arg_locs(*prototype*)

Return type
List[*SimFunctionArgument*]

get_args(*state*, *prototype*, *stack_base=None*)

set_return_val(*state*, *val*, *ty*, *stack_base=None*, *perspective_returned=False*)

setup_callsite(*state*, *ret_addr*, *args*, *prototype*, *stack_base=None*, *alloc_base=None*, *grow_like_stack=True*)

This function performs the actions of the caller getting ready to jump into a function.

Parameters

- **state** – The SimState to operate on
- **ret_addr** – The address to return to when the called function finishes
- **args** – The list of arguments that that the called function will see
- **prototype** – The signature of the call you're making. Should include variadic args concretely.
- **stack_base** – An optional pointer to use as the top of the stack, circa the function entry point
- **alloc_base** – An optional pointer to use as the place to put excess argument data
- **grow_like_stack** – When allocating data at alloc_base, whether to allocate at decreasing addresses

The idea here is that you can provide almost any kind of python type in *args* and it'll be translated to a binary format to be placed into simulated memory. Lists (representing arrays) must be entirely elements of the same type and size, while tuples (representing structs) can be elements of any type and size. If you'd like there to be a pointer to a given value, wrap the value in a *PointerWrapper*.

If stack_base is not provided, the current stack pointer will be used, and it will be updated. If alloc_base is not provided, the stack base will be used and grow_like_stack will implicitly be True.

grow_like_stack controls the behavior of allocating data at alloc_base. When data from args needs to be wrapped in a pointer, the pointer needs to point somewhere, so that data is dumped into memory at alloc_base. If you set alloc_base to point to somewhere other than the stack, set grow_like_stack to False so that sequential allocations happen at increasing addresses.

teardown_callsite(*state*, *return_val=None*, *prototype=None*, *force_callee_cleanup=False*)

This function performs the actions of the callee as it's getting ready to return. It returns the address to return to.

Parameters

- **state** – The state to mutate
- **return_val** – The value to return
- **prototype** – The prototype of the given function
- **force_callee_cleanup** – If we should clean up the stack allocation for the arguments even if it's not the callee's job to do so

TODO: support the stack_base parameter from setup_callsite…? Does that make sense in this context? Maybe it could make sense by saying that you pass it in as something like the "saved base pointer" value?

static find_cc(*arch*, *args*, *sp_delta*, *platform='Linux'*)

Pinpoint the best-fit calling convention and return the corresponding SimCC instance, or None if no fit is found.

Parameters

- **arch** (Arch) – An ArchX instance. Can be obtained from archinfo.
- **args** (List[*SimFunctionArgument*]) – A list of arguments. It may be updated by the first matched calling convention to remove non-argument arguments.
- **sp_delta** (int) – The change of stack pointer before and after the call is made.
- **platform** (*str*) –

Return type
Optional[*SimCC*]

Returns
A calling convention instance, or None if none of the SimCC subclasses seems to fit the arguments provided.

get_arg_info(*state*, *prototype*)

This is just a simple wrapper that collects the information from various locations prototype is as passed to self.arg_locs and self.get_args :param angr.SimState state: The state to evaluate and extract the values from :return: A list of tuples, where the nth tuple is (type, name, location, value) of the nth argument

class angr.**SimFileBase**(*name=None*, *writable=True*, *ident=None*, *concrete=False*, *file_exists=True*, ***kwargs*)

Bases: *SimStatePlugin*

SimFiles are the storage mechanisms used by SimFileDescriptors.

Different types of SimFiles can have drastically different interfaces, and as a result there's not much that can be specified on this base class. All the read and write methods take a `pos` argument, which may have different semantics per-class. `0` will always be a valid position to use, though, and the next position you should use is part of the return tuple.

Some simfiles are "streams", meaning that the position that reads come from is determined not by the position you pass in (it will in fact be ignored), but by an internal variable. This is stored as `.pos` if you care to read it. Don't write to it. The same lack-of-semantics applies to this field as well.

Variables

- **name** – The name of the file. Purely for cosmetic purposes
- **ident** – The identifier of the file, typically autogenerated from the name and a nonce. Purely for cosmetic purposes, but does appear in symbolic values autogenerated in the file.
- **seekable** – Bool indicating whether seek operations on this file should succeed. If this is True, then `pos` must be a number of bytes from the start of the file.
- **writable** – Bool indicating whether writing to this file is allowed.
- **pos** – If the file is a stream, this will be the current position. Otherwise, None.
- **concrete** – Whether or not this file contains mostly concrete data. Will be used by some SimProcedures to choose how to handle variable-length operations like fgets.
- **file_exists** – Set to False, if file does not exists, set to a claripy Bool if unknown, default True.

seekable = False

pos = None

__init__(*name=None*, *writable=True*, *ident=None*, *concrete=False*, *file_exists=True*, ***kwargs*)

static make_ident(*name*)

concretize(***kwargs*)

Return a concretization of the contents of the file. The type of the return value of this method will vary depending on which kind of SimFile you're using.

read(*pos*, *size*, ***kwargs*)

Read some data from the file.

Parameters

- **pos** – The offset in the file to read from.
- **size** – The size to read. May be symbolic.

Returns

A tuple of the data read (a bitvector of the length that is the maximum length of the read), the actual size of the read, and the new file position pointer.

write(*pos*, *data*, *size=None*, ***kwargs*)

Write some data to the file.

