TinyTalk

1.0.0

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Chapter 1

TT Language

1.1 Introduction

TT Technical Details

Chapter 2

TT Technical Details

2.1 Main Features

2.2 Details

Chapter 1: Memory Management

Syntax

Chapter 3: Implementation

2.3 Chapter 1: Memory Management

2.4 Syntax

```
object_ident ::= IDENT.
object_ident ::= IDENT IDENT.
unary_pattern ::= IDENT.
binary_pattern ::= BINOP IDENT.
keyword_pattern ::= KEYWORD IDENT.
keyword_pattern ::= keyword_pattern KEYWORD IDENT.
all ::= object_defs.
object_defs ::=.
object_defs ::= object_defs object_ident LBRACK var_list method_defs RBRACK.
object_defs ::= object_defs object_ident LARROW IDENT LBRACK var_list method_defs RBRACK.
var_list ::=.
var_list ::= BAR idents BAR.
idents ::= IDENT.
idents ::= idents IDENT.
method_defs ::=.
method_defs ::= method_defs msg_pattern LBRACK var_list statements RBRACK.
method_defs ::= method_defs msg_pattern VERBATIM.
msg_pattern ::= unary_pattern.
msg_pattern ::= binary_pattern.
msg_pattern ::= keyword_pattern.
statements ::= return_statement.
statements ::= return_statement DOT.
statements ::= expression DOT statements.
statements ::= expression.
statements ::= expression DOT.
```

```
return_statement ::= UARROW expression.
expression ::= IDENT LARROW expr.
expression ::= basic_expression.
basic_expression ::= primary.
basic_expression ::= primary messages cascaded_messages.
basic_expression ::= primary cascaded_messages.
basic_expression ::= primary messages.
primary ::= IDENT.
primary ::= STRING.
primary ::= LBRACK block_body RBRACK.
primary ::= LBRACE expression RBRACE.
block_body ::= block_arguments BAR var_list statements.
block_body ::= var_list statements.
block_body ::= var_list.
block_arguments ::= COLON IDENT.
block_arguments ::= block_arguments COLON IDENT.
messages ::= unary_messages.
messages ::= unary_messages keyword_message.
messages ::= unary_messages binary_messages.
messages ::= unary_messages binary_messages keyword_message.
messages ::= binary_messages.
messages ::= binary_messages keyword_message.
messages ::= keyword_message.
unary_messages ::= IDENT.
binary_messages ::= binary_message.
binary_messages ::= binary_message binary_messages.
binary_message ::= BINOP binary_argument.
binary_argument ::= primary unary_messages.
binary_argument ::= primary.
keyword_message ::= KEYWORD keyword_argument.
keyword_message ::= keyword_message KEYWORD keyword_argument.
keyword_argument ::= primary.
keyword_argument ::= primary unary_messages.
keyword_argument ::= primary unary_messages binary_messages.
cascaded_messages ::= SEMICOLON messages.
cascaded_messages ::= cascaded_messages SEMICOLON messages.
atom ::= IDENT.
atom ::= STRING.
unary_call ::= unary_call IDENT.
binary_call ::= binary_call BINOP unary_call.
unary_call ::= atom.
binary_call ::= unary_call.
expr ::= binary_call.
```

2.5 Chapter 3: Implementation

Chapter 3

Module Index

3.1 Modules

Here is a list of all modules:

Chapter 4

Data Structure Index

4.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 5

Module Documentation

5.1 list

Functions

- void **namelist_init** (t_namelist ∗nl)
- void **namelist_add** (t_namelist ∗nl, const char ∗name)
- void **namelist_copy** (t_namelist ∗to, t_namelist ∗from)

5.1.1 Detailed Description

5.2 ITab

Data Structures

- struct itab_entry

  structure of an entry in the itab.
- struct itab

  structure of itab
- struct itab_iter

  iterator over elements of an itab.

