•  the reason it stopped

Example
(idb)  info program
Using the running image of child process 23606.
Program stopped at 0x804b70c.
It stopped at breakpoint 3.
**info registers  (gdb mode only)**

Print registers and their contents.

**Syntax**

info registers [ $register_name ]

**Parameters**

- **register_name**

  The name of a register.

**Description**

This command displays the contents of a register when you specify `register_name`, or all registers and their contents when you do not. This command enables you to examine sets of registers and individual registers.

**Example**

The following example shows how to examine sets of registers:

```
(idb) info registers $sp
$14 = (void *) 0xbfffe2cc
(idb) info registers
$eax 0x1 1
$ecx 0xbfffe2cc -1073748948
$edx 0xbfffe3b0 -1073749072
$ebx 0xb74e7d98 -1219592808
$esp [$sp] 0xbfffe2cc (void *) 0xbfffe2cc
...
```

The following example shows two ways to examine the `eax` register:

```
(idb) info registers $eax
$eax 0x4 4
(idb) print $eax
$2 = 4
```

**See Also**

- `print`
- `printregs (idb mode only)`
info share (gdb mode only)

Print the names of shared libraries.

Syntax
info share

Parameters
None.

Description
This command is a synonym for info sharedlibrary.

See Also
info sharedlibrary (gdb mode only)
info sharedlibrary  (gdb mode only)

Print the names of shared libraries.

Syntax
info sharedlibrary

Parameters
None.

Description
This command prints the names of all currently loaded shared libraries.

Example
(idb)info sharedlibrary
From  To  Syms Read  Shared Object Library
0xb7f97000 0xb7fb16df No /lib/ld-2.5.so
0xb7b80000 0xb7bc21ef No /myapp/lib/libintlc.so.5
0xb7bc4000 0xb7e0fbd3 No /myapp/lib/libimf.so
0xb7e10000 0xb7e1307b No /lib/tls/i686/cmov/libdl-2.5.so
0xb7e14000 0xb7f545a3 No /lib/tls/i686/cmov/libc-2.5.so
0xb7f55000 0xb7f60343 No /lib/libgcc_s.so.1
0xb7f61000 0xb7f8707f No /lib/tls/i686/cmov/libm-2.5.so
0xb7f93000 0xb7f94e47 No /user/hal/workdir/libbpshr.so

See Also
info share (gdb mode only)
info signals  (gdb mode only)

Print signal setting information.

Syntax
info signals

Parameters
None.

Description
This command is a synonym for info handle.

See Also
info handle (gdb mode only)
info source (gdb mode only)

Print information about the current source file.

**Syntax**

```
info source
```

**Parameters**

None.

**Description**

This command prints the following information about the source file for the function containing the current point of execution, as specified during compilation:

- the name of the source file, and the directory containing it
- the directory in which it was compiled
- its length, in lines
- in which programming language it is written
- whether the executable includes debugging information for that file, and if so, the format of the information, such as STABS or Dwarf 2
- whether the debugging information includes information about preprocessor macros

**See Also**

`info sources (gdb mode only)`
info sources  (gdb mode only)

Print names of all source files.

Syntax

info sources

Parameters

None.

Description

This command prints the names of all source files, as specified during compilation, for which there is debugging information. The names of source files are divided into the following groups:

- files for which debugging information has been read
- files for which debugging information has not yet been read

Example

(idb) info sources

Source files for which symbols have been read in:
source/control.cpp, source/control.h, source/crm.cpp,
source/externio.cpp, source/test1.cpp, source/test2.cpp, source/test2.h,
source/test.cpp

Source files for which symbols will be read in on demand:

See Also

info source (gdb mode only)
info stack  (gdb mode only)

Print a backtrace of stack frames.

Syntax

info stack num

Parameters

num  The number of stack frames to print, starting from the current position.

Description

This command prints a backtrace of stack frames. This command is similar to backtrace. This command prints the current frame, which is the frame that has debugger focus, and the num-1 callers of the current frame.

For example, if you enter info stack 3, the debugger prints the current frame, its caller, and the caller of the caller.

The up command puts focus on the caller of the current frame.

See Also

backtrace (gdb mode only)
info target  (gdb mode only)

Print the names of the files in the debuggee.

Syntax
info target

Parameters
None.

Description
This command is equivalent to info files.

See Also
info files (gdb mode only)
info threads  (gdb mode only)

Print all threads.

Syntax

info threads

Parameters

None.

Description

This command prints a list of threads in the debuggee, including the following information:
- a thread ID that the debugger assigns
- a thread ID that the target system assigns
- a summary of the thread’s current stack frame
An asterisk (*) preceding the thread ID indicates the current thread.

Example

(idb) info threads

1 Thread 3074820864 (LWP 18872) [thawed] 0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so

2 Thread 3074804656 (LWP 18873) [thawed] 0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so

3 Thread 3064314800 (LWP 18875) [thawed] 0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/lib pthread-0.60.so

4 Thread 3053824944 (LWP 18876) [thawed] 0xb75a01fb in
pthread_cond_wait@@GLIBC_2.3.2 from /lib/tls/libpthread-0.60.so

* 5 Thread 3043335088 (LWP 18900) [thawed] 0x80487f3 in breakpoint1 at
/site/spt/anmod/sandbox-for-nightly/test/idb/Thread/src/pthread_prime_numbers.c:24

See Also

show thread (idb mode only)
info types  (gdb mode only)

Print a description of types in the program.

Syntax
info types [REGEXP]

Parameters

REGEXP  A regular expression pattern to match.

Description
This command prints a description of types in your program.

If you specify REGEXP, the debugger prints a description of types whose names match the regular expression.

If you do not specify REGEXP, the debugger prints a description of all types.

The debugger matches each complete type name as though it is a complete line. For example, info type foo prints information on all types in the debuggee whose names include the string foo. However, info type ^foo$ prints information only for types whose complete name is foo.

This command is similar to ptype, but differs in that it does not print a detailed description.

See Also
ptype (gdb mode only)
info variables  (gdb mode only)

Print names and types of all global variables.

Syntax
info variables [REGEXP]

Parameters

REGEXP     A regular expression.

Description
This command prints the names and types of all global and static variables matching REGEXP. If you don’t include the REGEXP parameter, this command prints all the names and types of all global and static variables.
info watchpoints (gdb mode only)
Print information about one or more watchpoints.

Syntax
info watchpoints [expr]

Parameters

expr An expression denoting the ID of a watchpoint.

Description
This command prints information about the specified watchpoint. If you do not specify an
ID, the debugger prints information about all watchpoints.

Watchpoints are also referred to as data breakpoints.
This command is the same as info breakpoints.

Example
(idb) info watchpoints
Num Type  Disp Enb Address          What
1 breakpoint  keep y  0x08051603 in main at src/x_list.cxx:182
                     breakpoint already hit 1 time(s)
2 breakpoint  keep y  0x0804ae5a in List<Node>::append(Node *
                     const) at src/x_list.cxx:148
                     breakpoint already hit 1 time(s)
3 watchpoint   keep y  _firstNode

See Also
info breakpoints (gdb mode only)
status (idb mode only)
jump  (gdb mode only)

Jump to the specified line number or address.

Syntax

jump { num | *addr }

Parameters

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>num</td>
<td>Number of the line to jump to.</td>
</tr>
<tr>
<td>addr</td>
<td>Address of the instruction to jump to.</td>
</tr>
</tbody>
</table>

Description

This command jumps the program counter to the specified location. The debugger resumes program execution at that point unless it encounters a breakpoint there.

NOTE. A jump does not change the stack frame or any memory contents. Jumping from one routine to another can lead to unpredictable results.

The tbreak command is commonly used in conjunction with this command.

One way you can use this command is to go to a section of the debuggee that has already executed, in order to examine it more closely.

If num is in a function other than the one currently executing, and the two functions require different argument patterns or different patterns for local variables, the output of this command may be unpredictable.

Because of this behavior, when num is not in the current function, the debugger prompts you to confirm this command.

This command is similar to storing a new value in the $pc register, in that it changes the address from which the application continues executing. For example, the command set $pc = 0x123 causes the next continue command to continue from the address 0x123.

See Also

goto (idb mode only)
kill

Kill the current process.

**Syntax**

```
kill
```

**Parameters**

None.

**Description**

This command kills the current process, leaving the debugger running. Any breakpoints previously set are retained. Later, you can execute the program again, by using the `run` command in GDB mode or the `rerun` command in IDB mode, without loading the debuggee again.

**Example**

**GDB Mode:**

```
(idb) info program
Using the running image of child process 17629.
Program stopped at 0x8051603.
It stopped at breakpoint 1.
(idb) kill
Program exited normally.
(idb) run
Starting program: /home/user/examples/x_list
Breakpoint 1, main () at src/x_list.cpp:182
182 List<Node> nodeList;
```

**IDB Mode:**

```
(idb) show process
Current Process: localhost:17336 (/home/user/examples/x_list)
paused.
(idb) kill
Process has exited
(idb) rerun
```
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;

See Also

run
erun (idb mode only)
list

Display lines of source code.

Syntax
Use one of the following forms:

**GDB Mode:**
list
list [ file_name:]line_expression
list begin,end
list begin,
list ,end
list +[num]
list -[num]
list *address

**IDB Mode:**
list [ line_expression ]
list begin , end
list begin : num
Parameters

**line_expression**

An expression that evaluates to an integer or the name of a function whose source code you want to display. The syntax of the command and the expression determine how the debugger evaluates `line_expression`.

When this expression is an integer, it can be the line number of the source code you want to display or any of the following parameters:
- `begin`
- `end`
- `+num`
- `-num`

**begin**

An expression that evaluates to the line number at the beginning of the range of source code you want to display.

**end**

An expression that evaluates to the line number at the end of the range of source code you want to display.

**num**

The number of lines to print.

**GDB Mode:**

Default is 10.

**file_name**

The name of the file containing the source code you want to print.

**line_number**

The line number of the source code you want to display.

**function**

The name of the function whose source code you want to display.

**address**

The address of the instruction that the compiler outputs from a line of source code.

Description

This command displays lines of source code, as specified by one of the following items:

- The position of the program counter
- The last line listed, if multiple list commands have been entered
- The line numbers specified as the parameters to the list command

**GDB Mode:**
If you do not specify a parameter, the debugger prints the ten lines surrounding the current line. If the last line that the debugger printed was the output of this command, the debugger prints the lines following the last line it printed. If the last line it printed was a single line that the debugger printed as part of a stack frame, the debugger prints the lines centered around that line.

If you specify only line_number or function, the debugger prints the lines centered around the specified line or the beginning of the function. By default, the debugger prints ten lines.

If you specify begin and end, the debugger prints the lines beginning with begin and ending with end. If you specify only begin or end, the debugger prints the ten lines either following begin or preceding end.

list + prints num lines after the last printed. list – prints num lines before the last printed. If you do not include num, the debugger prints ten lines.

If you specify *address, the debugger prints the line that was compiled to an instruction at the specified program address.

**IDB Mode:**

If you specify only line_number or function, the debugger prints the lines starting with the specified line or the beginning of the function. By default, the debugger prints ten lines.

If you specify begin, end, the debugger prints the lines beginning with begin and ending with end. If you specify begin : num, the debugger prints num lines, beginning with begin.

If you do not specify end or num, the debugger shows 20 lines, or fewer if it reaches the end of source file.

**Example**

For example, to list lines 16 through 20:

(idb) **list 16,20**

16 17 class Node {
18 public:
19 Node ();
20
To list 6 lines, beginning with line 16:

**GDB Mode:**

(idb) **list 16,+6**

16
17 class Node {
  18 public:
  19  Node ();
  20
  21 virtual void printNodeData() const = 0;
}

Here are some other examples of the list command:
list -2,
list ,+2
list -2,+2
list myfile:2
list myfile:2,
list ,myfile:2
list myfile:2,myfile:3
list myfile:bar
list myfile:bar,
list ,myfile:bar
list myfile:bar,myfile:foo
list *0x123

**IDB Mode:**
(idb) **list 16:6**
16
17 class Node {
  18 public:
  19  Node ();
  20
  21 virtual void printNodeData() const = 0;
}

See Also
set listsizes (gdb mode only)
**listobj**  (idb mode only)

List all loaded objects, including the main image and the shared libraries.

**Syntax**

`listobj`

**Parameters**

None.

**Description**

This command lists all loaded objects, including the main image and the shared libraries. For each object, the information listed consists of:

- the full object name, with path name
- the starting address for the text
- the size of the text region
- whether the debugger has read the symbol table information

**Example**

(idb) **listobj**

```
section Start Addr End Addr
---
/home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debuggable/x_list
 .text 0x8048000 0x80555cf
 .data 0x8056000 0x805be07
 .bss 0x805be08 0x805bebf
/lib/libdl-2.3.2.so
 .text 0xb73b1000 0xb73b2dc3
 .data 0xb73b3dc4 0xb73b3f53
 .bss 0xb73b3f54 0xb73b3f73
/lib/tls/libc-2.3.2.so
 .text 0xb73b4000 0xb74e44f5
 .data 0xb74e5500 0xb74e7fdb
 .bss 0xb74e7fde 0xb74eaa8b
```
/nfs/cmplr/icc-9.1.043/lib/libunwind.so.5
.text 0xb74eb000 0xb74ef28c
.data 0xb74f0290 0xb74f0a1b
.bss 0xb74f0a1c 0xb74f0b7b
/nfs/cmplr/icc-9.1.043/lib/libcxa.so.5
.text 0xb74f1000 0xb750cd5e
.data 0xb750d000 0xb7513bcb
.bss 0xb7513bcc 0xb7513d4f
/nfs/cmplr/icc-9.1.043/lib/libcprts.so.5
.text 0xb7514000 0xb7594aaaf
.data 0xb7595000 0xb75b3d23
.bss 0xb75b3d24 0xb75b469f
/lib/tls/libm-2.3.2.so
.text 0xb75b5000 0xb75d5dbf
.data 0xb75d6dc0 0xb75d6f43
.bss 0xb75d6f44 0xb75d6f8f
/lib/ld-2.3.2.so
.text 0xb75eb000 0xb75fffcf
.data 0xb7600000 0xb7600533
.bss 0xb7600534 0xb7600753

See Also
info share (gdb mode only)
info sharedlibrary (gdb mode only)
load  \textit{(idb mode only)}

Load an executable and core file for debugging.

\textbf{Syntax}

\begin{verbatim}
load filename [corefilename]
\end{verbatim}

\textbf{Parameters}

\begin{tabular}{ll}
\textit{filename} & The executable file for the debugger to load. \\
\textit{corefilename} & The name of the core file to load. \\
\end{tabular}

\textbf{Description}

This command specifies an executable, and optionally, a core file, for debugging.

Core file debugging is not supported on Mac OS* X.

This command reads the symbolic information for an executable file and the shared libraries it uses, if available. Objects compiled without debug information do not have symbols to load.

If you specify a core file, the debugger acts as though it is attached to the process at the point just before it died and generated the core file: The debugger uses the core file to enable debug operations such as printing variables and the stack and looking at source files, but because the core file is not an executable, you cannot use commands that require a runnable process, such as \texttt{step} or \texttt{continue}, or commands that try to evaluate function calls.

Loading a process makes the debugger aware of it and makes it the current process that the debugger controls.

The opposite of loading an executable file is unloading an executable file, during which the debugger removes all related symbol table information that the debugger associated with the debuggee.

\textbf{Example}

\begin{verbatim}
% idb /home/user/examples/x_list
(idb) listobj
Program is not active
(idb) load /home/user/examples/x_list
Reading symbolic information from /home/user/examples/test/idb/Examples/exp/i686-Linux-currstable/debuggable/x_list...done
\end{verbatim}
See Also

unload (idb mode only)
file (gdb mode only)
map source directory  (idb mode only)

Map one source directory to another one.

Syntax

map source directory from_directory_name to_directory_name

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>from_directory_name</td>
<td>The directory from which you want to map.</td>
</tr>
<tr>
<td>to_directory_name</td>
<td>The directory to which you want to map.</td>
</tr>
</tbody>
</table>

Description

This command tells the debugger that the source files in the directory from_directory_name can be found in the directory to_directory_name.

The directory used in the source specification in the compile command is the base for the from_directory_name. The compiler combines the file path in the compile command and the user's current directory at the time of the compilation and attempts to simplify the file path so that it is a relative path from that current working directory.

Example

Suppose that when you compiled the debuggee, the source files were in /src/foo/, and that you want the debugger to use the source files in /src/bar/. You would use the following command:

(idb) map source directory /src/foo /src/bar

See Also

set substitute-path  (gdb mode only)
**next**

Step forward in source, over any function calls.

**Syntax**

next [expr]

**Parameters**

expr A numeric expression.

**Description**

This command executes a line of source code. When the next line to be executed contains a function call, the debugger executes the function being called and stops the process at the line immediately following the function call.

If you specify expr, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the next command. The expression can be any expression that is valid in the current context.

