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# **x64dbg Documentation**

***Release 0.1***

**x64dbg**

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# CHAPTER 1

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## Suggested reads

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If you came here because someone told you to read the manual, start by reading **all sections** of the *introduction*.

**Contents:**

## 1.1 What is x64dbg?

This is a x64/x32 debugger that is currently in active development.

The debugger (currently) has three parts:

- DBG
- GUI
- Bridge

DBG is the debugging part of the debugger. It handles debugging (using TitanEngine) and will provide data for the GUI.

GUI is the graphical part of the debugger. It is built on top of Qt and it provides the user interaction.

Bridge is the communication library for the DBG and GUI part (and maybe in the future more parts). The bridge can be used to work on new features, without having to update the code of the other parts.

## 1.2 Introduction

This section explains the basics of x64dbg. **Make sure to fully read this!**

**Contents:**

## 1.2.1 Features

This program is currently under active development. It supports many basic and advanced features to ease debugging on Windows.

### Basic features

- Full-featured debugging of DLL and EXE files ([TitanEngine Community Edition](#))
- 32-bit and 64-bit Windows support from Windows XP to Windows 10
- Built-in assembler ([XEDParse/asmjit](#))
- Fast disassembler ([Zydis](#))
- C-like expression parser
- Logging
- Notes
- Memory map view
- Modules and symbols view
- Source code view
- Thread view
- Content-sensitive register view
- Call stack view
- SEH view
- Handles, privileges and TCP connections enumeration.
- Multi-datatype memory dump
- Dynamic stack view
- Executable patching
- Dynamically recognize modules and strings
- User database ([JSON](#)) for comments, labels, bookmarks, etc.
- Basic debug symbol (PDB) support
- Extendable, debuggable scripting language for automation
- Plugin support with growing API
- Basic anti-debugging

### Advanced features

- Import reconstructor integrated ([Scylla](#))
- Analysis
- Conditional breakpoints and tracing with great flexibility
- Collect data while tracing

## GUI features

- Intuitive and familiar, yet new user interface
- IDA-like sidebar with jump arrows
- IDA-like instruction token highlighter (highlight registers, commands, etc.)
- Fully customizable color scheme and short-cut keys
- Control flow graph
- Integrated mnemonic and registers help
- Code folding
- Easy integration with custom tools (favourites menu)

## 1.2.2 Glossary

This section describes various terms and concepts used by x64dbg.

- **Breakpoint** A breakpoint defines a condition when the debuggee should be paused. There are 5 types of breakpoint, namely software breakpoint, hardware breakpoint, memory breakpoint, DLL breakpoint and exception breakpoint.
- **Conditional Breakpoint** A conditional breakpoint lets you define some simple operations that executes automatically when the breakpoint is hit, and then conditionally resumes program execution. See [documentation for conditional breakpoint](#) for more information.
- **Conditional Tracing** Conditional tracing lets you execute the program step-by-step, and pause when the specified condition is met. See [documentation for conditional tracing](#) for more information.
- **DLL Breakpoint** A DLL breakpoint specifies the name of a DLL. When the DLL is loaded or unloaded, the debuggee will be paused.
- **Trace recording** A trace recording is a log of all traced instructions, typically displayed in the [Trace View](#).
- **Trace coverage** Trace coverage records if and how many times an instruction has been executed. An instruction that has been covered before will be displayed in a different background color (by default green). It is analogous to leaving footprints while exploring a maze.

## 1.2.3 Input

When using x64dbg you can often use various things as input.

### Commands

Commands have the following format:

```
command arg1, arg2, argN
```

### Variables

Variables optionally start with a \$ and can only store one DWORD (QWORD on x64).

## Registers

All registers of all sizes, except floating-point registers (eg: RAX, EAX, AL) can be used as variables.

Floating-point registers like XMM0, YMM0 or ST(0) may not be used as variables, but they may be logged via the [String Formatting](#) floating-point type. AVX-512 registers are currently not supported.

## Remarks

- The variable names for most registers are the same as the names for them, except for the following registers:
- **x87 Control Word Flag:** The flags for this register is named like this: `_x87CW_UM`
- In addition to the registers in the architecture, x64dbg provides the following registers: CAX , CBX , CCX , CDX , CSP , CBP , CSI , CDI , CIP. These registers are mapped to 32-bit registers on 32-bit platform, and to 64-bit registers on 64-bit platform. For example, CIP is EIP on 32-bit platform, and is RIP on 64-bit platform. This feature is intended to support architecture-independent code.

## Memory locations

You can read/write from/to a memory location by using one of the following expressions:

- `[addr]` read a DWORD/QWORD from `addr`.
- `n:[addr]` read `n` bytes from `addr`.
- `seg:[addr]` read a DWORD/QWORD from a segment at `addr`.
- `byte:[addr]` read a BYTE from `addr`.
- `word:[addr]` read a WORD from `addr`.
- `dword:[addr]` read a DWORD from `addr`.
- `qword:[addr]` read a QWORD from `addr` (x64 only).

## Remarks

- `n` is the amount of bytes to read, this can be anything smaller than 4 on x32 and smaller than 8 on x64 when specified, otherwise there will be an error.
- `seg` can be `gs`, `es`, `cs`, `fs`, `ds`, `ss`. Only `fs` and `gs` have an effect.

## Flags

Debug flags (interpreted as integer) can be used as input. Flags are prefixed with an `_` followed by the flag name. Valid flags are: `_cf`, `_pf`, `_af`, `_zf`, `_sf`, `_tf`, `_if`, `_df`, `_of`, `_rf`, `_vm`, `_ac`, `_vif`, `_vip` and `_id`.

## Numbers

**All numbers are interpreted as hex by default!** If you want to be sure, you can `x` or `0x` as a prefix. Decimal numbers can be used by prefixing the number with a dot: `.123=7B`.



## Expressions

See the *expressions* section for more information.

## Labels/Symbols

User-defined labels and symbols are a valid expressions (they resolve to the address of said label/symbol).

## Module Data

### DLL exports

Type `GetProcAddress` and it will automatically be resolved to the actual address of the function. To explicitly define from which module to load the API, use: `[module].dll:[api]` or `[module]:[api]`. In a similar way you can resolve ordinals, try `[module]:[ordinal]`. Another macro allows you to get the loaded base of a module. When `[module]` is an empty string `:GetProcAddress` for example, the module that is currently selected in the CPU will be used.

### Loaded module bases

If you want to access the loaded module base, you can write: `[module]:0`, `[module]:base`, `[module]:imagebase` or `[module]:header`.

### RVA/File offset

If you want to access a module RVA you can either write `[module]:0+[rva]` or you can write `[module]:$[rva]`. If you want to convert a file offset to a VA you can use `[module]:#[offset]`. When `[module]` is an empty string `:0` for example, the module that is currently selected in the CPU will be used.

### Module entry points

To access a module entry point you can write `[module]:entry`, `[module]:oep` or `[module]:ep`. Notice that when there are exports with the names `entry`, `oep` or `ep` the address of these will be returned instead.

## Remarks

Instead of the `:` delimiter you can also use a `.`. If you need to query module information such as `[module]:imagebase` or `[module]:entry` you are advised to use a `?` as delimiter instead: `[module]?entry`. The `?` delimiter does checking for named exports later, so it will still work when there is an export called `entry` in the module.

## Last words

Input for arguments can always be done in any of the above forms, except if stated otherwise.

## 1.2.4 Expressions

The debugger allows usage of basic expressions. Just type an expression in the command window and the result will be displayed in the console. Apart from calculations, it allows quick variable changes using a C-like syntax.

### Input

The basic input (numbers/variables) can be used as constants in expressions, see [Input](#) for more information.

### Operators

You can use the following operators in your expression. They are processed in the following order:

1. *parentheses/brackets*:  $(1+2)$ ,  $[1+6]$  have priority over other operations.
2. *unary minus/binary not/logical not*:  $-1$  (negative 1),  $\sim 1$  (binary not of 1),  $!0$  (logical not of 0).
3. *multiplication/division*:  $2*3$  (regular multiplication),  $2\`3$  (gets high part of the multiplication),  $6/3$  (regular division),  $5\%3$  (modulo/remainder of the division).
4. *addition/subtraction*:  $1+3$  (addition),  $5-2$  (subtraction).
5. *left/right shift/rotate*:  $1<<2$  (shift left, shl for unsigned, sal for signed),  $10>>1$  (shift right, shr for unsigned, sar for signed),  $1<<<2$  (rotate left),  $1>>>2$  (rotate right).
6. *smaller (equal)/bigger (equal)*:  $4<10$ ,  $3>6$ ,  $1\leq 2$ ,  $6\geq 7$  (resolves to 1 if true, 0 if false).
7. *equal/not equal*:  $1==1$ ,  $2!=6$  (resolves to 1 if true, 0 if false).
8. *binary and*:  $12\&2$  (regular binary and).
9. *binary xor*:  $2\^1$  (regular binary xor).
10. *binary or*:  $2\mid 8$  (regular binary or).
11. *logical and*:  $0\&\&3$  (resolves to 1 if true, 0 if false).
12. *logical or*:  $0\mid\mid 3$  (resolves to 1 if true, 0 if false).
13. *logical implication*:  $0\rightarrow 1$  (resolved to 1 if true, 0 if false).

### Quick-Assigning

Changing memory, a variable, register or flag can be easily done using a C-like syntax:

- $a?=b$  where ? can be any non-logical operator. a can be any register, flag, variable or memory location. b can be anything that is recognized as an expression.
- $a++/a--$  where a can be any register, flag, variable or memory location.

### Functions

You can use functions in expressions. See [Expression Functions](#) for the documentation of these functions.

## 1.2.5 Expression Functions

You may use functions in an expression. The following functions are defined by the debugger:

## Strings

- `utf8(addr)` : Reads a UTF-8 string from `addr` and returns the string value.
- `utf16(addr)` : Reads a UTF-16 string from `addr` and returns the string value.
- `strstr(str1, str2)` : Find a substring. Example: `strstr(utf8(addr), "abc")`.
- `streq(str1, str2)` : Compare two strings. Example: `streq(utf8(addr), "abc")`.
- `strlen(str)` : Calculates the length of a string.

The functions `utf8` and `utf16` can be used as inputs for other functions that take `str` arguments. The expression `utf8(rax)` does not return a number, so it cannot be used as a trace condition for example.

## GUI Interaction

- `disasm.sel()/dis.sel()` : Get the selected address in the disassembly view.
- `dump.sel()` : Get the selected address in the dump view.
- `stack.sel()` : Get the selected address in the stack view.

## Source

- `src.disp(addr)` : Get displacement of `addr` relative to last source line.
- `src.line(addr)` : Get the source line number of `addr`.

## Modules

- `mod.party(addr)` : Get the party number of the module `addr`. 0 is user module, 1 is system module.
- `mod.base(addr)` : Get the base address of the module `addr`.
- `mod.size(addr)` : Get the size of the module `addr`.
- `mod.hash(addr)` : Get the hash of the module `addr`.
- `mod.entry(addr)` : Get the entry address of the module `addr`.
- `mod.system(addr)` : True if the module at `addr` is a system module. False: module is a user module.
- `mod.user(addr)` : True if the module at `addr` is a user module. False: module is NOT a user module.
- `mod.main()` : Returns the base of the main module (debuggee). If this is a DLL it will return 0 until loaded.
- `mod.rva(addr)` : Get the RVA of `addr`. If `addr` is not inside a module it will return 0.
- `mod.offset(addr)` : Get the file offset of `addr`. If `addr` is not inside a module it will return 0.
- `mod.isexport(addr)` : True if `addr` is an exported function from a module.
- `mod.fromname(str)` : Gets the module base for `str`. 0 if the module is not found. Example: `mod.fromname("ntdll.dll")`.

## Process Information

- `peb()` : Get PEB address.
- `teb()` : Get TEB address.
- `tid()` : Get the current thread ID.
- `kusd()`, `KUSD()`, `KUSER_SHARED_DATA()` : Get the address of `KUSER_SHARED_DATA` (0x7FFE0000).

## General Purpose

- `bswap(value)` : Byte-swap value. For example, `bswap(44332211) = 0x11223344`.
- `ternary(condition, val1, val2)` : If condition is nonzero, return val1, otherwise return val2.
- `GetTickCount()` : Tick count of x64dbg.

## Memory

- `mem.valid(addr)` : True if addr is a valid memory address.
- `mem.base(addr)` : Returns the base of the memory page of addr (can change depending on your memory map mode).
- `mem.size(addr)` : Returns the size of the memory page of addr (can change depending on your memory map mode).
- `mem.iscode(addr)` : True if addr is a page that is executable.
- `mem.decodepointer(ptr)` : Equivalent to calling the `DecodePointer` API on ptr, only works on Vista+.

## Disassembly

- `dis.len(addr)` : Get the length of the instruction at addr.
- `dis.iscond(addr)` : True if the instruction at addr is a conditional branch.
- `dis.isbranch(addr)` : True if the instruction at addr is a branch (jcc/call).
- `dis.isret(addr)` : True if the instruction at addr is a ret.
- `dis.iscall(addr)` : True if the instruction at addr is a call.
- `dis.ismem(addr)` : True if the instruction at addr has a memory operand.
- `dis.isnop(addr)` : True if the instruction at addr is equivalent to a NOP.
- `dis.isunusual(addr)` : True if the instruction at addr is unusual.
- `dis.branchdest(addr)` : Branch destination of the instruction at addr (what it follows if you press enter on it).
- `dis.branchexec(addr)` : True if the branch at addr is going to execute.
- `dis.imm(addr)` : Immediate value of the instruction at addr.
- `dis.brtrue(addr)` : Branch destination of the instruction at addr.
- `dis.brfalse(addr)` : Address of the next instruction if the instruction at addr is a conditional branch.
- `dis.next(addr)` : Address of the next instruction from addr.

- `dis.prev(addr)` : Address of the previous instruction from `addr`.
- `dis.iscallsystem(addr)` : True if the instruction at `addr` goes to a system module.
- `dis.mnemonic(addr)` : Returns the mnemonic `str` for `addr`. Example: `str.streq(dis.mnemonic(cip), "cpuid")`.
- `dis.text(addr)` : Returns the instruction text as a string `addr`. Can be used for conditions, for example: `strstr(dis.text(rip), "rbx")`. **Note:** the instruction text might not exactly match the formatting in the GUI.
- `dis.match(addr, str)` : True if the instruction at `addr` matches the regex in `str`. Example: `dis.match(rip, "test.+, 0x1")`. You can use `dis.text` to see what you can match on.

## Tracing

- `tr.enabled(addr)` : True if the trace coverage is enabled at `addr`.
- `tr.hitcount(addr)` : Number of hits in the trace coverage at `addr`.
- `tr.isrecording(),tr.runtraceenabled()` : True if trace recording is enabled.

## Byte/Word/Dword/Qword/Ptr

- `ReadByte(addr),Byte(addr),byte(addr)` : Read a byte from `addr` and return the value. Example: `byte(eax)` reads a byte from memory location `[eax]`.
- `ReadWord(addr),Word(addr),word(addr)` : Read a word (2 bytes) from `addr` and return the value.
- `ReadDword(addr),Dword(addr),dword(addr)` : Read a dword (4 bytes) from `addr` and return the value.
- `ReadQword(addr),Qword(addr),qword(addr)` : Read a qword (8 bytes) from `addr` and return the value (only available on x64).
- `ReadPtr(addr),ReadPointer(addr),ptr(addr),Pointer(addr),pointer(addr)` : Read a pointer (4/8 bytes) from `addr` and return the value.

## Functions

- `func.start()` : Return start of the function `addr` is part of, zero otherwise.
- `func.end()` : Return end of the function `addr` is part of, zero otherwise.

## References

- `ref.count()` : Number of entries in the current reference view.
- `ref.addr(index)` : Get the address of the reference at `index`. Zero on failure.

## Arguments

This assumes the return address is on the stack (eg you are inside the function).

- `arg.get(index)` : Gets the argument at `index` (zero-based).
- `arg.set(index, value)` : Sets the argument at `index` (zero-based) to `value`.

## Exceptions

This is a set of functions to get information about the last exception. They can be used for exceptions breakpoints to construct more advanced conditions.

- `ex.firstchance()` : Whether the last exception was a first chance exception.
- `ex.addr()` : Last exception address. For example the address of the instruction that caused the exception.
- `ex.code()` : Last exception code.
- `ex.flags()` : Last exception flags.
- `ex.infocount()` : Last exception information count (number of parameters).
- `ex.info(index)` : Last exception information, zero if index is out of bounds. For access violations or memory breakpoints `ex.info(1)` contains the address of the accessed memory (see [EXCEPTION\\_RECORD.ExceptionInformation](#) for details).

## Plugins

Plugins can register their own expression functions. You can find an example in the [StackContains](#) plugin. Relevant functions:

- `_plugin_registerexprfunction`
- `_plugin_registerexprfunctionex`
- `_plugin_unregisterexprfunction`

### 1.2.6 Variables

This program supports variables. There are three types of variables:

- **USER:** Variables created by the user using the `var` command. These variables have no access restrictions.
- **SYSTEM:** Variables created by the system, that can be read and written, but cannot be deleted.
- **READONLY:** Variables created by the system, that can be read, but not written or deleted.

## Reserved Variables

There are a few reserved variables:

- `$res/$result`: General result variable.
- `$resN/$resultN`: Optional other result variables (N= 1-4).
- `$pid`: Process ID of the debugged executable.
- `$hp/$hProcess`: Debugged executable handle.
- `$lastalloc`: Last result of the `alloc` command.
- `$breakpointcondition` : Controls the pause behaviour in the conditional breakpoint command.
- `$breakpointcounter` : The hit counter of the breakpoint, set before the condition of the conditional breakpoint is evaluated.
- `$breakpointlogcondition` : The log condition of the conditional breakpoint. It cannot be used to control the logging behaviour.

## 1.2.7 Conditional Breakpoints

This section describes the conditional breakpoint capability in x64dbg.

### Operations overview

When a breakpoint is hit, x64dbg will do the following things:

- If the breakpoint is an exception breakpoint, set the system variable `$breakpointexceptionaddress` to the exception address;
- Increment the *hit counter*;
- Set the system variable `$breakpointcounter` to the value of *hit counter*;
- If *break condition* is set, evaluate the *expression* (defaults to 1);
- If *fast resume* is set and *break condition* evaluated to 0:
  - Resume execution of the debuggee (skip the next steps). This will also skip executing plugin callbacks and GUI updates.
- If *log condition* is set, evaluate the *expression* (defaults to 1);
- If *command condition* is set, evaluate the *expression* (defaults to *break condition*);
- If *break condition* evaluated to 1 (or any value other than '0'):
  - Print the standard log message; (if *the breakpoint is set to be silent*, standard log message is suppressed.)
  - Execute plugin callbacks.
- If *log text* is set and *log condition* evaluated to 1 (or any value other than '0'):
  - Format and print the *log text* (see *String Formatting*).
- If *command text* is set and *command condition* evaluated to 1:
  - Set the system variable `$breakpointcondition` to the *break condition*;
  - Set the system variable `$breakpointlogcondition` to the *log condition*;
  - Execute the command in *command text*;
  - The *break condition* will be set to the value of `$breakpointcondition`. So if you modify this system variable in the script, you will be able to control whether the debuggee would break.
- If *break condition* evaluated to 1 (or any value other than '0'):
  - Break the debuggee and wait for the user to resume.

If any expression is invalid, the condition will be triggered (That is, an invalid expression as condition will cause the breakpoint to always break, log and execute command).

### Hit counter

A hit counter records how many times a breakpoint has been reached. It will be incremented unconditionally, even if fast resume is enabled on this breakpoint. It may be viewed at breakpoint view and reset with *ResetBreakpointHit-Count*.

## Logging

The log can be formatted by x64dbg to log the current state of the program. See *formatting* on how to format the log string.

## Notes

You can set a conditional breakpoint with GUI by setting a software breakpoint(key F2) first, then right-click on the instruction and select “Edit breakpoint” command from the context menu. Fill in the conditional expression and/or other information as necessary, then confirm and close the dialog.

You should not use commands that can change the running state of the debuggee (such as `run`) inside the breakpoint command, because these commands are unstable when used here. You can use *break condition*, *command condition* or `$breakpointcondition` instead.

## Examples

### A conditional breakpoint which never breaks

*break condition:* 0 (Useful if you only want to execute command or log data, but not pause the debuggee)

### A conditional breakpoint which breaks only if EAX and ECX both equal to 1

*break condition:* `EAX==1 && ECX==1`

### A conditional breakpoint which breaks only if the first argument is 1

*break condition:* `arg.get(0)==1`

### A conditional breakpoint which breaks only if EAX is a valid address

*break condition:* `mem.valid(EAX)`

### A conditional breakpoint which breaks on the third hit

*break condition:* `$breakpointcounter==3 or ($breakpointcounter%3)==0`

### A conditional breakpoint which breaks only if executed by the thread 1C0

*break condition:* `tid()==1C0`

### A conditional breakpoint which breaks only if ECX points to a UTF-16 string containing “foo”

*break condition:* `strstr(utf16(ECX), "foo")`

## Comparison with Conditional Tracing

A conditional breakpoint can only pause the debuggee when it is executed. It cannot pause the debuggee when the breakpoint is not hit even if the condition is satisfied. If you don’t know where the condition will become true, try *conditional tracing* instead!

## See also

- *Conditional Breakpoint Control*
- *Expressions*
- *Expression Functions*
- *String Formatting*



## 1.2.8 Conditional Tracing

This section describes the *conditional tracing* capability in x64dbg.

### Operations overview

When a trace step is hit, x64dbg will do the following things:

- Increment the *trace counter*;
- Set the system variable `$tracecounter` to the value of *trace counter*;
- If *break condition* is set, evaluate the *expression* (defaults to 0);
- Execute plugin callbacks (allowing plugins to change the *break condition*);
- If *log condition* is set, evaluate the *expression* (defaults to 1);
- If *command condition* is set, evaluate the *expression* (defaults to *break condition*);
- If *switch condition* is set, evaluate the *expression* (defaults to 0)
- If *log text* is set and *log condition* evaluated to 1:
  - Format and print the *log text* (see *String Formatting*). To redirect the log to a file use *TraceSetLogFile*.
- If *command text* is set and *command condition* evaluated to 1:
  - Set the system variable `$tracecondition` to the *break condition*;
  - Set the system variable `$tracelogcondition` to the *log condition*;
  - Set the system variable `$traceswitchcondition` to the *switch condition*;
  - Execute the command in *command text*;
  - The *break condition* will be set to the value of `$tracecondition`. So if you modify this system variable in the script, you will be able to control whether the debuggee would break.
  - The *switch condition* will be set to the value of `$traceswitchcondition`. So if you modify this system variable in the script, you will be able to control whether the step type is switched.
- If *break condition* evaluated to 1:
  - Print the standard log message;
  - Break the debuggee and wait for the user to resume.
- If *switch condition* evaluated to 1:
  - Switch (invert) the step type. If you are tracing *in* it will switch to *out* (and the other way around). This allows you to for example not trace into system module calls with the condition `mod.party(dis.branchdest(cip)) == 1` or not trace into certain calls.

In addition to the above operations, x64dbg also has the ability to record traced instructions to the trace view and to update the trace coverage. This happens every time the debugger steps or pauses, also if you do it manually.

### Logging

The log can be formatted by x64dbg to log the current state of the program. See *formatting* on how to format the log string. If you are looking for logging the address and disassembly of all instructions traced you can use `{p:cip}` `{i:cip}`. To redirect the log to a file use *TraceSetLogFile*, or use the graphical interface.

## Trace coverage

If you use one of the trace coverage-based tracing options such as *TraceIntoBeyondTraceCoverage*, the initial evaluation of *break condition* includes the type of trace coverage tracing that you specified. The normal *break condition* can be used to break before the trace coverage condition is satisfied. If you want to include trace coverage in your condition for full control, you can use the *expression functions*.

## Notes

You can start a conditional tracing by “Trace over until condition”/“Trace into until condition” commands in the *Debug menu*.

You should not use commands that can change the running state of the debuggee (such as `run`) inside the breakpoint command, because these commands are unstable when used here. You can use *break condition*, *command condition* or `$tracecondition` instead.

When you use *Trace Over*, the debuggee would not be paused inside the calls that has been stepped over, even if the condition is true. Also other operations, such as logging and trace record, are not executed. This makes tracing faster, but if these operations are desired you should use *Trace Into*.

## See also

- *Tracing*
- *Expressions*
- *Expression Functions*
- *String Formatting*

## 1.2.9 String Formatting

This section explains the simple string formatter built into x64dbg.

The basic syntax is `{?:expression}` where `?` is the optional type of the expression. To output `{` or `}` in the result, escape them as `{{` or `}}`.