Functions

- int itab_lines (struct itab ∗itab)
- struct itab ∗ itab_new ()

  create a new itab with default parameters.
- int itab_entry_cmp (const void ∗aptr, const void ∗bptr)

  compares the keys of two entries
- void **itab_append** (struct itab ∗itab, const char ∗key, void ∗value)
- void ∗ **itab_read** (struct itab ∗itab, const char ∗key)
- void **itab_dump** (struct itab ∗itab)
- struct itab_iter ∗ **itab_foreach** (struct itab ∗tab)
- struct itab_iter ∗ **itab_next** (struct itab_iter ∗iter)
- void ∗ **itab_value** (struct itab_iter ∗iter)
- const char ∗ **itab_key** (struct itab_iter ∗iter)

5.2.1 Detailed Description

sorted list of structures -> tables with primary index

5.2.2 Function Documentation

5.2.2.1 itab_entry_cmp()

```
int itab_entry_cmp (
              const void * aptr,
              const void * bptr )
```

compares the keys of two entries

Returns

- < 0, when first key is lower
- == 0, when both keys are equal
- > 0, when second key is lower

```
                                                         {
    const struct itab_entry *a = aptr;
    const struct itab_entry *b = bptr;
    return strcmp( a->key, b->key );
}
```

5.2.2.2 itab_lines()

```
int itab_lines (
              struct itab * itab )
```

returns the number of lines in the table

```
                                        {
    assert( itab );
    return itab->used;
}
```

Referenced by src_add().

5.2.2.3 itab_new()

```
struct itab* itab_new (
              void  )
```

create a new itab with default parameters.

Returns

reference to an itab structure.

Detailed description follows here.

```
                          {
    struct itab *r = talloc_zero( NULL, struct itab );
    r->total = 10;
    r->used = 0;
    r->rows = talloc_array( r, struct itab_entry, r->total );
    return r;
}
```

Referenced by src_clear().

5.3 Tokenizer

Functions

- bool is_ident_char (int c)

  check if character is part of an identifier.
- bool **is_binary_char** (int c)
- bool src_clear ()
- bool src_add (const char ∗line)
- bool src_read (const char ∗name)
- bool src_dump ()
- bool readLine ()

  read one line from stdin stores the result into {gd.line}.
- bool readChar (char ∗t)

  read one character from input and store it somewhere.
- bool readStringToken (void)

  read string token.
- void **parse_verbatim** (char c)
- bool nextToken (void)

  read next token.

5.3.1 Detailed Description

convert stdin into tokens. each token is returned by the call to

See also

nextToken.

5.3.2 Function Documentation

5.3.2.1 is_ident_char()

```
bool is_ident_char (
              int c )
```

check if character is part of an identifier.

Parameters

in	*c*	character to classify.

Returns

true if if c is an identifier character.

```
                          {
    return isalpha( c ) || isdigit( c ) || c == '_';
}
```

Referenced by nextToken().

5.3.2.2 nextToken()

```
bool nextToken ( )
```

read next token.

This is a more detailed description.