**Example**

**GDB Mode:**

(idb) list +0,+4
151    Node* currentNode = _firstNode;
152    while (currentNode->getNextNode())
153        currentNode = currentNode->getNextNode();
154    currentNode->setNextNode(node);
(idb) next
152    while (currentNode->getNextNode())
(idb) next
153        currentNode = currentNode->getNextNode();
(idb) next
152    while (currentNode->getNextNode())
(idb) next
154    currentNode->setNextNode(node);

**IDB Mode:**

(idb) list $curline:4
> 151   Node* currentNode = _firstNode;
152   while (currentNode->getNextNode())
153       currentNode = currentNode->getNextNode();
154   currentNode->setNextNode(node);
(idb) **next**
stopped at [void List<Node>::append(class Node* const):152
0x0804c579]
152   while (currentNode->getNextNode())
(idb) **next**
stopped at [void List<Node>::append(class Node* const):153
0x0804c592]
153       currentNode = currentNode->getNextNode();
(idb) **next**
stopped at [void List<Node>::append(class Node* const):152
0x0804c5aa]
152   while (currentNode->getNextNode())
(idb) **next**
stopped at [void List<Node>::append(class Node* const):154
0x0804c5c3]
154   currentNode->setNextNode(node);

**See Also**

nexti
run
step
stepi
nexti

Step forward in assembler instructions, over any function calls.

**Syntax**

nexti [expr]

**Parameters**

`expr` A numeric expression.

**Description**

This command executes a machine instruction. When the instruction contains a function call, the command executes the function being called and stops the process at the instruction immediately following the call instruction.

If you specify `expr`, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `nexti` command. The expression can be any expression that is valid in the current context.

**See Also**

next
run
step
stepi
output  (gdb mode only)

Print the value of an expression.

Syntax

output /format expr

Parameters

| format | The format in which to print the expression. |
| expr   | The expression to be printed. |

Description

This command prints the value of the specified expression.

This command is very similar to the print command. The differences are:

- This command does not print a newline at the end of the value.
- This command does not add a value to the value history.

See print commands for details about format.

Example

(idb) output /x 10
(idb) output /c 12

See Also

print
printf
patch (idb mode only)

Modify an executable by writing the value of an expression to a specific address or variable.

Syntax

```
patch addr = expr
```

Parameters

<table>
<thead>
<tr>
<th>addr</th>
<th>The address or variable whose value you want to set.</th>
</tr>
</thead>
<tbody>
<tr>
<td>expr</td>
<td>The value for the address.</td>
</tr>
</tbody>
</table>

Description

This command modifies an executable by writing the value of an expression to a specified address or variable.

Use this command to correct bad data or instructions in executable disk files. You can patch text, initialized data, or read-only data areas. You cannot patch the `bss` segment, or stack and register locations, because they do not exist on disk files.

Patching the code directly is very risky. You need to be careful that the source and target fit in structure, size, byte order, etc. Any mismatch may damage your application.

Only use this command to change the on-disk binary file. To modify debuggee memory, use the `assign` command. If the image is executing when you issue the `patch` command, the corresponding location in the debuggee address space is updated as well. The debuggee is updated regardless of whether the patch to disk succeeded, as long as the `assign` command can process the source and destination expressions. If your program is loaded but not yet started, the patch to disk is performed without the corresponding assign to memory.

When you use the `patch` command, the debugger saves the original binary with the string ~backup appended to the file name, so you can revert to the original binary if necessary. The debugger may also create a file with the string ~temp appended to the file name. The debugger may delete this file after the debugging session is over.

Example

```
(idb) run
[1] stopped at [int main(void):24 0x120001324]
24 return 0;
(idb) patch i = 10
0x1400000d0 = 10
```
(idb) `patch j = i + 12
0x1400000d8 = 22
(idb)

See Also

`assign (idb mode only)`
**path (gdb mode only)**

Add specified directory to search path.

**Syntax**

`path dirname`

**Parameters**

`dirname` The directory to add to the search path.

**Description**

This command adds the specified directory to the search path for object files, the PATH environment variable, for the current debuggee process.

If you don’t specify `dirname`, the debugger displays the executable and object file path of the debuggee.

**See Also**

`setenv (idb mode only)`
playback input  (idb mode only)

Execute commands from a file.

**Syntax**

```
playback input filename
```

**Parameters**

- `filename`  The file from which to execute commands.

**Description**

This command executes commands from a file to automate tasks. You can record commands to a file using the `record` and `unrecord` commands, or by using the GUI.

**Example**

```
(idb) record input myscript
(idb) print "Hello World"
Hello World
(idb) unrecord input
(idb) playback input myscript
Hello World
```

**See Also**

- `record (idb mode only)`
- `source`
- `unrecord (idb mode only)`
**pop**  
(idb mode only)

Remove frames from the call stack.

**Syntax**

`pop [expr]`

**Parameters**

`expr`  
The number of stack frames to be removed.

**Description**

This command removes one or more call frames from the call stack.

By default, this command removes one call frame. This command undoes the work already done by the removed execution frames. However, it does not, reverse side effects, such as changes to global variables.

Because it is extremely unlikely this will fix all the effects of a half-executed call, this command is not recommended for general use. Furthermore, the `pop` command does not provide a way to specify a return value when the frame being discarded corresponds to a function that should return a value. You may need to use the `assign` command to restore the values of global variables.

Instead of using the `pop` command, you may want to use the IDB mode `return` command, which causes the called routine to resume execution and eventually return to the caller.

**Example**

`return (idb mode only)`
`return (gdb mode only)`
print

Print the value of an expression.

Syntax

**GDB Mode:**
print [/format] [expr]

**IDB Mode:**
printradix expr[,...]
print printable_type
Parameters

**format**

**GDB Mode:**
Specifies the format in which to print the expression. Use one of the following values:

- **x**
  Regard the bits of the value as an integer, and print the integer in hexadecimal.
- **d**
  Print as integer in signed decimal.
- **u**
  Print as integer in unsigned decimal.
- **o**
  Print as integer in octal.
- **t**
  Print as integer in binary. The letter `t` stands for two.
- **a**
  Print as an address, both absolute in hexadecimal and as an offset from the nearest preceding symbol.
- **c**
  Regard as an integer and print it as a character constant.
- **f**
  Regard the bits of the value as a floating-point number and print using typical floating point syntax.

**expr**

The expression to print.

Expressions in the debugger are valid expressions in the language in which your program is written.

The debugger attempts to duplicate the standard language semantics for expressions.

An expression can include a qualifier and a tick mark, which can help identify ambiguous expressions. For example, if both `a.cxx` and `b.cxx` include a file level variable, `x`, you can use the syntax "`a.cxx``x` to specify the variable `x` in `a.cxx`. Use the same syntax to specify object hierarchy.

**IDB Mode:**
Use commas to separate multiple expressions.

To print an expression including the C/C++ comma operator, you must enclose the expression in parentheses.
Description

This command prints the value of an expression. You can print the values of one or more expressions or all local variables. You can also use the print command to evaluate complex expressions involving typecasts, pointer dereferences, multiple variables, constants, and any legal operators allowed by the language of the program you are debugging.

For an array, the debugger prints every cell in the array if you do not specify a specific cell.

**GDB Mode:**

Use the set output-radix x command to select a radix for the output of the print command, where x can be 8, 10 or 16.

**IDB Mode:**

Use the $hexints, $decints, or $octints variables to select a radix for the output of the print command. If you do not want to change the radix permanently, use the printx, printd, printo, and printb commands to print expressions in hexadecimal, decimal, octal, or binary base format, respectively.

**Example**

Consider the following declarations in a C++ program:

**GDB Mode:**

```
(idb) list 59,+2
59 const unsigned int biggestCount = 10;
```
60 static Moon *biggestMoons[biggestCount];

**IDB Mode:**
(idb) list 59:2
59 const unsigned int biggestCount = 10;
60 static Moon *biggestMoons[biggestCount];

The following example uses the `print` command to display a non-string array:

**GDB Mode:**
(idb) print biggestMoons
$4 = {0x8067998, 0x8067cb0, 0x80679f0, 0x80678e8, 0x8067730, 0x8067940, 0x8068020, 0x8067f18, 0x8067c58, 0x8067f70}

**IDB Mode:**
(idb) print biggestMoons
[0] = 0x8067998,[1] = 0x8067cb0,[2] = 0x80679f0,[3] = 0x80678e8,[4] = 0x8067730,[5] = 0x8067940,[6] = 0x8068020,[7] = 0x8067f18,[8] = 0x8067c58,[9] = 0x8067f70

The following example shows how to print individual values of an array:

**GDB Mode:**
(idb) print biggestMoons[3]
$7 = (Moon *) 0x80678e8
(idb) print *biggestMoons[3]
$8 = {<Planet> = {<HeavenlyBody> = {_name = 0x805a514 "Io", _innerNeighbor = 0x0, _outerNeighbor = 0x8067940, _firstSatellite = 0x0, _lastSatellite = 0x0}, <Orbit> = {_primary = 0x8067890, _distance = 422, _name = 0x8067918 "Jupiter 1"}, _radius = 1815}

**IDB Mode:**
(idb) print biggestMoons[3]
0x80678e8
(idb) print *biggestMoons[3]
class Moon {
    _radius = 1815;
    _name = 0x805a514="Io"; // class Planet::HeavenlyBody
    _innerNeighbor = 0x0; // class Planet::HeavenlyBody
    _outerNeighbor = 0x8067940; // class Planet::HeavenlyBody
    _firstSatellite = 0x0; // class Planet::HeavenlyBody
_lastSatellite = 0x0; // class Planet::HeavenlyBody
_primary = 0x8067890; // class Planet::Orbit
_distance = 422; // class Planet::Orbit
_name = 0x8067918="Jupiter 1"; // class Planet::Orbit

See Also
printf
printi
**printenv (idb mode only)**

Display the value of one or all environment variables.

**Syntax**

```plaintext
printenv [varname]
```

**Parameters**

- **varname**
  
The environment variable whose value you want to display.

**Description**

This command displays the value of one environment variable if you specify `varname`, or all environment variables if you omit `varname`.

**Example**

The following example displays the value of all environment variables.

```plaintext
(idb) printenv
DESKTOP_STARTUP_ID=
DISPLAY=:1.0
HISTCONTROL=ignoreboth
HOME=/home/hal
LESSCLOSE=/usr/bin/lesspipe %s %s
LESSOPEN=| /usr/bin/lesspipe %s
... runlevel=2
(idb)
```

The following example displays the value of the `HOME` environment variable.

```plaintext
(idb) printenv HOME
HOME=/home/hal
(idb)
```

**See Also**

- `export (idb mode only)`
- `setenv (idb mode only)`
**printf**

Display a complex structure with formatting.

**Syntax**

printf format [, expr, ...]

**Parameters**

- `format`  
  A string expression of characters and conversion specifications using the same format specifiers as the `printf` C function.

- `expr, ...`  
  One or more expressions separated by commas.

**Description**

This command formats and displays a complex structure. This command requires a running target program because it uses `libc`. A comma must precede the first `expr` if there is one. Separate expressions with commas.

**Example**

(idb) printf "The PC is 0x%x", $pc
The PC is 0x8051a3c
printi

Display the value as an assembly instruction.

Syntax

printi [expr,...]

Parameters

expr,...  One or more expressions separated by commas.

Description

This command takes one or more numerical expressions and interprets each one as an assembly instruction, printing out the instruction, and its arguments when applicable. This command is typically used by engineers performing machine-level debugging.

Example

(idb) $curpc/1i
int main(void): src/x_list.cxx
* [line 182, 0x08051603] main+0x1b:        pushl  %edi
(idb) $curpc/1dd
0x08051603:  2022018391
(idb) printi $pc
main+0x1b:    pushl  %edi
`printregs` *(idb mode only)*

Display the values of hardware registers.

**Syntax**

```
printregs
```

**Parameters**

None.

**Description**

This command displays the values of all the hardware registers. The list of registers the debugger displays is machine-dependent.

By default, the debugger displays most values in decimal radix. To display the register values in hexadecimal radix, set the `$hexints` variable to 1.

**Example**

```
(idb) printregs
$eax  0x805be28 134594088
$ecx  0xb74e61a0 -1219599968
$edx  0xb74e5610 -1219602928
$ebx  0xb74e7d98 -1219592808
$esp  [sp]  0xbfff83a8 -1073773656
$ebp  [fp]  0xbfff8478 -1073773448
$esi  0xbfff8504 -1073773308
$edi  0xb74e567c -1219602820
$eip  [pc]  0x8051a3c 134552124
$eflags 0x286 646
$cs  0x23 35
$ss  0x2b 43
$ds  0x2b 43
$es  0x2b 43
$fs  0x0 0
$gs  0x33 51
$orig_eax  0xffffffff -1
```
$fctrl  0x37f  895
$fstat  0x0  0
$ftag  0x0  0
$fiseg  0x23  35
$fioff  0x804ea61  134539873
$foseg  0x2b  43
$fooff  0xbfff81c4 -1073774140
$fop  0x89  137
$f0  0x0  0
$f1  0x0  0
$f2  0x0  0
$f3  0x0  0
$f4  0x0  0
$f5  0x0  0
$f6  0x0  0
$f7  0xa1f7cf0000000000  10.1230001449584961
$xmm0  0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7] = 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_int64 = [0] = 0,[1] = 0;
}
$xmm1  0x0 union {
  v4_float = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
  v2_double = [0] = 0,[1] = 0;
  v8_int16 = [0] = 0,[1] = 0,[2] = 0,[3] = 0,[4] = 0,[5] = 0,[6] = 0,[7] = 0;
  v4_int32 = [0] = 0,[1] = 0,[2] = 0,[3] = 0;
v2_int64 = [0] = 0, [1] = 0;
}

$\text{xmm2} \quad \text{0x0 union} \{ 
  v2_double = [0] = 0, [1] = 0;
  v2_int64 = [0] = 0, [1] = 0;
\}

$\text{xmm3} \quad \text{0x0 union} \{ 
  v2_double = [0] = 0, [1] = 0;
  v2_int64 = [0] = 0, [1] = 0;
\}

$\text{xmm4} \quad \text{0x0 union} \{ 
  v2_double = [0] = 0, [1] = 0;
  v2_int64 = [0] = 0, [1] = 0;
\}

$\text{xmm5} \quad \text{0x0 union} \{ 
  v2_double = [0] = 0, [1] = 0;
\}
\texttt{v2\_double} = [0] = 0, [1] = 0;
\texttt{v4\_int32} = [0] = 0, [1] = 0, [2] = 0, [3] = 0;
\texttt{v2\_int64} = [0] = 0, [1] = 0;
\}
\texttt{\$xmm6} 0x0 union {
\texttt{v4\_float} = [0] = 0, [1] = 0, [2] = 0, [3] = 0;
\texttt{v2\_double} = [0] = 0, [1] = 0;
\texttt{v4\_int32} = [0] = 0, [1] = 0, [2] = 0, [3] = 0;
\texttt{v2\_int64} = [0] = 0, [1] = 0;
\}
\texttt{\$xmm7} 0x0 union {
\texttt{v4\_float} = [0] = 0, [1] = 0, [2] = 0, [3] = 0;
\texttt{v2\_double} = [0] = 0, [1] = 0;
\texttt{v4\_int32} = [0] = 0, [1] = 0, [2] = 0, [3] = 0;
\texttt{v2\_int64} = [0] = 0, [1] = 0;
\}
\texttt{\$mxcsr} 0x1f80 8064
\texttt{\$vfp} 0xbfff8480 -1073773440

See Also
\texttt{\$hexints}
\texttt{info registers (gdb mode only)
printt (idb mode only)

Interpret integer values as seconds since the epoch.

Syntax

    printt expression[,...]

Parameters

expression  An integer value. The number of seconds since the epoch.

Description

This command interprets integer values as seconds since January 1, 1970, Coordinated Universal Time (UTC).

For more information, see the man page for ctime.
process  (idb mode only)

Show or change the current process.

Syntax

process [ ID | filename ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>ID of the process to which you want to switch.</td>
</tr>
<tr>
<td>filename</td>
<td>Name of the file to which you want to switch.</td>
</tr>
</tbody>
</table>

Description

This command shows the current process or it changes the current process if you specify ID or filename.

The process you switch away from remains loaded, but stalled, until the debugger exits, or that process is unloaded, or untill you swicth to it to continue it.

Example

The following example creates two processes and switches from one to the other:

(idb) process
There is no current process.
You may start one by using the `load' or `attach' commands.
(idb) load x_list
Reading symbolic information from /home/user/examples/x.x_processes/x_list...done
(idb) process
>localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
(idb) set $old_process = $curprocess
(idb) printf "$old_process=%d", $old_process
$old_process=20492
(idb) load x_segv
Reading symbolic information from /home/user/examples/x.x_processes/x_segv...done
(idb) process
localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
>localhost:20492 (/home/user/examples/x.x_processes/x_segv) loaded.
(idb) process 20492
(idb) process
>localhost:20492 (/home/user/examples/x.x_processes/x_list) loaded.
localhost:20492 (/home/user/examples/x.x_processes/x_segv) loaded.