Parameters

- **pos** – The offset in the file to write to. May be ignored if the file is a stream or device.
- **data** – The data to write as a bitvector
- **size** – The optional size of the data to write. If not provided will default to the length of the data. Must be constrained to less than or equal to the size of the data.

Returns

The new file position pointer.

property size

The number of data bytes stored by the file at present. May be a symbolic value.

copy(*memo=None*, ***kwargs*)

Should return a copy of the plugin without any state attached. Should check the memo first, and add itself to memo if it ends up making a new copy.

In order to simplify using the memo, you should annotate implementations of this function with `SimStatePlugin.memo`

The base implementation of this function constructs a new instance of the plugin's class without calling its initializer. If you super-call down to it, make sure you instanciate all the fields in your copy method!

Parameters

memo – A dictionary mapping object identifiers (id(obj)) to their copied instance. Use this to avoid infinite recursion and diverged copies.

state: angr.SimState

class angr.**SimFile**(*name=None*, *content=None*, *size=None*, *has_end=None*, *seekable=True*, *writable=True*, *ident=None*, *concrete=None*, ***kwargs*)

Bases: *SimFileBase*, *DefaultMemory*

The normal SimFile is meant to model files on disk. It subclasses SimSymbolicMemory so loads and stores to/from it are very simple.

Parameters

- **name** – The name of the file
- **content** – Optional initial content for the file as a string or bitvector
- **size** – Optional size of the file. If content is not specified, it defaults to zero
- **has_end** – Whether the size boundary is treated as the end of the file or a frontier at which new content will be generated. If unspecified, will pick its value based on options.FILES_HAVE_EOF. Another caveat is that if the size is also unspecified this value will default to False.
- **seekable** – Optional bool indicating whether seek operations on this file should succeed, default True.
- **writable** – Whether writing to this file is allowed
- **concrete** – Whether or not this file contains mostly concrete data. Will be used by some SimProcedures to choose how to handle variable-length operations like fgets.

Variables

has_end – Whether this file has an EOF

__init__(*name=None*, *content=None*, *size=None*, *has_end=None*, *seekable=True*, *writable=True*, *ident=None*, *concrete=None*, ***kwargs*)

property category

reg, mem, or file.

Type

Return the category of this SimMemory instance. It can be one of the three following categories

set_state(*state*)

Sets a new state (for example, if the state has been branched)

property size

The number of data bytes stored by the file at present. May be a symbolic value.

concretize(***kwargs*)

Return a concretization of the contents of the file, as a flat bytestring.

read(*pos*, *size*, ***kwargs*)

Read some data from the file.

Parameters

- **pos** – The offset in the file to read from.
- **size** – The size to read. May be symbolic.

Returns

A tuple of the data read (a bitvector of the length that is the maximum length of the read), the actual size of the read, and the new file position pointer.

write(*pos*, *data*, *size=None*, *events=True*, ***kwargs*)

Write some data to the file.

Parameters

- **pos** – The offset in the file to write to. May be ignored if the file is a stream or device.
- **data** – The data to write as a bitvector

- **size** – The optional size of the data to write. If not provided will default to the length of the data. Must be constrained to less than or equal to the size of the data.

Returns
The new file position pointer.

copy(*memo=None*, ***kwargs*)

Should return a copy of the plugin without any state attached. Should check the memo first, and add itself to memo if it ends up making a new copy.

In order to simplify using the memo, you should annotate implementations of this function with `SimStatePlugin.memo`

The base implementation of this function constructs a new instance of the plugin's class without calling its initializer. If you super-call down to it, make sure you instanciate all the fields in your copy method!

Parameters
memo – A dictionary mapping object identifiers (id(obj)) to their copied instance. Use this to avoid infinite recursion and diverged copies.

merge(*others*, *merge_conditions*, *common_ancestor=None*)

Should merge the state plugin with the provided others. This will be called by `state.merge()` after copying the target state, so this should mutate the current instance to merge with the others.

Note that when multiple instances of a single plugin object (for example, a file) are referenced in the state, it is important that merge only ever be called once. This should be solved by designating one of the plugin's referees as the "real owner", who should be the one to actually merge it. This technique doesn't work to resolve the similar issue that arises during copying because merging doesn't produce a new reference to insert.

There will be n `others` and n+1 merge conditions, since the first condition corresponds to self. To match elements up to conditions, say `zip([self] + others, merge_conditions)`

When implementing this, make sure that you "deepen" both `others` and `common_ancestor` before calling sub-elements' merge methods, e.g.

```
self.foo.merge(
    [o.foo for o in others],
    merge_conditions,
    common_ancestor=common_ancestor.foo if common_ancestor is not None else None
)
```

During static analysis, merge_conditions can be None, in which case you should use `state.solver.union(values)`. TODO: fish please make this less bullshit

There is a utility `state.solver.ite_cases` which will help with constructing arbitrarily large merged ASTs. Use it like `self.bar = self.state.solver.ite_cases(zip(conditions[1:], [o.bar for o in others]), self.bar)`

Parameters

- **others** – the other state plugins to merge with
- **merge_conditions** – a symbolic condition for each of the plugins
- **common_ancestor** – a common ancestor of this plugin and the others being merged

Returns
True if the state plugins are actually merged.

Return type
bool