Returns

true if successful

```
                    {
    char c;
    bool result = false;
    while( true ) {
        while( readChar( &c ) && isspace( c ) );
        if( c == '"' ) {
            while( readChar( &c ) && c != '"' );
        }
        else
            break;
    }
    if( gd.state == 1 ) {
        if( isalpha( c ) ) {
            int idx = 0;
            for( ;; ) {
                gd.buf[idx++] = c;
                readChar( &c );
                if( !is_ident_char( c ) )
                    break;
            }
            if( c == ':' ) {
                gd.buf[idx++] = c;
                gd.token = TK_KEYWORD;
            }
            else {
                gd.pos--;
                gd.token = TK_IDENT;
            }
            gd.buf[idx] = 0;
            result = true;
        }
        else if( is_binary_char( c ) ) {
            for( int idx = 0; is_binary_char( c ); idx++ ) {
                gd.buf[idx] = c;
                gd.buf[idx + 1] = 0;
                readChar( &c );
            }
            gd.pos--;
            gd.token = 0;
            gd.token = TK_BINOP;
            result = true;
            if( strcmp( ":=", gd.buf ) == 0 ) {
                gd.token = TK_ASSIGN;
                result = true;
            }
            else if( strcmp( "<-", gd.buf ) == 0 ) {
                gd.token = TK_LARROW;
                result = true;
            }
            else if( strcmp( "|", gd.buf ) == 0 ) {
                gd.token = TK_BAR;
                result = true;
            }
            else if( 0 == strcmp( "<", gd.buf ) ) {
                gd.token = TK_LT;
                result = true;
            }
            else if( 0 == strcmp( ">", gd.buf ) ) {
                gd.token = TK_GT;
                result = true;
            }
        }
        else if( isdigit( c ) ) {
            int idx = 1;
            while( isdigit( c ) ) {
                gd.buf[idx - 1] = c;
                gd.buf[idx] = 0;
                readChar( &c );
            }
            gd.pos--;
            gd.token = TK_NUMBER;
            result = true;
        }
        else {
            switch ( c ) {
                case '\"':
                    result = readStringToken(  );
                    break;
                case '.':
                    result = true;
                    gd.token = TK_DOT;
                    break;
                case ';':
                    result = true;
                    gd.token = TK_SEMICOLON;
                    break;
                case '(':
                    result = true;
                    gd.token = TK_LPAREN;
                    break;
                case ')':
                    result = true;
                    gd.token = TK_RPAREN;
                    break;
                case '[':
                    result = true;
                    gd.token = TK_LBRACK;
                    break;
                case ']':
                    result = true;
                    gd.token = TK_RBRACK;
                    break;
                case '{':
                    result = true;
                    gd.token = TK_LBRACE;
                    break;
                case '}':
                    result = true;
                    gd.token = TK_RBRACE;
                    break;
                case '#':
                    readChar( &c );
                    for( int idx = 0; is_ident_char( c ) || c == ':'; idx++ ) {
                        gd.buf[idx] = c;
                        gd.buf[idx + 1] = 0;
                        readChar( &c );
                    }
                    gd.pos--;
                    gd.token = TK_SYMBOL;
                    result = true;
                    break;
                case '^':
                    result = true;
                    gd.token = TK_UARROW;
                    break;
                case ':':
                    result = true;
                    gd.token = TK_COLON;
                    readChar( &c );
                    if( c == '=' ) {
                        gd.token = TK_ASSIGN;
                    }
                    else
                        gd.pos--;
                    break;
                case '$':
                    result = true;
                    gd.token = TK_CHAR;
                    readChar( &c );
                    gd.buf[0] = c;
                    gd.buf[1] = 0;
                    break;
                default:
                    gd.pos--;
                    break;
            }
        }
    }
    return result;
}
```

References is_ident_char(), and readChar().

5.3.2.3 readChar()

```
bool readChar (
              char * t )
```

read one character from input and store it somewhere.

Parameters

in	*t*	c-string of some sort.

Returns

true if successful

```
                         {
    bool result = true;
    if( gd.state == 0 ) {
        result = readLine(  );
    }
    if( result ) {
        *t = gd.line[gd.pos++];
        while( *t == 0 ) {
            if( readLine(  ) ) {
                *t = gd.line[gd.pos++];
            }
            else {
                result = false;
                break;
            }
        }
    }
    return result;
}
```

References readLine().

Referenced by nextToken(), and readStringToken().

5.3.2.4 readLine()

```
bool readLine ( )
```

read one line from stdin stores the result into {gd.line}.

trailing blanks are removed.

```
                  {
    if( gd.src_iter == NULL ) {
        gd.src_iter = itab_foreach( gd.src );
    }
    else {
        gd.src_iter = itab_next( gd.src_iter );
    }
    if( gd.src_iter ) {
        gd.line = itab_value( gd.src_iter );
        gd.line_count++;
        printf( "%2d:%s\n", gd.line_count, gd.line );
        gd.pos = 0;
        gd.state = 1;
        return true;
    }
    else {
        gd.line = "";
        gd.state = 2;
        return false;
    }
}
```

Referenced by readChar().

5.3.2.5 readStringToken()

```
bool readStringToken (
            void )
```

read string token.

Returns

true if successful

```
                        {
    int idx = 0;
    char c;
    while( readChar( &c ) && '\"' != c ) {
        if( c == '\\' )
            readChar( &c );
        gd.buf[idx++] = c;
    }
    gd.buf[idx] = 0;
    gd.token = TK_STRING;
    return true;
}
```

References readChar().

5.3.2.6 src_add()

```
bool src_add (
            const char * )
```

adding one line to the source that will be parsed.

```
                                {
    int n = itab_lines( gd.src );
    char buf[10];
    sprintf( buf, "%09d", n + 1 );
    itab_append( gd.src, buf, talloc_strdup( gd.src, line ) );
}
```

References itab_lines().