See Also
attach
load (idb mode only)
show process (idb mode only)
show process set
**ptype** (gdb mode only)

Print the type declaration of the specified type, or the last value in history.

**Syntax**

`ptype [name]`

**Parameters**

- `name` Type for which you want the type declaration to be printed.

**Description**

This command prints a detailed description of a type, or the type of the last value in the command history.

This command is similar to `whatis`, but `whatis` prints just the name of the type.

**Example**

The following example applies if the command history contains the type `String`, but not the type `bitfield`.

```
(idb) ptype
type = String

(idb) ptype bitfield
type = void ()
```

**See Also**

`whatis`
**pwd**  *(gdb mode only)*

Display the current working directory.

**Syntax**

```
pwd
```

**Parameters**

None.

**Description**

This command displays the current working directory.

**Example**

```
(idb) pwd
Working directory /home/hal/myapp
```
**quit**

Exit the debugger.

**Syntax**

```plaintext
quit
```

**Parameters**

None

**Description**

This command exits the debugger.

**See Also**

- Exiting the Debugger
- `exit (idb mode only)`
**readsharedobj (idb mode only)**

Read symbol information for a shared object.

**Syntax**

`readsharedobj filename`

**Parameters**

- `filename` The shared object.

**Description**

This command reads the symbol table information for the specified shared object. The object must be a shared library. You can use this command only when you specify the debuggee using the `load` command or with the GUI.

**See Also**

- `delsharedobj (idb mode only)`
- `listobj (idb mode only)`
**record**  *(idb mode only)*

Record debugger interactions to a file.

**Syntax**

```
record { input | output | io } [file]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>file</td>
<td>The file to which you want to record interactions.</td>
</tr>
<tr>
<td>input</td>
<td>Records input only.</td>
</tr>
<tr>
<td>output</td>
<td>Records output only.</td>
</tr>
<tr>
<td>io</td>
<td>Records input and output.</td>
</tr>
</tbody>
</table>

**Description**

This command records debugger input, output, or both.

To help you make command files, as well as to help you see what has happened before, the debugger can write both its input and its output to files.

The **record input** command saves debugger commands to a file. You can execute the commands in the file using the **source** command or the **playback input** command.

If you do not specify a file name, the debugger creates a file with a random file name in `/tmp` as the record file. The debugger issues a message giving the name of that file.

The **record output** command saves the debugger output to a file. The output is simultaneously written to `stdout` (normal output) or `stderr` (error messages).

To stop recording debugger input or output, use the appropriate version of the **unrecord** command, then exit the debugger, or redirect the command to `/dev/null`, as shown in the following example:

```
(idb) record input /dev/null
(idb) record output /dev/null
(idb) record io /dev/null
```

The **record io** command saves both input to and output from the debugger. If the debugger is already recording input or output when you invoke this command, the debugger closes the old file and records to a new one. It does not record simultaneously to two files.

**record io** is equivalent to the combination of **record input** and **record output**, and closes any open recording files.
NOTE. Only the record io command records the prompt itself.

Example

The following example shows how to use the record input command to record a series of debugger commands in a file named myscript:

(idb) record input myscript
(idb) stop in main
[#1: stop in int main(void)]
(idb) run
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;
(idb) unrecord input

This example results in the following recorded input in myscript:

(idb) sh cat myscript
stop in main
run
unrecord input

The following example shows how to use the record output command to record a series of debugger commands in a file named myscript:

(idb) record output myscript
(idb) stop in List<Node>::append
[#2: stop in void List<Node>::append(class Node* const)]
(idb) cont
[2] stopped at [void List<Node>::append(class Node* const):148 0x0804ae5a]
148 if (!_firstNode)
(idb) cont to 156
stopped at [void List<Node>::append(class Node* const):156 0x0804aed7]
156 )
(idb) unrecord output

After the above commands are executed, myscript contains the following:

(idb) sh cat myscript
The following example shows how `record io` records input and output.

```plaintext
(idb) record io myscript
(idb) stop in main
[#1: stop in int main(void) ]
(idb) run
[1] stopped at [int main(void):12 0x120001130]
12 int i;
(idb) quit
% cat myscript
(idb) stop in main
[#1: stop in int main(void) ]
(idb) run
[1] stopped at [int main(void):12 0x120001130]
12 int i;
(idb) quit
```

See Also

- Scripting Commands
- playback input (idb mode only)
- source
rerun (idb mode only)

Restart the program.

Syntax

rerun [ args ] [ IO_redirection ... ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>args</td>
<td>The arguments to pass to the debuggee. Provides both the argc and argv for the created process in the same way a shell does.</td>
</tr>
<tr>
<td>IO_redirection</td>
<td>Enables you to change stdin, stdout, and stderr, which are otherwise inherited from the debugger process. You can enter the following values: &gt; filename Redirect stdout 1&gt; filename Redirect stdout 2&gt; filename Redirect stderr &gt;&amp; filename Redirect stdout and stderr 1&gt; filename 2&gt; filename Redirect stdout and stderr to different files</td>
</tr>
</tbody>
</table>

Description

This command restarts the debuggee.

When you do not include any parameters, this command uses the arguments and the IO_redirection parameters of the most recent run command entered with arguments. If there was no previous run command, the rerun command defaults to run.

If the last modification time or size of the binary file or any of the shared objects used by the binary file has changed since you issued the last run or rerun command, the debugger automatically rereads the symbol table information. When this happens, the old breakpoint settings may no longer be valid after the debugger reads the new symbol table information.
The debugger breaks up the argument string into words, and supports several shell features, including tilde (~) and environment variable expansion, wildcard substitution, single quote ('), double quote ("), and single character quote (\).

The IO redirection parameter enables you to change stdin, stdout, and stderr, which are otherwise inherited from the debugger process.

The various forms have the same effect as in the csh(1) shell.

**Example**
(idb) **stop at 182**
[#1: stop at "src/x_list.cxx":182]
(idb) **rerun -s > prog.output**
[1] stopped at [int main(void):182 0x08051603]
182 List<Node> nodeList;

**See Also**
run
return  (gdb mode only)

Remove frames from the call stack.

**Syntax**

return

**Parameters**

None.

**Description**

When you use `return`, the selected stack frame is discarded, and all frames within it. The `return` command does not resume execution. It leaves the program stopped in the state that would exist if the function had just returned. In contrast, the `finish` command resumes execution until the selected stack frame returns naturally.

**See Also**

*finish* (gdb mode only)

*pop* (idb mode only)
**return**  *(idb mode only)*

Continue execution until the current or specified function returns.

**Syntax**

```
return [function_name]
```

**Parameters**

*function_name*  The function until which you want to continue execution.

**Description**

This command continues execution until the current, or specified, function returns. If you do not specify a function name, this command continues execution of the current function until it returns to its caller.

Specify a function name to continue the execution until control is returned to the specified function. The function must be active on the call stack.

This command is sensitive to the user's location in the call stack. Suppose function A calls function B, which calls function C. Execution has stopped in function C, and you entered the up command, so you are now in function B, at the point where it called function C. Using the return command here returns you to function A, at the point where function A called function B. Functions B and C will have completed execution.

**Example**

In this example the return command causes the user routine *append* to complete and return to the caller. At that point, the debugger returns control to the user.

```
(idb) cont
[1] stopped at [void List<Node>::append(class Node* const):151 0x0804ae6d]
151 Node* currentNode = _firstNode;
(idb) return
stopped at [int main(void):195 0x080518c8]
195 nodeList.append(new IntNode(3)); {static int somethingToReturnTo; somethingToReturnTo++; }
```

**See Also**

*finish* *(gdb mode only)*
reverse-search  (gdb mode only)

Search backward in the source for a string or repeat last search.

Syntax

reverse-search [string]

Parameters

string  The character string to search for.

Description

This command searches backward, starting at the current position, in the current source file for the specified character string. If you do not specify string, the debugger uses the string of the most recent search.

The debugger interprets the rest of the line to be the search string, so you do not need to quote the string. The debugger executes alias expansion on whatever precedes this command on the same line, possibly changing the search string.

When the debugger finds a match, it lists the line number and the line. That line becomes the starting point for any further searches, or for a list command.

Example

(idb) reverse-search append
145 void List<NODETYPE>::append(NODETYPE* const node)
(idb) reverse-search
65 void append (NODETYPE* const node);

See Also

forward-search (gdb mode only)
search (gdb mode only)
run

Run the debuggee program.

Syntax
run [args] [IO_redirection]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>args</td>
<td>The arguments to pass to the debuggee.</td>
</tr>
<tr>
<td>IO_redirection</td>
<td>Enables you to change stdin, stdout, and stderr, which</td>
</tr>
<tr>
<td></td>
<td>are otherwise inherited from the debugger process.</td>
</tr>
<tr>
<td></td>
<td>You can enter the following values:</td>
</tr>
<tr>
<td></td>
<td>&lt; filename</td>
</tr>
<tr>
<td></td>
<td>Redirect stdin</td>
</tr>
<tr>
<td></td>
<td>&gt; filename</td>
</tr>
<tr>
<td></td>
<td>Redirect stdout</td>
</tr>
<tr>
<td></td>
<td>1&gt; filename</td>
</tr>
<tr>
<td></td>
<td>Redirect stderr</td>
</tr>
<tr>
<td></td>
<td>2&gt; filename</td>
</tr>
<tr>
<td></td>
<td>Redirect stdout and stderr</td>
</tr>
<tr>
<td></td>
<td>&gt;&amp; filename</td>
</tr>
<tr>
<td></td>
<td>Redirect stdout and stderr to different files</td>
</tr>
</tbody>
</table>

Description

This command runs the debuggee, creating a process executing the loaded program. If you do not specify any arguments, the debugger uses default arguments. Default arguments are specified by the previous run command with arguments.

The debugger breaks up the argument string into words, and supports several shell features, including tilde (~) and environment variable expansion, wildcard substitution, single quote (‘), double quote ("), and single character quote (\).

The debugger sets up argc and argv based on the argument list in the same way the shell does, where argv[0] is always the image run. For example, if you enter run a b c, then argc is 4, and argv is {"debuggee", "a", "b", "c"}.
You can also specify arguments using the `set args` command. To view default arguments, use the `show args` command.

**Examples**

(idb) `run`
(idb) `run -s > prog.output`

**See Also**

`file` (gdb mode only)  
`load` (idb mode only)  
`rerun` (idb mode only)  
`set args` (gdb mode only)  
`show args` (gdb mode only)
rwatch  (gdb mode only)

Set a read watchpoint on the specified expression.

Syntax

rwatch expr

Parameters

expr  The expression on which to set the watchpoint.

Description

This command sets a read watchpoint on the specified expression. When the debuggee reads the value of the specified expression, it stops.

Watchpoints are also referred to as data breakpoints.

See Also

awatch (gdb mode only)
watch (gdb mode only)
watch (idb mode only)
search  (gdb mode only)
Search forward in the source for a string or repeat last search.

Syntax
search [string]

Parameters

| string | The character string to search for |

Description
This command is a synonym for forward-search.

See Also
forward-search (gdb mode only)
reverse-search (gdb mode only)
set  (idb mode only)

Set a debugger variable to a value or show all debugger variables.

Syntax

set [ variable = expr ]

Parameters

variable  A debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language.

expr  The new definition of variable. This expression can be any expression that is valid in the current context.

Description

This command sets a debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language of the debuggee. Alternatively, this command displays a list of all debugger variables and their values.

To set a debugger variable, enter this command followed by a variable name, an equal sign, and a definition. Enclose string definitions in quotes.

To display the definitions of all debugger variables, enter this command without any parameters.

To display the definition of a single debugger variable, use the print command.

To delete one or all debugger variables, use the unset command.

To delete one or all environment variables, use the unsetenv command (not the unset command).

Enter help $variable for a list of all predefined debugger variables.

Example

(idb) print $givedebughints
0
(idb) set $givedebughints = "gdb"
(idb) print $givedebughints
1
See Also

set_variable (gdb mode only)
show_convenience (gdb mode only)
unset (idb mode only)
set args  (gdb mode only)

Specify arguments for the debuggee program.

Syntax

set args [arguments] [IO_redirection]

Parameters

<table>
<thead>
<tr>
<th>arguments</th>
<th>The arguments to pass to the debuggee.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IO_redirection</td>
<td>Enables you to change stdin, stdout, and stderr, which are otherwise inherited from the debugger process. You can enter the following values: &lt; filename Redirect stdin &gt; filename Redirect stdout 1&gt; filename Redirect stdout 2&gt; filename Redirect stderr &gt;&amp; filename Redirect stdout and stderr to a single file 1&gt; filename 2&gt; filename Redirect stdout and stderr to different files</td>
</tr>
</tbody>
</table>

Description

This command specifies arguments for the debuggee. If the run command does not specify any arguments, the debuggee uses the arguments from the previous run command or arguments that you set with the set args command.

If you do not include any parameters, the debugger sets the argument list to null.

The set args command does not affect processes currently running. New arguments affect only the next run.

To view default arguments, use the show args command.

Example

(idb) set args -s > prog.output
(idb) **show args**

Argument list to give program being debugged when it is started is "-s > prog.output".

**See Also**

run
show args (gdb mode only)
set confirm (gdb mode only)

Switch confirmation requests on or off.

Syntax

set confirm {on|off}

Parameters

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>Turns on confirmation requests.</td>
</tr>
<tr>
<td>off</td>
<td>Turns off confirmation requests.</td>
</tr>
</tbody>
</table>

Description

This command switches confirmation requests for various commands on or off.
set editing  (gdb mode only)

Enable or disable Emacs*-like control characters.

**Syntax**

set editing {on|off}

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>Enable Emacs*-like control characters.</td>
</tr>
<tr>
<td>off</td>
<td>Disable Emacs*-like control characters.</td>
</tr>
</tbody>
</table>

**Description**

This command enables or disables Emacs*-like control characters in the debugger. It is not possible to use vi*-like commands in IDB.

In the GUI console mode, this functionality is disabled by default. In the command-line interface, it is enabled by default.

**Example**

(idb) set editing on
(idb) show editing

Editing of command lines as they are typed is on.

**See Also**

show editing (gdb mode only)
set environment  (gdb mode only)

Set an environment variable to a value.

**Syntax**

```
set environment name [ value ]
```

**Parameters**

<table>
<thead>
<tr>
<th>name</th>
<th>The name of an environment variable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value for the environment variable.</td>
</tr>
</tbody>
</table>

**Description**

This command sets an environment variable to a value you specify.

To show the value of an environment variable, use `show environment`.

To remove an environment variable, use `unset environment`.

The environment commands have no effect on the environment of any currently running process. The environment commands do not change or show the environment variables of the debugger or of the current process. They only affect the environment variables that will be used when a new process is created.

You can set and unset environment variables for processes created in the future to set up an environment different from the environment of the debugger and of the shell from which the debugger was invoked. When set, the environment variables apply to all new processes you debug.

**See Also**

- `show environment (gdb mode only)`
- `unset environment (gdb mode only)`
- `export (idb mode only)`
- `setenv (idb mode only)`
set height  (gdb mode only)

Set the height of the screen.

Syntax

set height [num]

Parameters

<table>
<thead>
<tr>
<th>num</th>
<th>The screen height in lines.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default: 0</td>
<td></td>
</tr>
</tbody>
</table>

Description

This command sets the height of the screen to num lines high.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

Screen height determines how many lines of output the debugger prints without pausing. When the debugger prints a large amount of output, the output may scroll out of site. You can use this command to set the number of lines of output that the debugger prints at one time.

After printing num lines of output, the debugger pauses. To continue printing output, press Enter. If you don’t specify num, the debugger uses the default value 0, which prints all output without pausing.

You can also specify how many columns the debugger prints before wrapping its output using set width.

To show the current height, use show height.

Example

(idb) set height 10
(idb) show height
Number of lines idb thinks are in a page is 10
(idb) set height 0
(idb) show height
Number of lines idb thinks are in a page is 0

See Also

set width (gdb mode only)
show height (gdb mode only)
set history save

Switch command-line history on or off.

**Syntax**

```
set history save [{on|off}]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>Switches on command-line history.</td>
</tr>
<tr>
<td>off</td>
<td>Switches off command-line history.</td>
</tr>
</tbody>
</table>

**Description**

This command switches command-line history on or off.

**See Also**

*Viewing the Command History*
*set history size*
*show commands (gdb mode only)*
set history size

Specify the size of the command-line history.

Syntax

set history size num

Parameters

num The number of lines in the command-line history.

Description

This command sets the size of the command history. The default size is that of the environment variable HISTSIZE. If HISTSIZE is not set, the default value is 256.

See Also

Viewing the Command History

set history save
show commands (gdb mode only)
set language  (gdb mode only)

Set the source language.

**Syntax**

```
set language name
```

**Parameters**

- **name**
  
The source language to set.

  Possible values are:
  - `c`
  - `TableBulletauto (Default)`

**Description**

This command sets the current source language.