## Types

- `d` signed decimal: `-3`
- `u` unsigned decimal: `57329171`
- `p` zero prefixed pointer: `0000000410007683`
- `s` string pointer: `this is a string`
- `x` hex: `3C28A` (default for integer values)
- `a` address info: `00401010 <module.EntryPoint>`
- `i` instruction text: `jmp 0x77ac3c87`
- `f` single precision floating-point pointer or register: If `10001234` is an address of a single precision floating-point number `3.14`, `{f:10001234}` will print `3.14`. It can also accept XMM and YMM registers: `{f:XMM0}` prints the single precision floating-point number at XMM0 bit 31:0, `{f:YMM7[7]}` prints the single precision floating-point number at YMM7 bit 255:224. x87 and AVX-512 registers are currently not supported.

- `F` double precision floating-point pointer or register: Similar to `f`, except that the data is interpreted as double precision floating-point number. It can also accept XMM and YMM registers: `{F: YMM7[3]}` prints the double precision floating-point number at YMM7 bit 255:192.

**Note:** XMM and YMM registers may only be used with the `f/F` floating-point type. (Issue 2826 links to details about why)

## Complex Type

- `{mem;size@address}` will print the size bytes starting at address in hex.
- `{winerror@code}` will print the name of windows error code(returned with `GetLastError()`) and the description of it(with `FormatMessage`). It is similar to `ErrLookup` utility.
- `{ntstatus@code}` will print the name of NTSTATUS error code and the description of it(with `FormatMessage`).
- `{ascii[;length]@address}` will print the ASCII string at address with an optional length (in bytes).
- `{ansi[;length]@address}` will print the ANSI string at address with an optional length (in bytes).
- `{utf8[;length]@address}` will print the UTF-8 string at address with an optional length (in bytes).
- `{utf16[;length]@address}` will print the UTF-16 string at address with an optional length (in words).
- `{disasm@address}` will print the disassembly at address (equivalent to `{i:address}`).
- `{modname@address}` will print the name of the module at address.
- `{bswap[;size]@value}` will byte-swap value for a specified size (size of pointer per default).
- `{label@address}` will print the (auto)label at address.
- `{comment@address}` will print the (auto)comment at address.

## Examples

- `rax: {rax} formats to rax: 4C76`
- `password: {s:4*ecx+0x402000} formats to password: L"s3cret"`
- `function type: {mem;1@[ebp]+0xa} formats to function type: 01`
- `{x:bswap(rax)}` where `rax=0000000078D333E0` formats to `E033D37800000000` because of bswap fun which reverse the hex value
- `{bswap;4@rax}` where `rax=1122334455667788` formats to `88776655`
- `mnemonic: {dis.mnemonic(dis.sel())} formats to mnemonic: push`

## Logging

When using the `log` command you should put quotes around the format string (`log "{mem;8@rax}"`) to avoid ambiguity with the `;` (which separates two commands). See <https://github.com/x64dbg/x64dbg/issues/1931> for more details.

## Plugins

Plugins can use `_plugin_registerformatfunction` to register custom string formatting functions. The syntax is `{type;arg1;arg2;argN@expression}` where `type` is the name of the registered function, `argN` is any string (these are passed to the formatting function as arguments) and `expression` is any valid expression.

### 1.2.10 Command line

x64dbg supports the following command line:

- 1 argument: `x64dbg filename.exe` will debug `filename.exe`.
- 2 arguments: `x64dbg -p PID` will attach to the process with PID `PID`.
- 2 arguments: `x64dbg filename.exe cmdline` will debug `filename.exe` with `cmdline` as command line.
- 3 arguments: `x64dbg filename.exe cmdline currentdir` will debug `filename.exe` with `cmdline` as command line and `currentdir` as current directory.

### 1.2.11 Inability

This section gives a list of features currently not supported in x64dbg. You are always welcome to contribute to x64dbg to help fixing them.

- Fine-grained memory breakpoint. Unlike other debuggers, memory breakpoint is supported only on a whole memory page, but not on a subrange of the memory page.
- Search for non-English strings. Searching for non-English strings via the built-in strings search may not be able to find all the non-English strings. **Update: x64dbg now provides support for non-English strings through a generic algorithm.**
- Other pending issues at [issues.x64dbg.com](https://issues.x64dbg.com).

## 1.3 GUI manual

This section describes the usage of the program's graphical interface.

### Contents:

#### 1.3.1 Menus

This section describes menus in the GUI.

#### Content:

##### File

The file menu contains the following entries:

## Open

The **Open** action lets you open an executable to debug it. The file can be an EXE file or a DLL file.

The command for this action is *InitDebug/initdbg/init*.

## Recent Files

The **Recent Files** submenu contains several entries that you previously debugged. It does not include any file that cannot be debugged by the program.

The entries for this submenu can be found in the `Recent Files` section of the config INI file. You can edit that file to remove entries.

## Attach

Attach lets you attach to a running process. It will show a dialog listing the running processes, and allow you to choose one to attach. Currently you can only attach to an executable that is of the same architecture as the program. (eg, you cannot attach to a 64-bit process with x32dbg)

If you are debugging an executable, attaching to another process will terminate the previous debuggee.

The command for this action is *AttachDebugger/attach*.

## Detach

This action will detach the debugger from the debuggee, allowing the debuggee to run without being controlled by the debugger. You cannot execute this action when you are not debugging.

The command for this action is *DetachDebugger/detach*.

## Import database

This allows you to import a database.

The relevant command for this action is *dbload/loaddb*.

## Export database

This allows you to export an uncompressed database.

The relevant command for this action is *dbsave/savedb*.

## Patch file

Opens the patch dialog. You can view your patches and apply the patch to a file in the dialog.

## Restart as Admin

It will restart x64dbg and the current debuggee with administrator privilege.

### Exit

Terminate the debugger. If any process is being debugged by this program, they are going to be terminated as well.

### Debug

This menu contains the following actions. You cannot use any of these menu items except “**Restart**” and “**Command**” when you are not debugging.

### Run

Execute the command *run/go/r/g*.

### Run (Pass exceptions)

Execute the command *erun/ego/er/eg*.

### Run (swallow exception)

Execute the command *serun/sego*.

### Run until selection

Place a single-shoot software breakpoint at the selected instruction, and then execute the command *run/go/r/g* to run the debuggee.

### Run until expression

Enter an address. The debugger will then place a software breakpoint at that address, and then execute the command *run/go/r/g* to run the debuggee.

### Pause

Try to pause the debuggee when it is running, or try to stop animation. The command for this action is *pause*.

### Restart

Execute the command *InitDebug/initdbg/init* with the most recent used file.

### Close

Execute the command *StopDebug/stop/dbgstop*.

## Change Command Line

Display the current command line arguments of the debuggee in a dialog, and allow you to change it. The command line arguments will be saved in the database for later use.

## Step Into

Execute the command *StepInto/sti*.

## Step Into (pass exceptions)

Execute the command *eStepInto/esti*.

## Step Into (swallow exception)

Execute the command *seStepInto/sesti*.

## Step Into (source)

Step into, until another source line is reached. The command for this menu entry is `TraceIntoConditional src.line(cip) && !src.disp(cip)`.

## Trace into until condition

Enter an expression. The debugger will execute the command *TraceIntoConditional/ticnd*. Also see *Expressions* for the legal expression format.

## Animate into

Execute *StepInto/sti* command at a steady frequency automatically.

## Step Over

Execute the command *StepOver/step/sto/st*.

## Step Over (pass exceptions)

Execute the command *eStepOver/estep/esto/est*.

## Step Over (swallow exception)

Execute the command *seStepOver/sestep/sesto/sest*.

## Step Over (source)

Step over, until another source line is reached. The command for this menu entry is `TraceOverConditional src.line(cip) && !src.disp(cip).`

## Run to User Code

Execute the command *RunToUserCode/rtu*.

## Trace over until condition

Enter an expression. The debugger will execute the command *TraceOverConditional/tocnd*. Also see *Expressions* for the legal expression format.

## Animate over

Execute *StepOver/step/sto/st* command at a steady frequency automatically.

## Execute till return

Step over the instructions, until the current instruction pointed to by EIP or RIP is `ret` instruction.

The command for this action is *StepOut/rtr*.

## Execute till return (pass exceptions)

Step over the instructions, until the current instruction pointed to by EIP or RIP is `ret` instruction. This instruction passes first-chance exceptions to the debuggee but swallows second-chance exceptions.

The command for this action is *eStepOut/ertr*.

## Skip next instruction

Execute the command *skip*.

## Animate command

Pop up a dialog to enter a command, and execute that command at a steady frequency.

## Trace Coverage

## Undo last instruction

Execute the command *InstrUndo*.



## Command

Set focus to the command box at the bottom of the window, so that you can enter a command to execute.

## Hide debugger (PEB)

Execute the command *HideDebugger/dbh/hide*.

## Plugins

This menu includes all the available plugin menus. When you install a plugin, it may register a menu here. You can refer to the documentation of the plugin for more information.

## Scylla

Launch scylla.

## Favourites

This menu is customizable. When you click “Manage Favourite Tools” menu entry, a dialog will appear. You can add your custom tools to the menu, and also assign hotkeys to them. By default the path of the tool or script will appear in the menu, but if you set description of it, the description will appear in the menu instead.

- If you add %PID% in the command line of a tool, it will be replaced with the (decimal) PID of the debuggee (or 0 if not debugging).
- If you add %DEBUGGEE% it will add the (unquoted) full path of the debuggee.
- If you add %MODULE% it will add the (unquoted) full path of the module currently in the disassembly.
- If you add %-????-% it will perform *String Formatting* on whatever you put in place of ?????. Example: %-{cip}-% will be replaced with the hex value of cip.

Currently, three types of entries may be inserted into this menu: Tool, Script and Command.

### See also:

You can also add entries to this menu via the following commands:

*AddFavouriteCommand*

*AddFavouriteTool*

*AddFavouriteToolShortcut/SetFavouriteToolShortcut*

## Options

The options menu contains the following entries:

## Preferences

Show the *Settings* dialog. You can modify various settings in the dialog.

## Appearance

Show the **Appearance** dialog. You can customize the color scheme or font in the dialog.

## Shortcuts

Show the **Shortcuts** dialog. You can customize the shortcut keys for most of the operations.

## Customize Menus

Show the “Customize menus” dialog. You can click on the nodes to expand the corresponding menu and check or uncheck the menu items. Checked item will appear in “More commands” section of the menu, to shorten the menu displayed. You can check all menu entries that you don’t use.

## Topmost

Keep the main window above other windows(or stop staying topmost).

## Reload style.css

Reload `style.css` file. If this file is present, new color scheme specified in this file will be applied.

## Set Initialization Script

Set a initialization script globally or for the debuggee. If a global initialization script is specified, it will be executed when the program is at the system breakpoint or the attach breakpoint for every debuggee. If a per-debuggee initialization script is specified, it will be executed after the global initialization script finishes. You can clear the script setting by clearing the file path and click “OK” in the browse dialog.

## Import settings

Import settings from another configuration file. The corresponding entries in the configuration file will override the current configuration, but the missing entries will stay unmodified.

## Languages

Allow the user to choose a language for the program. “*American English - United States*” is the native language for the program.

## Help

This section describes the help menu.

## **Calculator**

Show a calculator that can perform expression evaluation, hex to decimal conversion and more.

## **Check for updates**

Connect to the server to query if an updated version of this software is available.

## **Donate**

Donate to the developer team.

## **Blog**

Visit the official blog.

## **Report Bug**

Report a bug about this software.

## **Manual**

The article you are reading.

## **FAQ**

View the solution of some frequently asked question.

## **About**

Information about this software.

## **Generate crash dump**

Generate an exception to generate a crash dump. This may help if the software encounters a deadlock. You can submit this crash dump to the developer team to help them fix the bug.

## **1.3.2 Views**

This section describes the usage of the views in the user interface.

### **Content:**

### CPU

This view is the main view. It includes the registers view, the disassembly view, the dump view and the watch view, the stack view, and the info box.

### Graph

Graph view contains the control flow graph. When you use *graph* command or context menu in the disassembly view (Default hotkey G), it will show the control flow graph here.

There are two modes to show the control flow graph: Normal mode and overview mode.

In overview mode, the program will draw all the control flow graph within the window area, but not output the disassembly. When the first instruction is traced when trace coverage is enabled on this memory page, the whole basic block will be shown in a different color (Default is green).

The graph view is now part of CPU view.

### Log

This view includes all the log messages. When an address is output in the log message, it will be shown as a hyperlink. You can click on it to follow it in disassembly or in dump, depending on its memory access rights.

The log view has the following context menu:

#### Clear

Clear the log view.

#### Select All

Select all the text of the log.

#### Copy

Copy the selected text.

#### Save

Save the log to a text file.

#### Disable Logging/Enable Logging

Disables or enables log output. When the logging is disabled, no more messages will output to the log.

#### Auto scroll

Enables or disables auto-scrolling. When enabled, the log view will scroll to the bottom as new log messages are coming in.

## Redirect Log

Redirect log message to a file. If you enable this feature, all the messages will be saved to a UTF-16 encoded text file. The message will be saved to the text file no matter whether logging is enabled.

## Disable Log Redirection

This menu entry is valid only if the log redirection is active. It stops log redirection.

## Notes

Notes view have two text fields to edit, one globally and one for the debuggee. Any text entered here will be saved, and will be restored in future debugging sessions, so the user can make notes conveniently. Global notes will be stored in “notes.txt” under the working directory. Debuggee notes will be stored in the debug database. You cannot edit per-debuggee notes while not debugging.

## Call Stack

Call stack view displays the call stack of the current thread. It has 6 columns.

**Address** is the base address of the stack frame.

**To** is the address of the code that is going to return to.

**From** is the probable address of the routine that is going to return.

**Size** is the size of the call stack frame, in bytes.

**Comment** is a brief description of the call stack frame.

**Party** describes whether the procedure that is going to return to, is a user module or a system module.

When **Show suspected call stack frame** option in the context menu in call stack view is active, it will search through the entire stack for possible return addresses. When it is inactive, it will use standard stack walking algorithm to get the call stack. It will typically get more results when **Show suspected call stack frame** option is active, but some of which may not be actual call stack frames.

## Trace

Trace view is a view in which you can see history of stepped instructions. This lets you examine the details of each instruction stepped when you are stepping manually or *tracing* automatically, or view a trace history previously saved. This functionality must be enabled explicitly from trace view or *CPU view*. It features saving all the instructions, registers and memory accesses during a trace.

You can double-click on columns to perform quick operation:

- Index: follow in disassembly.
- Address: toggle RVA display mode.
- Opcode: toggle breakpoint.
- Disassembly: follow in disassembly.
- Comments: set comments.

### Start trace recording

To enable trace logging into trace view, you first enable it via “**Start trace recording**” menu item. It will pop up a dialog allowing you to save the recorded instructions to a file. The default location of this file is in the database directory.

Once started, every instruction you stepped or traced will appear immediately in Trace view. If you let the application run the executed instructions will not be recorded.

### Stop trace recording

This menu can stop recording instructions.

### Close

Close current trace file and clear the trace view.

### Close and delete

Close current trace file and clear the trace view, and also delete current trace file from disk.

### Open

Open a trace file to view the content of it. It can be used when not debugging, but it is recommended that you debug the corresponding debuggee when viewing a trace, as it will be able to render the instructions with labels from the database of the debuggee. The debugger will show a warning if you want to load a trace file which is not recorded from currently debugged executable.

### Recent files

Open a recent file to view the content of it.

### Search

#### Constant

Search for the user-specified constant in the entire recorded trace, and record the occurrences in references view.

#### Memory Reference

Search for memory accesses to the user-specified address.

### Toggle Auto Disassembly Scroll

When turned on, the disassembly view in the *CPU view* will automatically follow the EIP or RIP of selected instruction in trace view.

### 1.3.3 Settings

This section describes the settings dialog and each setting in the dialog. All the settings with “\*” mark do not take effect until next start.

#### Contents:

#### Events

This page contains a list of debug events. You can specify whether the program should pause when the debug events happen.

#### System Breakpoint

This event happens when the process is being initialized but have not begun to execute user code yet.

#### TLS Callbacks

Set a single-shoot breakpoint on the TLS callbacks when a module is loaded to pause at the TLS callback.

#### Entry Breakpoint

Set a single-shoot breakpoint on the entry of the EXE module to pause at the entry point.

#### DLL Entry

Set a single-shoot breakpoint on the entry of the DLL module to pause at the entry point.

#### Attach Breakpoint

This event happens when the process is successfully attached.

#### Thread Entry

Set a single-shoot breakpoint on the entry of the thread when a thread is about to run.

#### DLL Load

Pause when a DLL is mapped to the address space.

#### DLL Unload

Pause when a DLL is unmapped from the address space.

### **Thread Start**

Pause when a new thread is about to run.

### **Thread End**

Pause when a thread has exited.

### **Debug Strings**

Pause when a debug string is emitted by the debuggee.

### **Exceptions**

This page contains a list of ignored exceptions. When a listed first-chance exception occurs, x64dbg will pass that exception to the debuggee without pausing.

#### **Add Range**

You can specify a range of exception codes to ignore. The input is hexadecimal.

#### **Delete Range**

Delete an ignored exception range, so that it will not be ignored.

#### **Add Last**

Add the last exception to the list.

### **GUI**

This section describes various settings in the GUI tab.

#### **Show FPU registers as little endian**

Some FPU registers, especially SSE and AVX registers, are usually used to perform parallel computation. Using little endian helps to correspond floating point numbers to their index in memory arrays. However, big endian representation are more familiar to most users. This option can set whether FPU registers are shown as little endian or as big endian. You also edit the FPU registers in the endianness set here.

#### **Save GUI layout and column orders**

Allow column order, width and layout of some views, to be saved in the config file. Note that not all views support this option. Currently, this option has not been implemented in the CPU view.



### **Don't show close dialog**

Do not show the close dialog when the debugger exits.

### **Show PID in HEX**

Show PID in hexadecimal in the attach dialog. If not set, it will use decimal, just like in the Task Manager.

### **Enable Load/Save Tab Order**

Allow x64dbg to load and save tab order. If not set, x64dbg will always use the default tab order.

### **Show Watch Labels in Side Bar**

When you add a watched variable in the watch view, a label with the name of the watched variable can appear in the side bar of the disassembly view if the address is in the sight. They just look like labels for registers. This label might help you understand the operation and progress of a self modifying routine. If disabled, no labels will be added in the side bar for watched variables.

### **Do not call SetForegroundWindow**

When a debug event occurs, x64dbg will focus itself so you can view the state of the debuggee. In some circumstances this might not be desired. This option can be used to tell x64dbg not to focus itself when a debug event occurs.

### **Show RVA addresses in graph view**

When enabled in graph view the offset addresses are shown in front of the disassembly.

### **Graph zoom mode**

Allows to zoom graph view by holding and turning the mousewheel up and down. Note: Press G on the CPU tab press G to open graph view

### **Show exit confirmation dialog**

When enabled the dialog “The debuggee is still running and will be terminated if you exit. Do you really want to exit?” is shown when you exit x64dbg but it's still attached to some process for debugging.

### **Disable auto completion in goto dialog**

Here you can turn of the auto completion that will suggest words as soon you start typing in the “Enter expression” dialog. Go to/expression from the right click context menu will bring up the “Enter expression” dialog. Note: That sting will be handy in case there are delays when typing.

## Show ASCII/Unicode in address dump mode

When enabled the column “ASCII” is added to the dump panels. Furthermore the view mode(right click) must be set to “Address” to see this effect. Note: The column “ASCII” must not be hidden. Right click on column header to bring up the ‘Edit column’ dialog to check. ^^ Note from the doc contributor: However please don’t ask why there is an option here when there is also that ‘Edit column’ dialog that does nearly the same thing.

## Other settings

These settings do not appear in settings dialog, nor can they be changed in x64dbg GUI elsewhere, but can be modified by editing the INI configuration file.

## Engine

### AnimateInterval

If set to a value of milliseconds, animation will proceed every specified milliseconds.

Update: This setting has been added into settings dialog, and previous lower limit of 20ms has been removed.

### MaxSkipExceptionCount

If set (default is 10000), during a run that ignores first-chance exceptions(example, `erun`), it will only ignore that specified number of first-chance exceptions. After that the debuggee will pause when one more first-chance exception happens. If set to 0 first-chance exceptions will always be ignored during such runs.

## Gui

### NonprintReplaceCharacter

If set to a Unicode value, dump view will use this character to represent nonprintable characters, instead of the default ”.”

### NullReplaceCharacter

If set to a Unicode value, dump view will use this character to represent null characters, instead of the default ”.”

## Misc

### AnimateIgnoreError

Set to 1 to ignore errors while animating, so animation will continue when an error in the animated command occurs.

### NoSeasons

Set to 1 to disable easter eggs and Christmas icons.

### 1.3.4 Dialogs

This sections describes the dialogs in x64dbg graphical user interface.

#### Contents:

#### Entropy

This dialog contains a graph that displays the entropy changing trend of selected data.

The height of each point represents the entropy of a continuous 128-byte data block. The data blocks are sampled evenly over the selected buffer. The base address differences between the neighbouring sampled data blocks are the same. If the selected buffer is over 38400 bytes ( $300 \times 128$ ), there will be gaps between sampled data blocks. If the selected buffer is less than 38400 bytes, the data blocks will overlap. If the selected buffer is less than 128 bytes (size of a data block), then the data block size will be set to half the buffer size.

### 1.3.5 Translate the x64dbg

The x64dbg GUI is currently available in multiple languages. The launcher is available in both English and Chinese.

You can choose the UI language in the *Options* menu.

You can contribute your translations at <http://translate.x64dbg.com>

### 1.3.6 Tips

This section contains some useful tips about the user interface of this program.

#### Modules view

The modules view is inside the symbols view.

#### Relative Addressing

If you double-click the address column, then relative addressing will be used. The address column will show the relative address relative to the double-clicked address.

#### Tables

You can reorder and hide any column by right-clicking, middle-clicking or double-clicking on the header. Alternatively, you can drag one column header to another one to exchange their order.

#### Highlight mode

Don't know how to highlight a register? Press Ctrl+H (or click "Highlight mode" menu on the disassembly view). When the red border is shown, click on the register(or command, immediate or any token), then that token will be highlighted with an underline.

## Middle mouse button

In disassembly view, pressing middle mouse button will copy the selected address to the clipboard.

## Select the entire function or block

You can select the entire function by double-clicking on the checkbox next to the disassembly. This checkbox can also be used to fold the block into a single line.

Note: when you select only 1 instruction, or if the function is not analyzed, the checkbox might not appear. In this case, please select the instruction you want to fold first.

## Code page

You can use the codepage dialog(in the context menu of the dump view) to select a code page. UTF-16LE is the codepage that matches windows unicode encoding. You can use UTF-16LE code page to view strings in a unicode application.

## Change Window Title

You can rename the windows of x64dbg by renaming “x64dbg.exe” or “x32dbg.exe” to another name, if the debuggee doesn’t support running in a system with a window or process named as such. You should also rename the “x64dbg.ini” or “x32dbg.ini” to keep it the same name as the debugger.

## Search for strings

You can use the following methods to search for string:

- Search for / Pattern: you will be asked to provide a string to search, and x64dbg will search for it and display the results in the references view.
- Search for / Strings references: x64dbg will search all pointers that look like an ANSI or Unicode string and display the results in the references view. Older versions of x64dbg supports only Latin strings, while latest x64dbg version supports non-English languages through a generic algorithm that may or may not work well in your language. **If you need to search for strings in other languages better, please install appropriate plugins.**
- Search for / Constant: search for a constant that is the first DWORD/QWORD of the string.

### 1.3.7 Unusual instructions

Unusual instructions are the instruction which is either privileged, invalid, have no use in ordinary applications, or make attempts to access sensitive information.

To notify the user of their existence, unusual instructions are usually special-colored in the disassembly.

The following instructions are considered unusual:

- All privileged instructions (including I/O instructions and RDMSR/WRMSR)
- RDTSC,RDTSCP,RDRAND,RDSEED
- CPUID
- SYSENTER and SYSCALL

- UD2 and UD2B

## 1.4 Commands

This is the documentation of x64dbg commands.