5.3.2.7 src_clear()

```
bool src_clear ( )
```

clear and initialize the source that will alter be parsed.

needs to be called before using *src_add*. *src_read* will do it automatically.

```
                       {
    if( gd.src ) {
        talloc_free( gd.src );
    }
    gd.src = itab_new(  );
    if( gd.src_iter ) {
        talloc_free( gd.src_iter );
    }
    gd.src_iter = NULL;
}
```

References itab_new().

Referenced by src_read().

5.3.2.8 src_dump()

```
bool src_dump ( )
```

dumps all the lines of the current source.

```
                      {
    for( struct itab_iter * x = itab_foreach( gd.src );
         x; x = itab_next( x ) ) {
        printf( "%s:%s\n", itab_key( x ), itab_value( x ) );
    }
}
```

5.3.2.9 src_read()

```
bool src_read (
               const char * name )
```

read file into itab.

read a file into src itab.

```
                                       {
    FILE *f = fopen( name, "r" );
    char buf[1000];
    char *line;
    int line_no = 1;
    src_clear(  );
    for( ;; ) {
        line = fgets( buf, sizeof( buf ), f );
        if( line == NULL )
            break;
        int n = strlen( line );
        while( n > 0 && isspace( line[--n] ) )
            line[n] = 0;
        char line_number[10];
        sprintf( line_number, "%09d", line_no );
        itab_append( gd.src, line_number, talloc_strdup( gd.src, line ) );
        line_no++;
    }
    fclose( f );
}
```

References src_clear().

5.4 Messages

Data Structures

- struct **s_msgs**

Typedefs

- typedef char **t_msg**[200]

Functions

- void **msg_init** ()
- void **msg_add** (const char ∗msg,...)
- void **msg_print_last** ()

5.4.1 Detailed Description

5.5 Syntax Messages

Functions

- void **message_add_msg** (t_messages ∗ms, t_messages ∗m)

Variables

- bool **classinfo::meta**
- char ∗ **classinfo::name**
- char ∗ **classinfo::super**
- int **classinfo::num**
- char ∗ **methodinfo::classname**
- char ∗ **methodinfo::name**
- char ∗ **varinfo::classname**
- char ∗ **varinfo::name**
- int **stringinfo::num**
- const char ∗ **itab_entry::key**
- void ∗ **itab_entry::value**
- int **itab::total**
- int **itab::used**
- struct itab_entry ∗ **itab::rows**
- struct itab ∗ **itab_iter::tab**
- int **itab_iter::pos**
- int **s_msgs::size**
- int **s_msgs::pos**
- t_msg **s_msgs::msgs** [20]

5.5.1 Detailed Description

5.6 Internal_structures

Data Structures

- struct s_namelist
- struct s_expression_list
- struct s_names
- struct s_pattern
- struct s_classdef
- struct s_statements
- struct s_methoddef
- struct s_message_pattern
- struct s_block
- struct s_expression
- struct s_messages
- struct s_message_cascade
- struct s_object
- struct s_env

Typedefs

- typedef struct s_namelist **t_namelist**
- typedef struct s_names ∗ **t_names**
- typedef struct s_expression_list **t_expression_list**
- typedef struct s_pattern ∗ **t_pattern**
- typedef struct s_classdef **t_classdef**
- typedef enum e_statement_type **t_statement_type**
- typedef struct s_statements **t_statements**
- typedef struct s_methoddef **t_methoddef**
- typedef struct s_message_pattern **t_message_pattern**
- typedef enum e_expression_tag **t_expression_tag**
- typedef struct s_block **t_block**
- typedef struct s_expression **t_expression**
- typedef struct s_messages **t_messages**
- typedef struct s_message_cascade **t_message_cascade**
- typedef struct s_object ∗(∗ **t_message_handler**) (struct s_object ∗, const char ∗sel, struct s_object ∗∗args)
- typedef struct s_object **t_object**
- typedef struct s_env **t_env**

Enumerations

- enum **e_statement_type** { **stmt_return** = 100 , **stmt_assign** , **stmt_message** }
- enum **e_expression_tag** {
  tag_string , **tag_message** , **tag_number** , **tag_ident** ,
  tag_block , **tag_array** }

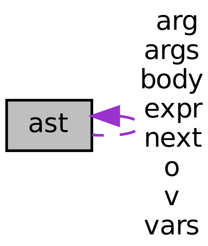
5.6.1 Detailed Description

Chapter 6

Data Structure Documentation

6.1 ast Struct Reference

Collaboration diagram for ast:



Data Fields

- int tag

    *descriminator for the union, tags start with AST_*

-

  union {
    struct {
      char ∗ v
        string value owned by the syntax tree
    } str
        string node
    struct {
      char ∗ v
        id value owned by the syntax tree
    } id
        id node
    struct {

```
      struct ast ∗ o
         method target
      char ∗ sel
         selector
      struct ast ∗ arg
         list of arguments
   } unary
         unary method call node
   struct {
      struct ast ∗ v
         argument value node
      struct ast ∗ next
         next argument
   } arg
   struct argdef {
      const char ∗ key
      const char ∗ name
         parameter name
      struct ast ∗ next
         next keyword in the list
   } argdef
   struct {
      struct ast ∗ v
      struct ast ∗ next
   } stmt
   struct {
      char ∗ var
      struct ast ∗ expr
   } asgn
   struct {
      char ∗ name
      char ∗ super
      int num
      struct ast ∗ vars
      struct ast ∗ next
   } cls
   struct {
      char ∗ v
      struct ast ∗ next
   } names
   struct {
      const char ∗ name
      struct ast ∗ args
      char ∗ classname
      char ∗ src
      struct ast ∗ body
      struct ast ∗ next
   } methods
} u
```

6.1.1 Field Documentation

6.1.1.1 key

```
const char* ast::key
```

Keyword including the colon at the end if it is no keyword then the plain unary or binary name is here.

6.1.1.2 next

```
struct ast* ast::next
```

next argument

next keyword in the list

6.1.1.3 v

```
char* ast::v
```

string value owned by the syntax tree

id value owned by the syntax tree

The documentation for this struct was generated from the following file:

- global.h

6.2 classinfo Struct Reference

Data Fields

- bool **meta**
- char ∗ **name**
- char ∗ **super**
- int **num**

6.2.1 Detailed Description

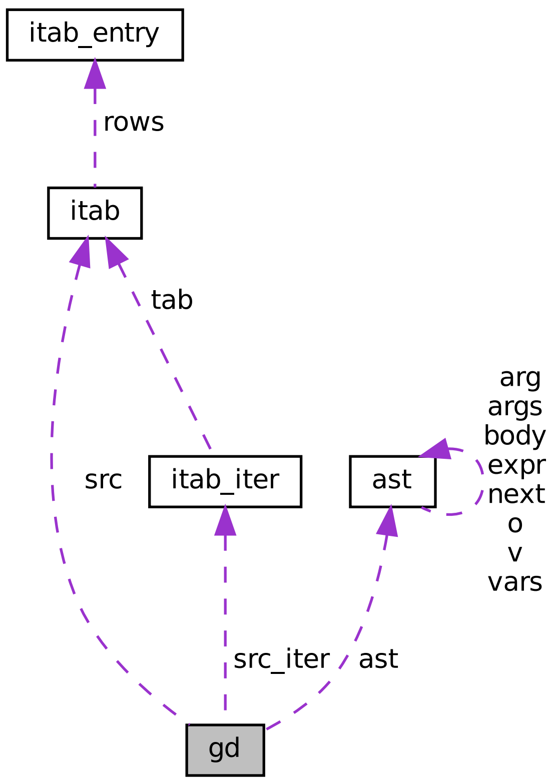
details of a class

The documentation for this struct was generated from the following file:

- lib.c

6.3 gd Struct Reference

Collaboration diagram for gd:



Data Fields

- int **state**
- int **paridx**
- int **token**
- int **pos**
- char **buf** [50]
- char ∗ **line**
- int **line_count**
- struct ast ∗ **ast**
- int **classnum**
- struct itab ∗ **src**
- struct itab_iter ∗ **src_iter**

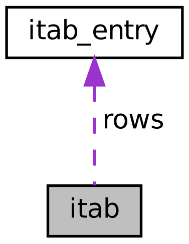
The documentation for this struct was generated from the following file:

- global.h

6.4 itab Struct Reference

structure of itab

Collaboration diagram for itab:



Data Fields

- int **total**
- int **used**
- struct itab_entry ∗ **rows**

6.4.1 Detailed Description

structure of itab

The documentation for this struct was generated from the following file:

- lib.c

6.5 itab_entry Struct Reference

structure of an entry in the itab.