By default, the debugger gets the source language from the debuggee, and the debugger parses expressions the same way in the debugger interface and in the debuggee.

You may want to set the debugger interface language to be different from the source language. For example, if you are debugging a Fortran program and want to see where a pointer in a register actually points, you can switch to C syntax to do the cast (`p *(int *)$r4`), which is more difficult to express in Fortran.

When you set the language manually and then step or continue the debuggee, thereby creating a new context, the debugger sets the language back.

**Example**

```
(idb) set language c++
(idb) show language
The current source language is "c++"
```

**See Also**

*show language (gdb mode only)*
set listsize  (gdb mode only)

Set the default number of source lines for the list command to display.

**Syntax**

```
set listsize num
```

**Parameters**

- `num`: The default number of source lines that the list command should display.

**Description**

This command sets the default number of source lines for the list command to display.

**Example**

```
(idb) set listsize 10
(idb) list
79
80 // To sort the array.
81 array4[a][b] = array4[c][d];
82
83 // Set a breakpoint to watch the array.
84 array4[c][d] = help;
85 }
86 }
87 }
88 }
(idb)
```

**See Also**

- `list`
- `show listsize (gdb mode only)`
set max-user-call-depth (gdb mode only)

Set the maximum number of recursion levels a user-defined command may have.

**Syntax**

```
set max-user-call-depth num
```

**Parameters**

- `num` The maximum number of recursion levels.

**Description**

This command sets the maximum number of recursion levels a user-defined command may have. If the number of recursion levels in a user-defined command exceeds `num`, the debugger assumes an infinite recursion and aborts the command.

**See Also**

*User-defined Commands*

- `define (gdb mode only)`
- `show max-user-call-depth (gdb mode only)`
**set output-radix (gdb mode only)**

Set the default numeric base for numeric output.

**Syntax**

`set output-radix base`

**Parameters**

`base` The default base for numeric output. Possible values, listed in decimal base, are:
- 8
- 10
- 16

**Description**

This command sets the default numeric base in which the debugger displays numeric output. The same rules apply for specifying the base as do with the `set input-radix` command.

**Example**

(idb) `set output-radix 8`
Output radix now set decimal 8, hex 8, octal 10.
(idb) `show output-radix`
Default output radix for printing of values is 8.

**See Also**

`show output-radix (gdb mode only)`
set print address  (gdb mode only)
Set the debugger’s default to either print or not print the value of a pointer as an address.

**Syntax**

set print address [ on | off ]

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>on</td>
<td>Show an address value for pointers. This is the default value.</td>
</tr>
<tr>
<td>off</td>
<td>Hide an address value for pointers.</td>
</tr>
</tbody>
</table>

**Description**

This command sets the debugger’s default to either print or not print the value of a pointer as an address.

The debugger shows the value of a pointer as an address by default.

This information may include the location of stack traces, breakpoints, structure and pointer values.

**See Also**

show print address (gdb mode only)
**set print elements  (gdb mode only)**  
Set a limit on the number of array elements to print.

**Syntax**

```
set print elements num
```

**Parameters**

- **num**
  - The number of elements to print.
  - The default value is 200.

**Description**

This command sets a limit on the number of array elements to print, which may be useful in a case where the debugger is printing a large array. This limit also applies to the number of characters the debugger will print when printing the value of a char * variable.

If you set `num` to zero, there is no limit on the number of elements.

**Example**

```
(idb) p pc
$1 = (char *) 0x80485b8 "1234"
(idb) set prin ele 2
(idb) p pc
$2 = (char *) 0x80485b8 "12"...
(idb)
```

**See Also**

- `show print elements  (gdb mode only)`
**set print repeats  (gdb mode only)**

Limit the number of consecutive, identical array elements the debugger prints.

**Syntax**

```
set print repeats threshold
```

**Parameters**

- `threshold`: The maximum number of consecutive, identical array elements the debugger prints. The default value is 10.

**Description**

This command limits the number of consecutive, identical array elements the debugger prints. When the number of such elements exceeds `threshold`, instead of printing the elements, the debugger prints `repeats n times`, where `n` is the number of repetitions.

When `threshold` is 0, the debugger prints all consecutive, identical array elements.

**Example**

```
(idb) p pBig
$1 = "0111112111133333333", '1' <repeats 40 times>
(idb) set print repe 2
(idb) p pBig
$2 = "0", '1' <repeats 5 times>, "2", '1' <repeats 5 times>, '3' <repeats 9 times>, '1' <repeats 40 times>
(idb)
```

**See Also**

- `show print repeats (gdb mode only)`
set print static-members (gdb mode only)

Print static members when showing a C++ object.

Syntax

set print static-members [on | off]

Parameters

<table>
<thead>
<tr>
<th>on</th>
<th>The debugger prints static members. This is the default.</th>
</tr>
</thead>
<tbody>
<tr>
<td>off</td>
<td>The debugger does not print static members.</td>
</tr>
</tbody>
</table>

Description

This command enables or disables printing static members when showing a C++ object.

Example

(idb) set print stat off
(idb) p *jb
$3 = {JBfoo = 1}
(idb) set print stat on
(idb) p *jb
$4 = {JBfoo = 1, static yoyo = 99}
(idb)

See Also

show print static-members (gdb mode only)
**set prompt  (gdb mode only)**

Set a new string for the debugger prompt.

**Syntax**

```
set prompt prompt
```

**Parameters**

- `prompt` The new prompt. The default debugger prompt is `idb`.

**Description**

This command sets a new string for the debugger prompt.

If `prompt` contains spaces or special characters, enclose the parameter in quotes (" ").

You also can specify a debugger prompt when you start the debugger from a shell with the -prompt option. For example:

```bash
% idb -prompt ">> \\
>> quit
```

You can also change the prompt by setting the `$prompt` debugger variable. For example:

```
(idb) set $prompt = "newPrompt>> \\
newPrompt>>
```

To see the current debugger prompt, use the `show prompt` command.

**Example**

```
(idb) set prompt "(gdb mode) \\
(gdb mode) show prompt
idb's prompt is "(gdb mode) \\
(idg mode)
```

There is a space at the end of the first line of the example above. If the space is missed, the result will be as follows:

```
(idb) set prompt "(gdb mode)"
(gdb mode) show prompt
idb's prompt is "(gdb mode)".
```

---

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See Also

show prompt (gdb mode only)
set substitute-path  (gdb mode only)
Set a substitution rule for finding source files.

Syntax
set substitute-path from-path to-path

Parameters

| from-path | The path to be replaced. |
| to-path   | The new path. |

Description
This command sets a substitution rule for finding source files.

See Also
map source directory (idb mode only)
unset substitute-path (gdb mode only)
Specifying Source Path Substitution Rules
set variable (gdb mode only)

Set a debugger variable to a value.

Syntax

set variable variable = [expression]

Parameters

variable The variable to set.

expression The value for the variable.

Description

This command sets the values of a debugger variable, memory address, or expression that is accessible according to the scope and visibility rules of the language. The expression can be any expression that is valid in the current context.

The set variable command evaluates the specified expression. If the expression includes the assignment operator (=), the debugger evaluates that operator, as it does with all operators in expressions, and assigns the new value. The only difference between the set variable and the print commands is that set variable does not print anything, while print assigns the new value and displays the new value of the variable.

If you do not specify expression, debugger variables are set to void, while program variables do not change.

You can omit the keyword variable if the beginning of expression is unambiguous to the debugger. For example, if expression begins with the string height, the debugger interprets the command as the set height command.

For C++, use the set variable command to modify static and object data members in a class, and variables declared as reference types, type const, or type static. You cannot change the address referred to by a reference type, but you can change the value at that address.

Do not use the set variable command to change the PC. When you change the PC, no adjustment to the contents of registers or memory is made. Because most instructions change registers or memory in ways that can impact the meaning of the application,
changing the PC is very likely to cause your application to do incorrect calculations and arrive at the wrong answer. Access violations and other errors and signals may result from changing the value in the PC.

**Example**

The following example shows how to deposit the value 5 into the data member `_data` of a C++ object:

(idb) **print node->_data**
$2 = 2$
(idb) **set variable node->_data = 5**
(idb) **print node->_data**
$3 = 5$

The following example shows how to change the value associated with a variable and the value associated with an expression:

(idb) **print *node**
$6 = \{\text{<IntNode>} = \{\text{<Node>} = \{\_nextNode = 0x0\}, \_data = 5\}, \_fdata = 12.345\}$
(idb) **set variable node->_data = -32**
(idb) **set variable node->_fdata = 3.14 * 4.5**
(idb) **set variable node->_nextNode = _firstNode**
(idb) **print *node**
$7 = \{\text{<IntNode>} = \{\text{<Node>} = \{\_nextNode = 0x805c4e8\}, \_data = -32\}, \_fdata = 14.13\}$

You can use the **set variable** command to alter the contents of memory specified by an address as shown in the following example:

(idb) **set variable $address = &(node->_data)**
(idb) **print $address**
$11 = (\text{int *}) 0x805c500$
(idb) **print *(int *)($address)**
$12 = -32$
(idb) **set variable *(int *)($address) = 1024**
(idb) **print *(int *)($address)**
$13 = 1024$

**See Also**

*assign (idb mode only)*
print
set (idb mode only)
show convenience (gdb mode only)
set width  (gdb mode only)

Set the width of the screen.

Syntax

set width [num]

Parameters

num  The screen width in characters.
     Default: 0

Description

This command sets the width of the screen to num characters wide.

This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

Screen width determines how many characters of output the debugger prints without wrapping. When the debugger prints a large amount of output, the output may scroll out of site. You can use this command to set the number of characters of output that the debugger prints before wrapping to the next line.

If you don’t specify num, the debugger uses the default value 0, which prints all output without pausing.

You can also specify how many lines the debugger prints before pausing its output using set height.

To show the current width, use show width.

Example

(idb) set width 40
(idb) show width
Number of characters idb thinks are in a line is 40
(idb) set width 0
(idb) show width
Number of characters idb thinks are in a line is 0

See Also

set height (gdb mode only)
show width (gdb mode only)
setenv  (idb mode only)

Set the value of an environment variable.

Syntax
setenv [ name value ]

Parameters

<table>
<thead>
<tr>
<th>name</th>
<th>The variable for which you want to set the value.</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>The value for the variable.</td>
</tr>
</tbody>
</table>

Description

This command sets the value of an environment variable when you include name and value, or lists all environment variables when you do not include any parameters.

setenv is similar to export, except that export requires the equal sign to set a value, while setenv does not.

This command has no effect on the environment of any currently running process. This command does not change or show the environment variables of the debugger or of the current process. It only affects the environment variables that will be used when a new process is created.

You can set and unset environment variables for processes created in the future to set up an environment different from the environment of the debugger and from the shell that invoked the debugger. When set, the environment variables apply to all new processes you debug.

There is no command to return environment variables to their initial state.

To print all environment variables, use printenv, setenv, or export.

To print a single environment variable, use printenv.

To unset an environment variable, use unsetenv.

Example

(idb) printenv TOOLDIRECTORY
Error: Environment variable 'TOOLDIRECTORY' was not found in the environment.

(idb) setenv TOOLDIRECTORY /home/user/examples/tools
(idb) printenv TOOLDIRECTORY
TOOLDIRECTORY=/home/user/examples/tools
See Also

export (idb mode only)
printenv (idb mode only)
unsetenv (idb mode only)
set environment (gdb mode only)
sh  (idb mode only)
    Execute a shell command.

Syntax
    sh string

Parameters

    string  The command to execute.

Description
    This command executes a call to an OS shell command.
    When using the Console window in the GUI, the shell output appears in the shell window
    that invoked the debugger.

Example
    The following examples are based on the command-line debugger, not on the GUI.
    (idb) sh uname -s
    Linux
    (idb)
    To execute more than one command at the shell, spawn a shell and enter commands, as
    shown in the following example:
    (idb) sh bash -f
    % ls out
    out
    % ls *.b
    recio.b
    stdio.b
    % exit
    (idb)

See Also
    shell (gdb mode only)
shell  (gdb mode only)

Execute a shell command.

**Syntax**

```plaintext
shell string
```

**Parameters**

- `string` The command to execute.

**Description**

This command executes a call to the operating system’s `system` function. This function is documented in `system(3)`.

When using the Console window in the GUI, the shell output appears in the shell window that invoked the debugger.

**Example**

The following examples are based on the command-line debugger, not on the GUI.

```plaintext
(idb) sh uname -s
Linux
(idb)
```

To execute more than one command at the shell, spawn a shell and enter commands, as follows:

```plaintext
(idb) shell bash --norc
$ ls out
out
$ ls *.b
recio.b stdio.b
$ exit
(idb)
```

**See Also**

- `sh (idb mode only)`
show aggregated message

Print the specified aggregated messages.

Syntax

show aggregated message [ {all | msgs} ]

Parameters

msgs

A list of comma-separated, aggregated message IDs. The debugger assigns each aggregated message a unique integer ID when it first displays the ID.

Description

This command prints the specified aggregated messages, which is useful when debugging parallel applications.

The root debugger collects the outputs from the leaf debuggers and presents you with an aggregated output. In most cases, this aggregation works fine, but it can be an impediment if you want to know the exact output from certain leaf debuggers. To remedy this, the debugger assigns a unique number, called a message ID, to each aggregated message and saves the message in the message ID list.

If you specify a list of message IDs, the debugger displays the aggregated messages with these IDs.

If you specify all, IDB displays all the aggregated messages in the list.

If you specify nothing, the debugger shows the most recently added message.

See Also

expand aggregated message
show architecture  (gdb mode only)

Show the current architecture.

Syntax
show architecture

Parameters
None.

Description
This command shows the architecture of the current machine.

Possible values are:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i686</td>
<td>IA-32 architecture</td>
</tr>
<tr>
<td>x86_64</td>
<td>Intel® 64 architecture</td>
</tr>
<tr>
<td>ia64</td>
<td>IA-64 architecture</td>
</tr>
</tbody>
</table>
show args   (gdb mode only)

Show arguments and input and output redirections.

Syntax

    show args

Parameters

None.

Description

This command shows the default arguments and it shows input and output redirections for
the debuggee. To set argument and input and output redirections, use `set args`.

See Also

    set args   (gdb mode only)
show commands  (gdb mode only)
Print commands in history.

Syntax
show commands [num]

Parameters

num  The number of commands to print. By default, the value is set to 10.

Description
This command lists the last num commands in the debugger’s command history.

See Also
Viewing the Command History
set history save
set history size
show condition (idb mode only)

List information about pthreads condition variables.

Syntax

show condition

Parameters

None.

Description

This command lists information about pthreads condition variables.
show convenience    (gdb mode only)

Show a list of debugger variables and their values.

**Syntax**

```
show convenience
```

**Parameters**

None.

**Description**

This command displays a list of all debugger variables and their values.

**See Also**

- `set variable (gdb mode only)`
- `set (idb mode only)}`
show directories  (gdb mode only)

Show the list of source directories to search.

Syntax

show directories

Parameters

None.

Description

This command lists the current source directories.

Example

(idb) directory
Source directories searched: $cdir:$cwd
(idb) directory aa:cc:dd
Source directories searched: aa:cc:dd:$cdir:$cwd
(idb) show directory
Source directories searched: aa:cc:dd:$cdir:$cwd

See Also

Specifying Source Directories
Specifying Source Path Substitution Rules
directory (gdb mode only)
use (idb mode only)
show editing  (gdb mode only)

Show whether command line editing is on or off.

**Syntax**

```
show editing
```

**Parameters**

None.

**Description**

This command shows whether command line editing is on or off.

**Example**

```
(idb) set editing on
(idb) show editing
```

Editing of command lines as they are typed is on.

**See Also**

`set editing (gdb mode only)`
show environment  (gdb mode only)

Show one or all environment variables.

**Syntax**

show environment [name]

**Parameters**

*name*  The environment variable to show.

**Description**

This command shows one or all environment variables and their values.

If you do not specify *name*, the debugger displays all environment variables with their values.

**Example**

(idb) show environment USER
USER=hal

**See Also**

- set environment (gdb mode only)
- export (idb mode only)
- printenv (idb mode only)
**show height**  *(gdb mode only)*

Show the height of the screen.

**Syntax**

```
show height
```

**Parameters**

None.

**Description**

This command shows the height of the screen in lines.

To set the height, use `set height`.

**See Also**

`set height (gdb mode only)`
show language  (gdb mode only)

Show the current source language.

Syntax
show language

Parameters
None.

Description
This command shows the current source language.
To set the current source language, use set language.

Example
(idb) set language c++
(idb) show language
The current source language is "c++"

See Also
set language (gdb mode only)
show listsize  (gdb mode only)

Show the default number of lines for the list command.

**Syntax**

```
show listsize
```

**Parameters**

None.

**Description**

This command shows the default number of lines the debugger lists when you use the `list` command.

**Example**

```
(idb) show listsize
```

Number of source lines idb will list by default is 10.

**See Also**

- `list`
- `set listsize (gdb mode only)`
show lock  (idb mode only)

List information about OpenMP* locks.