FAQ:

- Please note that all integer constants are represented in hex. For example, after executing the following command, `$i` will be 256 (0x100): `mov $i, 100`. This also means a variable cannot begin with letters from A to F.
- Throughout this documentation, `[arg1]` (argument with a square bracket) represents an optional argument. `arg1` (argument without a square bracket) represents a mandatory argument. “[” and “]” represent memory reference operation in expression evaluation for the argument. If you don’t want to refer to the content in the memory pointer, don’t add “[” and “]”.
- For commands with two or more arguments, a comma (,) is used to separate these arguments. Do not use a space to separate the arguments.
- x64dbg only supports integer in expressions. Strings, Floating point numbers and SSE/AVX data is not supported. Therefore you cannot use `[eax]== "abcd"` operator to compare strings. Instead, you can compare the first DWORD/QWORD of the string, or use an appropriate plugin which provides such feature.
- The “==” operator is used to test if both operands are equal. The “=” operator is used to transfer the value of the expression to the destination.

**Contents:**

### 1.4.1 General Purpose

This section contains various commands that are used for calculations etc.

**Content:**

#### **inc**

Increase a value.

#### **arguments**

`arg1` Destination.

#### **result**

This command does not set any result variables.

#### **dec**

Decrease a value.

### **arguments**

arg1 Destination.

### **result**

This command does not set any result variables.

### **add**

Add two values.

### **arguments**

arg1 Destination.

arg2 Source.

### **result**

This command does not set any result variables.

### **sub**

Subtract two values.

### **arguments**

arg1 Destination.

arg2 Source.

### **result**

This command does not set any result variables.

### **mul**

Multiply two values.

### **arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

**div**

Devide two values.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

**and**

Binary AND two values.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

**or**

Binary OR two values.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

## **xor**

Binary XOR two values.

### **arguments**

arg1 Destination.

arg2 Source.

### **result**

This command does not set any result variables.

## **neg**

Negate a value.

### **arguments**

arg1 Destination.

### **result**

This command does not set any result variables.

## **not**

Binary NOT a value.

### **arguments**

arg1 Destination.

### **result**

This command does not set any result variables.

## **bswap**

Perform a bswap operation.

### **arguments**

arg1 Destination.



**result**

This command does not set any result variables.

**rol**

Binary ROL a value.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

**ror**

Binary ROR a value.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

**shl/sal**

Binary SHL/SAL (signed/unsigned shift left) a value.

**arguments**

arg1 Destination.

arg2 Source.

**result**

This command does not set any result variables.

## **shr**

Binary SHR (unsigned shift right) a value.

### **arguments**

arg1 Destination.

arg2 Source.

### **result**

This command does not set any result variables.

## **sar**

Binary SAR (signed shift right) a value.

### **arguments**

arg1 Destination.

arg2 Source.

### **result**

This command does not set any result variables.

## **push**

Push a value on the stack.

### **arguments**

arg1 The value to push on the stack.

### **result**

This command does not set any result variables.

## **pop**

Pop a value from the stack.

### arguments

[arg1] The destination. When not specified it will just increase CSP.

### result

This command does not set any result variables.

### test

Binary TEST a value.

### arguments

arg1 Value to test.

arg2 Tester.

### result

This command sets the internal variables `$_EZ_FLAG` and `$_BS_FLAG`. `$_EZ_FLAG` is set to 1 when `arg1 & arg2 == 0`. `$_BS_FLAG` is always set to 0.

### cmp

This command compares two expressions. Notice that when you want to check for values being bigger or smaller, the comparison `arg1>arg2` is made. If this evaluates to true, the `$_BS_FLAG` is set to 1, meaning the value is bigger. So you test if `arg1` is bigger/smaller than `arg2`.

### arguments

arg1 First expression to compare.

arg2 Second expression to compare.

### result

This command sets the internal variables `$_EZ_FLAG` and `$_BS_FLAG`. They are checked when a branch is performed.

### mov/set

Set a variable.

## **arguments**

`arg1` Variable name (optionally prefixed with a `$`) to set. When the variable does not exist, it will be created.

`arg2` Value to store in the variable. If you use `#11 22 33#` it will write the bytes `11 22 33` in the process memory at `arg1`.

## **result**

This command does not set any result variables.

## **1.4.2 Debug Control**

### **Contents:**

#### **InitDebug/initdbg/init**

Initializes the debugger. This command will load the executable (do some basic checks), set breakpoints on TLS callbacks (if present), set a breakpoint at the process entry point and break at the system breakpoint before giving back control to the user.

## **arguments**

`arg1` Path to the executable file to debug. If no full path is given, the `GetCurrentDirectory` API will be called to retrieve a full path. Use quotation marks to include spaces in your path.

[`arg2`] Commandline to create the process with.

[`arg3`] Current folder (passed to the `CreateProcess` API).

## **result**

This command will give control back to the user after the system breakpoint is reached. It will set `$pid` and `$hp/$hProcess` variables.

#### **StopDebug/stop/dbgstop**

Terminate the current debuggee and stop debugging it.

## **arguments**

This command has no arguments.

## **result**

This command does not set any result variables.

### **AttachDebugger/attach**

Attach the debugger to a running process.

#### **arguments**

[arg1] Process Identifier (PID) of the running process.

[arg2] Handle to an Event Object to signal (this is for internal use only).

[arg3] Thread Identifier (TID) of the thread to resume after attaching (this is for internal use only).

#### **result**

This command will give control back to the user after the system breakpoint is reached. It will set \$pid and \$hp/\$hProcess variables.

### **DetachDebugger/detach**

Detach the debugger from the currently-debugged process.

#### **arguments**

This command has no arguments.

#### **results**

This command does not set any result variables.

### **run/go/r/g**

Free the lock and allow the program to run.

#### **arguments**

[arg1] When specified, place a single-shot breakpoint at this location before running.

#### **results**

This command does not set any result variables.

### **erun/ego/er/eg**

Free the lock and allow the program to run, **passing all first-chance exceptions to the debuggee.**

### **arguments**

[arg1] When specified, place a single-shot breakpoint at this location before running.

### **results**

This command does not set any result variables.

### **serun/sego**

Free the lock and allow the program to run, **swallowing the current exception, skipping exception dispatching in the debuggee.**

### **arguments**

[arg1] When specified, place a single-shot breakpoint at this location before running.

### **results**

This command does not set any result variables.

### **pause**

Pause the debuggee or stop animation if animation is in progress.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

### **DebugContinue/con**

Set debugger continue status.

### **arguments**

[arg1] When set (to anything), the exception will be handled by the program. Otherwise the exception will be swallowed.

### **result**

This command does not set any result variables.

### StepInto/sti

Single Step (using Trap-Flag).

#### arguments

[arg1] The number of steps to take. If not specified 1 is used.

#### result

This command does not set any result variables.

### eStepInto/esti

Single Step (using Trap-Flag), **passing all first-chance exceptions to the debuggee.**

#### arguments

[arg1] The number of steps to take. If not specified 1 is used.

#### result

This command does not set any result variables.

### seStepInto/sesti

Single Step (using Trap-Flag), **swallowing the current exception, skipping exception dispatching in the debuggee.**

#### arguments

[arg1] The number of steps to take. If not specified 1 is used.

#### result

This command does not set any result variables.

### StepOver/step/sto/st

Step over calls. When the instruction at EIP/RIP isn't a call, a StepInto is performed.

#### arguments

This command has no arguments.

## **results**

This command does not set any result variables.

## **eStepOver/estep/esto/est**

Step over calls, **passing all first-chance exceptions to the debuggee**. When the instruction at EIP/RIP isn't a call, a `eStepInto` is performed.

## **arguments**

[arg1] The number of steps to take. If not specified 1 is used.

## **result**

This command does not set any result variables.

## **seStepOver/sestep/sesto/sest**

Step over calls, **swallowing the current exception, skipping exception dispatching in the debuggee**. When the instruction at EIP/RIP isn't a call, a `eStepInto` is performed.

## **arguments**

[arg1] The number of steps to take. If not specified 1 is used.

## **result**

This command does not set any result variables.

## **StepOut/rtr**

Return from function by calling `StepOver` until the current instruction is a RET.

## **arguments**

[arg1] The number of times to step out. If not specified 1 is used.

## **result**

This command does not set any result variables.



### eStepOut/etr

Return from function by calling eStepOver until the current instruction is a RET. This command **passes all first-chance exceptions to the debuggee**.

#### arguments

[arg1] The number of times to step out. If not specified 1 is used.

#### result

This command does not set any result variables.

### skip

Skip the next instruction. This command swallows the current exception (if present). Useful if you want to continue after an INT3 command.

#### arguments

[arg1] The number of instructions to skip. If not specified 1 is used.

#### result

This command does not set any result variables.

### InstrUndo

Undo last instruction stepped. This command is only valid if some instructions are stepped in. Stepping over, running or tracing will clear the history context.

#### arguments

This command has no arguments.

#### results

This command does not set any result variables.

## 1.4.3 Breakpoint Control

This section contains breakpoint control (set/delete/enable/disable) commands.

**Context:**

## **SetBPX/bp/bpx**

Set an INT3 (SHORT/LONG) or UD2 breakpoint and optionally assign a name to it.

### **arguments**

`arg1` Address to put a breakpoint on. This can be an API name.

`[arg2]` Name of the breakpoint, use quotation marks to include spaces. This name can be used by the `EnableBPX`, `DisableBPX` and `DeleteBPX` functions as alias, but is mainly intended to provide a single line of information about the currently-hit breakpoint. When `arg2` equals to a valid type (`arg3`) the type is used and `arg2` is ignored.

`[arg3]` Breakpoint type. Can be one of the following options in random order: “ss” (single shot breakpoint), “long” (CD03), “ud2” (0F0B) and “short” (CC). You can combine the “ss” option with one of the type options in one string. Example: “SetBPX 00401000,”entrypoint”,ssud2” will set a single shot UD2 breakpoint at 00401000 with the name “entrypoint”. When specifying no type or just the type “ss” the default type will be used. Per default this equals to the “short” type. You can change the default type using the “SetBPXOptions” command.

### **result**

This command does not any result variables.

## **DeleteBPX/bpc/bc**

Delete a breakpoint set using the `SetBPX` command.

### **arguments**

`[arg1]` Name or address of the breakpoint to delete. If this argument is not specified, all breakpoints will be deleted.

### **result**

This command does not set any result variables.

## **EnableBPX/bpe/be**

Enable a breakpoint set using the `SetBPX` command.

### **arguments**

`[arg1]` Name or address of the breakpoint to enable. If this argument is not specified, all breakpoints will be enabled.

### **result**

This command does not set any result variables.

### **DisableBPX/bpd/bd**

Disable a breakpoint set using the SetBPX command.

#### **arguments**

[arg1] Name or address of the breakpoint to disable. If this argument is not specified, all breakpoints will be disabled.

#### **result**

This command does not set any result variables.

### **SetHardwareBreakpoint/bph/bphws**

Set a hardware breakpoint (using debug registers).

#### **arguments**

arg1 Address of the hardware breakpoint.

[arg2] Hardware breakpoint type. Can be either 'r' (readwrite), 'w' (write) or 'x' (execute). When not specified, 'x' is assumed.

[arg3] Hardware breakpoint size. Can be either '1', '2', '4' or '8' (x64 only). Per default, '1' is assumed. The address you're putting the hardware breakpoint on must be aligned to the specified size.

#### **result**

This command does not set any result variables.

### **DeleteHardwareBreakpoint/bphc/bphwc**

Delete a hardware breakpoint set using the SetHardwareBreakpoint command.

#### **arguments**

[arg1] Name or address of the hardware breakpoint to delete. If this argument is not specified, all hardware breakpoints will be deleted.

#### **result**

This command does not set any result variables.

### **EnableHardwareBreakpoint/bphe/bphwe**

Enable a previously disabled hardware breakpoint.

## **arguments**

[arg1] Address of the hardware breakpoint to enable. If this argument is not specified, as many as possible hardware breakpoints will be enabled.

## **result**

This command does not set any result variables.

## **DisableHardwareBreakpoint/bphd/bphwd**

Disable a hardware breakpoint.

## **arguments**

[arg1] Address of the hardware breakpoint to disable. If this argument is not specified, all hardware breakpoints will be disabled.

## **result**

This command does not set any result variables.

## **SetMemoryBPX/membp/bpm**

Set a memory breakpoint (GUARD\_PAGE) on the whole memory region the provided address is in.

## **arguments**

arg1 Address of or inside a memory region that will be watched.

[arg2] 1/0 restore the memory breakpoint once it's hit? When this value is not equal to '1' or '3', it's assumed to be arg3. This means "bpm eax,r" would be the same command as: "bpm eax,0,r".

[arg3] Breakpoint type, it can be 'a' (read+write+execute) 'r' (read), 'w' (write) or 'x' (execute). Per default, it's 'a' (read+write+execute)

## **result**

This command does not set any result variables.

## **DeleteMemoryBPX/membpc/bpmc**

Delete a memory breakpoint set using the SetMemoryBPX command.

### arguments

[arg1] Name or (base) address of the memory breakpoint to delete. If this argument is not specified, all memory breakpoints will be deleted.

### result

This command does not set any result variables.

### EnableMemoryBreakpoint/membpe/bpme

Enable a previously disabled memory breakpoint.

### arguments

[arg1] Address of the memory breakpoint to enable. If this argument is not specified, all memory breakpoints will be enabled.

### result

This command does not set any result variables.

### DisableMemoryBreakpoint/membpd/bpmd

Disable a memory breakpoint.

### arguments

[arg1] Address of the memory breakpoint to disable. If this argument is not specified, all memory breakpoints will be disabled.

### result

This command does not set any result variables.

### LibrarianSetBreakpoint/bpdll

Set a singleshoot breakpoint on DLL load/unload.

### arguments

arg1 DLL Name to break on.

[arg2] a means on load and unload, l means on load, u means on unload. When not specified, x64dbg will break on both load and unload.

[arg3] When specified, the breakpoint will be singleshoot. When not specified the breakpoint will not be removed after it has been hit.

### result

This command does not set any result variables.

### LibrarianRemoveBreakpoint/bcdll

Remove a DLL breakpoint.

### arguments

arg1 DLL Name to remove the breakpoint from.

### result

This command does not set any result variables.

### LibrarianEnableBreakpoint/bpedll

Enable a DLL breakpoint set using the LibrarianSetBreakpoint command.

### arguments

[arg1] DLL Name of the DLL breakpoint to enable. If this argument is not specified, all DLL breakpoints will be enabled.

### result

This command does not set any result variables.

### LibrarianDisableBreakpoint/bpddll

Enable a DLL breakpoint set using the LibrarianSetBreakpoint command.

### arguments

[arg1] DLL Name of the DLL breakpoint to disable. If this argument is not specified, all DLL breakpoints will be disabled.

### result

This command does not set any result variables.

## SetExceptionBPX

Set an exception breakpoint. If an exception breakpoint is active, all the exceptions with the same chance and code will be captured as a breakpoint event and will not be handled by the default exception handling policy.

### arguments

`arg1` Exception name or code of the new exception breakpoint

`[arg2]` Chance. Set to `first/1` to capture first-chance exceptions, `second/2` to capture second-chance exceptions, `all/3` to capture all exceptions. Default value is `first`.

### result

This command does not any result variables.

## DeleteExceptionBPX

Delete an exception breakpoint set using the SetExceptionBPX command.

### arguments

`[arg1]` Name, exception name or code of the exception breakpoint to delete. If this argument is not specified, all exception breakpoints will be deleted.

### result

This command does not set any result variables.

## EnableExceptionBPX

Enable an exception breakpoint set using the SetExceptionBPX command.

### arguments

`[arg1]` Name, exception name or code of the exception breakpoint to enable. If this argument is not specified, all exception breakpoints will be enabled.

### result

This command does not set any result variables.

## DisableExceptionBPX

Disable an exception breakpoint set using the SetExceptionBPX command.

### arguments

[arg1] Name, exception name or code of the exception breakpoint to enable. If this argument is not specified, all exception breakpoints will be disabled.

### result

This command does not set any result variables.

### bpgoto

Configure the breakpoint so that when the program reaches it, the program will be directed to a new location. It is equivalent to the following commands:

```
SetBreakpointCondition arg1, 0
SetBreakpointCommand arg1, "CIP=arg2"
SetBreakpointCommandCondition arg1, 1
SetBreakpointFastResume arg1, 0
```

### arguments

arg1 The address of the breakpoint.

arg2 The new address to execute if the breakpoint is reached.

### results

This command does not set any result variables.

### bplist

Get a list of breakpoints. This list includes their state (enabled/disabled), their type, their address and (optionally) their names.

### arguments

This command has no arguments.

### result

This command does not set any result variables. A list entry has the following format:

STATE:TYPE:ADDRESS[:NAME]

STATE can be 0 or 1. 0 means disabled, 1 means enabled. Only singleshoot and 'normal' breakpoints can be disabled.

TYPE can be one of the following values: BP, SS, HW and GP. BP stands for a normal breakpoint (set using the SetBPX command), SS stands for SINGLESLOT, HW stands for HARDWARE and GP stand for Guard Page, the way of setting memory breakpoints.



ADDRESS is the breakpoint address, given in 32 and 64 bits for the x32 and x64 debugger respectively.

NAME is the name assigned to the breakpoint.

### **SetBPXOptions/bptype**

Set the default type for the “SetBPX” command.

#### **arguments**

arg1 Default type. This can be “short” (CC), “long” (CD03) or “ud2” (0F0B). Type default type affects both NORMAL and SINGLESHOT breakpoints.

#### **result**

This command does not set any result variables.

## **1.4.4 Conditional Breakpoint Control**

This section describes commands that can be used to set various advanced properties of breakpoints.

### **Contents:**

#### **SetBreakpointName/bpname**

Sets the name of a software breakpoint. It will be displayed in the breakpoints view and in the log when the breakpoint is hit.

#### **arguments**

arg1 The address of an existing software breakpoint.

[arg2] The name of the breakpoint (empty when not specified).

#### **result**

This command does not set any result variables.

#### **SetBreakpointCondition/bpcond/bpcnd**

Sets the software breakpoint condition. When this condition is set, it is evaluated every time the breakpoint hits and the debugger would stop only if condition is not 0.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The condition expression.

## **result**

This command does not set any result variables.

## **SetBreakpointLog/bplog/bpl**

Sets log text when a software breakpoint is hit. When log condition is not specified, it will always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

arg1 The address of the breakpoint.

[arg2] The log format string (see introduction/formatting).

## **result**

This command does not set any result variables.

## **SetBreakpointLogCondition/bplogcondition**

Sets the logging condition of a software breakpoint. When log condition is not specified, log text always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

arg1 The address of the breakpoint.

[arg2] The logging condition (default condition when not specified).

## **result**

This command does not set any result variables.

## **SetBreakpointCommand**

Sets the command to execute when a software breakpoint is hit. If the command condition is not specified, it will be executed when the debugger breaks, otherwise it will be executed when the condition is satisfied.

## **arguments**

arg1 The address of the breakpoint.

[arg2] The command (empty when not specified).

**result**

This command does not set any result variables.

**SetBreakpointCommandCondition**

Sets the command condition of a software breakpoint. When command condition is not specified, the command will be executed when the debugger would break, otherwise it will be executed when the condition is satisfied.

**arguments**

arg1 The address of the breakpoint.

[arg2] The command condition (default condition when not specified).

**result**

This command does not set any result variables.

**SetBreakpointFastResume**

Sets the fast resume flag of a software breakpoint. If this flag is set and the break condition doesn't evaluate to break, no GUI, plugin, logging or any other action will be performed, except for incrementing the hit counter.

**arguments**

arg1 The address of the breakpoint.

[arg2] The fast resume flag. If it is 0 (default), fast resume is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

**SetBreakpointSingleshoot**

Sets the singleshoot flag of a software breakpoint. If this flag is set the breakpoint will be removed on the first hit.

**arguments**

arg1 The address of the breakpoint.

[arg2] The singleshoot flag. If it is 0 (default), singleshoot is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

### **SetBreakpointSilent**

Sets the silent flag of a software breakpoint. If this flag is set, the default log message will not appear. User-defined log is not affected.

#### **arguments**

`arg1` The address of the breakpoint.

`[arg2]` The silent flag. If it is 0 (default), silent is disabled, otherwise it is enabled

#### **result**

This command does not set any result variables.

### **GetBreakpointHitCount**

Gets the hit counter of a software breakpoint.

#### **arguments**

`arg1` The address of the breakpoint.

#### **result**

`$result` will be set to the current value of the hit counter.

### **ResetBreakpointHitCount**

Resets the hit counter of a software breakpoint.

#### **arguments**

`arg1` The address of the breakpoint.

`[arg2]` The new hit count (zero when not specified).

#### **result**

This command does not set any result variables.

### **SetHardwareBreakpointName/bphwname**

Sets the name of a hardware breakpoint. It will be displayed in the breakpoints view and in the log when the breakpoint is hit.

**arguments**

arg1 The address of an existing hardware breakpoint.

[arg2] The name of the breakpoint (empty when not specified).

**result**

This command does not set any result variables.

**SetHardwareBreakpointCondition/bphwcond**

Sets the hardware breakpoint condition. When this condition is set, it is evaluated every time the breakpoint hits and the debugger would stop only if condition is not 0.

**arguments**

arg1 The address of the breakpoint.

[arg2] The condition expression.

**result**

This command does not set any result variables.

**SetHardwareBreakpointLog/bphwlog**

Sets log text when a hardware breakpoint is hit. When log condition is not specified, it will always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

**arguments**

arg1 The address of the breakpoint.

[arg2] The log format string (see introduction/formatting).

**result**

This command does not set any result variables.

**SetHardwareBreakpointLogCondition/bphwlogcondition**

Sets the logging condition of a hardware breakpoint. When log condition is not specified, log text always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

`arg1` The address of the breakpoint.

`[arg2]` The logging condition (default condition when not specified).

## **result**

This command does not set any result variables.

## **SetHardwareBreakpointCommand**

Sets the command to execute when a hardware breakpoint is hit. If the command condition is not specified, it will be executed when the debugger breaks, otherwise it will be executed when the condition is satisfied.

## **arguments**

`arg1` The address of the breakpoint.

`[arg2]` The command (empty when not specified).

## **result**

This command does not set any result variables.

## **SetHardwareBreakpointCommandCondition**

Sets the command condition of a hardware breakpoint. When command condition is not specified, the command will be executed when the debugger would break, otherwise it will be executed when the condition is satisfied.

## **arguments**

`arg1` The address of the breakpoint.

`[arg2]` The command condition (default condition when not specified).

## **result**

This command does not set any result variables.

## **SetHardwareBreakpointFastResume**

Sets the fast resume flag of a hardware breakpoint. If this flag is set and the break condition doesn't evaluate to break, no GUI, plugin, logging or any other action will be performed, except for incrementing the hit counter.

**arguments**

arg1 The address of the breakpoint.

[arg2] The fast resume flag. If it is 0 (default), fast resume is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

**SetHardwareBreakpointSingleshoot**

Sets the singleshoot flag of a hardware breakpoint. If this flag is set the breakpoint will be removed on the first hit.

**arguments**

arg1 The address of the breakpoint.

[arg2] The singleshoot flag. If it is 0 (default), singleshoot is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

**SetHardwareBreakpointSilent**

Sets the silent flag of a hardware breakpoint. If this flag is set, the default log message will not appear. User-defined log is not affected.

**arguments**

arg1 The address of the breakpoint.

[arg2] The silent flag. If it is 0 (default), silent is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

**GetHardwareBreakpointHitCount**

Gets the hit counter of a hardware breakpoint.

**arguments**

arg1 The address of the breakpoint.

## **result**

\$result will be set to the current value of the hit counter.

## **ResetHardwareBreakpointHitCount**

Resets the hit counter of a hardware breakpoint.

## **arguments**

arg1 The address of the breakpoint.

[arg2] The new hit count (zero when not specified).

## **result**

This command does not set any result variables.

## **SetMemoryBreakpointName/bpmname**

Sets the name of a memory breakpoint. It will be displayed in the breakpoints view and in the log when the breakpoint is hit.

## **arguments**

arg1 The address of an existing memory breakpoint.

[arg2] The name of the breakpoint (empty when not specified).

## **result**

This command does not set any result variables.

## **SetMemoryBreakpointCondition/bpmcond**

Sets the memory breakpoint condition. When this condition is set, it is evaluated every time the breakpoint hits and the debugger would stop only if condition is not 0.

## **arguments**

arg1 The address of the breakpoint.

[arg2] The condition expression.

## **result**

This command does not set any result variables.



### **SetMemoryBreakpointLog/bpmlog**

Sets log text when a memory breakpoint is hit. When log condition is not specified, it will always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The log format string (see introduction/formatting).

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointLogCondition/bpmlogcondition**

Sets the logging condition of a memory breakpoint. When log condition is not specified, log text always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The logging condition (default condition when not specified).

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointCommand**

Sets the command to execute when a memory breakpoint is hit. If the command condition is not specified, it will be executed when the debugger breaks, otherwise it will be executed when the condition is satisfied.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The command (empty when not specified).

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointCommandCondition**

Sets the command condition of a memory breakpoint. When command condition is not specified, the command will be executed when the debugger would break, otherwise it will be executed when the condition is satisfied.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The command condition (default condition when not specified).

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointFastResume**

Sets the fast resume flag of a memory breakpoint. If this flag is set and the break condition doesn't evaluate to break, no GUI, plugin, logging or any other action will be performed, except for incrementing the hit counter.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The fast resume flag. If it is 0 (default), fast resume is disabled, otherwise it is enabled

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointSingleshoot**

Sets the singleshoot flag of a memory breakpoint. If this flag is set the breakpoint will be removed on the first hit.

#### **arguments**

arg1 The address of the breakpoint.

[arg2] The singleshoot flag. If it is 0 (default), singleshoot is disabled, otherwise it is enabled

#### **result**

This command does not set any result variables.

### **SetMemoryBreakpointSilent**

Sets the silent flag of a memory breakpoint. If this flag is set, the default log message will not appear. User-defined log is not affected.

**arguments**

arg1 The address of the breakpoint.

[arg2] The silent flag. If it is 0 (default), silent is disabled, otherwise it is enabled

**result**

This command does not set any result variables.

**GetMemoryBreakpointHitCount**

Gets the hit counter of a memory breakpoint.

**arguments**

arg1 The address of the breakpoint.

**result**

\$result will be set to the current value of the hit counter.

**ResetMemoryBreakpointHitCount**

Resets the hit counter of a memory breakpoint.

**arguments**

arg1 The address of the breakpoint.

[arg2] The new hit count (zero when not specified).

**result**

This command does not set any result variables.

**SetLibrarianBreakpointName**

Sets the name of a librarian breakpoint. It will be displayed in the breakpoints view and in the log when the breakpoint is hit.

**arguments**

arg1 The DLL name.

[arg2] The name of the breakpoint (empty when not specified).

## **result**

This command does not set any result variables.

## **SetLibrarianBreakpointCondition**

Sets the librarian breakpoint condition. When this condition is set, it is evaluated every time the breakpoint occurs and the debugger would stop only if condition is not 0.

## **arguments**

arg1 The DLL name.

[arg2] The condition expression.

## **result**

This command does not set any result variables.

## **SetLibrarianBreakpointLog**

Sets log text when a librarian breakpoint is hit. When log condition is not specified, it will always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

arg1 The DLL name.

[arg2] The log format string (see introduction/formatting).

## **result**

This command does not set any result variables.

## **SetLibrarianBreakpointLogCondition**

Sets the logging condition of a librarian breakpoint. When log condition is not specified, log text always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

arg1 The DLL name.

[arg2] The logging condition (default condition when not specified).

**result**

This command does not set any result variables.

**SetLibrarianBreakpointCommand**

Sets the command to execute when a librarian breakpoint is hit. If the command condition is not specified, it will be executed when the debugger breaks, otherwise it will be executed when the condition is satisfied.

**arguments**

arg1 The DLL name.

[arg2] The command (empty when not specified).

**result**

This command does not set any result variables.

**SetLibrarianBreakpointCommandCondition**

Sets the command condition of a librarian breakpoint. When command condition is not specified, the command will be executed when the debugger would break, otherwise it will be executed when the condition is satisfied.

**arguments**

arg1 The DLL name.

[arg2] The command condition (default condition when not specified).

**result**

This command does not set any result variables.

**SetLibrarianBreakpointFastResume**

Sets the fast resume flag of a librarian breakpoint. If this flag is set and the break condition doesn't evaluate to break, no GUI, plugin, logging or any other action will be performed, except for incrementing the hit counter.

**arguments**

arg1 The DLL name.

[arg2] The fast resume flag. If it is 0 (default), fast resume is disabled, otherwise it is enabled

## **result**

This command does not set any result variables.

## **SetLibrarianBreakpointSingleshoot**

Sets the singleshoot flag of a librarian breakpoint. If this flag is set the librarian breakpoint will be removed on the first hit.

## **arguments**

`arg1` The DLL name.

`[arg2]` The singleshoot flag. If it is 0 (default), singleshoot is disabled, otherwise it is enabled

## **result**

This command does not set any result variables.

## **SetLibrarianBreakpointSilent**

Sets the silent flag of a librarian breakpoint. If this flag is set, the default log message will not appear. User-defined log is not affected.

## **arguments**

`arg1` The DLL name.

`[arg2]` The silent flag. If it is 0 (default), silent is disabled, otherwise it is enabled

## **result**

This command does not set any result variables.

## **GetLibrarianBreakpointHitCount**

Gets the hit counter of a librarian breakpoint.

## **arguments**

`arg1` The DLL name.

## **result**

`$result` will be set to the current value of the hit counter.

### **ResetLibrarianBreakpointHitCount**

Resets the hit counter of a librarian breakpoint.

#### **arguments**

arg1 The DLL name.

[arg2] The new hit count (zero when not specified).

#### **result**

This command does not set any result variables.

### **SetExceptionBreakpointName**

Sets the name of an exception breakpoint. It will be displayed in the breakpoints view and in the log when the breakpoint is hit.

#### **arguments**

arg1 The name, exception name or code of the exception breakpoint.

[arg2] The name of the breakpoint (empty when not specified).

#### **result**

This command does not set any result variables.

### **SetExceptionBreakpointCondition**

Sets the exception breakpoint condition. When this condition is set, it is evaluated every time the exception occurs (chance must match) and the debugger would stop only if condition is not 0.

#### **arguments**

arg1 The name, exception name or code of the exception breakpoint.

[arg2] The condition expression.

#### **result**

This command does not set any result variables.

### **SetExceptionBreakpointLog**

Sets log text when an exception breakpoint is hit. When log condition is not specified, it will always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The log format string (see introduction/formatting).

## **result**

This command does not set any result variables.

## **SetExceptionBreakpointLogCondition**

Sets the logging condition of an exception breakpoint. When log condition is not specified, log text always be logged regardless of the break condition, otherwise it will be logged when the logging condition is satisfied.

## **arguments**

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The logging condition (default condition when not specified).

## **result**

This command does not set any result variables.

## **SetExceptionBreakpointCommand**

Sets the command to execute when an exception breakpoint is hit. If the command condition is not specified, it will be executed when the debugger breaks, otherwise it will be executed when the condition is satisfied.

## **arguments**

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The command (empty when not specified).

## **result**

This command does not set any result variables.

## **SetExceptionBreakpointCommandCondition**

Sets the command condition of an exception breakpoint. When command condition is not specified, the command will be executed when the debugger would break, otherwise it will be executed when the condition is satisfied.



## arguments

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The command condition (default condition when not specified).

## result

This command does not set any result variables.

### SetExceptionBreakpointFastResume

Sets the fast resume flag of an exception breakpoint. If this flag is set and the break condition doesn't evaluate to break, no GUI, plugin, logging or any other action will be performed, except for incrementing the hit counter.

## arguments

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The fast resume flag. If it is 0 (default), fast resume is disabled, otherwise it is enabled

## result

This command does not set any result variables.

### SetExceptionBreakpointSingleshoot

Sets the singleshoot flag of an exception breakpoint. If this flag is set the exception breakpoint will be removed on the first hit.

## arguments

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The singleshoot flag. If it is 0 (default), singleshoot is disabled, otherwise it is enabled

## result

This command does not set any result variables.

### SetExceptionBreakpointSilent

Sets the silent flag of an exception breakpoint. If this flag is set, the default log message will not appear. User-defined log is not affected.

## **arguments**

`arg1` The name, exception name or code of the exception breakpoint.

`[arg2]` The silent flag. If it is 0 (default), silent is disabled, otherwise it is enabled

## **result**

This command does not set any result variables.

## **GetExceptionBreakpointHitCount**

Gets the hit counter of an exception breakpoint.

## **arguments**

`arg1` The name, exception name or code of the exception breakpoint.

## **result**

`$result` will be set to the current value of the hit counter.

## **ResetExceptionBreakpointHitCount**

Resets the hit counter of an exception breakpoint.

## **arguments**

`arg1` The name, exception code or name of the exception breakpoint.

`[arg2]` The new hit count (zero when not specified).

## **result**

This command does not set any result variables.

### **See also:**

*Conditional Breakpoints*

## **1.4.5 Tracing**

### **Contents:**

#### **TraceIntoConditional/ticnd**

Trace the program by `StepInto`, until the specified condition is satisfied, or maximum number of steps reached.

### arguments

`arg1` The condition used. When this is evaluated to be a value other than 0, tracing will stop.

`[arg2]` The maximum step count to trace before the debugger gives up.

### results

This command does not set any result variables.

### TraceOverConditional/tocnd

Trace the program by `StepOver`, until the specified condition is satisfied, or maximum number of steps reached.

### arguments

`arg1` The condition used. When this is evaluated to be a value other than 0, tracing will stop.

`[arg2]` The maximum step count to trace before the debugger gives up.

### results

This command does not set any result variables.

### TraceIntoBeyondTraceCoverage/TraceIntoBeyondTraceRecord/tibt

Perform `StepInto` until the program reaches somewhere outside the trace coverage. This is similar to `ticnd tr.hitcount(cip)==0&&arg1, arg2` except that it achieves higher performance by avoiding the expression function invocation.

Usage example: If you want to find out the forking point of the program when different inputs are provided, first enable or re-enable trace coverage to clean trace coverage data. Then you trace while input A is provided. Finally you provide input B and execute `TraceIntoBeyondTraceRecord` command. The program will be paused where the instruction is never executed before.

### arguments

`[arg1]` The break condition of tracing. When this condition is satisfied, tracing will stop regardless of EIP/RIP location. If this argument is not specified then tracing will be unconditional.

`[arg2]` The maximum steps before the debugger gives up. If this argument is not specified, the default value will be 50000.

### result

This command does not set any result variables.

### **TraceOverBeyondTraceCoverage,TraceOverBeyondTraceRecord/tobt**

Perform StepOver until the program reaches somewhere outside the trace coverage.

#### **arguments**

[arg1] The break condition of tracing. When this condition is satisfied, tracing will stop regardless of EIP/RIP location. If this argument is not specified then tracing will be unconditional.

[arg2] The maximum steps before the debugger gives up. If this argument is not specified, the default value will be 50000.

#### **result**

This command does not set any result variables.

### **TraceIntoIntoTraceCoverage/TraceIntoIntoTraceRecord/tiit**

Perform StepInto until the program reaches somewhere inside the trace coverage.

#### **arguments**

[arg1] The break condition of tracing. When this condition is satisfied, tracing will stop regardless of EIP/RIP location. If this argument is not specified then tracing will be unconditional.

[arg2] The maximum steps before the debugger gives up. If this argument is not specified, the default value will be 50000.

#### **result**

This command does not set any result variables.

### **TraceOverIntoTraceCoverage/TraceOverIntoTraceRecord/toit**

Perform StepOver until the program reaches somewhere inside the trace coverage.

#### **arguments**

[arg1] The break condition of tracing. When this condition is satisfied, tracing will stop regardless of EIP/RIP location. If this argument is not specified then tracing will be unconditional.

[arg2] The maximum steps before the debugger gives up. If this argument is not specified, the default value will be 50000.

#### **result**

This command does not set any result variables.

## RunToParty

Run the program until the program reaches somewhere belonging to the party number. This works by putting temporary memory breakpoints on all memory pages with matching party number.

### arguments

`arg1` The party number. This value cannot be an expression. Note: 0 is user module, 1 is system module.

### results

This command does not set any result variables.

### see also

*RunToUserCode*

## RunToUserCode/rtu

Run until user code is reached. It is equivalent to `RunToParty 0`.

### arguments

This command has no arguments.

### results

This command does not set any result variables.

## TraceSetLog/SetTraceLog

Change the trace log text and condition during tracing. See *Conditional Tracing* for more information.

### arguments

`[arg1]` Log text. If not specified the current text/condition is cleared.

`[arg2]` Log condition. If not specified the default condition is used.

### results

This command does not set any result variables.

## TraceSetCommand/SetTraceCommand

Change the trace command text and condition during tracing. See *Conditional Tracing* for more information.

## arguments

[arg1] Command text. If not specified the current text/condition is cleared.

[arg2] Command condition. If not specified the default condition is used.

## results

This command does not set any result variables.

## TraceSetLogFile/SetTraceLogFile

Redirect the trace log to a file.

## arguments

arg1 File name to redirect the trace log to. This file will be cleared and overwritten when the trace starts. **This does nothing if you don't set the log text!**

## results

This command does not set any result variables.

## StartTraceRecording/StartRunTrace/opentrace

Start recording a trace to the specified file. The file will also be opened in the trace view. Note you need to use *TraceIntoConditional* or other command to actually trace the program and record instructions.

## arguments

arg1 The file name. Default file extension “trace32” or “trace64” is not added automatically.

## result

This command does not set any result variables.

## StopTraceRecording/StopRunTrace/tc

Stops trace recording and closes the file.

## arguments

This command has no arguments.

**result**

This command does not set any result variables.

## 1.4.6 Thread Control

**Contents:****createthread[,threadcreate,newthread,threadnew]**

Create a new thread at the specified entry.

**arguments**

`arg1` The entry of the new thread.

`[arg2]` The argument of the new thread. If the argument is not specified, the default argument is 0.

**results**

`$result` will be set to the thread id of the new thread.

**switchthread/threadswitch**

Switch the internal current thread to another thread (resulting in different callstack + different registers displayed).

**arguments**

`[arg1]` ThreadId of the thread to switch to (see the Threads tab). When not specified, the main thread is used.

**result**

This command does not set any result variables.

**suspendthread/threadsuspend**

Suspend a thread in the debuggee.

**arguments**

`[arg1]` ThreadId of the thread to suspend (see the Threads tab). When not specified, the main thread is used.

**result**

This command does not set any result variables.

### **resumethread/threadresume**

Resume a thread in the debuggee.

#### **arguments**

[arg1] ThreadId of the thread to resume (see the Threads tab). When not specified, the main thread is used.

#### **result**

This command does not set any result variables.

### **killthread/threadkill**

Kill a thread in the debuggee.

#### **arguments**

[arg1] ThreadId of the thread to kill (see the Threads tab). When not specified, the main thread is used.

[arg2] Thread exit code. When not specified, 0 will be used.

#### **result**

This command does not set any result variables.

### **suspendallthreads/threadsuspendall**

Suspend all threads in the debuggee.

#### **arguments**

This command has no arguments.

#### **result**

This command does not set any result variables.

### **resumeallthreads/threadresumeall**

Resume all threads in the debuggee.

#### **arguments**

This command has no arguments.



## result

This command does not set any result variables.

## setthreadpriority/setprioritythread/threadsetpriority

Set thread priority in the debuggee.

## arguments

arg1 ThreadId of the thread to change the priority of (see the Threads tab).

arg2 Priority value, this can be the integer of a valid thread priority (see MSDN) or one of the following values: "Normal", "AboveNormal", "TimeCritical", "Idle", "BelowNormal", "Highest", "Lowest".

## result

This command does not set any result variables.

## setthreadname/threadsetname

Set thread name (only for the debugger, nothing changes in the debuggee).

## arguments

arg1 ThreadId of the thread to change the priority of (see the Threads tab).

arg2 New thread name. Leave empty to remove the current name.

## result

This command does not set any result variables.

## 1.4.7 Memory Operations

This section contains commands to manipulate memory inside the debuggee.

### Contents:

## alloc

Allocate memory in the debuggee (using VirtualAllocEx). The memory is allocated with PAGE\_EXECUTE\_READWRITE protection.

## **arguments**

[arg1] Size of the memory to allocate. When not specified, a default size of 0x1000 is used.

[arg2] Address to allocate the memory at. Unspecified or zero means a random address.

## **result**

This command sets \$result to the allocated memory address. It also sets the \$lastalloc variable to the allocated memory address when VirtualAllocEx succeeded.

## **Fill/memset**

Set memory of the debuggee to a specified byte.

## **arguments**

arg1 Memory address to start setting bytes.

arg2 Value (byte) to set memory with.

[arg3] Size to set. When not specified the rest of the page is used.

## **result**

This command does not set any result variables.

## **memcpy**

Copy memory in the context of the debuggee, without applying patches.

## **arguments**

arg1 Destination address.

arg2 Source address.

arg3 Size to copy.

## **result**

This command sets \$result to the total amount of bytes written at the destination. The condition \$result == arg3 is true if all memory was copied.

## **free**

Free memory in the debuggee (using VirtualFreeEx).

### arguments

[arg1] Address of the memory to free. When not specified, the value at \$lastalloc is used.

### result

This command sets \$result to 1 if VirtualFreeEx succeeded, otherwise it's set to 0. \$lastalloc is set to zero when the address specified is equal to \$lastalloc.

### getpagerights/getpagerights/getrightspage

Get the rights of a memory page.

### arguments

arg1 Memory Address of page (it fix the address if this arg is not the top address of a page).

### result

This command does not set any result variables.

### setpagerights/setpagerights/setrightspage

Change the rights of a memory page.

### arguments

arg1 Memory Address of page (it fix the address if this arg is not the top address of a page).

arg2 New Rights, this can be one of the following values: "Execute", "ExecuteRead", "ExecuteReadWrite", "ExecuteWriteCopy", "NoAccess", "ReadOnly", "ReadWrite", "WriteCopy". You can add a G at first for add PAGE GUARD. example: "GReadOnly". Read the MSDN for more info.

### result

This command does not set any result variables.

### savedata

Save a memory region to disk.

### arguments

arg1 The filename. If you use `:memdump:` as name it will save a file as `memdump_pid_addr_size.bin` in the x64dbg directory. You can use [String Formatting](#) here.

arg2 The address of the memory region.

arg3 The size of the memory region.

### results

This command does not set any result variables.

### minidump

Create a `minidump` with full memory and handle information from the debuggee.

### arguments

arg1 The filename of the `.dmp`.

### results

This command does not set any result variables.

## 1.4.8 Operating System Control

This section contains the commands that can be used to control certain properties managed by the operating system.

### Content:

#### DisablePrivilege

Revoke the privilege.

### arguments

arg1 The name of the privilege. Example: `SeDebugPrivilege`

### results

This command does not set any result variables.

#### EnablePrivilege

Permit the privilege.

### arguments

arg1 The name of the privilege. Example: SeDebugPrivilege

### results

This command does not set any result variables.

## GetPrivilegeState

Query whether the privilege is enabled on the debuggee.

### arguments

arg1 The name of the privilege. Example: SeDebugPrivilege.

### results

This command sets `$result` to 1 if the privilege is disabled on the debuggee, 2 or 3 if the privilege is enabled on the debuggee, 0 if the privilege is not found in the privilege collection of the token of the debuggee or something is wrong with the API.

## handleclose/closehandle

Close a remote handle so that its system resources can be released.

### arguments

arg1 The handle value of the handle, in the context of the debuggee.

### results

This command does not set any result variables.

## 1.4.9 Watch Control

This section describes the commands that control the watch view.

### Contents:

#### AddWatch

Add a watch item.

## arguments

`arg1` The expression to watch.

[`arg2`] The data type of the watch item. `uint` displays hexadecimal value, `int` displays signed decimal value, `ascii` displays the ASCII string pointed by the value. `unicode` displays the Unicode string pointed by the value. `uint` is the default type.

## results

This command sets `$result` value to the id of the watch item.

## DelWatch

Delete a watch item.

## arguments

`arg1` The id of the watch item to delete.

## result

This command does not set any result variables.

## SetWatchdog

Set the watchdog mode of a watch item.

## arguments

`arg1` The id of the watch item.

[`arg2`] The watchdog mode. Possible values:

- `disabled` : Watchdog is disabled.
- `changed` : Watchdog is triggered when the value is changed.
- `unchanged` : Watchdog is triggered when the value is not changed.
- `istru` : Watchdog is triggered when the value is not 0.
- `isfalse` : Watchdog is triggered when the value is 0.

When this argument is not specified, the mode will be set to “changed” if the current watchdog mode is “disabled”, otherwise watchdog will be disabled.

## results

This command does not set any result variables.

### SetWatchExpression

Change the expression of an existing watch item.

#### arguments

arg1 The id of the watch item.

arg2 The new expression to watch.

arg3 The new data type of the watch item.

#### results

This command does not set any result variables.

### SetWatchName

Rename a watch item.

#### arguments

arg1 The id of the watch item to rename.

arg2 The new name.

#### results

This command does not set any result variables.

### CheckWatchdog

Evaluate all the watch items, trigger or reset watchdog when appropriate.

#### arguments

This command has no arguments.

#### results

This command set `$result` to 1 if any watchdog is triggered, 0 otherwise.

## 1.4.10 Variables

This section contains commands that can manipulate variables.

**Contents:**

### **var/varnew**

Declare a new variable.

### **arguments**

arg1 Variable name (will be prefixed with '\$' if not done).

[arg2] Initial variable value (see console input for details).

### **result**

This command does not set any result variables.

### **vardel**

Delete a user-defined variable.

### **arguments**

arg1 Name of the variable to delete (\$ will be prepended when not present).

### **result**

This command does not set any result variables.

### **varlist**

Get a list of all variables and their values.

### **arguments**

[arg1] Filter (USER, SYSTEM, READONLY).

### **result**

This command does not set any result variables.

## **1.4.11 Searching**

This section contains commands that are used to search data.

**Contents:**



## find

Find a pattern in a memory page. If you want to find all occurrences of a pattern in a memory page use *findall*.

### arguments

arg1 The address to start searching from. Notice that the searching will stop when the end of the memory page this address resides in has been reached. This means you cannot search the complete process memory without enumerating the memory pages first. If you want to find all occurrences of a pattern in the entire memory map use *findallmem*.

arg2 The byte pattern to search for. This byte pattern can contain wildcards (?) for example: EB0?90??8D. You can use *String Formatting* here.

[arg3] The size of the data to search in. Default is the size of the memory region.

### result

The `$result` variable is set to the virtual address of the address that matches the byte pattern. `$result` will be 0 when the pattern could not be matched.

## findall

Find all occurrences of a pattern in a memory page.

### arguments

arg1 The address to start searching from. Notice that the searching will stop when the end of the memory page this address resides in has been reached. This means you cannot search the complete process memory without enumerating the memory pages first. You can use *findallmem* to search for a pattern in the whole memory.

arg2 The byte pattern to search for. This byte pattern can contain wildcards (?) for example: EB0?90??8D. You can use *String Formatting* here.

[arg3] The size of the data to search in. Default is the size of the memory region.

### result

`$result` is set to the number of occurrences.

### examples

Search for all occurrences a pattern in the memory page CIP is residing:

```
findall mem.base(cip), "0FA2 E8 ???????? C3"
```

Search for all occurrences of the value of cax in the stack memory page:

```
findall mem.base(csp), "{bswap@cax}"
```

## findallmem/findmemall

Find all occurrences of a pattern in the entire memory map.

### arguments

arg1 The address to start searching from.

arg2 The byte pattern to search for. This byte pattern can contain wildcards (?) for example: EB0?90??8D. You can use *String Formatting* here.

[arg3] The size of the data to search in. Default is the entire memory map (-1).

[arg4] Set to user/system/module to only include (user/system) modules in the search.

### result

\$result is set to the number of occurrences.

## findasm/asmfind

Find assembled instruction.

### arguments

arg1 Instruction to look for (make sure to use quoted “mov eax, ebx” to ensure you actually search for that instruction). You can use *String Formatting* here.

[arg2] Address of/inside a memory page to look in. When not specified CIP will be used.

[arg3] The size of the data to search in. Default is the size of the memory region.

### result

The \$result variable is set to the number of references found.

## findguid/guidfind

Find references to GUID. The referenced GUID must be registered in the system, otherwise it will not be found.

### arguments

[arg1] The base of the memory range. If not specified, RIP or EIP will be used.

[arg2] The size of the memory range.

[arg3] The region to search. 0 is current region (specified with arg1 and arg2). 1 is current module (the module specified with arg1). 2 is all modules.

## results

Set `$result` to 1 if any GUID is found, 0 otherwise.

## reffind/findref/ref

Find references to a certain value.

## arguments

`arg1` The value to look for.

`[arg2]` Address of/inside a memory page to look in. When not specified CIP will be used.

`[arg3]` The size of the data to search in.

## result

The `$result` variable is set to the number of references found.

## reffindrange/findrefrange/refrange

Find references to a certain range of values.

## arguments

`arg1` Start of the range (will be included in the results when found).

`[arg2]` End of range (will be included in the results when found). When not specified the first argument will be used.

`[arg3]` Address of/inside a memory page to look in. When not specified CIP will be used.

`[arg4]` The size of the data to search in.

## result

The `$result` variable is set to the number of references found.

## refstr/strref

Find referenced text strings.