Syntax
show lock [ name,... ]

Parameters

name  The name of the lock.

Description
This command lists information about one or more OpenMP* locks.
If you don't specify name, then the debugger displays all the currently known locks.
show max-user-call-depth  (gdb mode only)

Show the maximum recursion level for user-defined commands.

Syntax

show max-user-call-depth

Parameters

None.

Description

This command shows the maximum number of recursion levels a user-defined command may have.

See Also

User-defined Commands
define (gdb mode only)
set max-user-call-depth (gdb mode only)
**show mutex  (idb mode only)**

Show information about pthreads mutexes.

**Syntax**

```
show mutex [ [mutex_id_list [ with state == locked ]] ]
```

**Parameters**

- **mutex_id_list**  
  A list of mutex identifiers.

**Description**

This command shows information about currently available pthreads mutexes.

If you supply one or more mutex identifiers, the debugger displays information about only those mutexes that you specify, provided that the list matches the identity of currently available mutexes.

If you omit the mutex identifier specification, the debugger displays information about all mutexes currently available.

**Use** `show mutex with state == locked` to display information exclusively about locked mutexes.
show openmp thread tree  (idb mode only)

Display the threads in the process in a tree format.

Syntax

show openmp thread tree

Parameters

None.

Description

This command is equivalent to idb info openmp thread tree.

See Also

idb info openmp thread tree (gdb mode only)
show team (idb mode only)
show output-radix  (gdb mode only)

Show the default numeric base for numeric output.

Syntax
show output-radix

Parameters
None.

Description
This command shows the default numeric base in which the debugger displays numeric output.

Example
(idb) set output-radix 8
Output radix now set decimal 8, hex 8, octal 10.
(idb) show output-radix
Default output radix for printing of values is 8.

See Also
set output-radix (gdb mode only)
show print address  (gdb mode only)

Show whether the debugger is set to print or not print the value of a pointer as an address.

Syntax

show print address

Parameters

None.

Description

This command shows whether the debugger is set to print or not print the value of a pointer as an address.

This command shows the current display setting for variables.

The debugger shows the value of a pointer as an address by default.

This information may include the location of stack traces, breakpoints, structure and pointer values.

See Also

set print address  (gdb mode only)
show print elements    (gdb mode only)
Show the maximum number of array elements the debugger is set to print.

Syntax
show print elements

Parameters
None.

Description
This command shows the maximum number of array elements the debugger is set to print. If the number is 0, there is no limit.

See Also
set print elements (gdb mode only)
show print repeats  (gdb mode only)

Show the current threshold of repeated identical elements that the debugger is set to print.

Syntax
show print repeats

Parameters
None.

Description
This command shows the current threshold of repeated identical elements that the debugger is set to print.

See Also
set print repeats (gdb mode only)
show print static-members  (gdb mode only)

Show the current setting for printing static class members with the the `print` command.

**Syntax**

```
show print static-members
```

**Parameters**

None.

**Description**

This command shows the current setting for printing static class members with the the `print` command.

**See Also**

- `set print static-members (gdb mode only)`
show process  (idb mode only)

Show process information.

Syntax

show process [ {all | *} ]

Parameters

all | *  Instructs the debugger to show all processes.

Description

This command shows process information for the current debuggee process. If you do not specify any parameter, or if you specify all, the debugger shows information for all processes.

Example

(idb) show process
Current Process: 127.0.0.1:29573 (/home/hal/example_ia/control_icc_9.0) paused.

See Also

process (idb mode only)
show process set
show process set

List information about one or all process sets.

**Syntax**

```
show process set [ {all|name} ]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Lists information about all process sets.</td>
</tr>
<tr>
<td>name</td>
<td>The process set whose information you want to see.</td>
</tr>
</tbody>
</table>

**Description**

This command lists information about one or all process sets.

If you do not specify `name`, or if you specify `all`, the debugger displays all the process sets that are currently stored in debugger variables.

**Example**

(idb) `set $set2 = [8:9, 5:2, 22:27]`
`'5:2' is not a legal process range. Ignored.`
(idb) `show process set $set2`
$set2 = [8:9, 22:27]
(idb) `show process set *`
$set1 = [:7, 10, 15:20, 30:] $set2 = [8:9, 22:27]

**See Also**

- [Storing Process and Thread Sets in Debugger Variables](#)
- `process` (idb mode only)
- `show process` (idb mode only)
show prompt (gdb mode only)

Show the current debugger prompt.

Syntax

show prompt

Parameters

None.

Description

This command shows the current debugger prompt. Use the set prompt command to set the debugger prompt.

Example

(idb) set prompt "(gdb mode) "
(gdb mode) show prompt
idb's prompt is "(gdb mode) ".
(gdb mode)

See Also

set prompt (gdb mode only)
show source directory  \hspace{1em} (idb mode only)

List information about directory mappings.

Syntax
show \hspace{1em} [ all ] \hspace{1em} source \hspace{1em} directory \hspace{1em} [ \hspace{1em} directory \hspace{1em} ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Show mapping information of all descendants of directory.</td>
</tr>
<tr>
<td>directory</td>
<td>The directory for which you are seeking mapping information.</td>
</tr>
</tbody>
</table>

Description
This command displays the directory mapping information of directory and its child directories.

If you do not specify directory, the debugger displays the mapping information of all the source directories whose parent is not a source directory.

If you specify all, the debugger displays the mapping information of all the descendants of directory.

To set a directory mapping, use map source directory.
To unset a directory mapping, use unmap source directory.

See Also
map source directory \hspace{0.5em} (idb mode only)
unmap source directory \hspace{0.5em} (idb mode only)
**show team**  *(idb mode only)*

List information about OpenMP* teams.

**Syntax**

```plaintext
show team [team_id,...]
```

**Parameters**

*team_id*  
The team for which you want to list the information.

**Description**

This command lists information about live OpenMP* teams.

If you specify `team_id` one or more times, the debugger displays information about only those teams that you specify, provided that the list matches the identity of currently live teams.

If you do not specify `team_id`, the debugger displays information about all live teams.

**Example**

```plaintext
(idb) show team 6917529027641120768
OpenMP Team: 6917529027641120768
Parent Team: 6917529027641117440
Created At: "/projects/OpenMP/src/c_omp.c":main:58:98
Team members
[0] Thread 1, is master of team 6917529027641153024
[1] Thread 3, is master of team 6917529027641184768
```

**See Also**

`show openmp thread tree` *(idb mode only)*
show thread  (idb mode only)

List information about a thread.

**Syntax**

show thread [ [thread_id,...] with state == thread_state ]

**Parameters**

<table>
<thead>
<tr>
<th>thread_id</th>
<th>A thread ID. Specify one or more.</th>
</tr>
</thead>
<tbody>
<tr>
<td>thread_state</td>
<td>Threads that you want to list are in this state. Valid state values for native threads:</td>
</tr>
<tr>
<td></td>
<td>• ready</td>
</tr>
<tr>
<td></td>
<td>• blocked</td>
</tr>
<tr>
<td></td>
<td>• running</td>
</tr>
<tr>
<td></td>
<td>• terminated</td>
</tr>
<tr>
<td></td>
<td>• detached</td>
</tr>
</tbody>
</table>

**Description**

This command lists all the threads known to the debugger. If you specify one or more thread identifiers, the debugger displays information about the threads with matching thread ID and thread state.

If you do not specify `thread_id_list`, the debugger displays information for all threads.

Specify `with state == thread_state` to list threads that have specific characteristics, such as threads that are currently blocked.

**Example**

(idb) show thread 1,2,3

**See Also**

`info threads (gdb mode only)`
show user  (gdb mode only)

Show the definition of one or all user-defined commands.

Syntax

show user [cmd]

Parameters

\[cmd\]  
The user-defined command whose definition you want to show.

Description

This command shows the definition of one or all user-defined commands. If you specify \[cmd\], the debugger displays the definition of that command. If you do not specify \[cmd\], it displays the definitions of all user-defined commands.

See Also

User-defined Commands
define (gdb mode only)
**show values**  *(gdb mode only)*

Show ten values of the value history.

**Syntax**

`show values [ {num|+} ]`

**Parameters**

<table>
<thead>
<tr>
<th>num</th>
<th>Show values centered on value num.</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Start showing values after the last value printed.</td>
</tr>
</tbody>
</table>

**Description**

This command shows the last ten values in the value history.

If you specify `num`, the debugger shows the ten values centered around the value at the `num` place in the history.

If you specify `+`, the debugger shows the ten values in the history starting with the most recently printed value. For example, if the most recent printed value is `$7`, the debugger shows the ten values starting with `$8`.

If the value history does not contain enough values to print ten, the debugger prints the number of values it has in the value history. For example, if you do not specify `num` or `+`, and the debugger only has seven value, it shows seven values. If you specify `+`, and the value history only has seven values after the most recent one it printed, it shows those seven values.
show width   (gdb mode only)

Show the width of the screen.

Syntax

show width

Parameters

None.

Description

This command shows the width of the screen in characters.

To set the width, use set width.

Example

(idb) set width 40
(idb) show width

Number of characters idb thinks are in a line is 40

(idb) set width 0
(idb) show width

Number of characters idb thinks are in a line is 0

See Also

set width (gdb mode only)
source

Execute commands from a batch file.

Syntax

source filename

Parameters

filename The file from which to execute commands.

Description

This command specifies a file from which the debugger reads and executes a series of commands.

Alternatively, you can execute debugger commands when you invoke the debugger by creating an initialization file named .idbrc or .dbxinit.

If you place commands in a file, you can execute them directly from the file rather than cutting and pasting them to the terminal. These commands can be nested. If you have multiple command files, the debugger continues reading and processing the commands in a subsequent file immediately after processing the final command of the previous file.

The following rules and guidelines apply to command files:

- Blank lines in command files do not repeat the last command, as opposed to blank lines entered directly from the prompt.
- Format the commands as if they were entered at the debugger prompt.
- Use the pound character (#) to create comments to format your scripts.
- When the debugger executes a command file, the value of the $pimode debugger variable determines whether the commands are echoed. If the $pimode variable is set to 1, commands are echoed. If $pimode is set to 0, the default, commands are not echoed. The debugger output resulting from the commands is always echoed.

Example

The following example is a debugger script named ../src/myscript:

step
where 2

The following example shows how to execute this script:

(idb) run
[1] stopped at [int main(void):187 0x080516aa]
188 nodeList.append(newNode); (static int somethingToReturnTo;
          somethingToReturnTo++; )
(idb) source ../src/myscript
stopped at [void List<Node>::append(class Node* const):148 0x0804ae5a]
148 if (!_firstNode)
>0 0x0804ae5a in
((List<Node>*)0xbfffa460)->List<Node>::append(node=0x805c500)
"src/x_list.cxx":148

See Also

Configuring Default Startup Actions Using Initialization Files
playback input (idb mode only)
record (idb mode only)
status  (idb mode only)

Print info on all breakpoints and tracepoints.

Syntax
status

Parameters
None.

Description
This command displays all currently existing breakpoints and their properties.

Example
(idb) status
#1 PC==0x08051603 in int main(void) "src/x_list.cxx":182 { stop }
#2 PC==0x0804ae5a in void List<Node>::append(class Node* const)
"src/x_list.cxx":148 { break }
#3 Access memory (write) 0xbfffdb00 to 0xbfffdb03 { stop }

See Also
delete (idb mode only)
disable
enable
info breakpoints (gdb mode only)
info watchpoints (gdb mode only)
stop every (idb mode only)
step

Step forward in source, into any function calls.

Syntax

step [expr]

Parameters

expr  A numeric expression.

Description

This command executes a line of source code. When the next line to be executed contains a function call, the debugger steps into the function and stops at the first executable statement.

If you specify expr, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the step command. The expression can be any expression that is valid in the current context.

Example

In the following example, five step commands continue executing a C++ program:

GDB Mode:

(idb) list +0,+4
151 Node* currentNode = _firstNode;
152 while (currentNode->getNextNode())
153 currentNode = currentNode->getNextNode();
154 currentNode->setNextNode(node);
(idb) step
152 while (currentNode->getNextNode())
(idb) step
Node::getNextNode (this=0x805c500) at src/x_list.cxx:81
81 Node* Node::getNextNode() { return _nextNode; }
(idb) step
81 Node* Node::getNextNode() { return _nextNode; }
(idb) step
List<Node>::append (this=0xbfffcbe0, node=0x805c510) at src/x_list.cxx:152
152 while (currentNode->getNextNode())
   (idb) step
154 currentNode->setNextNode(node);

**IDB Mode:**
   (idb) list $curline:4
> 151 Node* currentNode = _firstNode;
152 while (currentNode->getNextNode())
153 currentNode = currentNode->getNextNode();
154 currentNode->setNextNode(node);
   (idb) step
stopped at [void List<Node>::append(class Node* const):152 0x0804ae75]
152 while (currentNode->getNextNode())
   (idb) step
stopped at [class Node* Node::getNextNode(void):81 0x08051be5]
81 Node* Node::getNextNode() {return _nextNode; }
   (idb) step
stopped at [class Node* Node::getNextNode(void):81 0x08051bec]
81 Node* Node::getNextNode() {return _nextNode; }
   (idb) step
stopped at [void List<Node>::append(class Node* const):152 0x0804ae81]
152 while (currentNode->getNextNode())
   (idb) step
stopped at [void List<Node>::append(class Node* const):154 0x0804aebf]
154 currentNode->setNextNode(node);

**See Also**

next
nexti
run
stepl
**stei**

Step forward in assembler instructions, into any function calls.

**Syntax**

```
stei [expr]
```

**Parameters**

<table>
<thead>
<tr>
<th>expr</th>
<th>A numeric expression.</th>
</tr>
</thead>
</table>

**Description**

This command executes a machine instruction. When the instruction contains a function call, the command steps into the function being called.

For multithreaded applications, use the `stei` command to step the current thread one machine instruction while putting all other threads on hold.

If you specify `expr`, the debugger evaluates the expression as a positive integer that specifies the number of times to execute the `stei` command. The expression can be any expression that is valid in the current context.

**Example**

The following example shows stepping by instruction (`stei`). To see stepping over calls, see the example of the `next` command.

**GDB Mode:**

```plaintext
(idb) x /8i $pc
0x0804ae6d <append+25>: movlr 0x8(%ebp), %eax
0x0804ae70 <append+28>: movlr (%eax), %eax
0x0804ae72 <append+30>: movl %eax, -16(%ebp)
0x0804ae75 <append+33>: pushl %edi
0x0804ae76 <append+34>: movlr -16(%ebp), %eax
0x0804ae79 <append+37>: movl %eax, (%esp)
0x0804ae7c <append+40>: call 0x08051be2 <getNextNode>
0x0804ae81 <append+45>: addl $0x4, %esp
(idb) stei
0x0804ae70 151 Node* currentNode = _firstNode;
(idb) x /li $pc
```
0x0804ae70 <append+28>: movlr (%eax), %eax
(idb) stepi $count - 1
0x0804ae70 151 Node* currentNode = _firstNode;
(idb) x/8i $pc
0x0804ae70 <append+28>: movlr (%eax), %eax
(idb) stepi
0x0804ae72 151 Node* currentNode = _firstNode;
(idb) x/8i $pc
0x0804ae72 <append+30>: movl %eax, -16(%ebp)

**IDB Mode:**
(idb) $curpc/8i
void List<Node>::append(class Node* const): src/x_list.hxx
[line 151, 0x0804ae6d] append(class Node* const)+0x19: movlr 0x8(%ebp), %eax
[line 151, 0x0804ae70] append(class Node* const)+0x1c: movlr (%eax), %eax
[line 151, 0x0804ae72] append(class Node* const)+0x1e: movl %eax, -16(%ebp)
[line 152, 0x0804ae75] append(class Node* const)+0x21: pushl %edi
[line 152, 0x0804ae76] append(class Node* const)+0x22: movlr -16(%ebp), %eax
[line 152, 0x0804ae79] append(class Node* const)+0x25: movl %eax, (%esp)
[line 152, 0x0804ae7c] append(class Node* const)+0x28: call getNextNode
[line 152, 0x0804ae81] append(class Node* const)+0x2d: addl $0x4, %esp
(idb) stepi
stopped at [void List<Node>::append(class Node* const):151 0x0804ae70] append(class Node* const)+0x1c: movlr (%eax), %eax
(idb) stepi $count - 1
stopped at [void List<Node>::append(class Node* const):151 0x0804ae70] append(class Node* const)+0x1c: movlr (%eax), %eax
(idb) stepi
stopped at [void List<Node>::append(class Node* const):151 0x0804ae72] append(class Node* const)+0x1e: movl %eax, -16(%ebp)

**See Also**
next
nexti
run
step
**stop at**  (idb mode only)

Set a breakpoint at a line number or expression.

**Syntax**

```
stop [quiet] at expr [thread ID ({, ...})][if cond] [commands]
```

**Parameters**

- **expr**: A line number in source code or an expression, other than a function name.
- **ID**: A thread ID.
- **cond**: A conditional expression.
- **commands**: A list of debugger commands.

**Description**

This command sets a breakpoint on an expression that you specify with `expr`

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify `commands`.

**Example**