## arguments

`[arg1]` Address of/inside a memory page to find referenced text strings in. When not specified CIP will be used.

`[arg2]` The size of the data to search in.

### **result**

The `$result` variable is set to the number of string references found.

### **modcallfind**

Find all inter-modular calls.

### **arguments**

[`arg1`] Address of/inside a memory page to find inter-modular calls in. When not specified EIP/RIP will be used.

[`arg2`] The size of the data to search in.

### **result**

The `$result` variable is set to the number of inter-modular calls found.

### **setmaxfindresult/findsetmaxresult**

Set the maximum number of occurrences found.

### **arguments**

`arg1` The maximum number of occurrences. The default value is 5000.

### **results**

This command does not set any result variables.

## **1.4.12 User Database**

This section contains commands that manipulate the user database (comments, labels and bookmarks).

### **dbsave/savedb**

Save a program database from memory to disk.

### **arguments**

[`arg1`] Path to save the database to. If not specified your current program database is used.

### **result**

This command does not set any result variables.

**dbload/loaddb**

Load a program database from disk in memory.

**arguments**

[arg1] Path to load the database from. If specified your current data will not be automatically cleared (import). If not specified all your data will be cleared and the current program database is reloaded from disk.

**result**

This command does not set any result variables.

**dbclean/cleardb**

Clear the program database from memory (not from disk).

**arguments**

This command has no arguments.

**result**

This command does not set any result variables.

**commentset/cmt/cmtset**

Set a comment.

**arguments**

arg1 Address to set the comment at (preferably inside a module).

arg2 Comment text.

**result**

This command does not set any result variables.

**commentdel/cmtc/cmtdel**

Delete a comment.

**arguments**

arg1 Address of the comment to delete.

### **result**

This command does not set any result variables.

### **commentlist**

List user-defined comments in reference view.

### **arguments**

This command has no arguments.

### **result**

\$result will be set to the number of user-defined comments.

### **commentclear**

Delete all comments in all modules.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

### **labelset/lbl/lblset**

Set a label.

### **arguments**

arg1 Address to set the label at (preferably inside a module).

arg2 Label text. You can use *String Formatting* here.

### **result**

This command does not set any result variables.

### **labeldel/lblc/lbldel**

Delete a label.

### **arguments**

arg1 Address of the label to delete.

### **result**

This command does not set any result variables.

### **labellist**

List user-defined labels in reference view.

### **arguments**

This command has no arguments.

### **result**

\$result will be set to the number of user-defined labels.

### **labelclear**

Delete all labels in all modules.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

### **bookmarkset/bookmark**

Set a bookmark.

### **arguments**

arg1 Address to set the bookmark at (preferably inside a module).

### **result**

This command does not set any result variables.

### **bookmarkdel/bookmarkc**

Delete a bookmark.

#### **arguments**

arg1 Address of the bookmark to delete.

#### **result**

This command does not set any result variables.

### **bookmarklist**

List user-defined bookmarks in reference view.

#### **arguments**

This command has no arguments.

#### **result**

\$resultwill be set to the number of user-defined bookmarks.

### **bookmarkclear**

Delete all bookmarks in all modules.

#### **arguments**

This command has no arguments.

#### **result**

This command does not set any result variables.

### **functionadd/func**

Add a function.

#### **arguments**

arg1 Function range start.

arg2 Function range end.



**result**

This command does not set any result variables.

**functiondel/funcc**

Delete a function.

**arguments**

arg1 Address inside the function range to delete.

**result**

This command does not set any result variables.

**functionlist**

List user-defined functions in reference view.

**arguments**

This command has no arguments.

**result**

\$resultwill be set to the number of user-defined functions.

**functionclear**

Delete all functions in all modules.

**arguments**

This command has no arguments.

**result**

This command does not set any result variables.

**argumentadd**

Add a argument.

### **arguments**

arg1 argument range start.

arg2 argument range end.

### **result**

This command does not set any result variables.

### **argumentdel**

Delete a argument.

### **arguments**

arg1 Address inside the argument range to delete.

### **result**

This command does not set any result variables.

### **argumentlist**

List user-defined arguments in reference view.

### **arguments**

This command has no arguments.

### **result**

\$resultwill be set to the number of user-defined arguments.

### **argumentclear**

Delete all arguments in all modules.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

### 1.4.13 Analysis

This section contains commands that are used for analysis.

#### Contents:

#### **analyse/analyze/anal**

Do function analysis.

#### **arguments**

This command has no arguments.

#### **result**

This command does not set any result variables.

#### **exanalyse/exanalyze/exanal**

Do exception directory analysis. This kind of analysis doesn't work on 32-bit executables.

#### **arguments**

This command has no arguments.

#### **results**

This command does not set any result variables.

#### **cfanalyze/cfanalyse/cfanal**

Do control flow analysis in the module selected in the disassembly view.

#### **arguments**

This command has no arguments.

#### **results**

This command does not set any result variables.

#### **analyse\_nukem/analyze\_nukem/anal\_nukem**

Do function analysis using nukem's algorithm.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

### **analxrefs/analx**

Do xrefs analysis in the module selected in the disassembly view.

### **arguments**

This command has no arguments.

### **results**

This command does not set any result variables.

### **analrecur/analr**

Do single function analysis.

### **arguments**

arg1 The base address of the function to analyze.

### **results**

This command does not set any result variables.

### **analadv**

Do function analysis, embedded data analysis and xref analysis.

### **arguments**

This command has no arguments.

### **results**

This command does not set any result variables.

## **virtualmod**

Tell the debugger to treat a memory range as a virtual module.

### **arguments**

arg1 the user-supplied module name.

arg2 the base of the memory range.

[arg3] the size of the memory range.

### **result**

This command does not set any result variables.

## **symdownload/downloadsym**

Attempt to download a symbol from a Symbol Store.

### **arguments**

[arg1] Module name (with or without extension) to attempt to download symbols for. When not specified, an attempt will be done to download symbols for all loaded modules.

[arg2] Symbol Store URL. When not specified, the default store will be used.

### **result**

This command does not set any result variables.

## **symload/loadsym**

Attempt to load a symbol from disk.

### **arguments**

arg1 Module name (with or without extension) to attempt to load symbols for.

arg2 Path to the symbol file.

[arg3] Force load. Set to 1 to skip symbol validation.

### **result**

This command does not set any result variables.

## **symunload/unloadsym**

Unload a symbol.

### **arguments**

`arg1` Module name (with or without extension) to unload symbols from.

### **result**

This command does not set any result variables.

## **imageinfo**

Output the image information for a module. The information describes the Characteristics and DLL Characteristics fields in the PE header structure.

### **arguments**

[`arg1`] The base of the module. If not specified the module at CIP will be used.

### **results**

This command does not set any result variables.

## **GetRelocSize/grs**

Get the correct size of a relocation table. This is useful while unpacking and restoring the original relocation table.

### **arguments**

`arg1` The address of the relocation table to analyze.

### **results**

The found size of the relocation table is stored in `$result`.

## **exhandlers**

Print all exception handlers, including SEH(StructuredExceptionHandler), VEH(VectoredExceptionHandler), VCH(VectoredContinueHandler) and UnhandledExceptionFilter, into the log.

### **arguments**

This command has no arguments

## results

This command does not set any result variables.

## exinfo

Print the EXCEPTION\_DEBUG\_INFO structure from the last exception.

Sample output:

```
EXCEPTION_DEBUG_INFO:
    dwFirstChance: 1
    ExceptionCode: 80000001 (EXCEPTION_GUARD_PAGE)
    ExceptionFlags: 00000000
    ExceptionAddress: 00007FFE16FB1B91 ntdll.00007FFE16FB1B91
    NumberParameters: 2
ExceptionInformation[00]: 0000000000000008
ExceptionInformation[01]: 00007FFE16FB1B91 ntdll.00007FFE16FB1B91
```

## arguments

This command has no arguments

## results

This command does not set any result variables.

## traceexecute

Tell the debugger that an address has been traced.

## arguments

arg1 The address.

## result

This command does not set any result variables.

## 1.4.14 Types

This section contains commands that are used to manipulate data types.

### Contents:

#### DataUnknown

Mark data at address as Unknown.

### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

### **result**

This command does not set any result variables.

### **DataByte/db**

Mark data at address as Byte.

### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

### **result**

This command does not set any result variables.

### **DataWord/dw**

Mark data at address as Word.

### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

### **result**

This command does not set any result variables.

### **DataDword/dw**

Mark data at address as Dword.

### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.



## result

This command does not set any result variables.

## DataFword

Mark data at address as Fword.

## arguments

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

## result

This command does not set any result variables.

## DataQword/dq

Mark data at address as Qword.

## arguments

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

## result

This command does not set any result variables.

## DataTbyte

Mark data at address as Tbyte.

## arguments

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

## result

This command does not set any result variables.

### **DataOword**

Mark data at address as Oword.

#### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

#### **result**

This command does not set any result variables.

### **DataMmword**

Mark data at address as Mmword.

#### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

#### **result**

This command does not set any result variables.

### **DataXmmword**

Mark data at address as Xmmword.

#### **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

#### **result**

This command does not set any result variables.

### **DataYmmword**

Mark data at address as Ymmword.

**arguments**

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

**result**

This command does not set any result variables.

**DataFloat/DataReal4/df**

Mark data at address as Float.

**arguments**

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

**result**

This command does not set any result variables.

**DataDouble/DataReal8**

Mark data at address as Double.

**arguments**

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

**result**

This command does not set any result variables.

**DataLongdouble/DataReal10**

Mark data at address as Long double.

**arguments**

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

## **result**

This command does not set any result variables.

## **DataAscii/da**

Mark data at address as Ascii.

## **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

## **result**

This command does not set any result variables.

## **DataUnicode/du**

Mark data at address as Unicode.

## **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

## **result**

This command does not set any result variables.

## **DataCode/dc**

Mark data at address as Code.

## **arguments**

`arg1` The address you want to mark.

`[arg2]` Size (in bytes) to mark, when not set this defaults to 1.

## **result**

This command does not set any result variables.

## DataJunk

Mark data at address as Junk.

### arguments

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

### result

This command does not set any result variables.

## DataMiddle

Mark data at address as Middle.

### arguments

arg1 The address you want to mark.

[arg2] Size (in bytes) to mark, when not set this defaults to 1.

### result

This command does not set any result variables.

## AddType

Add a type alias.

### arguments

arg1 An existing type.

arg2 The new type alias.

### result

This command does not set any result variables.

## AddStruct

Add a new struct.

## arguments

arg1 The type name of the struct.

## result

This command does not set any result variables.

## AddUnion

Add a new union.

## arguments

arg1 The type name of the union.

## result

This command does not set any result variables.

## AddMember

Add a new member to the end of a struct/union.

## arguments

arg1 The type name of the struct/union (parent).

arg2 The type of the new member.

arg3 The name of the new member.

[arg4] The array size. A value greater than zero will make this member an array.

[arg5] Offset from the start of the structure, only use this for implicitly padded structures. Overlapping with other members is **not** allowed.

## result

This command does not set any result variables.

## AppendMember

Add a new member to the end of the last manipulated struct/union.

## arguments

arg1 The type of the new member.

arg2 The name of the new member.

[arg3] The array size. A value greater than zero will make this member an array.

[arg4] Offset from the start of the structure, only use this for implicitly padded structures. Overlapping with other members is **not** allowed.

## result

This command does not set any result variables.

## AddFunction

Add a new function.

## arguments

arg1 The type name of the function.

arg2 The return type.

[arg3] Calling convention, choose between `cdecl`, `stdcall`, `thiscall` and `delphi`.

[arg4] Set to `nonzero` to mark this function as `noreturn`.

## result

This command does not set any result variables.

## AddArg

Add a new argument to the end of a function.

## arguments

arg1 The type name of the function (parent).

arg2 The type of the new argument.

arg3 The name of the new argument.

## result

This command does not set any result variables.

## **AppendArg**

Add a new argument to the end of the last manipulated function.

### **arguments**

`arg1` The type of the new argument.

`arg2` The name of the new argument.

### **result**

This command does not set any result variables.

## **SizeofType**

Get the size of a type.

### **arguments**

`arg1` Name of the type.

### **result**

This command will set `$result` to the size of the type.

## **VisitType**

Visit a type and print its members.

### **arguments**

`arg1` The type to visit.

[`arg2`] Address to print from. If not specified (or zero) the type will be printed without values.

[`arg3`] Maximum pointer resolution depth (default is 0). This can be used to also display structures (and values) pointed to by members of the type you are visiting.

### **result**

This command does not set any result variables.

## **ClearTypes**

Clear all types.



### arguments

[arg1] The owner to clear. Leave this empty unless you know what you're doing.

### result

This command does not set any result variables.

## RemoveType

Remove a type.

### arguments

arg1 The type to remove.

### result

This command does not set any result variables.

## EnumTypes

Enumerate all types.

### arguments

This command has no arguments.

### result

This command does not set any result variables.

## LoadTypes

Load types from a JSON file.

### arguments

arg1 The path to the JSON file. The owner of the loaded types will be the filename of the JSON file. Any types previously defined with this owner will be removed.

### result

This command does not set any result variables.

## **ParseTypes**

Parse and load types from a header file.

### **arguments**

`arg1` The path to the header file. The owner of the loaded types will be the filename of the header file. Any types previously defined with this owner will be removed.

### **result**

This command does not set any result variables.

## **1.4.15 Plugins**

This section contains debugger-embedded plugin commands.

### **Contents:**

#### **StartScylla/scylla/imprec**

Start the Scylla plugin auto-selecting the currently debugged DLL/EXE and EIP/RIP as entry point.

### **arguments**

This command has no arguments.

### **result**

This command does not set any result variables.

#### **plugload/pluginload/loadplugin**

Load a plugin.

### **arguments**

`arg1` Name of the plugin.

### **result**

This command does not set any result variables.

#### **pluginunload/pluginunload/unloadplugin**

Unload a plugin.

### arguments

arg1 Name of the plugin.

### result

This command does not set any result variables.

## 1.4.16 Script Commands

This section contains various commands that are only used or available in a scripting context. Commands that also exist in a non-scripting context have priority.

### Contents:

#### call

A call works exactly the same as an unconditional branch, but it places it's address on the script stack.

### arguments

arg1 The label to jump to.

### result

This command does not set any result variables.

#### invalid

Invalid command to throw an error message. This command will halt the script execution.

### arguments

This command has no arguments.

### result

This command does not set any result variables.

### error

Show an error message and terminate the script.

### arguments

arg1 The error message to show.

## result

This command does not set any result variables.

## Jxx/IFxx

There are various branches that can react on the flags set by the `cmp` (and maybe other) command(s):

- unconditional branch - `jmp/goto`
- branch if not equal - `jne/ifne(q)/jnz/ifnz`
- branch if equal - `je/ife(q)/jz/ifz`
- branch if smaller - `jb/ifb/jl/ifl`
- branch if bigger - `ja/ifa/jg/ifg`
- branch if smaller/equal - `jbe/ifbe(q)/jle/ifle(q)`
- branch if bigger/equal - `jae/ifae(q)/jge/ifge(q)`

## arguments

`arg1` The label to jump to.

## result

This command does not set any result variables.

## log

Put information in the log.

## arguments

[`arg1`] Format string (see *String Formatting*). When not specified, a newline will be logged. When using a format string it is recommended to use quotes to avoid ambiguity with the `;` (command separator): `log "{mem; 8@rax}"`.

## result

This command does not set any result variables.

## msg

Display a message box.

## arguments

`arg1` Message box text. You can use *String Formatting* here.

**result**

This command does not set any result variables.

**msgyn**

Display a message box, asking the user to answer yes or no.

**arguments**

`arg1` Message box text. You can use *String Formatting* here.

**result**

The `$result` variable will be set to 1 when the user answered yes. Otherwise it's set to 0.

**pause**

Halt the script execution. The user can resume the script after this command.

**arguments**

This command has no arguments.

**result**

This command does not set any result variables.

**printstack[,logstack]**

Print the stack trace in the log.

**arguments**

This command has no arguments.

**result**

This command does not set any result variables.

**ret**

When called without an entry on the stack, this command will end the script and set the script IP to the first line. When 'call' was executed before, ret will return from that call.

## **arguments**

This command has no arguments.

## **result**

This command does not set any result variables.

## **scriptload**

Load a script file.

## **arguments**

arg1 Script file to load.

## **result**

This command does not set any result variables.

## **scriptdll/dllscript**

Execute a script DLL.

## **arguments**

arg1 The filename and path of the script DLL. If a full path is not provided x64dbg will look in the `scripts` directory for the DLL.

## **results**

This command does not set any result variables. However, the script DLL may set any variable.

## **remarks**

A script DLL is a DLL that exports either `AsyncStart()` or `Start()` function.

If the DLL exports `AsyncStart()` function, then x64dbg will call this function on a separate thread. If the DLL exports `Start()` function, then x64dbg will call this function on the current thread, blocking any further command execution until the script DLL finishes execution. If both `AsyncStart()` and `Start()` are exported, only `AsyncStart()` will be executed. Any return value of `AsyncStart()` and `Start()` will not be used by x64dbg.

After `AsyncStart()` or `Start()` finishes, the script DLL will be unloaded from the process.

## **scriptcmd**

Execute a command in the context of a running script.

## arguments

Unlike other commands this command forwards everything after `scriptcmd` directly to the command processor. For example `scriptcmd add rax, 0x1245` will execute the command `add rax, 0x1234`.

## result

This command does not set any result variables.

## example

This command can be used in combination with *SetBreakpointCommand* to execute scripts on breakpoint callbacks:

```
fn_addr = module.dll:$0x1234 // module.dll RVA 0x1234
bp fn_addr
SetBreakpointCommand fn_addr, "scriptcmd call mycallback"

// make sure the script is not unloaded

mycallback:
log "fn({arg.get(0)}, {arg.get(1)})"
ret
```

## 1.4.17 GUI

This section describes the commands that control various portions of the GUI.

### Contents:

#### disasm/dis/d

Disassemble at a certain position.

## arguments

[arg1] The address to disassemble at. When not specified, there will be disassembled at CIP.

## result

This command does not set any result variables.

## dump

Dump at a certain position.

## **arguments**

`arg1` The address to dump at.

## **result**

This command does not set any result variables.

## **sdump**

Dump the stack at a certain position.

## **arguments**

`[arg1]` The address to dump at (must be inside the thread stack range). If not specified, `csp` will be used.

## **result**

This command does not set any result variables.

## **memmapdump**

Follow an address in the memory map.

## **arguments**

`arg1` The address to follow.

## **result**

This command does not set any result variables.

## **graph**

Graph the control flow of function in the graph view.

## **arguments**

`[arg1]` The address of the function. The default value is EIP or RIP. `[arg2]` Options. If it contains “force” the graph will be reanalyzed, if it contains “silent” no messages will be printed on the console.

## **results**

This command does not set any result variables.



**guiupdateenable**

Enables GUI update after `guiupdatedisable` is executed.

**arguments**

[arg0] If not 0, tells the debugger to update its GUI immediately.

**result**

This command does not set any result variables.

**guiupdatedisable**

Disable GUI update. This can speed up script execution.

**arguments**

This command has no arguments.

**result**

This command does not set any result variables.

**setfreezestack**

Set if the stack should be frozen.

**arguments**

arg1 '0' for unfrozen, '1' for frozen.

**result**

This command does not set any result variables.

**refinit**

Initialize reference view for command usage.

**arguments**

[arg1] The title of the new reference view. You can use *String Formatting* here.

## **result**

This command does not set any result variables.

## **refadd**

Add an entry to the reference view. You need to call ‘refinit’ before using refadd.

## **arguments**

arg1 Address to put in the reference view.

arg2 Text to put after the address. You can use *String Formatting* here.

## **result**

This command does not set any result variables.

## **refget**

Retrieve the address of a reference.

## **arguments**

arg1 Zero-based index of the reference address to retrieve.

## **result**

The `$result` variable will be set to the address of the requested reference (zero on failure).

## **EnableLog/LogEnable**

Enable the log output.

## **arguments**

This command has no arguments.

## **results**

This command does not set any result variables.

## **DisableLog/LogDisable**

Disable the log output. New log messages will not be appended to the log view, but they will still be saved in the log file if log redirection is enabled in the log view.

### arguments

This command has no arguments.

### results

This command does not set any result variables.

### ClearLog/cls/lc/lclr

Clear the log window.

### arguments

This command has no arguments.

### result

This command does not set any result variables.

### AddFavouriteTool

Add a tool in the favourites menu.

Note: You can use %PID% in the path. This special placeholder will be replaced by the PID of the debuggee before the tool is launched.

### arguments

arg1 The path of the tool.

[arg2] The optional description of the tool. When this is set, it is displayed in the menu instead of the full path.

### results

This command does not set any result variables.

### AddFavouriteCommand

Add a command in the favourites menu.

### arguments

arg1 The command to add.

[arg2] The optional shortcut key for the command.

## **results**

This command does not set any result variables.

## **AddFavouriteToolShortcut/SetFavouriteToolShortcut**

Set the shortcut key for an existing favourite tool.

## **arguments**

arg1 The full path of an existing favourite tool.

arg2 The shortcut key for it.

## **results**

This command does not set any result variables.

## **FoldDisassembly**

Fold the disassembly within the specified range.

## **arguments**

arg1 The start address of the range.

arg2 The length of the range.

## **results**

This command does not set any result variables.

## **1.4.18 Miscellaneous**

This section contains all commands that do not directly fit in another section.

### **Contents:**

#### **chd**

Change current directory (SetCurrentDirectory).

## **arguments**

arg1 Path of a directory to change to.

## result

This command does not set any result variables.

## zzz/doSleep

Halt execution for some time (equivalent of calling `kernel32.Sleep`).

## arguments

[arg1] Time (in milliseconds) to sleep. If not specified this is set to 100ms (0.1 second). Keep in mind that input is in hex per default so `Sleep 100` will actually sleep 256 milliseconds (use `Sleep .100` instead).

## result

This command does not set any result variables.

## HideDebugger/dbh/hide

Hide the debugger from (very) simple detection methods. The PEB will be modified so that `IsDebuggerPresent()` will return false.

## arguments

This command has no arguments.

## result

This command does not set any result variables.

## loadlib

Load a DLL into debugged program memory.

## arguments

arg1 The name/path of the module to load.

## result

The `$result` variable will be set to the address of the loaded library.

## asm

Assemble an instruction.

### arguments

`arg1` Address to place the assembled instruction at.

`arg2` Instruction text. You can use *String Formatting* here.

[`arg3`] When specified the remainder of the previous instruction will be filled with NOPs.

### result

\$result will be set to the assembled instruction size. 0 on failure.

### gpa

Get the address of an export inside a DLL.

### arguments

`arg1` Export name.

[`arg2`] DLL name.

### result

The \$result variable is set to the export address. When the export is not found, \$result will be set to 0.

### setjit/jitset

Set the Just-In-Time Debugger in Windows. In WIN64 systems there are two JIT entries: one for a x32 debugger and other for a x64 debugger. In a WIN64 system when a x32 process crash: Windows attach the x32 debugger stored in the x32-JIT entry.

Important notes:

- Its possible change the x32-JIT entry from the x64 debugger (using the x32 arg).
- Its possible change the x64-JIT entry from the x32 debugger ONLY if the x32 debugger its running in a WIN64 System (using the x64 arg).

### arguments

Without arguments: Set the current debugger as JIT.

`arg1`

1. *oldsave*: Set the current debugger as JIT and save the last JIT entry.
2. *restore*: Set the old JIT entry stored as JIT and remove it from debugger db.
3. *old* (without `arg2`): Set the old JIT entry stored as new JIT.
4. *old* (with `arg2`): Set the `arg2` as old JIT entry stored.
5. *x32*: Set the `arg2` as new x32-JIT entry.

6. *x64*: Set the *arg2* as new x64-JIT entry.

## result

This command does not set any result variables.

## getjit/jitget

Get the Just-In-Time Debugger in Windows. In WIN64 systems there are two JIT entries: one for a x32 debugger and other for a x64 debugger. In a WIN64 system when a x32 process crash: Windows attach the x32 debugger stored in the x32-JIT entry.

Important notes:

- Its possible get the x32-JIT entry from the x64 debugger (using the x32 arg).
- Its possible get the x64-JIT entry from the x32 debugger ONLY if the x32 debugger its running in a WIN64 System (using the x64 arg).

## arguments

Without arguments: Get the current JIT debugger.

*arg2*

1. *old*: Get the old JIT entry stored.
2. *x32*: Get the x32-JIT entry.*x64*: Get the x64-JIT entry.

## result

This command does not set any result variables.

## getjिताuto/jitgetauto

Get the Auto Just-In-Time Debugger FLAG in Windows. if this flag value its TRUE Windows runs the debugger without user confirmation when a process crash. In WIN64 systems there are two JIT AUTO FLAG entries: one for a x32 debugger and other for a x64 debugger. In a WIN64 system when a x32 process crash with AUTO FLAG = FALSE: Windows confirm before attach the x32 debugger stored in the x32-JIT entry.

Important notes:

- Its possible get the x32-JIT AUTO FLAG entry from the x64 debugger (using the x32 arg).
- Its possible get the x64-JIT AUTO FLAG entry from the x32 debugger ONLY if the x32 debugger its running in a WIN64 System (using the x64 arg).

## arguments

without args: Get current JIT entry FLAG.

*arg1*

1. *x32*: Get the x32-JIT AUTO FLAG.

2. x64: Get the x64-JIT AUTO FLAG.

## result

This command does not set any result variables.

## setjitauto/jitsetauto

Set the Auto Just-In-Time Debugger FLAG in Windows. if this flag value its TRUE Windows runs the debugger without user confirmation when a process crash. In WIN64 systems there are two JIT AUTO FLAG entries: one for a x32 debugger and other for a x64 debugger. In a WIN64 system when a x32 process crash with AUTO FLAG = FALSE: Windows confirm before attach the x32 debugger stored in the x32-JIT entry.

Important notes:

- Its possible set the x32-JIT AUTO FLAG entry from the x64 debugger (using the x32 arg).
- Its possible set the x64-JIT AUTO FLAG entry from the x32 debugger ONLY if the x32 debugger its running in a WIN64 System (using the x64 arg).

## arguments

arg1

1. 1/ON: Set current JIT entry FLAG as TRUE.
2. 0/FALSE: Set current JIT entry FLAG as FALSE.
3. x32: Set the x32-JIT AUTO FLAG TRUE or FALSE. It needs an arg2: can be ON/1 or OFF/0.
4. x64: Set the x64-JIT AUTO FLAG TRUE or FALSE. It needs an arg2: can be ON/1 or OFF/0.

## result

This command does not set any result variables.

## getcommandline/getcmdline

It gets the actual command line.

## arguments

This command has no arguments.

## result

This command does not set any result variables.

## setcommandline/setcmdline

It changes the command line data.



### arguments

arg1 New command line.

### result

This command does not set any result variables.

### mnemonichelp

Output the detailed help information about an assembly mnemonic to the log.

### arguments

arg1 the mnemonic name

### result

This command does not set any result variables.

### mnemonicbrief

Output the brief help information about an assembly mnemonic to the log.

### arguments

arg1 the mnemonic name

### result

This command does not set any result variables.

### config

Get or set the configuration of x64dbg. It can also be used to load and store configuration specific to the script in the configuration file of x64dbg.

### arguments

arg1 Section name of the INI file.

arg2 Key name of the INI file.

[arg3] Optional new value of the configuration. If this argument is set to a number, it will be stored in the configuration file and `$result` is not updated. If this argument is not set, the current configuration will be read into `$result`.

## results

This command sets `$result` to the current configuration number if `arg3` is not set.

## 1.5 Developers

The x64dbg can be automated and extended in various ways: by the use of x64dbg script, [scriptdll/dllscript](#), a script written in a language provided by a scripting plugin, or an x64dbg plugin.

This section contains documentation intended to help developers to write code related to this program.

**Notice:** It is easy to compile x64dbg. If you find it is more interesting in working directly on x64dbg source code to add your new features, don't forget to share it with us on Github, as required by GPLv3 licence of x64dbg, so that everyone can benefit from a better x64dbg. It will also ensure your code won't suddenly break due to incompatible changes made by x64dbg team who don't know your work.

### Contents:

### 1.5.1 Plugins

This section describes various plugin functions for x64dbg.

You can install plugins by copying the `*.dp32` (x32 plugins) or `*.dp64` (x64 plugins) to the 'plugins' directory.

### Contents:

#### The basics

This page covers the basic principles of plugin development for x64dbg. See the [plugin page](#) for example plugins and templates.

#### Exports

A plugin has at least one export. This export must be called `pluginit`. See the `PLUG_INITSTRUCT` and the plugin headers for more information. The other valid exports are:

`plugstop` called when the plugin is about to be unloaded. Remove all registered commands and callbacks here. Also clean up plugin data.

`plugsetup` Called when the plugin initialization was successful, here you can register menus and other GUI-related things.

**CB\*** Instead of calling `_plugin_registercallback`, you can create a `CDECL` export which has the name of the callback. For example when you create an export called `CBMENUENTRY`, this will be registered as your callback for the event `CB_MENUENTRY`. Notice that you should not use an underscore in the export name.

**CBALLEVENTS** An export with the name `CBALLEVENTS` will get every event registered to it. This is done prior to registering optional other export names.

## Definitions

Initialization exports.

```
extern "C" __declspec(dllexport) bool plugininit(PLUG_INITSTRUCT* initStruct);
extern "C" __declspec(dllexport) bool plugstop();
extern "C" __declspec(dllexport) void plugsetup(PLUG_SETUPSTRUCT* setupStruct);
```

Callback exports. **Make sure to only export callbacks that you actually use!**

```
extern "C" __declspec(dllexport) void CBINITDEBUG(CBTYPE cbType, PLUG_CB_INITDEBUG* _
↳info);
extern "C" __declspec(dllexport) void CBSTOPDEBUG(CBTYPE cbType, PLUG_CB_STOPDEBUG* _
↳info);
extern "C" __declspec(dllexport) void CBEXCEPTION(CBTYPE cbType, PLUG_CB_EXCEPTION* _
↳info);
extern "C" __declspec(dllexport) void CBDEBUGEVENT(CBTYPE cbType, PLUG_CB_DEBUGEVENT* _
↳info);
extern "C" __declspec(dllexport) void CBMENUENTRY(CBTYPE cbType, PLUG_CB_MENUENTRY* _
↳info);
```

## Notes

The following coding guide are helpful to make your plugin more compliant.

## Character encoding

x64dbg uses UTF-8 encoding everywhere it accepts a string. If you are passing a string to x64dbg, ensure that it is converted to UTF-8 encoding. This will help to reduce encoding errors.

## Functions

This section contains information about the *\_plugin\_* prefixed functions exported by x64dbg.

### Contents:

#### \_plugin\_debugpause

This function returns debugger control to the user. You would use this function when you write an unpacker that needs support from x64dbg (for example in development). Calling this function will set the debug state to 'paused' and it will not return until the user runs the debuggee using the *run* command.

```
void _plugin_debugpause();
```

### Parameters

This function has no parameters.

### Return Values

This function does not return a value.

## **`_plugin_debugskipexceptions`**

This function returns sets if the debugger should skip first-chance exceptions. This is useful when creating unpackers or other plugins that run the debuggee.

```
void _plugin_debugskipexceptions(  
    bool skip //skip flag  
);
```

### **Parameters**

**skip** Flag if we need to skip first-chance exceptions or not.

### **Return Values**

This function does not return a value.

## **`_plugin_logprintf`**

This function prints a message to the log window.

```
void _plugin_logprintf(  
    const char* format, //format string  
    ... //additional arguments  
);
```

### **Parameters**

**format** Format string that has the same specifications as printf.

**...** Additional arguments (when needed by the format string).

### **Return Values**

This function does not return a value.

## **`_plugin_logputs`**

This function prints a single line to the log window.

```
void _plugin_logputs(  
    const char* text //text to print  
);
```

### **Parameters**

**text** Piece of text to put to the log window. This text can contain line breaks.

## Return Values

This function does not return a value.

### `_plugin_menuadd`

This function adds a new child menu to a menu.

```
int _plugin_menuadd(  
int hMenu, //menu handle to add the new child menu to  
const char* title //child menu title  
);
```

## Parameters

**hMenu** Menu handle from a previously-added child menu or from the main plugin menu.

**title** Menu title.

## Return Values

Returns the child menu handle (unique), -1 on failure.

### `_plugin_menuaddentry`

This function adds a menu entry to a menu.

```
bool _plugin_menuaddentry(  
int hMenu, //menu handle to add the new child menu to  
int hEntry, //plugin-wide identifier for the menu entry  
const char* title //menu entry title  
);
```

## Parameters

**hMenu** Menu handle from a previously-added child menu or from the main plugin menu.

**hEntry** A plugin-wide identifier for the menu entry. This is the value you will get in the `PLUG_CB_MENUENTRY` callback structure.

**title** Menu entry title.

## Return Values

Returns *true* when the entry was added without problems, *false* otherwise.

## **\_plugin\_menuaddseparator**

This function adds a new child menu to a menu.

```
bool _plugin_menuaddseparator(  
int hMenu //menu handle to add the separator to  
);
```

### **Parameters**

**hMenu** Menu handle from a previously-added child menu or from the main plugin menu.

### **Return Values**

Returns *true* on success.

## **\_plugin\_menuclear**

This function removes all entries and child menus from a menu. It will not remove the menu itself.

```
bool _plugin_menuclear (  
int hMenu //menu handle of the menu to clear  
);
```

### **Parameters**

**hMenu** Menu handle from a previously-added child menu or from the main plugin menu.

### **Return Values**

Returns *true* on success.

## **\_plugin\_menuentryseticon**

This function sets an icon to a menu entry.

```
void _plugin_menuentryseticon (  
int pluginHandle, //plugin handle  
int hEntry, //handle of the menu entry  
const ICONDATA* icon //icon data  
);
```

### **Parameters**

**pluginHandle** Handle of the calling plugin.

**hEntry** Menu handle from a previously-added child menu or from the main plugin menu.

**icon** Icon data. See *bridgemain.h* for a definition.

## Return Values

This function does not return a value.

## `_plugin_menuentrysetchecked`

This function sets the checked state of a menu entry. Notice that this function sets a menu item as checkable and thus it will toggle per default on click. If you want different behavior, make sure to call this function on every click with your desired state.

```
void _plugin_menuentrysetchecked (
int pluginHandle, //plugin handle
int hEntry, //handle of the menu entry
bool checked //new checked state
);
```

## Parameters

**pluginHandle** Handle of the calling plugin.

**hEntry** Menu handle from a previously-added child menu or from the main plugin menu.

**checked** New checked state.

## Return Values

This function does not return a value.

## `_plugin_menuseticon`

This function sets an icon to a menu.

```
void _plugin_menuseticon (
int hMenu, //handle of the menu
const ICONDATA* icon //icon data
);
```

## Parameters

**hMenu** Menu handle from a previously-added child menu or from the main plugin menu.

**icon** Icon data. See *bridgemain.h* for a definition.

## Return Values

This function does not return a value.

## `_plugin_registercallback`

This function registers an event callback for a plugin. Every plugin can have it's own callbacks for every event. It is not possible to have multiple callbacks on the same event.

```
void _plugin_registercallback(  
int pluginHandle, //plugin handle  
CBTYPE cbType, //event type  
CBPLUGIN cbPlugin //callback function  
);
```

### Parameters

**pluginHandle** Handle of the calling plugin.

**cbType** The event type. This can be any of the following values:

- CB\_INITDEBUG** ,//callbackInfo: PLUG\_CB\_INITDEBUG\*
- CB\_STOPDEBUG** ,//callbackInfo: PLUG\_CB\_STOPDEBUG\*
- CB\_CREATEPROCESS** ,//callbackInfo: PLUG\_CB\_CREATEPROCESS\*
- CB\_EXITPROCESS** ,//callbackInfo: PLUG\_CB\_EXITPROCESS\*
- CB\_CREATETHREAD** ,//callbackInfo: PLUG\_CB\_CREATETHREAD\*
- CB\_EXITTHREAD** ,//callbackInfo: PLUG\_CB\_EXITTHREAD\*
- CB\_SYSTEMBREAKPOINT** ,//callbackInfo: PLUG\_CB\_SYSTEMBREAKPOINT\*
- CB\_LOADDLL** ,//callbackInfo: PLUG\_CB\_LOADDLL\*
- CB\_UNLOADDLL** ,//callbackInfo: PLUG\_CB\_UNLOADDLL\*
- CB\_OUTPUTDEBUGSTRING** ,//callbackInfo: PLUG\_CB\_OUTPUTDEBUGSTRING\*
- CB\_EXCEPTION** ,//callbackInfo: PLUG\_CB\_EXCEPTION\*
- CB\_BREAKPOINT** ,//callbackInfo: PLUG\_CB\_BREAKPOINT\*
- CB\_PAUSEDDEBUG** ,//callbackInfo: PLUG\_CB\_PAUSEDDEBUG\*
- CB\_RESUMEDDEBUG** ,//callbackInfo: PLUG\_CB\_RESUMEDDEBUG\*
- CB\_STEPPED** ,//callbackInfo: PLUG\_CB\_STEPPED\*
- CB\_ATTACH** ,//callbackInfo: PLUG\_CB\_ATTACHED\*
- CB\_DETACH** ,//callbackInfo: PLUG\_CB\_DETACHED\*
- CB\_DEBUGEVENT** ,//callbackInfo: PLUG\_CB\_DEBUGEVENT\*
- CB\_MENUENTRY** ,//callbackInfo: PLUG\_CB\_MENUENTRY\*
- CB\_WINEVENT** ,//callbackInfo: PLUG\_CB\_WINEVENT\*
- CB\_WINEVENTGLOBAL** ,//callbackInfo: PLUG\_CB\_WINEVENTGLOBAL\*
- CB\_LOADDB** ,//callbackInfo: PLUG\_CB\_LOADSAVEDB\*
- CB\_SAVEDB** ,//callbackInfo: PLUG\_CB\_LOADSAVEDB\*
- CB\_FILTERSYMBOL** ,//callbackInfo: PLUG\_CB\_FILTERSYMBOL\*
- CB\_TRACEEXECUTE** ,//callbackInfo: PLUG\_CB\_TRACEEXECUTE\*



**cbPlugin** Callback with the following typedef:

```
void CBPLUGIN(
CBTYPE bType //event type (useful when you use the same function for multiple events
void* callbackInfo //pointer to a structure of information (see above)
);
```

## Return Values

This function does not return a value.

## `_plugin_registercommand`

This function registers a command for usage inside scripts or the command bar.

```
bool _plugin_registercommand(
int pluginHandle, //plugin handle
const char* command, //command name
CBPLUGINCOMMAND cbCommand, //function that is called when the command is executed
bool debugonly //restrict the command to debug-only
);
```

## Parameters

**pluginHandle** Handle of the calling plugin.

**command** Command name.

**cbCommand** Callback with the following typedef:

```
bool CBPLUGINCOMMAND (
int argc //argument count (number of arguments + 1)
char* argv[] //array of arguments (argv[0] is the full command, arguments start at
↳argv[1])
);
```

**debugonly** When set, the command will never be executed when there is no target is being debugged.

## Return Values

This function returns true when the command was successfully registered, make sure to check this, other plugins may have already registered the same command.

## `_plugin_unregistercallback`

This plugin unregisters a previously set callback. It is only possible to remove callbacks that were previously set using `_plugin_registercallback`.

```
bool _plugin_unregistercallback(  
int pluginHandle, //plugin handle  
CBTYPE cbType //callback type to remove  
);
```

## Parameters

**pluginHandle** Handle of the calling plugin.

**cbType** The event type. This can be any of the following values:

- CB\_INITDEBUG,
- CB\_STOPDEBUG,
- CB\_CREATEPROCESS,
- CB\_EXITPROCESS,
- CB\_CREATETHREAD,
- CB\_EXITTHREAD,
- CB\_SYSTEMBREAKPOINT,
- CB\_LOADDLL,
- CB\_UNLOADDLL,
- CB\_OUTPUTDEBUGSTRING,
- CB\_EXCEPTION,
- CB\_BREAKPOINT,
- CB\_PAUSEDDEBUG,
- CB\_RESUMEDDEBUG,
- CB\_STEPPED,
- CB\_ATTACH,
- CB\_DETACH,
- CB\_DEBUGEVENT,
- CB\_MENUENTRY,
- CB\_WINEVENT,
- CB\_WINEVENTGLOBAL

## Return Values

This function returns true when the callback was removed without problems.

## **\_plugin\_unregistercommand**

This function removes a command set by a plugin. It is only possible to remove commands that you previously registered using *\_plugin\_registercommand*.

```
bool _plugin_unregistercommand(  
int pluginHandle, //plugin handle  
const char* command //command name  
);
```

### **Parameters**

**pluginHandle** Handle of the calling plugin.

**command** Command name.

### **Return Values**

This function returns true when the callback was removed without problems.

## **\_plugin\_waituntilpaused**

Wait until the debugger paused.

```
bool _plugin_waituntilpaused();
```

### **Parameters**

This function does not have any arguments.

### **Return Values**

This command returns true if the debuggee is still active, returns false if the debuggee has stopped running.

## **\_plugin\_hash**

This function allows you to hash some data. It is used by x64dbg in various places.

```
bool _plugin_hash(  
const void* data, //data to hash  
duint size //size (in bytes) of the data to hash  
);
```

### **Parameters**

**data** Data to hash

**size** Size (in bytes) of the data to hash.

## Return Values

Returns the hash.

## Structures

This section describes the various plugin SDK structures.

### Contents:

## PLUG\_INITSTRUCT

This structure is used by the only **needed** export in the plugin interface:

```
struct PLUG_INITSTRUCT
{
    //data provided by the debugger to the plugin.
    [IN] int pluginHandle; //handle of the plugin

    //data provided by the plugin to the debugger (required).
    [OUT] int sdkVersion; //plugin SDK version, use the PLUG_SDKVERSION define for_
    ↪this
    [OUT] int pluginVersion; //plugin version, useful for crash reports
    [OUT] char pluginName[256]; //plugin name, also useful for crash reports
};
```

## PLUG\_SETUPSTRUCT

This structure is used by the function that allows the creation of plugin menu entries:

```
struct PLUG_SETUPSTRUCT
{
    //data provided by the debugger to the plugin.
    [IN] HWND hwndDlg; //GUI window handle
    [IN] int hMenu; //plugin menu handle
    [IN] int hMenuDisasm; //plugin disasm menu handle
    [IN] int hMenuDump; //plugin dump menu handle
    [IN] int hMenuStack; //plugin stack menu handle
};
```

## Callback Structures

This section describes the various plugin SDK callback structures.

These structures are used inside event callbacks (registered using `_plugin_registercallback`).

Notice that the pointer 'void\* callbackInfo' is never NULL, but the members of the various structures can be NULL.

Also remember that you cannot use any of the provided pointers out of the callback function scope.

In general AVOID time-consuming operations inside callbacks, do these in separate threads.

You can register a callback with `_plugin_registercallback` function. The type definition for the callbacks is:

```
void CBPLUGIN(
  CBTYP bType //event type (useful when you use the same function for multiple events
  void* callbackInfo //pointer to a structure of information (see below)
);
```

### Contents:

## PLUG\_CB\_INITDEBUG

Called on debug initialization, useful to initialize some variables:

```
struct PLUG_CB_INITDEBUG
{
    const char* szFileName;
};
```

## PLUG\_CB\_STOPDEBUG

Called when the debugging has been stopped, useful to reset some variables:

```
struct PLUG_CB_STOPDEBUG
{
    void* reserved;
};
```

## PLUG\_CB\_CREATEPROCESS

Called after process creation (in the debug loop), after the initialization of the symbol handler, the database file and setting breakpoints on TLS callbacks / the entry breakpoint:

```
struct PLUG_CB_CREATEPROCESS
{
    CREATE_PROCESS_DEBUG_INFO* CreateProcessInfo;
    IMAGEHLP_MODULE64* modInfo;
    const char* DebugFileName;
    PROCESS_INFORMATION* fdProcessInfo;
};
```

## PLUG\_CB\_EXITPROCESS

Called after the process exits (in the debug loop), before the symbol handler is cleaned up:

```
struct PLUG_CB_EXITPROCESS
{
    EXIT_PROCESS_DEBUG_INFO* ExitProcess;
};
```

## **PLUG\_CB\_CREATETHREAD**

Called after thread creation (in the debug loop), after adding the thread to the internal thread list, before breaking the debugger on thread creation and after setting breakpoints on the thread entry:

```
struct PLUG_CB_CREATETHREAD
{
    CREATE_THREAD_DEBUG_INFO* CreateThread;
    DWORD dwThreadId;
};
```

## **PLUG\_CB\_EXITTHREAD**

Called after thread termination (in the debug loop), before the thread is removed from the internal thread list, before breaking on thread termination:

```
struct PLUG_CB_EXITTHREAD
{
    EXIT_THREAD_DEBUG_INFO* ExitThread;
    DWORD dwThreadId;
};
```

## **PLUG\_CB\_SYSTEMBREAKPOINT**

Called at the system breakpoint (in the debug loop), after setting the initial dump location, before breaking the debugger on the system breakpoint:

```
struct PLUG_CB_SYSTEMBREAKPOINT
{
    void* reserved;
};
```

## **PLUG\_CB\_LOADDLL**

Called on DLL loading (in the debug loop), after the DLL has been added to the internal library list, after setting the DLL entry breakpoint:

```
struct PLUG_CB_LOADDLL
{
    LOAD_DLL_DEBUG_INFO* LoadDll;
    IMAGEHLP_MODULE64* modInfo;
    const char* modname;
};
```

## **PLUG\_CB\_UNLOADDLL**

Called on DLL unloading (in the debug loop), before removing the DLL from the internal library list, before breaking on DLL unloading:

```
struct PLUG_CB_UNLOADDLL
{
    UNLOAD_DLL_DEBUG_INFO* UnloadDll;
};
```

## PLUG\_CB\_OUTPUTDEBUGSTRING

Called on a DebugString event (in the debug loop), before dumping the string to the log, before breaking on a debug string:

```
struct PLUG_CB_OUTPUTDEBUGSTRING
{
    OUTPUT_DEBUG_STRING_INFO* DebugString;
};
```

## PLUG\_CB\_EXCEPTION

Called on an unhandled (by the debugger) exception (in the debug loop), after setting the continue status, after locking the debugger to pause:

```
struct PLUG_CB_EXCEPTION
{
    EXCEPTION_DEBUG_INFO* Exception;
};
```

## PLUG\_CB\_BREAKPOINT

Called on a normal/memory/hardware breakpoint (in the debug loop), after locking the debugger to pause:

```
struct PLUG_CB_BREAKPOINT
{
    BRIDGEBP* breakpoint;
};
```

## PLUG\_CB\_PAUSEDEBUG

Called after the debugger has been locked to pause (in the debug loop), before any other callback that's before pausing the debugger:

```
struct PLUG_CB_PAUSEDEBUG
{
    void* reserved;
};
```

## PLUG\_CB\_RESUMEDEBUG

Called after the debugger has been unlocked to resume (outside of the debug loop):

```
struct PLUG_CB_RESUMEDEBUG
{
    void* reserved;
};
```

## **PLUG\_CB\_STEPPED**

Called after the debugger stepped (in the debug loop), after locking the debugger to pause:

```
struct PLUG_CB_STEPPED
{
    void* reserved;
};
```

## **PLUG\_CB\_ATTACH**

Called before attaching to a process:

```
struct PLUG_CB_ATTACH
{
    DWORD dwProcessId;
};
```

## **PLUG\_CB\_DETACH**

Called before detaching from the process:

```
struct PLUG_CB_DETACH
{
    PROCESS_INFORMATION* fdProcessInfo;
};
```

## **PLUG\_CB\_DEBUGEVENT**

Called on any debug event, even the ones that are handled internally.

Avoid doing stuff that takes time here, this will slow the debugger down a lot!:

```
struct PLUG_CB_DEBUGEVENT
{
    DEBUG_EVENT* DebugEvent;
};
```

## **PLUG\_CB\_MENUENTRY**

Called when a menu entry created by the plugin has been clicked, the GUI will resume when this callback returns:



```
struct PLUG_CB_MENUENTRY
{
    int hEntry;
};
```

## PLUG\_CB\_WINEVENT

Called before TranslateMessage and DispatchMessage Windows functions (PreTranslateMessage).

Avoid calling user32 functions without precautions here, there will be a recursive call if you fail to take countermeasures:

```
struct PLUG_CB_WINEVENT
{
    MSG* message;
    long* result;
    bool retval; //only set this to true if you want Qt to ignore the event.
};
```

## PLUG\_CB\_WINEVENTGLOBAL

Called before TranslateMessage and DispatchMessage Windows functions (PreTranslateMessage).

Avoid calling user32 functions without precautions here, there will be a recursive call if you fail to take countermeasures.