```
(idb) stop in main
[#1: stop in int main(void) ]

(idb) stop at 167
[#1: stop at "src/x_list.cxx":167]
(idb) run
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
```
See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop every (idb mode only)
stop in (idb mode only)
stop pc (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)
stop every (idb mode only)

Set a breakpoint on every function entry point or on every instruction.

Syntax

\[
\text{stop [quiet] every procedure entry [thread ID {,...}] [if \ cond] [\ commands]} \\
\text{stop [quiet] every instruction [thread ID {,...}] [if \ cond] [\ commands]}
\]

Parameters

<table>
<thead>
<tr>
<th>ID</th>
<th>A thread ID.</th>
</tr>
</thead>
<tbody>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
</tbody>
</table>

Description

This command sets a breakpoint on every entry point to a function in the program, or on every instruction in the program.

To suppress status reporting messages when the debugger hits a breakpoint, specify quiet.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify thread and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify if cond.

To run one or more commands upon hitting a breakpoint, specify commands.

A disadvantage of this command is that it establishes breakpoints for hundreds or even thousands of entry points about which you have little or no information. For example, if you use stop every procedure entry immediately after loading a program and then run it, the debugger will stop or trace over 100 entry points before reaching your main entry point. About the only thing that you can do if execution stops at most such unknown places is continue until some function relevant to your debugging is reached.

NOTE. This command can be very time consuming because the debugger searches your entire program—including all shared libraries that it references—and establishes breakpoints for every entry point in every executable image. This can also considerably slow execution of your program as it runs.
See Also

*break* *(gdb mode only)*
*delete* *(idb mode only)*
*disable*
*enable*
*status* *(idb mode only)*
*stop at* *(idb mode only)*
*stop in* *(idb mode only)*
*stop memory* *(idb mode only)*
*stop pc* *(idb mode only)*
*stop signal* *(idb mode only)*
*stop unaligned* *(idb mode only)*
*stop variable* *(idb mode only)*
stop in    (idb mode only)

Set a breakpoint in a function.

**Syntax**

```
stop [quiet] [in] [all] funcname [thread ID {, ...}] [if cond] [commands]
```

**Parameters**

- `funcname`    Sets a breakpoint on the function of this name.
- `ID`          A thread ID.
- `cond`        A conditional expression.
- `commands`    A list of debugger commands.

**Description**

This command sets a breakpoint on a function named `funcname`. If you specify `all`, the debugger breaks on all functions with this name.

Whenever the debugger hits a breakpoint, the debugger suspends program execution and waits for a command from you.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify `commands`.

**Example**

(idb) **stop in main**
[
[#1: stop in int main(void) ]

(idb) **stop at 167**
[
[#1: stop at "src/x_list.cxx":167]

(idb) **run**
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)

See Also
break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop at (idb mode only)
stop every (idb mode only)
stop memory (idb mode only)
stop pc (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)

Set a breakpoint on a region in memory.

Syntax

stop [quiet] memory start-addr [, end-addr] :size] [access] [within funcname] [thread ID {,...}][if cond] [commands]

Parameters

<table>
<thead>
<tr>
<th>ID</th>
<th>A thread ID.</th>
</tr>
</thead>
<tbody>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
<tr>
<td>start-addr</td>
<td>The address at the start of the memory region.</td>
</tr>
<tr>
<td>end-addr</td>
<td>The address at the end of the memory region starting from start-addr.</td>
</tr>
<tr>
<td>size</td>
<td>The size of the memory region starting from start-addr.</td>
</tr>
<tr>
<td>funcname</td>
<td>The name of a function.</td>
</tr>
<tr>
<td>access</td>
<td>Possible values are:</td>
</tr>
<tr>
<td></td>
<td>• write</td>
</tr>
<tr>
<td></td>
<td>• read</td>
</tr>
<tr>
<td></td>
<td>• changed This mode detects writes that change the contents of the memory.</td>
</tr>
<tr>
<td></td>
<td>• any This mode detects both read and write.</td>
</tr>
<tr>
<td></td>
<td>Default value: write</td>
</tr>
</tbody>
</table>

Description

This command sets a breakpoint on a region in memory that you specify. If you specify within funcname, program execution breaks only when the access occurs in the specified function.

start-addr is the address at the beginning of a memory region. This memory region is 8-bytes in size when you do not specify end-addr or size.

If you specify size, the memory region starts with start-addr and is size-bytes long.

If you specify end-addr, the memory region is from start-addr through end-addr, inclusive.

To suppress status reporting messages when the debugger hits a breakpoint, specify quiet.
To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify `commands`.

**See Also**

`break (gdb mode only)`  
`delete (idb mode only)`  
`disable`  
`enable`  
`status (idb mode only)`  
`stop in (idb mode only)`  
`stop at (idb mode only)`  
`stop pc (idb mode only)`  
`stop variable (idb mode only)`  
`stop signal (idb mode only)`  
`stop unaligned (idb mode only)`  
`stop every (idb mode only)`
stop pc  (idb mode only)

Set a breakpoint when PC equals a specific address.

Syntax

stop [quiet] pc address [thread ID {,...}][if cond] [commands]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>An address.</td>
</tr>
<tr>
<td>ID</td>
<td>A thread ID.</td>
</tr>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
</tbody>
</table>

Description

This command sets a breakpoint that stops program execution when PC equals an address that you specify.

To suppress status reporting messages when the debugger hits a breakpoint, specify quiet.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify thread and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify if cond.

To run one or more commands upon hitting a breakpoint, specify commands.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)
stop signal  (idb mode only)

Set a breakpoint on a signal.

Syntax
stop [quiet] signal signal [, ...] [thread ID [, ...]] [if cond] [commands]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>signal</td>
<td>One or more comma-separated signals.</td>
</tr>
<tr>
<td>ID</td>
<td>A thread ID.</td>
</tr>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
</tbody>
</table>

Description
This command sets a breakpoint on a signal. Program execution stops when it receives any of the signals that you specify.

To see a list of signals, use the GDB mode command info handle.

You can notate a signal with or without the prefix SIG. Signal notation is not case-sensitive. For example, all of the following refer to the same signal:
- hup
- sighup
- HUP
- SIGHUP

To suppress status reporting messages when the debugger hits a breakpoint, specify quiet.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify thread and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify if cond.

To run one or more commands upon hitting a breakpoint, specify commands.

Example
(idb) stop signal hup, int
[#5: stop signal hup, int]
See Also

break (gdb mode only)
catch (idb mode only)
delete (idb mode only)
disable
enable
info handle (gdb mode only)
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop pc (idb mode only)
stop variable (idb mode only)
stop memory (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)
**stop unaligned (idb mode only)**

Set a breakpoint on unaligned accesses.

**Syntax**

```
stop [quiet] unaligned [thread ID {,...}] [if cond] [commands]
```

**Parameters**

<table>
<thead>
<tr>
<th>ID</th>
<th>A thread ID.</th>
</tr>
</thead>
<tbody>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
</tbody>
</table>

**Description**

This command sets a breakpoint that stops the debugger when program execution encounters an unaligned access.

To suppress status reporting messages when the debugger hits a breakpoint, specify `quiet`.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a breakpoint, specify `commands`.

**See Also**

- `break (gdb mode only)`
- `delete (idb mode only)`
- `disable`
- `enable`
- `status (idb mode only)`
- `stop in (idb mode only)`
- `stop at (idb mode only)`
- `stop pc (idb mode only)`
- `stop variable (idb mode only)`
- `stop memory (idb mode only)`
- `stop signal (idb mode only)`
- `stop every (idb mode only)`
stop variable  (idb mode only)

Set a breakpoint on a specific variable.

Syntax

stop [quiet] variable lvalue [access] [within funcname] [thread ID {,...}][if cond] [commands]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lvalue</td>
<td>An expression that designates a memory location.</td>
</tr>
<tr>
<td>ID</td>
<td>A thread ID.</td>
</tr>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
<tr>
<td>commands</td>
<td>A list of debugger commands.</td>
</tr>
<tr>
<td>funcname</td>
<td>The name of a function.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>access</th>
<th>Possible values are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>write</td>
<td></td>
</tr>
<tr>
<td>read</td>
<td></td>
</tr>
<tr>
<td>changed</td>
<td>This mode detects writes that change the contents of the memory.</td>
</tr>
<tr>
<td>any</td>
<td>This mode detects both read and write.</td>
</tr>
</tbody>
</table>

Default value: write

Description

This command sets a breakpoint on a variable that you specify. If you specify within funcname, program execution breaks only when the access occurs in the specified function.

To suppress status reporting messages when the debugger hits a breakpoint, specify quiet.

To set a breakpoint such that the debugger stops when it hits one or more specific threads, specify thread and one or more comma-separated thread IDs.

To set a breakpoint based on a conditional expression, specify if cond.

To run one or more commands upon hitting a breakpoint, specify commands.

See Also

break (gdb mode only)
delete (idb mode only)
disable
enable
status (idb mode only)
stop in (idb mode only)
stop at (idb mode only)
stop pc (idb mode only)
stop memory (idb mode only)
stop signal (idb mode only)
stop unaligned (idb mode only)
stop every (idb mode only)
stopi  (idb mode only)

Set a breakpoint at an instruction, or if a variable changes.

Syntax

stopi [traced_expression] [thread ID ,...] [at address] [if cond]
stopi address [thread ID ,...] [if cond]

Parameters

<table>
<thead>
<tr>
<th>parameter</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>traced_expression</td>
<td>An expression that you want to trace.</td>
</tr>
<tr>
<td>ID</td>
<td>A thread ID.</td>
</tr>
<tr>
<td>address</td>
<td>An address. When using the form stopi address, this value is an integer constant.</td>
</tr>
<tr>
<td>cond</td>
<td>A conditional expression.</td>
</tr>
</tbody>
</table>

Description

This command sets a breakpoint at an instruction or on a traced expression.

If you specify traced_expression, program execution stops when the value of the traced expression changes.

If you specify if cond, program execution stops when cond evaluates to true.

If you specify both traced_expression and if cond, program execution stops only if cond evaluates to true and the value of traced_expression has changed.

If you specify at address, program execution stops when it hits address.

If you specify both traced_expression and at address, program execution stops only if the variable has changed when the address is hit.

If you specify both at address and if cond, execution stops only if cond evaluates to true when the address is hit.

If you specify traced_expression, at address and if cond, execution stops only if the value of traced_expression has changed and if cond evaluates to true when the address is hit.

Specify the thread list to set tracepoints in specific threads. If you list one or more thread IDs, the debugger sets a tracepoint only in those threads you specify. If you do not specify a thread ID, the debugger sets a tracepoint in all the threads of the application.
The `stopi` command differs from the `stop` command in that the debugger checks the breakpoint set with the `stopi` command after executing each machine instruction. So using `stopi` affects performance of the debuggee.
**target core  (gdb mode only)**

Specify a core file as a target.

**Syntax**

target core filename

**Parameters**

filename The filename of the target core file.

**Description**

This command specifies a core file to use as a target.
Core file debugging is not supported on Mac OS* X.
This command is the same as core-file filename.

**See Also**

core-file (gdb mode only)
tbreak  (gdb mode only)

Set a temporary breakpoint at specified location.

**Syntax**

tbreak { funcname | num }

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>funcname</td>
<td>The name of a function.</td>
</tr>
<tr>
<td>num</td>
<td>The number of a source code line.</td>
</tr>
</tbody>
</table>

**Description**

This command sets a temporary breakpoint at the specified location, either a line number in source code, or a function.

This command differs from the break command in that the tbreak command creates a temporary breakpoint that is automatically removed after it stops program execution.

**Example**

(idb) tbreak main

**See Also**

break (gdb mode only)
commands (gdb mode only)
condition (gdb mode only)
disable
enable
ignore (gdb mode only)
info breakpoints (gdb mode only)
jump (gdb mode only)
**thread**

Show or change the current thread.

**Syntax**

```
thread [ID]
```

**Parameters**

| ID | The identifier of the thread to which you want to switch. |

**Description**

This command shows or changes the current thread. If you omit a thread identifier, the debugger shows the current thread. If you specify a thread identifier, the debugger makes that thread the current thread.

The debugger variable `$curthread` contains the thread identifier of the current thread. The `$curthread` value is updated when program execution stops or completes.

You can modify the current thread by assigning `$curthread` a valid thread identifier, which is equivalent to issuing the `thread ID` command. When there is no process or program, `$curthread` is set to 0.

**Example**

**GDB Mode:**

```
(idb) thread 2
* 2 Thread 1026 (LWP 19515) 0x804f8f6 in __sigsuspend from /tmp/pthread_manythreads
```

**IDB Mode:**

```
(idb) thread 2
ID    STATE
*1     stopped
```

**See Also**

`$curthread`
unalias  (idb mode only)

Remove an alias.

Syntax

unalias alias_name

Parameters

alias_name  The name of the alias to be removed.

Description

This command removes the alias specified by alias_name.

Example

(idb) alias cs
alias cs is not defined
(idb) alias cs "stop at 186; run"
(idb) cs
[#1: stop at "x_list.cxx":186 ]
[1] stopped at [int main(void):186 0x120002420]
186 IntNode* newNode = new IntNode(1);
(idb) unalias cs
(idb)

See Also

alias (idb mode only)
unload  (idb mode only)

Unload an image or a core file from the debugger.

Syntax

unload [ {filename|pid,...} ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>filename</td>
<td>The executable file to unload.</td>
</tr>
<tr>
<td>pid</td>
<td>An integer constant representing the ID of the process to unload.</td>
</tr>
</tbody>
</table>

Description

This command unloads an image or a core file from the debugger.

Core file debugging is not supported on Mac OS X.

Example

(idb) listobj
section Start Addr End Addr
------------------------------------------------------------------------
/home/user/examples/x_list
.text 0x8048000 0x8056e3f
.data 0x8057000 0x805deeb
.bss 0x805deec 0x805dfb3
/lib/libdl-2.3.2.so
.text 0xb7386000 0xb7387dc3
.data 0xb7388dc4 0xb7388f53
.bss 0xb7388f54 0xb7388f73
/lib/tls/libc-2.3.2.so
.text 0xb7389000 0xb74b94f5
.data 0xb74ba500 0xb74bcfdb
.bss 0xb74bcfde 0xb74bfa8b
/nfs/cmplr/icc-9.0.031/lib/libunwind.so.5
.text 0xb74c0000 0xb74c433f
Program is not active

See Also

load (idb mode only)
unmap source directory  (idb mode only)

Remove a directory mapping.

Syntax
unmap source directory dirname

Parameters

 dirname The directory whose mapping will be removed.

Description
This command removes a directory mapping by restoring the default mapping of dirname.

Example
(idb) show source directory
.
/home/user/examples/solarSystemSrc *=>
/home/user/examples/movedSolarSystemSrc
...
(idb) show source directory /home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc *=>
/home/user/examples/movedSolarSystemSrc
/home/user/examples/solarSystemSrc/base_class_includes =>
/home/user/examples/movedSolarSystemSrc/base_class_includes
/home/user/examples/solarSystemSrc/derived_class_includes =>
/home/user/examples/movedSolarSystemSrc/derived_class_includes
/home/user/examples/solarSystemSrc/main =>
/home/user/examples/movedSolarSystemSrc/main
(idb) unmap source directory /home/user/examples/solarSystemSrc
(idb) show source directory /home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc
/home/user/examples/solarSystemSrc/base_class_includes
/home/user/examples/solarSystemSrc/derived_class_includes
unrecord  (idb mode only)

Stop recording debugger input, output, or both.

Syntax
unrecord \{input|output|io\}

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>input</td>
<td>Stops logging input.</td>
</tr>
<tr>
<td>output</td>
<td>Stops logging output</td>
</tr>
<tr>
<td>io</td>
<td>Stops logging input and output.</td>
</tr>
</tbody>
</table>

Description
This command stops recording debugger input, output, or both.
To record, use the record command.

Example
(idb) record output myscript
(idb) stop in List<Node>::append
[#2: stop in void List<Node>::append(class Node* const)]
(idb) cont
[2] stopped at [void List<Node>::append(class Node* const):148 0x0804ae5a]
148 if (!firstNode)
(idb) cont to 156
stopped at [void List<Node>::append(class Node* const):156 0x0804aed7]
156 }
(idb) unrecord output

See Also
record (idb mode only)
unset  (idb mode only)

Delete the specified debugger variable.

**Syntax**

```plaintext
unset name
```

**Parameters**

<table>
<thead>
<tr>
<th>name</th>
<th>The variable to delete.</th>
</tr>
</thead>
</table>

**Description**

This command deletes the specified debugger variable.

**Example**