This function is global, so it also captures hotkeys (see Qt documentation). In Qt5 this function is almost never called, use [PLUG\\_CB\\_WINEVENT](#) instead.

```
struct PLUG_CB_WINEVENTGLOBAL
{
    MSG* message;
    bool retval; //only set this to true if you want Qt to ignore the event.
};
```

## PLUG\_CB\_LOADSAVEDB

Load or save data to database. Data is retrieved or stored or retrieved in a JSON format:

Two constants are defined in the `_plugins.h` file for the `loadSaveType`:

`PLUG_DB_LOADSAVE_DATA` `PLUG_DB_LOADSAVE_ALL`

```
struct PLUG_CB_LOADSAVEDB
{
    json_t* root;
    int loadSaveType;
};
```

## PLUG\_CB\_FILTERSYMBOL

Called before a symbol is emitted to the automatic labels. Set *retval* to *false* if you want to filter the symbol.

```
struct PLUG_CB_FILTERSYMBOL
{
    const char* symbol;
    bool retval;
};
```

## PLUG\_CB\_TRACEEXECUTE

Called during conditional tracing. Set the *stop* member to *true* to stop tracing.

```
struct PLUG_CB_TRACEEXECUTE
{
    duint cip;
    bool stop;
};
```

## 1.5.2 Functions

This section describes functions in the bridge. Many are currently undocumented, help if you can!

### Contents:

#### Bridge Functions

This section contains information about the Bridge functions of x64dbg.

**Please note: Bridge functions are handled by x64dbg and should not normally be called by any third party program or plugin - they are included for documentation purposes.**

### Contents:

#### BridgeAlloc

Function description.

```
void* BridgeAlloc(
    size_t size // memory size to allocate
);
```

#### Parameters

`size` Memory size (in bytes) to allocate.

#### Return Value

Returns a pointer to the memory block allocated. If an error occurs allocating memory, then x64dbg is closed down.

## Example

```
auto ptr = (char*)BridgeAlloc(128);  
//do something with ptr  
BridgeFree(ptr);
```

## Related functions

- *BridgeFree*

## BridgeFree

Function description.

```
void BridgeFree(  
    void* ptr // pointer to memory block to free  
);
```

## Parameters

`ptr` Pointer to memory block to free

## Return Value

This function does not return a value.

## Example

```
auto ptr = (char*)BridgeAlloc(128);  
//do something with ptr  
BridgeFree(ptr);
```

## Related functions

- *BridgeAlloc*

## BridgeGetDbgVersion

Internal function, don't use!

```
int BridgeGetDbgVersion();
```

## Parameters

This function has no parameters.

### Return Value

Return an integer value representing the version of the x64dbg.

### Example

```
int version = BridgeGetDbgVersion();
```

### Related functions

- List of related functions

### BridgeInit

Initializes the Bridge, defines the .ini file used for x64dbg and loads the main GUI and Debug functions. **Internal function, don't use!**

```
const wchar_t* BridgeInit();
```

### Parameters

This function has no parameters.

### Return Value

Returns 0 if successful, otherwise a string indicating the error that occurred.

### Example

```
Example code.
```

### Related functions

- List of related functions

### BridgeSettingFlush

Flush the settings stored in memory to disk.

```
bool BridgeSettingFlush();
```

## Parameters

This function has no parameters.

## Return Value

This function returns true if successful or false otherwise.

## Example

Example code.

## Related functions

- *BridgeSettingGet*
- *BridgeSettingGetUint*
- *BridgeSettingSet*
- *BridgeSettingSetUint*
- *BridgeSettingRead*

## BridgeSettingGet

Reads a string file from the settings.

```
bool BridgeSettingGet (
    const char* section, // ini section name to read
    const char* key, // ini key in the section to read
    char* value // string to hold the value read
);
```

## Parameters

section Section name to read.

key Key in the section to read.

value Destination buffer. Should be of MAX\_SETTING\_SIZE.

## Return Value

This function returns true if successful or false otherwise.

## Example

Example code.

## Related functions

- List of related functions

## BridgeSettingGetUint

Reads an integer from the settings.

```
bool BridgeSettingGetUint(  
    const char* section, // ini section name to write to  
    const char* key, // ini key in the section to write  
    duint* value // an integer variable to hold the value read  
);
```

## Parameters

section Section name to read.

key Key in the section to read.

value Destination value.

## Return Value

This function returns true if successful or false otherwise.

## Example

Example code.

## Related functions

- List of related functions

## BridgeSettingRead

Read the settings from disk (INI file).

```
bool BridgeSettingRead(  
    int* errorLine // line that error occurred on  
);
```

## Parameters

`errorLine` Line that error occurred on.

## Return Value

This function returns true if successful or false otherwise.

## Example

Example code.

## Related functions

- List of related functions

## BridgeSettingSet

Writes a string value to the settings.

```
bool BridgeSettingSet(  
    const char* section, // ini section name to write to  
    const char* key, // ini key in the section to write  
    char* value // string value to write  
);
```

## Parameters

`section` Section name to write to.

`key` Key in the section to write.

`value` New setting value.

## Return Value

This function returns true if successful or false otherwise.

## Example

Example code.

## Related functions

- List of related functions

## BridgeSettingSetUint

Reads an integer from the settings.

```
bool BridgeSettingSetUint(  
    const char* section, // ini section name to write to  
    const char* key, // ini key in the section to write  
    uint value // an integer variable to write  
);
```

### Parameters

section Section name to read.

key Key in the section to read.

value New value.

### Return Value

This function returns true if successful or false otherwise.

### Example

```
Example code.
```

### Related functions

- List of related functions

## BridgeStart

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.



## Example

```
Example code.
```

## Related functions

- List of related functions

## Debug Functions

This section contains information about debug functions of x64dbg.

### Contents:

## DbgArgumentAdd

This function will add an argument to the specified address range.

```
bool DbgArgumentAdd(duint start, duint end);
```

## Parameters

`start` first address of the argument range.

`end` last address of the argument range.

## Return Value

The function return TRUE if argument is successfully setted or FALSE otherwise.

## Example

```
if(DbgArgumentAdd(0x00401000, 0x00401013))
    GuiAddLogMessage("Argument successfully setted\r\n");
else
    GuiAddLogMessage("Argument couldn't be set\r\n");
```

## Related functions

- DbgArgumentDel
- DbgArgumentGet
- DbgArgumentOverlaps

## DbgArgumentDel

This function deletes a previous setted argument at the specified address.

```
bool DbgArgumentDel(duint addr);
```

### Parameters

`addr` Address of the argument to delete.

### Return Value

The function return TRUE if argument is successfully deleted or FALSE otherwise.

### Example

```
if(DbgArgumentDel(0x00401013))
    GuiAddLogMessage("Argument successfully deleted\r\n");
else
    GuiAddLogMessage("Argument couldn't be deleted\r\n");
```

### Related functions

- DbgArgumentAdd
- DbgArgumentGet
- DbgArgumentOverlaps

## DbgArgumentGet

This function gets the boundaries of the given argument location as start and end addresses.

```
bool DbgArgumentGet(duint addr, duint* start, duint* end);
```

### Parameters

`addr` Address of the argument to fetch.

`start` Pointer to a duint variable that will hold the start address of the argument.

`end` Pointer to a duint variable that will hold the end address of the argument.

### Return Value

The function return TRUE if the start and end addresses are found or FALSE otherwise. If TRUE, the variables `start` and `end` will hold the fetched values.

## Example

```
duint start;
duint end;
std::string message;

if(DbgArgumentGet(0x00401000, &start, &end))
{
    sprintf_s(message.c_str(), MAX_PATH, "Argument range: %08X-%08X\r\n", start, end);
    GuiAddLogMessage(message);
}
else
{
    GuiAddLogMessage("Argument start and end addresses couldn't be get\r\n");
}
```

## Related functions

- DbgArgumentAdd
- DbgArgumentDel
- DbgArgumentOverlaps

## DbgArgumentOverlaps

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgAssembleAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgClearAutoBookmarkRange

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgClearAutoCommentRange

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgClearAutoFunctionRange

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## **DbgClearAutoLabelRange**

Function description.

Function definition.

### **Parameters**

param1 Parameter description.

### **Return Value**

Return value description.

### **Example**

Example code.

### **Related functions**

- List of related functions

## **DbgClearBookmarkRange**

Function description.

Function definition.

### **Parameters**

param1 Parameter description.

### **Return Value**

Return value description.

### **Example**

Example code.

### **Related functions**

- List of related functions

## DbgClearCommentRange

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgClearLabelRange

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgCmdExec

Execute the command on the command processing thread.

```
bool DbgCmdExec(const char* cmd);
```

### Parameters

cmd The command string in UTF-8 encoding

### Return Value

true if the command is sent to the command processing thread for asynchronous execution, false otherwise.

### Example

```
DbgCmdExec("run");
```

### Related functions

- *DbgCmdExecDirect*

## DbgCmdExecDirect

Execute the command on the calling thread.

```
bool DbgCmdExecDirect(const char* cmd)
```

### Parameters

cmd The command string in UTF-8 encoding

### Return Value

true if the command is executed successfully, false otherwise.

### Example

```
DbgCmdExecDirect("run");
```

### Related functions

- *DbgCmdExec*



## DbgDelEncodeTypeRange

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgDelEncodeTypeSegment

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## **DbgDisasmAt**

Function description.

Function definition.

## **Parameters**

param1 Parameter description.

## **Return Value**

Return value description.

## **Example**

Example code.

## **Related functions**

- List of related functions

## **DbgDisasmFastAt**

Function description.

Function definition.

## **Parameters**

param1 Parameter description.

## **Return Value**

Return value description.

## **Example**

Example code.

## **Related functions**

- List of related functions

## DbgExit

Used by x64dbg GUI to send exit signal to debugger and close the debugger.

```
void DbgExit ()
```

### Parameters

No parameters

### Return Value

No return value.

### Example

```
Example code.
```

### Related functions

- [List of related functions](#)

## DbgFunctionAdd

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- [List of related functions](#)

## DbgFunctionDel

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgFunctionGet

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgFunctionOverlaps

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgFunctions

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetArgTypeAt

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetBookmarkAt

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetBpList

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetBpxTypeAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## **DbgGetBranchDestination**

Function description.

Function definition.

### **Parameters**

param1 Parameter description.

### **Return Value**

Return value description.

### **Example**

Example code.

### **Related functions**

- List of related functions

## **DbgGetCommentAt**

Function description.

Function definition.

### **Parameters**

param1 Parameter description.

### **Return Value**

Return value description.

### **Example**

Example code.

### **Related functions**

- List of related functions



## DbgGetEncodeSizeAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetEncodeTypeAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetEncodeTypeBuffer

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetFunctionTypeAt

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetLabelAt

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgGetLoopTypeAt

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgGetModuleAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgGetRegDump

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgGetStringAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetThreadList

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetTimeWastedCounter

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetWatchList

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgGetXrefCountAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgGetXrefTypeAt

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## **DbgInit**

Function description.

```
Function definition.
```

## **Parameters**

param1 Parameter description.

## **Return Value**

Return value description.

## **Example**

```
Example code.
```

## **Related functions**

- List of related functions

## **DbgIsBpDisabled**

Function description.

```
Function definition.
```

## **Parameters**

param1 Parameter description.

## **Return Value**

Return value description.

## **Example**

```
Example code.
```

## **Related functions**

- List of related functions



## DbgIsDebugging

Determines if the debugger is currently debugging an opened file or attached process.

```
bool DbgIsDebugging();
```

### Parameters

This function has no parameters.

### Return Value

This function returns true if x64dbg is currently debugging, or false otherwise.

### Example

```
if(!DbgIsDebugging())
{
    GuiAddLogMessage("You need to be debugging to use this option!\n");
    return false;
}
```

```
.data
szMsg db "You need to be debugging to use this option!",13,10,0 ; CRLF

.code
Invoke DbgIsDebugging
.IF eax == FALSE
    Invoke GuiAddLogMessage, Addr szMsg
.ENDIF
```

### Related functions

- *DbgIsRunning*

## DbgIsJumpGoingToExecute

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgIsRunLocked

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgIsRunning

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgIsValidExpression

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgLoopAdd

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgLoopDel

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgLoopGet

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgLoopOverlaps

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgMemFindBaseAddr

Returns the baseaddress and size of a specific module

```
duint DbgMemFindBaseAddr(  
    duint addr,  
    duint* size  
);
```

## Parameters

`addr` Virtual address which is in a specific module. `size` Pointer, which will, on success, hold the module size.

## Return Value

On success, returns the virtual address of a specific module. On failure, it will return 0.

## Example

Example code.

## Related functions

- *DbgMemGetPageSize*

## DbgMemGetPageSize

Function description.

Function definition.

## Parameters

`param1` Parameter description.

## Return Value

Return value description.

## Example

Get page base and size of selected instruction.

```
SELECTIONDATA sel;           // Define Address the slected line in the Disassembly_
↪window ( begin , End )
    GuiSelectionGet (GUI_DISASSEMBLY, &sel); // Get the value of sel(begin addr , End_
↪addr )
    duint pagesize = DbgMemGetPageSize(sel.start); // get the page size of the_
↪section from the selected memory addr
    //Or use the following statement to get page base and size in one call.
    duint sctionbase = DbgMemFindBaseAddr(sel.start, &pagesize); // get the base of_
↪this section ( begin addr of the section )
```

## Related functions

- List of related functions

## DbgMemIsValidReadPtr

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgMemMap

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgMemRead

Function description.

```
bool DbgMemRead(  
    duint va,  
    void* dest,  
    duint size  
);
```

## Parameters

va Virtual address to source dest Pointer to pre allocated buffer of size size size Number of bytes that should be read

## Return Value

Returns true on success.

## Example

```
// read user selected data from disassembly window  
SELECTIONDATA sel;  
GuiSelectionGet(GUI_DISASSEMBLY, &sel);  
uint16_t size = sel.end - sel.start + 1;  
uint8_t* dest = new uint8_t[size];  
bool success = DbgMemRead(sel.start, dest, size);  
// on success, the selected data is stored in dest
```

## Related functions

- List of related functions

## DbgMemWrite

Function description.

Function definition.



## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgMenuEntryClicked

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgModBaseFromName

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

### DbgReleaseEncodeTypeBuffer

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgScriptAbort

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgScriptBpGet

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgScriptBpToggle

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgScriptCmdExec

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgScriptGetBranchInfo

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgScriptGetLineType

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgScriptLoad

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgScriptRun

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgScriptSetIp

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgScriptStep

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## DbgScriptUnload

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSetAutoBookmarkAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions



## DbgSetAutoCommentAt

Set an auto comment at the given address.

```
bool DbgSetAutoCommentAt(duint addr, const char* text)
```

### Parameters

addr The address to comment.

text The auto comment in UTF-8 encoding.

### Return Value

true if the function is successful, false otherwise.

### Example

```
DbgSetAutoCommentAt(DbgValFromString("dis.sel()"), "This is the currently selected_↵  
↵instruction");
```

### Related functions

- *DbgSetCommentAt*
- *DbgSetAutoLabelAt*
- *DbgSetAutoBookmarkAt*
- *DbgSetLabelAt*
- *DbgSetBookmarkAt*

## DbgSetAutoFunctionAt

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSetAutoLabelAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSetBookmarkAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSetCommentAt

Set a comment at the given address.

```
bool DbgSetCommentAt (duint addr, const char* text)
```

## Parameters

addr The address to comment.

text The comment in UTF-8 encoding.

## Return Value

true if the function is successful, false otherwise.

## Example

```
DbgSetCommentAt (DbgValFromString("dis.sel()"), "This is the currently selected_  
↪instruction");
```

## Related functions

- *DbgSetAutoCommentAt*
- *DbgSetAutoLabelAt*
- *DbgSetAutoBookmarkAt*
- *DbgSetLabelAt*
- *DbgSetBookmarkAt*

## DbgSetEncodeType

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSetLabelAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSettingsUpdated

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgStackCommentGet

Function description.

Function definition.

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

## DbgSymbolEnum

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgSymbolEnumFromCache

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgValFromString

Evaluate the expression.

```
duint DbgValFromString(const char* string);
```

### Parameters

string The *expression* to evaluate in UTF-8 encoding.

### Return Value

The value of the expression.

### Example

```
eip = DbgValFromString("cip");
```

### Related functions

- *DbgValToString*

## DbgValToString

Set the variable to the value.

```
bool DbgValToString(const char* string, duint value);
```

### Parameters

string The name of the thing to set in UTF-8 encoding.

value The value to set.

### Return Value

true if the value was set successfully, false otherwise.

### Example

```
DbgValToString("eax", 1);
```

## Related functions

- *DbgValFromString*

## DbgWinEvent

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgWinEventGlobal

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example



Example code.

## Related functions

- List of related functions

## DbgXrefAdd

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## DbgXrefDelAll

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## DbgXrefGet

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GUI Functions

This section contains information about the Graphical User Interface GUI functions of x64dbg.

### Contents:

## GuiAddLogMessage

Adds a message to the log. The message will be shown in the log window and on the status bar at the bottom of x64dbg.

```
void GuiAddLogMessage(  
    const char* msg // string containg message to add to log  
);
```

## Parameters

`msg` String containing the message to add to the log. Ensure that a carriage line and return feed are included with the string for it to properly display it. Encoding is UTF-8.

## Return Value

This function does not return a value.

## Example

```
GuiAddLogMessage("This text will be displayed in the log view.\n");
```

```
.data
szMsg db "This text will be displayed in the log view",13,10,0 ; CRLF

.code
Invoke GuiAddLogMessage, Addr szMsg
```

## Related functions

- *GuiLogClear*
- *GuiAddStatusBarMessage*

## GuiAddQWidgetTab

Function description.

Function definition.

## Parameters

`param1` Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiAddRecentFile

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiAddStatusBarMessage

Shows text in the statusbar, which can be used to inform the user.

```
void GuiAddStatusBarMessage(const char* msg);
```

## Parameters

msg String containing the message to add to the status bar.

## Return Value

This function does not return a value.

## Example

```
GuiAddStatusBarMessage("This text will be displayed in the statusbar.");
```

## Related functions

- *GuiAddLogMessage*

## GuiAutoCompleteAddCmd

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiAutoCompleteClearAll

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiAutoCompleteDelCmd

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiCloseQWidgetTab

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiDisasmAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiDisplayWarning

Shows a warning dialog with title text and main message text.

```
void GuiDisplayWarning(const char* title, const char* text)
```

## Parameters

param1 Parameter description.

## Return Value

This function does not return a value.

## Example

```
GuiDisplayWarning("Warning!", "Operation cannot be reversed.");
```

## Related functions

- *GuiAddLogMessage*
- *GuiAddStatusBarMessage*

## GuiDumpAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiDumpAtN

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.



## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiExecuteOnGuiThread

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiFocusView

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

### GuiGetDebuggeeNotes

Returns into a variable a pointer to a string containing notes and information that a user has made relating to the target being debugged (the debuggee). The function `GuiGetGlobalNotes` can be used to get the global notes stored by a user.

```
void GuiGetDebuggeeNotes(char** text)
```

### Parameters

`text` A variable that will contain a pointer to a buffer on return. The pointer returned points to a string that will contain the notes for the debuggee.

### Return Value

This function does not return a value. The string containing the notes is returned via the pointer supplied via the `text` parameter.

### Example

```
char* text = nullptr;
GuiGetDebuggeeNotes(&text);
if(text)
{
    // do something with text
}
```

### Related functions

- *GuiSetDebuggeeNotes*
- *GuiGetGlobalNotes*
- *GuiSetGlobalNotes*

## GuiGetDisassembly

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiGetGlobalNotes

Returns into a variable a pointer to a string containing global notes and information that a user has made. The function GuiGetDebuggeeNotes can be used to get the local notes stored by a user for the target being debugged (the debuggee).

**void** GuiGetGlobalNotes(**char\*\*** text)

## Parameters

text A variable that will contain a pointer to a buffer on return. The pointer returned points to a string that will contain the global notes.

## Return Value

This function does not return a value. The string containing the notes is returned via the pointer supplied via the text parameter.

## Example

```
char* text = nullptr;
GuiGetGlobalNotes(&text);
if(text)
{
    // do something with text
}
```

## Related functions

- *GuiSetGlobalNotes*
- *GuiGetDebuggeeNotes*
- *GuiSetDebuggeeNotes*

## GuiGetLineWindow

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiGetWindowHandle

Obtains the main window handle for x64dg.

```
HWND GuiGetWindowHandle();
```

## Parameters

This function has no parameters.

## Return Value

Returns the main window handle for x6dbg as a HWND variable

## Example

```
hWnd = GuiGetWindowHandle();
```

## Related functions

### GuiGraphAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

### GuIsUpdateDisabled

Returns the status of the internal update flag, which can be disabled via GuiUpdateDisable function or enabled via the GuiUpdateEnable function.

```
bool GuiIsUpdateDisabled()
```

## Parameters

This function has no parameters.

## Return Value

Returns a boolean value indicating if the internal update flag is set to disabled. If it is set to disabled the value is TRUE otherwise updates are enabled and the value is FALSE.

## Example

```
bool bUpdate = GuiIsUpdateDisabled();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiLoadGraph

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiLoadSourceFile

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiLogClear

Clears the log window of all text.

```
void GuiLogClear();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiLogClear();
```

## Related functions

- [GuiAddLogMessage](#)

## GuiMenuAdd

This function adds a new child menu to a menu.

```
int GuiMenuAdd(int hMenu, const char* title)
```

## Parameters

**hMenu** Menu handle from a previously-added menu or from the main menu.

**title** A const char representing the text title of the menu item to be added.

## Return Value

Returns the menu handle (unique), or -1 on failure.

## Example

```
hNewMenu = GuiMenuAdd(hMenu, &szMenuTitle);
```

## Related functions

- [\*GuiMenuAddEntry\*](#)
- [\*GuiMenuAddSeparator\*](#)
- [\*GuiMenuClear\*](#)
- [\*GuiMenuSetEntryIcon\*](#)
- [\*GuiMenuSetIcon\*](#)

Note: Plugin developers should make use of the plugin functions provided:

- [\\_](#)
- [\\_](#)



- \_
- \_
- \_
- \_

## GuiMenuAddEntry

This function adds a menu entry to a menu.

```
int GuiMenuAddEntry(int hMenu, const char* title)
```

### Parameters

`hMenu` Menu handle from a previously-added menu or from the main menu.

`title` A const char representing the text title of the menu item to be added.

### Return Value

Returns the menu handle (unique), or -1 on failure.

### Example

```
hNewMenuEntry = GuiMenuAddEntry(hMenu, &szMenuEntryText);
```

### Related functions

- *GuiMenuAdd*
- *GuiMenuAddSeparator*
- *GuiMenuClear*
- *GuiMenuSetEntryIcon*
- *GuiMenuSetIcon*

Note: Plugin developers should make use of the plugin functions provided:

- \_
- \_
- \_
- \_
- \_
- \_

## GuiMenuAddSeparator

Adds a menu separator to a menu.

```
void GuiMenuAddSeparator(int hMenu)
```

### Parameters

hMenu Menu handle from a previously-added menu or from the main menu.

### Return Value

This function does not return a value.

### Example

```
hNewMenu = GuiMenuAdd(hMenu, &szMenuTitle);
GuiMenuAddEntry(hNewMenu, &szMenuEntry1Text);
GuiMenuAddEntry(hNewMenu, &szMenuEntry2Text);
GuiMenuAddSeparator(hNewMenu);
GuiMenuAddEntry(hNewMenu, &szMenuEntry3Text);
GuiMenuAddEntry(hNewMenu, &szMenuEntry4Text);
```

### Related functions

- *GuiMenuAdd*
- *GuiMenuAddEntry*
- *GuiMenuClear*
- *GuiMenuSetEntryIcon*
- *GuiMenuSetIcon*

Note: Plugin developers should make use of the plugin functions provided:

- —
- —
- —
- —
- —
- —

## GuiMenuClear

This function removes all entries and child menus from a menu. It will not remove the menu itself.

```
void GuiMenuClear(int hMenu)
```

## Parameters

hMenu Menu handle from a previously-added menu or from the main menu.

## Return Value

This function does not return a value.

## Example

```
hNewMenu = GuiMenuAdd(hMenu, &szMenuTitle);  
GuiMenuClear(hMenuNew);
```

## Related functions

- *GuiMenuAdd*
- *GuiMenuAddEntry*
- *GuiMenuAddSeparator*
- *GuiMenuSetEntryIcon*
- *GuiMenuSetIcon*

Note: Plugin developers should make use of the plugin functions provided:

- \_
- \_
- \_
- \_
- \_
- \_

## GuiMenuSetEntryIcon

Sets an icon for a specified menu entry.

```
void GuiMenuSetEntryIcon(int hEntry, const ICONDATA* icon)
```

## Parameters

hEntry Parameter description.

icon

## Return Value

This function does not return a value.

## Example

```
ICONDATA rocket;
rocket.data = icon_rocket;
rocket.size = sizeof(icon_rocket);
hNewMenuEntry = GuiMenuAddEntry(hMenu, &szMenuEntryText);
GuiMenuSetEntryIcon(hNewMenuEntry, &rocket);
```

## Related functions

- *GuiMenuAdd*
- *GuiMenuAddEntry*
- *GuiMenuAddSeparator*
- *GuiMenuClear*
- *GuiMenuSetIcon*

Note: Plugin developers should make use of the plugin functions provided:

- \_
- \_
- \_
- \_
- \_
- \_

## GuiMenuSetIcon

Sets an icon for a specified menu.

```
void GuiMenuSetIcon(int hMenu, const ICONDATA* icon)
```

## Parameters

`hMenu` Menu handle from a previously-added menu or from the main menu.

`icon`

## Return Value

This function does not return a value.

## Example

```
ICONDATA rocket;
rocket.data = icon_rocket;
rocket.size = sizeof(icon_rocket);
hNewMenuEntry = GuiMenuAddEntry(hMenu, &szMenuEntryText);
GuiMenuSetIcon(hMenuDisasm, &rocket);
```

## Related functions

- *GuiMenuAdd*
- *GuiMenuAddEntry*
- *GuiMenuAddSeparator*
- *GuiMenuClear*
- *GuiMenuSetEntryIcon*

Note: Plugin developers should make use of the plugin functions provided:

- \_
- \_
- \_
- \_
- \_
- \_

## GuiReferenceAddColumn

Adds a column to the current Reference View instance.

```
void GuiReferenceAddColumn(int width, const char* title);
```

## Parameters

**width** An integer indicating the width of the column to add.

**title** A const char representing the column's title name to add.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceAddColumn(8, &sztitle);
```

## Related functions

- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceDeleteAllColumns

Removes all columns from the current Reference View instance.

```
void GuiReferenceDeleteAllColumns();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceDeleteAllColumns();
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*

- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceGetCellContent

Retrieves the data stored in a specified cell in the current Reference View instance, based on the supplied row and column parameters.

```
char* GuiReferenceGetCellContent(int row, int col)
```

### Parameters

`row` An integer representing the row for the cell for which the data is fetched.

`col` An integer representing the column for the cell for which the data is fetched.

### Return Value

The return value is a pointer to a char representing the data (typically a string) that was stored at the specified row/column of the current Reference View instance. NULL if there was no data or the row/column specified was incorrect.

### Example

```
Data = GuiReferenceGetCellContent(0,0);
```

### Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceGetRowCount

Gets the total rows count in the current Reference View instance.

```
int GuiReferenceGetRowCount ()
```

### Parameters

This function has no parameters.

### Return Value

Returns an integer value representing the total rows in the current Reference View instance.

### Example

```
int iTotalRows = GuiReferenceGetRowCount ();
```

### Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceInitialize

Initializes and creates a new instance of a Reference View. A new tab will appear under Reference Views entitled as per the name parameter. Columns can be added to this instance via the `GuiReferenceAddColumn` function. Rows can be inserted by using the `GuiReferenceSetRowCount` function and data for each cell (row and column) can be added via the `GuiReferenceSetCellContent` function. See the appropriate functions for more details.

```
void GuiReferenceInitialize (const char* name)
```



## Parameters

name A const char representing the text string to name the Reference View instance.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceInitialize("Code Caves");
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceReloadData

Reloads (refreshes) the data in the current Reference View instance.

```
void GuiReferenceReloadData();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceReloadData();
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetCellContent

Sets a specified cell's data content in the Reference View based on the supplied row and column parameters.

```
void GuiReferenceSetCellContent(int row, int col, const char* str);
```

## Parameters

`row` integer representing the row to set data for.

`col` integer representing the column to set data for.

`str` `const char*` representing the string data to set at the row, col specified.

## Return Value

This function does not return a value.

## Example

```
const char szRefStart = "Start";
const char szRefFinish = "Finish";
const char szRefType = "Type";
GuiReferenceInitialize("Some Information"); // Add Reference View Header Title
GuiReferenceAddColumn(2 * sizeof(DWORD), &szRefStart); // Add column Name
GuiReferenceAddColumn(2 * sizeof(DWORD), &szRefFinish); // Add column Name
```

```

GuiReferenceAddColumn(8,&szRefType); // Add column Name
GuiReferenceSetRowCount(2); // add 2 rows
int iRow = 0;
GuiReferenceSetCellContent(iRow,0,&szCodeCaveStartAddress); // add start address
GuiReferenceSetCellContent(iRow,1,&szCodeCaveFinishAddress); // add finish address
GuiReferenceSetCellContent(iRow,2,&szNop); // add type
iRow = iRow + 1; // Increment rows
// get variables to convert to strings (szCodeCaveStartAddress,
↳szCodeCaveFinishAddress etc)
// add to next row's columns

```

## Notes

The Reference View must be initialized beforehand, and any columns required added before adding any rows and setting data for them.

Ensure you increment the row counter after you have set all data for all columns in a particular row, otherwise you will just overwrite any data you have set previously.

GuiReferenceSetRowCount needs to be called before setting cell contents - to update the reference view with a total count of rows, for example to add 5 rows: GuiReferenceSetRowCount(5), if you then decide to add another row later on then you would specify GuiReferenceSetRowCount(6)

Ideally you will use some variable that is incremented to automatically keep track of total rows added.

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetCurrentTaskProgress

Sets the percentage bar and some status text in the current Reference View instance. This can indicate to the user that an operation is taking place, e.g. searching/sorting.

```
void GuiReferenceSetCurrentTaskProgress(int progress, const char* taskTitle);
```

## Parameters

`progress` An integer representing the value of the percentage bar.

`taskTitle` A const char representing a text string to indicate status or progress to the user.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceSetCurrentTaskProgress(0, "Starting Search, Please Wait...");  
// do something  
GuiReferenceSetCurrentTaskProgress(50, "Searching, Please Wait...");  
// do something else  
GuiReferenceSetCurrentTaskProgress(100, "Finished Searching.");  
// finished
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetProgress

Sets the progress bar in the Reference View instance to a specific percentage value. This can be used to indicate to the user an operation is occurring, e.g. searching/sorting etc.

```
void GuiReferenceSetProgress(int progress);
```

## Parameters

`progress` An integer representing the percentage value to set the progress bar to.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceSetProgress(0);  
// do something  
GuiReferenceSetProgress(50);  
// do something else  
GuiReferenceSetProgress(100);  
// tell user operation has ended
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetRowCount

Sets the total number of rows that the Reference View will contain.

```
void GuiReferenceSetRowCount(int count);
```

## Parameters

`count` integer representing the total number of rows that the current Reference View will contain.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceSetRowCount (5) ;
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetSearchStartCol*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetSearchStartCol

Sets the search starting column in the current Reference View instance.

```
void GuiReferenceSetSearchStartCol (int col) ;
```

## Parameters

`col` An integer representing the 0 based column to use for searching.

## Return Value

This function does not return a value.

## Example

```
GuiReferenceSetSearchStartCol (1) ;
```

## Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*

- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*
- *GuiReferenceSetRowCount*
- *GuiReferenceSetSingleSelection*

## GuiReferenceSetSingleSelection

Sets the currently selected row in the Reference View instance.

```
void GuiReferenceSetSingleSelection(int index, bool scroll);
```

### Parameters

`index` integer representing the row index to set the current selection to.

`scroll` a boolean value indicating if the selected index should be scrolled into view if it is not currently.

### Return Value

This function does not return a value.

### Example

```
GuiReferenceSetSingleSelection(0,true);
```

### Related functions

- *GuiReferenceAddColumn*
- *GuiReferenceDeleteAllColumns*
- *GuiReferenceGetCellContent*
- *GuiReferenceGetRowCount*
- *GuiReferenceInitialize*
- *GuiReferenceReloadData*
- *GuiReferenceSetCellContent*
- *GuiReferenceSetCurrentTaskProgress*
- *GuiReferenceSetProgress*

- *GuiReferenceSetRowCount*
- *GuiReferenceSetSearchStartCol*

## GuiRegisterScriptLanguage

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

## GuiRepaintTableView

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```



## Related functions

- List of related functions

## GuiScriptAdd

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiScriptClear

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiScriptEnableHighlighting

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiScriptError

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

### GuiScriptMessage

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

### Example

```
Example code.
```

### Related functions

- List of related functions

### GuiScriptMsgyn

Function description.

```
Function definition.
```

### Parameters

param1 Parameter description.

### Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiScriptSetInfoLine

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiScriptSetIp

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiScriptSetTitle

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiSelectionGet

Gets the currently selected line (or lines) of the specified GUI view and returns the information as start and end addresses into a SELECTIONDATA variable.

```
bool GuiSelectionGet(int hWindow, SELECTIONDATA* selection)
```

## Parameters

hWindow an integer representing one of the following supported GUI views: GUI\_DISASSEMBLY, GUI\_DUMP, GUI\_STACK.

selection a SELECTIONDATA structure variable that stores the start and end address of the current selection.

## Return Value

Return TRUE if successful or FALSE otherwise.

## Example

```
SELECTIONDATA sel;
GuiSelectionGet(GUI_DISASSEMBLY, &sel)
sprintf(msg, "%p - %p", sel.start, sel.end);
```

## Related functions

- *GuiSelectionSet*

## GuiSelectionSet

Sets the currently selected line (or lines) of the specified GUI view based on the start and end addresses stored in a SELECTIONDATA variable.

```
bool GuiSelectionSet(int hWindow, const SELECTIONDATA* selection)
```

## Parameters

`hWindow` an integer representing one of the following supported GUI views: GUI\_DISASSEMBLY, GUI\_DUMP, GUI\_STACK.

`selection` a SELECTIONDATA structure variable that stores the start and end address of the current selection.

## Return Value

Return TRUE if successful or FALSE otherwise.

## Example

```
SELECTIONDATA sel;
GuiSelectionGet(GUI_DISASSEMBLY, &sel)
sel.end += 4; //expand selection
GuiSelectionSet(GUI_DISASSEMBLY, &sel)
```

## Related functions

- *GuiSelectionGet*

## GuiSetDebuggeeNotes

Sets the notes of the target being debugged (the debuggee), based on the text variable passed to the function. The text variable is a pointer to a string containing the information to set as the debuggee's notes.

```
void GuiSetDebuggeeNotes(char** text)
```

### Parameters

`text` A variable that contains a pointer to a string that contains the text to set as the debuggee notes.

### Return Value

This function does not return a value.

### Example

```
const char* text = json_string_value(json_object_get(root, "notes"));
GuiSetDebuggeeNotes(text);
```

### Related functions

- *GuiGetDebuggeeNotes*
- *GuiGetGlobalNotes*
- *GuiSetGlobalNotes*

## GuiSetDebugState

Function description.

```
Function definition.
```

### Parameters

`param1` Parameter description.

### Return Value

Return value description.

### Example

Example code.

### Related functions

- List of related functions

### GuiSetGlobalNotes

Sets the global notes, based on the text variable passed to the function. The text variable is a pointer to a string containing the information to set as the global notes.

```
void GuiSetGlobalNotes(char** text)
```

### Parameters

text A variable that contains a pointer to a string that contains the text to set as the global notes.

### Return Value

This function does not return a value.

### Example

```
notesFile = String(szProgramDir) + "\\notes.txt";
String text;
if(!FileExists(notesFile.c_str()) || FileHelper::ReadAllText(notesFile, text))
    GuiSetGlobalNotes(text.c_str());
```

### Related functions

- *GuiGetGlobalNotes*
- *GuiGetDebuggeeNotes*
- *GuiSetDebuggeeNotes*

### GuiSetLastException

Function description.

Function definition.

### Parameters

param1 Parameter description.



## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiShowCpu

Switches the focus and view of the GUI to the main disassembly window (CPU tab)

```
void GuiShowCpu();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiShowCpu();
```

## Related functions

## GuiShowQWidgetTab

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiStackDumpAt

Function description.

```
Function definition.
```

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

```
Example code.
```

## Related functions

- List of related functions

## GuiSymbolLogAdd

Function description.

```
void GuiSymbolLogAdd(const char* message);
```

## Parameters

**message** String containing the message to add to the symbol log. Ensure that a carriage line and return feed are included with the string for it to properly display it. Encoding is UTF-8.

## Return Value

This function does not return a value.

## Example

```
GuiSymbolLogAdd (&szMsg) ;
```

## Related functions

- *GuiSymbolLogClear*
- *GuiSymbolRefreshCurrent*
- *GuiSymbolSetProgress*
- *GuiSymbolUpdateModuleList*

## GuiSymbolLogClear

Function description.

```
void GuiSymbolLogClear ();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiSymbolLogClear ();
```

## Related functions

- *GuiSymbolLogAdd*
- *GuiSymbolRefreshCurrent*
- *GuiSymbolSetProgress*
- *GuiSymbolUpdateModuleList*

## GuiSymbolRefreshCurrent

Refreshes the symbol view list of symbols and exports.

```
void GuiSymbolRefreshCurrent ();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiSymbolRefreshCurrent ();
```

## Related functions

- *GuiSymbolLogAdd*
- *GuiSymbolLogClear*
- *GuiSymbolSetProgress*
- *GuiSymbolUpdateModuleList*

## GuiSymbolSetProgress

Sets the progress bar in the symbol view based on the integer value supplied. This can be used to convey to the user an operation and how close it is to completion, for example with searches.

```
void GuiSymbolSetProgress (int percent);
```

## Parameters

`percent` an integer representing the percentage to set for the progress bar.

## Return Value

This function does not return a value.

## Example

```
GuiSymbolSetProgress(50);
```

## Related functions

- *GuiSymbolLogAdd*
- *GuiSymbolLogClear*
- *GuiSymbolRefreshCurrent*
- *GuiSymbolUpdateModuleList*

## GuiSymbolUpdateModuleList

Refreshes the symbol view modules list.

```
void GuiSymbolUpdateModuleList(int count, SYMBOLMODULEINFO* modules)
```

## Parameters

count An integer representing the number of symbol module's to update.

modules A SYMBOLMODULEINFO variable that will hold the symbol module information.

## Return Value

This function does not return a value.

## Example

```
// Build the vector of modules
std::vector<SYMBOLMODULEINFO> modList;

if(!SymGetModuleList(&modList))
{
    GuiSymbolUpdateModuleList(0, nullptr);
    return;
}

// Create a new array to be sent to the GUI thread
size_t moduleCount = modList.size();
SYMBOLMODULEINFO* data = (SYMBOLMODULEINFO*)BridgeAlloc(moduleCount *
↳ sizeof(SYMBOLMODULEINFO));
```

```
// Direct copy from std::vector data
memcpy(data, modList.data(), moduleCount * sizeof(SYMBOLMODULEINFO));

// Send the module data to the GUI for updating
GuiSymbolUpdateModuleList((int)moduleCount, data);
```

## Related functions

- *GuiSymbolLogAdd*
- *GuiSymbolLogClear*
- *GuiSymbolRefreshCurrent*
- *GuiSymbolSetProgress*

## GuiUnregisterScriptLanguage

Function description.

Function definition.

## Parameters

param1 Parameter description.

## Return Value

Return value description.

## Example

Example code.

## Related functions

- List of related functions

## GuiUpdateAllViews

Refreshes the contents of all opened views (tabs)

```
void GuiUpdateAllViews();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateAllViews();
```

## Related functions

- *GuiUpdateEnable*
- *GuiUpdateDisable*
- *GuiIsUpdateDisabled*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateArgumentWidget

Refreshes the contents of the arguments widget.

```
void GuiUpdateArgumentWidget();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateArgumentWidget();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateBreakpointsView

Refreshes the contents of the breakpoints view.

```
void GuiUpdateBreakpointsView();
```



## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateBreakpointsView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateCallStack

Refreshes the contents of the call stack widget.

```
void GuiUpdateCallStack();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateCallStack();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateDisable

Sets and internal variable to disable the update of views. To re-enable updating after processing or performing some operation, use the GuiUpdateEnable function.

```
void GuiUpdateDisable();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateDisable();
```

## Related functions

- *GuiIsUpdateDisabled*
- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateDisassemblyView

Refreshes the contents of the disassembly view (CPU tab).

```
void GuiUpdateDisassemblyView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateDisassemblyView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateDumpView

Refreshes the contents of the dump views.

```
void GuiUpdateDumpView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateDumpView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateEnable

Sets an internal variable to enable (or re-enable if previously disabled via `GuiUpdateDisable`) the refresh of all views. The `updateNow` parameter can be used to force the update straight away, otherwise the updates of views will continue as per normal message scheduling, now that they have been enabled with `GuiUpdateEnable`.

```
void GuiUpdateEnable(bool updateNow);
```

### Parameters

`updateNow` is a boolean value indicating if the update of all views should occur straight away.

### Return Value

This function does not return a value.

### Example

```
GuiUpdateEnable (bool updateNow) ;
```

### Related functions

- *GuiIsUpdateDisabled*
- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

### GuiUpdateGraphView

Refreshes the contents of the Graph view.

```
void GuiUpdateGraphView() ;
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateGraphView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateMemoryView

Refreshes the contents of the memory view.

```
void GuiUpdateMemoryView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateMemoryView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdatePatches

Refreshes the contents of the patches.

```
void GuiUpdatePatches();
```



## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdatePatches();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateRegisterView

Refreshes the contents of the registers view.

```
void GuiUpdateRegisterView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateRegisterView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateSEHChain

Refreshes the contents of the SEH Chain.

```
void GuiUpdateSEHChain();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateSEHChain();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateSideBar

Refreshes the contents of the Sidebar.

```
void GuiUpdateSideBar();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateSideBar();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateThreadView

Refreshes the contents of the threads view.

```
void GuiUpdateThreadView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateThreadView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateTimeWastedCounter

Refreshes the time wasted counter.

```
void GuiUpdateTimeWastedCounter();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateTimeWastedCounter();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateWatchView

Refreshes the contents of the watchdog view.

```
void GuiUpdateWatchView();
```

## Parameters

This function has no parameters.

## Return Value

This function does not return a value.

## Example

```
GuiUpdateWatchView();
```

## Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

## GuiUpdateWindowTitle

Updates the x64dbg window title with a string to be appended to the title text. Typically the string is a filename.

```
void GuiUpdateWindowTitle(const char* filename)
```

### Parameters

`filename` a const char variable to be appended to the x64dbg title bar.

### Return Value

This function does not return a value.

### Example

```
GuiUpdateWindowTitle("");  
GuiUpdateWindowTitle(szFileName);
```

### Related functions

- *GuiUpdateAllViews*
- *GuiUpdateArgumentWidget*
- *GuiUpdateBreakpointsView*
- *GuiUpdateCallStack*
- *GuiUpdateDisable*
- *GuiUpdateDisassemblyView*
- *GuiUpdateDumpView*
- *GuiUpdateEnable*
- *GuiUpdateGraphView*
- *GuiUpdateMemoryView*
- *GuiUpdatePatches*
- *GuiUpdateRegisterView*
- *GuiUpdateSEHChain*
- *GuiUpdateSideBar*
- *GuiUpdateThreadView*
- *GuiUpdateTimeWastedCounter*
- *GuiUpdateWatchView*
- *GuiUpdateWindowTitle*

### 1.5.3 x64dbg trace file format specification

x64dbg trace file is a binary file that contains all information about program execution. Each trace file is composed of 3 parts: **Magic word**, **JSON header** and **binary trace blocks**. x64dbg trace file is little-endian.



## Magic word

Every trace file will begin with 4 bytes, “TRAC” (encoded in ASCII).

## Header

Header is located after header at offset 4. It is composed of a 4-byte length field, followed by a JSON blob. The JSON blob might not be null-terminated and might not be aligned to 4-byte boundary.

## Binary trace blocks

Binary trace data is immediately after header without any padding and might not be aligned to 4-byte boundary. It is defined as a sequence of blocks. Currently, only block type 0 is defined.

Every block is started with a 1-byte type number. This type number must be 0, which means it is a block that describes an instruction traced.

If the type number is 0, then the block will contain the following data:

```
struct {
    uint8_t BlockType; //BlockType is 0, indicating it describes an instruction_
    ↪execution.
    uint8_t RegisterChanges;
    uint8_t MemoryAccesses;
    uint8_t BlockFlagsAndOpcodeSize; //Bitfield

    DWORD ThreadId;
    uint8_t Opcode[];

    uint8_t RegisterChangePosition[];
    uint RegisterChangeNewData[];

    uint8_t MemoryAccessFlags[];
    uint MemoryAccessAddress[];
    uint MemoryAccessOldData[];
    uint MemoryAccessNewData[];
};
```

RegisterChanges is a unsigned byte that counts the number of elements in the array RegisterChangePosition and RegisterChangeNewData.

MemoryAccesses is a unsigned byte that counts the number of elements in the array MemoryAccessFlags.

BlockFlagsAndOpcodeSize is a bitfield. The most significant bit is ThreadId bit. When this bit is set, ThreadId field is available and indicates the thread id which executed the instruction. When this bit is clear, the thread id that executed the instruction is the same as last instruction, so it is not stored in file. The least 4 significant bits specify the length of Opcode field, in number of bytes. Other bits are reserved and set to 0. Opcode field contains the opcode of current instruction.

RegisterChangePosition is an array of unsigned bytes. Each element indicates a pointer-sized integer in struct REGDUMP that is updated after execution of current instruction, as an offset to previous location. The absolute index is computed by adding the absolute index of previous element +1 (or 0 if it is first element) with this relative index. RegisterChangeNewData is an array of pointer-sized integers that contains the new value of register, that is recorded before the instruction is executed. REGDUMP structure is given below.

```
typedef struct
{
    REGISTERCONTEXT regcontext;
    FLAGS flags;
    X87FPUREGISTER x87FPURegisters[8];
    unsigned long long mmx[8];
    MXCSRFIELDS MxCsrFields;
    X87STATUSWORDFIELDS x87StatusWordFields;
    X87CONTROLWORDFIELDS x87ControlWordFields;
    LASTERROR lastError;
    //LASTSTATUS lastStatus; //This field is not supported and not included in trace_
    ↪file.
} REGDUMP;
```

For example, `ccx` is the second member of `regcontext`. On x64 architecture, it is at byte offset 8 and on x86 architecture it is at byte offset 4. On both architecture, it is at index 1 and `cax` is at index 0. Therefore, when `RegisterChangePosition[0] = 0`, `RegisterChangeNewData[0]` contains the new value of `cax`. If `RegisterChangePosition[1] = 0`, `RegisterChangeNewData[1]` contains the new value of `ccx`, since the absolute index is computed by  $0+0+1=1$ . The use of relative indexing helps achieve better data compression if a lossless compression is then applied to trace file, and also allow future expansion of `REGDUMP` structure without increasing size of `RegisterChanges` and `RegisterChangePosition` beyond a byte. Note: the file reader can locate the address of the instruction using `cip` register in this structure.

x64dbg will save all registers at the start of trace, and every 512 instructions (this number might be changed in future versions to have different tradeoff between speed and space). A block with all registers saved will have `RegisterChanges=172` on 64-bit platform and 216 on 32-bit platform. This allows x64dbg trace file to be randomly accessed. x64dbg might be unable to open a trace file that has a sequence of instruction longer than an implementation-defined limit without all registers saved.

`MemoryAccessFlags` is an array of bytes that indicates properties of memory access. Currently, only bit 0 is defined and all other bits are reserved and set to 0. When bit 0 is set, it indicates the memory is not changed (This could mean it is read, or it is overwritten with identical value), so `MemoryAccessNewData` will not have an entry for this memory access. The file reader may use a disassembler to determine the true type of memory access.

`MemoryAccessAddress` is an array of pointers that indicates the address of memory access.

`MemoryAccessOldData` is an array of pointer-sized integers that stores the old content of memory.

`MemoryAccessNewData` is an array of pointer-sized integers that stores the new content of memory.

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively state the exclusion of warranty; and each file should have at least the “copyright” line and a pointer to where the full notice is found.

```
<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>
```

```
This program is free software: you can redistribute it and/or modify
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the Free Software Foundation, either version 3 of the License, or
```

```
(at your option) any later version.
```

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If the program does terminal interaction, make it output a short notice like this when it starts in an interactive mode:

```
<program> Copyright (C) <year> <name of author>
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under certain conditions; type `show c' for details.
```

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## 1.6.2 TitanEngine Update

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```

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1) Use a suitable shared library mechanism for linking with the
Library. A suitable mechanism is one that (a) uses at run time
```

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```
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a copy of the Library already present on the user's computer
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## CHAPTER 2

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### Indices and tables

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- `modindex`
- `search`