```plaintext
(idb) set $color="blue"
(idb) print $color
  "blue"
(idb) unset $color
(idb) print $color
Symbol "$color" is not defined.
```

**See Also**

set (idb mode only)
unset environment  (gdb mode only)
Delete the specified environment variable.

Syntax
unset environment [ name ]

Parameters

name  Environment variable to unset.

Description
This command deletes the specified environment variable, so that it is no longer part of the environment.

To assign an environment variable an empty value, use set environment name = . If you do not specify name, the debugger deletes all environment variables.

See Also
set environment (gdb mode only)
unsetenv (idb mode only)
unset substitute-path (gdb mode only)

Unset a source directory substitution rule.

Syntax

unset substitute-path from-path

Parameters

from-path The path you replaced with the set substitute-path command.

Description

This command unsets a source directory substitution rule. Specify the original path for which you created a substitution rule.

See Also

set substitute-path (gdb mode only)
Specifying Source Path Substitution Rules


`unsetenv` **(idb mode only)**

Delete the specified environment variable, or all.

**Syntax**

`unsetenv {name|*}`

**Parameters**

<table>
<thead>
<tr>
<th>name</th>
<th>The environment variable to unset.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Unsets all environment variables.</td>
</tr>
</tbody>
</table>

**Description**

This command deletes a specific environment variable or all environment variables, so that they are no longer part of the environment.

To delete a specific environment variable, specify `name`.

To delete all environment variables, specify `*`.

To assign an environment variable an empty value, use `setenv name =`.

**See Also**

- `setenv` **(idb mode only)**
- `unset environment` **(gdb mode only)**
until  (gdb mode only)
        Run until a specific line.

Syntax
    until [line]

Parameters

    line  The line until which to run.

Description
This command continues the debuggee past the current line until the next source line in the current stack frame. Use this command to avoid single stepping through a loop more than once.

If you specify line, the debugger continues running until it either reaches the specified location, or the current stack frame returns.

See Also
advance (gdb mode only)
continue (gdb mode only)
unuse    (idb mode only)

Remove the specified directories from the source path or set path to default.

Syntax
unuse [ { dirname, ... | * } ]

Parameters

dirname The directory to remove from source path.
*
Sets path to default.

Description
This command removes entries from the list of source directories that the debugger uses to search for source and script files when opening an executable file.

To add entries to the list, use use.

If you do not specify any directories, this command sets the search list to the default, which is the home directory, the current directory, and the directory containing the executable file.

If you specify any directory names, the debugger removes them from the search list.

If you specify an asterisk (*), the debugger removes all directories from the search list.

Example
(idb) unuse aa
Directory search path for source files:
. ../src /home/user/examples bb cc
(idb) unuse aa
aa not in the current source path
Directory search path for source files:
. ../src /home/user/examples bb cc
(idb) unuse bb cc
Directory search path for source files:
. ../src /home/user/examples
(idb) unuse *
Directory search path for source files:
(idb) **unuse**

Directory search path for source files:
. ../src /home/user/examples

**See Also**
- `show source directory (idb mode only)`
- `use (idb mode only)`
**up**

Move a specific number of frames up the stack and print them.

**Syntax**

up [ num ]

**Parameters**

| num | A numeric expression of non-negative value. The default value is 1. |

**Description**

This command moves to the stack frame num levels above the current frame and then prints those frames. The default value for num is 1.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

When the current call frame changes, the debugger displays the source line corresponding to the last instruction executed in the function executing the selected call frame.

**Example**

**GDB Mode:**

```
(idb) up 2
#2 0x08051a3c in main () at src/x_list.cxx:203
203   nodeList.print();
(idb) list 200,+5
200   CompoundNode* cNode2 = new CompoundNode(10.123, 5);
201   nodeList.append(cNode2); {static int somethingToReturnTo;
   somethingToReturnTo++; }
202
203   nodeList.print();
204 }
```

**See Also**

down
down-silently (gdb mode only)
up-silently (gdb mode only)
up-silently  (gdb mode only)

Move a specific number of frames up the stack but do not print them.

**Syntax**

```
up-silently [num]
```

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>num</td>
<td>A numeric expression of non-negative value</td>
</tr>
</tbody>
</table>

**Description**

This command moves to the stack frame `num` levels above the current frame. The default value for `num` is 1. This command is the same as `up`, except that it does not display the new frame.

If the specified number of levels exceeds the number of active calls on the stack in the specified direction, the debugger issues a warning message and the call frame does not change.

**See Also**

- **down**
- **down-silently (gdb mode only)**
- **up**
**use**  *(idb mode only)*

Add a directory to the source path, or show directories in the source path.

**Syntax**

use [ dirname ... ]

**Parameters**

`dirname` The path of the directory to add to the source path.

**Description**

This command adds directories to the list of source directories that the debugger uses to search for source and script files when opening an executable file.

If you do not specify `dirname`, the debuggee lists the directories in which the debugger searches for source code files.

If you specify `dirname`, the debugger searches source code files in that directory, and appends `dirname` to the list of source directories, or it replaces the list, depending on the value of the `$dbxuse` debugger variable: When `$dbxuse` is zero, the debugger appends. Otherwise it replaces. The default value of `$dbxuse` is 0.

Alternatively, you can specify the `-I` option when you start the debugger.

You can customize your debugger environment source code search paths by adding commands to your `.idbrc` file that use the `use` command.

**Example**

(idb) use
Directory search path for source files:
. ../src /home/user/examples
(idb) use aa
Directory search path for source files:
. ../src /home/user/examples aa
(idb) use bb cc
Directory search path for source files:
. ../src /home/user/examples aa bb cc
(idb) use bb
Directory search path for source files:
. ../src /home/user/examples aa bb cc
(idb) **use aa bb cc**
Directory search path for source files:
. ../src /home/user/examples aa bb cc
(idb) **set $dbxuse = 1**
(idb) **use aa**
Directory search path for source files:
. ../src /home/user/examples aa

**See Also**
- show source directory (idb mode only)
- unuse (idb mode only)
- $dbxuse
watch  (gdb mode only)

Set a write watchpoint on the specified expression.

Syntax
watch lvalue

Parameters

lvalue An expression that designates a memory location.

Description
This command sets a write watchpoint on the specified expression. When the debuggee
writes to the memory location designated by lvalue, it stops.

The debugger does not detect writing if the value of memory is not changed.

Watchpoints are also referred to as data breakpoints.

See Also
awatch (gdb mode only)
rwatch (gdb mode only)
watch (idb mode only)
watch  (idb mode only)

Set a watchpoint on the specified variable or memory range.

**Syntax**

```
watch memory start-addr [, end-addr| :size] [access] [thread ID {, ...}] [within funcname] [if cond] [commands]
```

```
watch variable lvalue [access] [thread ID {, ...}] [within funcname] [if cond] [commands]
```

**Parameters**

- **lvalue**: An expression that designates a memory location.
- **ID**: A thread ID.
- **cond**: A conditional expression.
- **commands**: A list of debugger commands.
- **start-addr**: The address at the start of the memory region.
- **end-addr**: The address at the end of the memory region starting from `start-addr`.
- **size**: The size of the memory region starting from `start-addr`.
- **funcname**: The name of a function.
- **access**: Possible values are:
  - **write**
  - **read**
  - **changed** This mode detects writes that change the contents of the memory.
  - **any** This mode detects both read and write.
  Default value: write

**Description**

This command sets a write watchpoint on the specified variable or memory range. Watchpoints are also referred to as data breakpoints.

If `varname` is a pointer, `watch variable varname` watches the content of the pointer, not the memory that `varname` points to. Use `watch memory *varname` to watch the memory pointed to by `varname`.

You can use watchpoints to determine when a variable or memory location is read from, written to, or changed.
You can specify a variable whose memory is to be watched, or specify the memory directly. You can set the accesses that the debugger watches to those that:

- write (the default)
- read
- write and actually change the value
- all accesses

If you specify a variable, the memory to be watched includes all of the memory for that variable, as determined by the variable’s type.

If you specify memory directly in terms of its address, the memory to be watched is defined as follows:

- `start-addr` is the address at the beginning of a memory region. This memory region is 8-bytes in size when you do not specify `end-addr` or `size`.
- If you specify `size`, the memory region starts with `start-addr` and is `size`-bytes long.
- If you specify `end-addr`, the memory region is from `start-addr` through `end-addr`, inclusive.

To set a watchpoint such that the debugger breaks when it hits one or more specific threads, specify `thread` and one or more comma-separated thread IDs.

To set a watchpoint based on a conditional expression, specify `if cond`.

To run one or more commands upon hitting a watchpoint, specify `commands`.

If you specify `within funcname`, program execution breaks only when the access occurs in the specified function.

**Example**

The following example watches for write accesses to the variable `_nextNode`:

```
(idb) whatis _nextNode
class Node* Node:: _nextNode
(idb) print "sizeof(_nextNode) =", sizeof(_nextNode))
sizeof(_nextNode) = 4
(idb) watch variable _nextNode write
[#3: watch variable _nextNode write]
```

The following example watches the 4 bytes specified on the command line.

```
(idb) watch memory & _nextNode, ((long)&_nextNode) + 3 read
[#5: watch memory & _nextNode, ((long)& _nextNode) + 3 read]
```
The following example watches the 2 bytes specified on the command line for a change in contents.

(idb) watch memory &_nextNode : 2 changed [#6: stop memory &_nextNode : 2 changed]

If you specify the within modifier, then the debugger watches only those accesses that occur within the specified function, but not any function it calls. For example:

(idb) whatis t
int t
(idb) watch variable t write within C::foo(void)
[#3: watch variable t write within void C::foo(void)]
(idb) cont
Select from
----------------------------------------------------
1 int C::foo(double*)
2 void C::foo(float)
3 void C::foo(int)
4 void C::foo(void)
5 None of the above
----------------------------------------------------
5
Value of <overloaded function> not completely specified
foo is not a valid breakpoint address
[3] Address 0x0804d5d0 was accessed at:
void C::foo(void): src/x_overload.cxx
[line 22, 0x08048789] foo+0x3: movl $0x0, 0x804d5d0
0x0804d5d0: Old value = 0x0000000f
0x0804d5d0: New value = 0x00000000
[3] stopped at [void C::foo(void):22 0x08048793]
22 void C::foo() { t = 0; state++; return; }
whatis

Print the type of a variable.

Syntax

whatis expr

Parameters

expr

The expression whose type you want to print. The expression can be a normal language expression or the name of a type, function, or other language entity.

Description

This command prints the type of a variable.

You can print information about the basic nature of an expression. The debugger shows you information about the entity rather than evaluating it. However, it will evaluate any contained expressions, such as pointers, needed to determine the entity to which you are referring.

Example

The following example uses the whatis command to determine the storage representation for the data member _classification:

(idb) whatis sun->_classification
const enum StellarClass Star::_classification
(idb) whatis StellarClass
enum StellarClass {O, B, A, F, G, K, M, R, N, S}
(idb) print sun->_classification
G
**when**  (idb mode only)

Set a breakpoint that executes a command list when it is hit.

**Syntax**

```plaintext
when [quiet] detector [thread ID,...] [if cond] [commands]
```

**Parameters**

See the `stop` commands.

**Description**

This command sets a breakpoint that executes a list of commands when it is hit and both thread and if conditions, if specified, evaluate to `TRUE`.

When the event specified by the breakpoint occurs and all processing for that breakpoint has been completed, the debugger resumes execution of the program.

*detector* represents the various syntactical variations of the `stop` commands, such as `in`, `at`, and `variable`.

The difference between `stop` and `when` is that a breakpoint created using `stop` suspends the execution when hit, whereas one created using `when` does not.

**See Also**

`stop in` (idb mode only)
`stop at` (idb mode only)
`stop pc` (idb mode only)
`stop variable` (idb mode only)
`stop memory` (idb mode only)
`stop signal` (idb mode only)
`stop unaligned` (idb mode only)
`stop every` (idb mode only)
wheni  (idb mode only)

Set an instruction breakpoint that executes a command list when it is hit.

Syntax
wheni [traced_expression] [thread ID ,...] [at address] [if cond] 
{commands ;...}
wheni address [thread ID ,...] [if cond] {commands ;...}

Parameters
commands A list of debugger commands.

For all other parameters, see the stopi command.

Description
This command sets an instruction breakpoint that executes a command list when it is hit.

The difference between stopi and wheni is that a breakpoint created using stopi suspends the execution when hit and does not execute any commands, whereas one created using wheni does not suspend execution and does execute commands.

See Also
stopi (idb mode only)
where  (idb mode only)

Show the current stack trace of currently active functions.

Syntax

where [num] [thread { thread_id, ... | all | * } ]

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>num</td>
<td>The number of call frames to show, starting from the beginning of the stack.</td>
</tr>
<tr>
<td>thread_id</td>
<td>The thread whose call stack should be shown.</td>
</tr>
<tr>
<td>all</td>
<td>*</td>
</tr>
</tbody>
</table>

Description

This command displays the stack trace of currently active functions.

If you do not specify the thread keyword, the debugger displays the stack trace of currently active functions for the current thread.

If you specify the thread keyword, the debugger displays the stack trace of the specified threads.

To display a specific number of call frames at the top of the stack, specify the num parameter. Each active function is designated by a number, which you can use as an parameter for the func command. If you do not specify the number, the debugger displays all levels.

The top level on the stack is 0.

For example, if you enter the command where 3, the debugger displays levels 0, 1, and 2.

When large and complex values are passed by value to a routine on the stack, the output of the where command can be voluminous. You can set the control variable $stackargs to 0 to suppress the output of argument values in the call stack. Setting $stack_levels to a numeric value limits the number of stacks displayed to the specified value.

See Also

backtrace (gdb mode only)
show thread (idb mode only)
whereis (idb mode only)

Show all declarations of a specific expression.

Syntax

whereis name

Parameters

name

An identifier or typedef name of the expression.

Description

The whereis command lists all declarations of a variable and each declaration's fully qualified scope information.

The scope information of a variable usually consists of the name of the source file that contains the function in which the variable is declared, the name of that function, and the name of the variable. The components of the scope information are separated by back-quotes (').

You can use this command to obtain information needed to differentiate overloaded identifiers that are in different units, or within different routines in the same unit.

Example

The following example shows how to set breakpoints in two C++ methods, both named printBody:

(idb) whereis printBody

"/home/user/examples/solarSystemSrc/heavenlyBody.cxx"`HeavenlyBody::
printBody(const class HeavenlyBody*, unsigned int)

"/home/user/examples/solarSystemSrc/planet.cxx"`Moon::printBody(unsigned int) const

"/home/user/examples/solarSystemSrc/planet.cxx"`Moon::printBody(unsigned int) const

"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(unsigned int) const

"/home/user/examples/solarSystemSrc/planet.cxx"`Planet::printBody(unsigned int) const

"/home/user/examples/solarSystemSrc/star.cxx"`Star::printBody(unsigned int) const
/home/user/examples/solarSystemSrc/star.cxx`Star::printBody(unsigned int) const
(idb) stop in "star.h"`Star::printBody
Select from

-----------------------------
1 /home/user/examples/solarSystemSrc/main/solarSystem.cxx
2 /home/user/examples/solarSystemSrc/star.cxx
3 None of the above

-----------------------------
1
[#2: stop in virtual void Star::printBody(unsigned int) const]

See also the which command for another example of the whereis command.

If you are not sure how to spell a symbol, you can use the whereis command to search the symbol table for the regular expression represented by the quoted string. All symbols that match the rules of the regular expression are displayed in ascending order. For example:

(idb) whereis planet
Symbol not found
(idb) whereis "[Pp]lanet"
"solarSystemSrc/derived_class_includes/planet.h`Moon::Moon(char*,
Megameters, Kilometers, class Planet*)
"solarSystemSrc/derived_class_includes/planet.h`Planet
"solarSystemSrc/derived_class_includes/planet.h`Planet
"solarSystemSrc/derived_class_includes/planet.h`Planet
"solarSystemSrc/derived_class_includes/planet.h`Planet::Planet(char *
*, Megameters, class HeavenlyBody*)
"solarSystemSrc/derived_class_includes/planet.h`Planet::Planet(char *
*, Megameters, class HeavenlyBody*)
"solarSystemSrc/derived_class_includes/planet.h`Planet::print(unsigned int)
"solarSystemSrc/derived_class_includes/planet.h`__INTER__Moon_Moon_ Orbit_Planet_Xv
"solarSystemSrc/derived_class_includes/planet.h`__INTER__Planet_Pla net_Orbit_Xv
"solarSystemSrc/derived_class_includes/planet.h`__dt__6PlanetXv
__T_6Planet
__cxxexsig6Planet
__vtbl_5Orbit6Planet
__vtbl_5Orbit6Planet4Moon
__vtbl_6Planet
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/derived_class_includes/planet.h
solarSystemSrc/planet.cxx
(idb) **whereis** "^Planet$"
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char *
, Megameters, class HeavenlyBody*)
(idb) **whereis** Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet::Planet(char *
, Megameters, class HeavenlyBody*)
(idb) **which** Planet
"solarSystemSrc/derived_class_includes/planet.h"`Planet
(idb) **whatis** Planet
class Planet : HeavenlyBody, Orbit {
 Planet(char*, Megameters, class HeavenlyBody*);
 virtual void print(unsigned int);
}

You can use the **$symbolsearchlimit** debugger variable to specify the maximum number
of symbols that will be returned by the **whereis** command for a regular expression search.
The default value for the **$symbolsearchlimit** variable is 100; a value of 0 indicates no
limit.

**See Also**

**which** *(idb mode only)*
which  (idb mode only)

Show the full scope of an expression.

Syntax

which name

Parameters

name  An identifier or typedef name of the expression.

Description

This command shows the full scope of an expression.

Use this command to determine to which declaration an identifier resolves. This command shows the fully qualified scope information for the instance of the specified expression visible from the current scope.

The scope information of a variable usually consists of the name of the source file that contains the function in which the variable is declared, the name of that function, and the name of the variable. The components of the scope information are separated by back-quotes (`).

Example

The following example shows how to use the whereis and which commands to determine a variable's scope:

(idb) where 4
>0 0x8053549 in ((Planet*)0x806ae98)->Planet::printBody(i=2) "/home/user/examples/solarSystemSrc/planet.cxx":19
#1 0x804bacf in ((HeavenlyBody*)0x806ae98)->HeavenlyBody::printBodyAndItsSatellites(i=2) "/home/user/examples/solarSystemSrc/heavenlyBody.cxx":62
#2 0x804bb0a in ((HeavenlyBody*)0x806ae40)->HeavenlyBody::printBodyAndItsSatellites(i=1) "/home/user/examples/solarSystemSrc/heavenlyBody.cxx":68
#3 0x8056745 in main() "/home/user/examples/solarSystemSrc/main/solarSystem.cxx":120
(idb) which i "/home/user/examples/solarSystemSrc/planet.cxx`Planet::printBody(unsigned int) const`i
assign i = 10
print i

whereis i

func HeavenlyBody::printBodyAndItsSatellites
void HeavenlyBody::printBodyAndItsSatellites(unsigned int) const in /home/user/examples/solarSystemSrc/heavenlyBody.cxx line No. 62:
62 printBody(i); {static int somethingToReturnTo; somethingToReturnTo++;
}

which i

print i
while

Execute the command list while the specified expression is not zero.

Syntax

**GDB Mode:**
while expr
cmds
d

**IDB Mode:**
while expr "{" cmds "}"  

Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>expr</td>
<td>Conditional expression controlling the while-loop</td>
</tr>
<tr>
<td>commands</td>
<td>One or more debugger commands or programmatic expressions to be executed.</td>
</tr>
</tbody>
</table>

**GDB Mode:**
Enter one command per line.

**IDB Mode:**
Delineate commands with a semicolon (;).

Description

The debugger executes the commands in cmdlist as long as expr evaluates to a non-zero value.

This is different from testing for true or false according to the current language. For example, if the current language is Fortran and the expression evaluates to 2, the while continues, because although 2 is .FALSE. in Fortran, 2 is non-zero.

While you can put continue, step or next commands in the while command’s body, be aware that doing so may lead to confusion. For example, breakpoints may trigger during a continuation of the application within the body of the while command.

**GDB Mode:** This command only applies when you are using the debugger in command-line mode. It has no effect when you are using the Console window in the GUI.

Example

**GDB Mode:**
(idb) set $loop = 5
(idb) while $loop > 0
>output "$loop is 
>output $loop
>echo \n
>set $loop = $loop - 1
>end
$loop is 5
$loop is 4
$loop is 3
$loop is 2
$loop is 1

**IDB Mode:**
(idb) while $loop > 0 { p $loop; set $loop = $loop - 1}
5
4
3
2
1
(idb)

The following example demonstrates a more complicated use of the *while* command, including continuing the application within the body of the *while*:

**IDB Mode:**
(idb) run
The list is:
[1] stopped at [void List<Node>::print(void) const:167 0x080af2e]
167 cout << "Node " << i ;
(idb)
(idb) while (currentNode->_data != 5) { print "currentNode->_data is ", currentNode->_data; cont }
currentNode->_data is 1
Node 1 type is integer, value is 1
[1] stopped at [void List<Node>::print(void) const:167 0x080af2e]
167 cout << "Node " << i ;
currentNode->_data is 2
Node 2 type is compound, value is 12.345
parent type is integer, value is 2
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 7
Node 3 type is compound, value is 3.1415
parent type is integer, value is 7
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 3
Node 4 type is integer, value is 3
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
currentNode->_data is 4
Node 5 type is integer, value is 4
[1] stopped at [void List<Node>::print(void) const:167 0x0804af2e]
167 cout << "Node " << i ;
(idb)
(idb) **print currentNode->_data**
5
**x** (gdb mode only)

Print memory at the specified address.

**Syntax**

`x [/nfu] [addr]`

**Parameters**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>n</code></td>
<td>The amount of memory to display, in units set by <code>u</code>. The default value is 1.</td>
</tr>
</tbody>
</table>
| `f` | The format in which to display memory. Possible values are:  
  - `i` instr  
  - `s` string  
  - `x` hex  
  - `d` sdecimal  
  - `u` udecimal  
  - `o` octal  
  - `t` binary  
  - `a` addr  
  - `c` char  
  - `f` float  
  The default changes each time you use this command or the `print` command. The initial default value is `x`. The current default value is whatever you used most recently. |
| `u` | The units in which to display memory. Possible values are:  
  - `b` byte  
  - `h` halfword  
  - `w` word  
  - `g` giant (8 bytes)  
  The default changes each time you use this command. The current default value is whatever you used most recently. |
| `addr` | The starting address for which you want to print memory. The default is the address following the most recently printed address when using this or the `print` command. |

**Description**

This command prints memory.
When you use defaults for n, f, and u, the slash (/) is optional.

**Example**
(idb) x/10i &main

0x080483c4 <main>: pushl %ebp
0x080483c5 <main+1>: movlr %esp, %ebp
0x080483c7 <main+3>: subl $0x3, %esp
0x080483ca <main+6>: andl $-8, %esp
0x080483cd <main+9>: addl $0x4, %esp
0x080483d0 <main+12>: subl $0x14, %esp
0x080483d3 <main+15>: flds 0x8048628
0x080483d9 <main+21>: fstps -20(%ebp)
0x080483dc <main+24>: movl $-1, -16(%ebp)
0x080483e3 <main+31>: movl $0xa, -12(%ebp)

End of assembler dump.

**See Also**

print
# List of Predefined Debugger Variables

The debugger has the following predefined variables. The Intel® Debugger’s convention for variable names is a leading dollar sign ($) followed by an identifier.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Default</th>
<th>Setting Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$aggregatedmsghistory</td>
<td>0</td>
<td>Controls the length of the aggregated message list. If set to the default (0), the debugger records as many messages as the system will allow.</td>
</tr>
<tr>
<td>$ascii</td>
<td>1</td>
<td>Displays whether prints are in ASCII format or all ISO Latin-1. See $lc_ctype.</td>
</tr>
<tr>
<td>$beep</td>
<td>1</td>
<td>Beeps on illegal command line editing.</td>
</tr>
<tr>
<td>$childprocess</td>
<td>0</td>
<td>When the debugger detects a fork, it assigns the child process ID to $childprocess.</td>
</tr>
<tr>
<td>$cmdset</td>
<td>gdb</td>
<td>Sets the current debugger command mode. Possible values are gdb and idb. Enclose the value in quotation marks.</td>
</tr>
<tr>
<td>$curcolumn</td>
<td>0</td>
<td>Displays the current column number if that information is available; 0 otherwise.</td>
</tr>
<tr>
<td>$curevent</td>
<td>0</td>
<td>Displays the current breakpoint number.</td>
</tr>
<tr>
<td>Variable</td>
<td>Default</td>
<td>Setting Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>$curfile</td>
<td>(null)</td>
<td>Displays the current source file name.</td>
</tr>
<tr>
<td>$curfilepath</td>
<td>(null)</td>
<td>Displays the current source file access path.</td>
</tr>
<tr>
<td>$curline</td>
<td>0</td>
<td>Displays the current source line.</td>
</tr>
<tr>
<td>$curpc</td>
<td>0</td>
<td>Displays the current point of program execution (the program counter).</td>
</tr>
<tr>
<td>$curprocess</td>
<td>0</td>
<td>Displays the current process ID.</td>
</tr>
<tr>
<td>$cursrccline</td>
<td>0</td>
<td>Displays the last source line at end of most recent source listing.</td>
</tr>
<tr>
<td>$cursrcpc</td>
<td>0</td>
<td>Displays the PC address at end of most recent machine code listing.</td>
</tr>
<tr>
<td>$curthread</td>
<td>0</td>
<td>Displays the current thread ID.</td>
</tr>
<tr>
<td>$dbxoutputformat</td>
<td>0</td>
<td>Displays various data structures in dbx format.</td>
</tr>
<tr>
<td>$dbxuse</td>
<td>0</td>
<td>Replaces (0) or appends to (1) current use paths</td>
</tr>
<tr>
<td>$decints</td>
<td>0</td>
<td>Displays integers in decimal radix.</td>
</tr>
<tr>
<td>$doverbosehelp</td>
<td>1</td>
<td>Displays the help menu front page.</td>
</tr>
<tr>
<td>$editline</td>
<td>1</td>
<td>Enables or disables Emacs*-like control characters in the debugger. It is not possible to use vi*-like commands in IDB. In the GUI console mode, this functionality is disabled by default. In the command-line interface, it is enabled by default.</td>
</tr>
<tr>
<td>$eventecho</td>
<td>1</td>
<td>Echoes events with event numbers.</td>
</tr>
<tr>
<td>Variable</td>
<td>Default</td>
<td>Setting Description</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>$exitonterminationofprocesswithpid</td>
<td>None</td>
<td>If set to a process ID, the debugger exits when that process terminates.</td>
</tr>
<tr>
<td>$float80bit</td>
<td>1</td>
<td>If set to 0 (the default), prints 128-bit floating point numbers normally; if set to a non-zero value, prints 128-bit floating point numbers as 128-bit containers holding 80-bit floating point numbers.</td>
</tr>
<tr>
<td>$floatshrinking</td>
<td>1</td>
<td>If set to the default (1), the debugger prints binary floating point numbers using the shortest possible decimal number. If set to 0, the debugger prints the decimal number which is the closest representation in the number of decimal digits available of the internal binary number.</td>
</tr>
<tr>
<td>$framesearchlimit</td>
<td>0</td>
<td>Defines the maximum number of call frames by which to extend normal language-based identifier lookup.</td>
</tr>
<tr>
<td>$funcsig</td>
<td>1</td>
<td>Displays function signature at breakpoint.</td>
</tr>
<tr>
<td>$gdb_compatible_output</td>
<td>0</td>
<td>Makes IDB output compatible with GDB output.</td>
</tr>
<tr>
<td>$givedebughints</td>
<td>1</td>
<td>Displays hints on debugger features.</td>
</tr>
<tr>
<td>$hasmeta</td>
<td>0</td>
<td>Interprets multibyte characters.</td>
</tr>
<tr>
<td>$hexints</td>
<td>0</td>
<td>Displays integers in hex radix.</td>
</tr>
<tr>
<td>$highpc</td>
<td>(internal debugger variable)</td>
<td>Returns the highest address associated with &quot;function&quot;.</td>
</tr>
<tr>
<td>$historylines</td>
<td>20</td>
<td>Defines the number of commands to show for history.</td>
</tr>
<tr>
<td>Variable</td>
<td>Default</td>
<td>Setting Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>$indent</td>
<td>1</td>
<td>Prints structures with indentation.</td>
</tr>
<tr>
<td>$lang</td>
<td>&quot;None&quot;</td>
<td>Defines the programming language of current routine.</td>
</tr>
<tr>
<td>$lasteventmade</td>
<td>0</td>
<td>Displays the number of last (successful) breakpoint definition.</td>
</tr>
<tr>
<td>$lc_ctype</td>
<td>result of <code>setlocale(LC_CTYPE, 0L)</code></td>
<td>Defines the current locale information. If set, passes the value through <code>setlocale()</code> and becomes the result. &quot;&quot; is passed as 0L.</td>
</tr>
<tr>
<td>$listwindow</td>
<td>20</td>
<td>Displays the number of lines to show for list.</td>
</tr>
<tr>
<td>$main</td>
<td>&quot;main&quot;</td>
<td>Displays the name of the first routine in the program.</td>
</tr>
<tr>
<td>$maxstrlen</td>
<td>128</td>
<td>Defines the length of the largest string (in characters) to printed in full.</td>
</tr>
<tr>
<td>$memorymatchall</td>
<td>0</td>
<td>When set to non-zero, displays all memory matches in the specified range. Otherwise, only the first memory match is displayed.</td>
</tr>
<tr>
<td>$octints</td>
<td>0</td>
<td>Displays integers in octal radix.</td>
</tr>
<tr>
<td>$overloadmenu</td>
<td>1</td>
<td>Prompts for choice of overloaded C++ name.</td>
</tr>
<tr>
<td>$page</td>
<td>1</td>
<td>If non-zero, debugger terminal output is paged.</td>
</tr>
<tr>
<td>$pagewindow</td>
<td>0</td>
<td>Defines the number of lines per output page. The default of 0 causes the debugger to query the terminal for the page size.</td>
</tr>
</tbody>
</table>
### List of Predefined Debugger Variables

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<tr>
<td>$parallel_branchingfactor</td>
<td>8</td>
<td>Specifies the factor used to build the n-ary tree and determine the number of aggregators in the tree.</td>
</tr>
<tr>
<td>$parallel_aggregatordelay</td>
<td>3000 milliseconds</td>
<td>Specifies the length of time that aggregators wait before they aggregate and send messages down to the next level when not all the expected messages have been received.</td>
</tr>
<tr>
<td>$parentprocess</td>
<td>0</td>
<td>When the debugger detects a fork, it assigns the parent process ID to $parentprocess.</td>
</tr>
<tr>
<td>$pimode</td>
<td>0</td>
<td>Echoes input to log file on playback input. Only applicable to IDB mode.</td>
</tr>
<tr>
<td>$prompt</td>
<td>&quot;(idb) &quot;</td>
<td>Specifies debugger prompt.</td>
</tr>
<tr>
<td>$readtextfile</td>
<td>0</td>
<td>If set to non-zero, instructions are read from the text area of the binary file rather than from the memory image.</td>
</tr>
<tr>
<td>$regstyle</td>
<td>1</td>
<td>Controls the format of register names during disassembly. Valid settings are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0  compiler names, for example, t0, ra, or zero.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1  hardware names, for example, r1, r26, or r31.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2  assembly names, for example, $1, $26, or $31.</td>
</tr>
<tr>
<td>$repeatmode</td>
<td>1</td>
<td>Repeats previous command when you press Enter if 1.</td>
</tr>
<tr>
<td>$reportsotrans</td>
<td>0</td>
<td>Report when an event was changed because a shared object library was either opened or closed if 1.</td>
</tr>
<tr>
<td>$showlineonstartup</td>
<td>0</td>
<td>Displays the first executable line in main if 1.</td>
</tr>
</tbody>
</table>
### Intel® Debugger Command Reference

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<tr>
<th>Variable</th>
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</tr>
</thead>
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<tr>
<td>$showwelcomemsg</td>
<td>1</td>
<td>Displays welcome message at startup time if 1.</td>
</tr>
<tr>
<td>$stackargs</td>
<td>1</td>
<td>Shows arguments in the call stack if 1.</td>
</tr>
<tr>
<td>$stack_levels</td>
<td>50</td>
<td>Controls the number of call stack output levels.</td>
</tr>
<tr>
<td>$statusargs</td>
<td>1</td>
<td>Prints breakpoints with parameters if 1.</td>
</tr>
<tr>
<td>$stepg0</td>
<td>0</td>
<td>Controls how a step command behaves when encountering a function with minimal debug information. Possible settings: 0 Steps over routines. 1 Steps into routines.</td>
</tr>
<tr>
<td>$stoponattach</td>
<td>0</td>
<td>Stops the running process on attach if 1.</td>
</tr>
<tr>
<td>$symbolsearchlimit</td>
<td>100</td>
<td>Specifies the maximum number of symbols that will be returned by the whereis command for a regular expression search. The default value is 100; a value of 0 indicates no limit.</td>
</tr>
<tr>
<td>$threadlevel</td>
<td>native</td>
<td>Specifies native threads.</td>
</tr>
<tr>
<td>$usedynamictypes</td>
<td>1</td>
<td>Evaluates using C++ static (if 0) or dynamic (if 1) type.</td>
</tr>
<tr>
<td>$verbose</td>
<td>0</td>
<td>Produces even more output if 1.</td>
</tr>
<tr>
<td>$catchexecs</td>
<td>0</td>
<td>Stops execution on program exec.</td>
</tr>
<tr>
<td>$catchforkinfork</td>
<td>0</td>
<td>Notifies you as soon as the forked process is created (otherwise you are notified when the call finishes).</td>
</tr>
<tr>
<td>$catchforks</td>
<td>0</td>
<td>Notifies you on program fork and stops child.</td>
</tr>
</tbody>
</table>