Data Fields

- const char ∗ **key**
- void ∗ **value**

6.5.1 Detailed Description

structure of an entry in the itab.

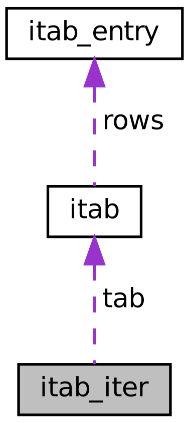
The documentation for this struct was generated from the following file:

- lib.c

6.6 itab_iter Struct Reference

iterator over elements of an itab.

Collaboration diagram for itab_iter:



Data Fields

- struct itab ∗ **tab**
- int **pos**

6.6.1 Detailed Description

iterator over elements of an itab.

The documentation for this struct was generated from the following file:

- lib.c

6.7 methodinfo Struct Reference

Data Fields

- char ∗ **classname**
- char ∗ **name**

6.7.1 Detailed Description

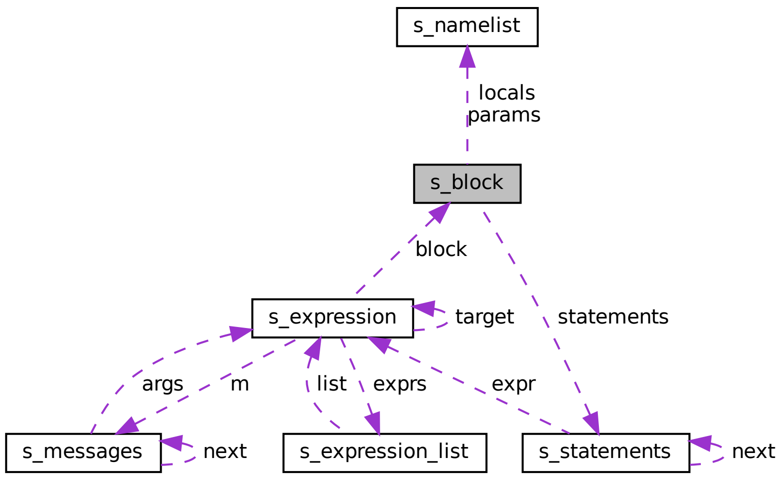
details of a method

The documentation for this struct was generated from the following file:

- lib.c

6.8 s_block Struct Reference

Collaboration diagram for s_block:



Data Fields

- t_namelist **params**
- t_namelist **locals**
- t_statements ∗ **statements**

The documentation for this struct was generated from the following file:

- lib.h

6.9 s_classdef Struct Reference

Data Fields

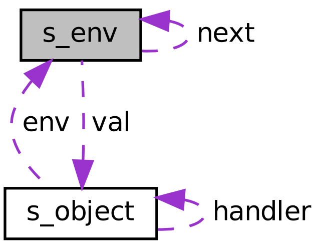
- int **id**
- char ∗ **name**
- char ∗ **meta**
- char ∗ **super**

The documentation for this struct was generated from the following file:

- lib.h

6.10 s_env Struct Reference

Collaboration diagram for s_env:



Data Fields

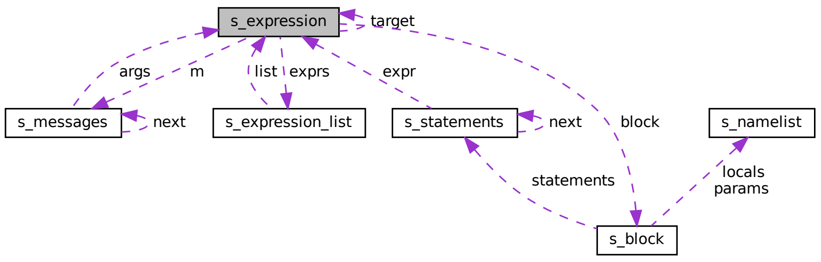
- const char ∗ **name**
- t_object ∗ **val**
- struct s_env ∗ **next**

The documentation for this struct was generated from the following file:

- lib.h

6.11 s_expression Struct Reference

Collaboration diagram for s_expression:



Data Fields

- t_expression_tag **tag**
-

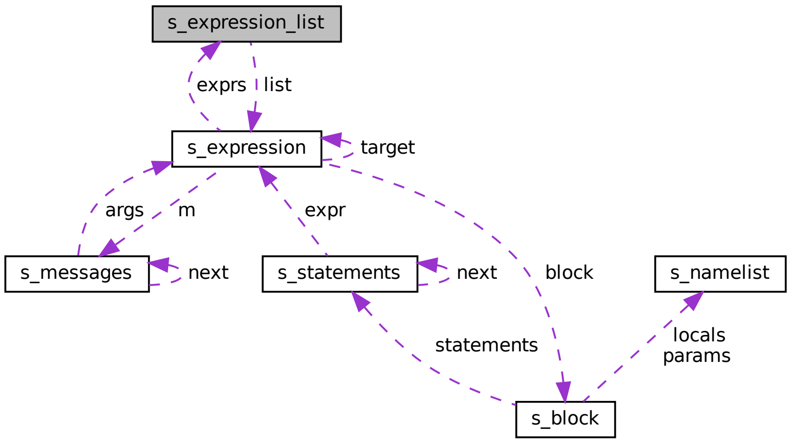
  union {
  int **intvalue**
  const char ∗ **strvalue**
  const char ∗ **ident**
  t_expression_list **exprs**
  struct **msg** {
  struct s_expression ∗ **target**
  struct s_messages ∗ **m**
  } **msg**
  t_block **block**
  } **u**

The documentation for this struct was generated from the following file:

- lib.h

6.12 s_expression_list Struct Reference

Collaboration diagram for s_expression_list:



Data Fields

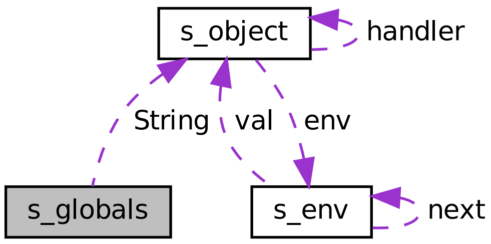
- int **count**
- struct s_expression ∗∗ **list**

The documentation for this struct was generated from the following file:

- lib.h

6.13 s_globals Struct Reference

Collaboration diagram for s_globals:



Data Fields

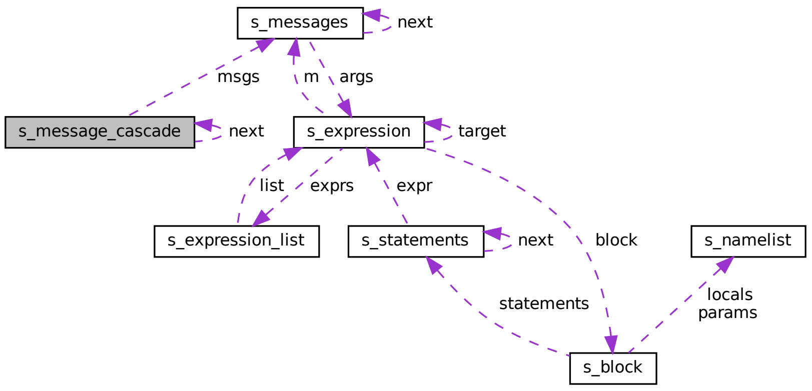
- t_object ∗ **String**

The documentation for this struct was generated from the following file:

- tt_test.c

6.14 s_message_cascade Struct Reference

Collaboration diagram for s_message_cascade:



Data Fields

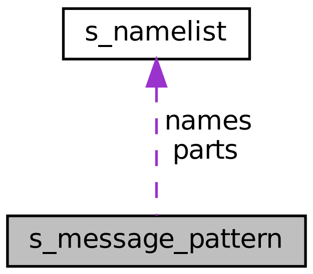
- t_messages ∗ **msgs**
- struct s_message_cascade ∗ **next**

The documentation for this struct was generated from the following file:

- lib.h

6.15 s_message_pattern Struct Reference

Collaboration diagram for s_message_pattern:



Data Fields

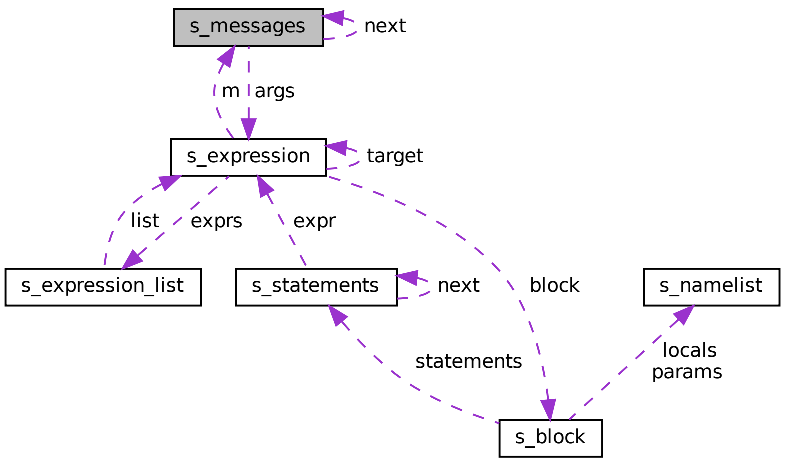
- t_namelist **parts**
- t_namelist **names**

The documentation for this struct was generated from the following file:

- lib.h

6.16 s_messages Struct Reference

Collaboration diagram for s_messages:



Data Fields

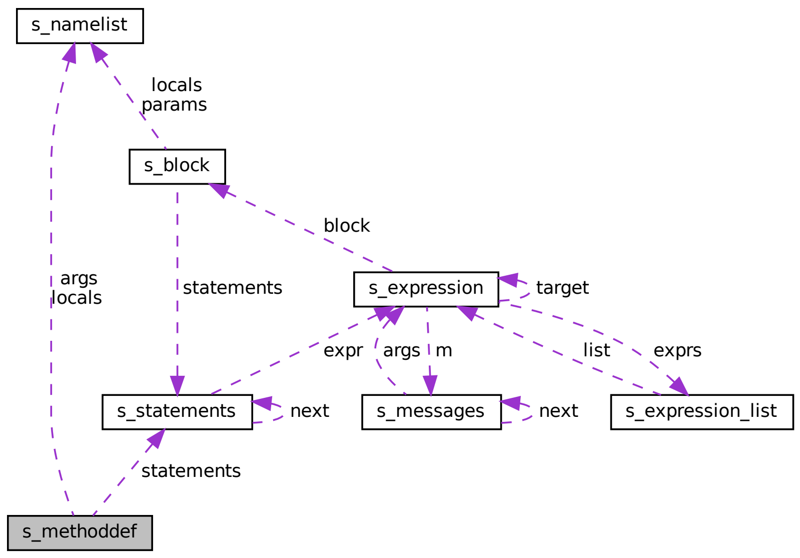
- char ∗ **sel**
- int **argc**
- t_expression ∗∗ **args**
- struct s_messages ∗ **next**

The documentation for this struct was generated from the following file:

- lib.h

6.17 s_methoddef Struct Reference

Collaboration diagram for s_methoddef:



Data Fields

- char ∗ **sel**
- t_namelist **args**
- t_namelist **locals**
- t_statements ∗ **statements**

The documentation for this struct was generated from the following file:

- lib.h

6.18 s_namelist Struct Reference

Data Fields

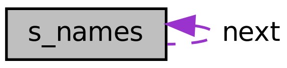
- int **count**
- char ∗∗ **names**

The documentation for this struct was generated from the following file:

- lib.h

6.19 s_names Struct Reference

Collaboration diagram for s_names:



Data Fields

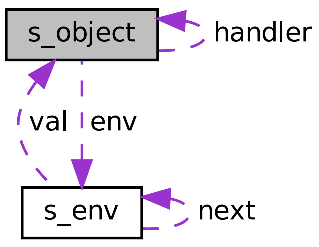
- char ∗ **name**
- t_names **next**

The documentation for this struct was generated from the following file:

- lib.h

6.20 s_object Struct Reference

Collaboration diagram for s_object:



Data Fields

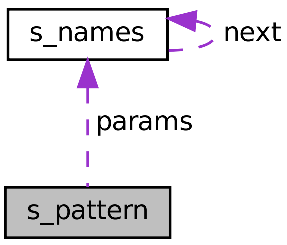
- t_message_handler **handler**
- void ∗ **data**
- struct s_env ∗ **env**

The documentation for this struct was generated from the following file:

- lib.h

6.21 s_pattern Struct Reference

Collaboration diagram for s_pattern:



Data Fields

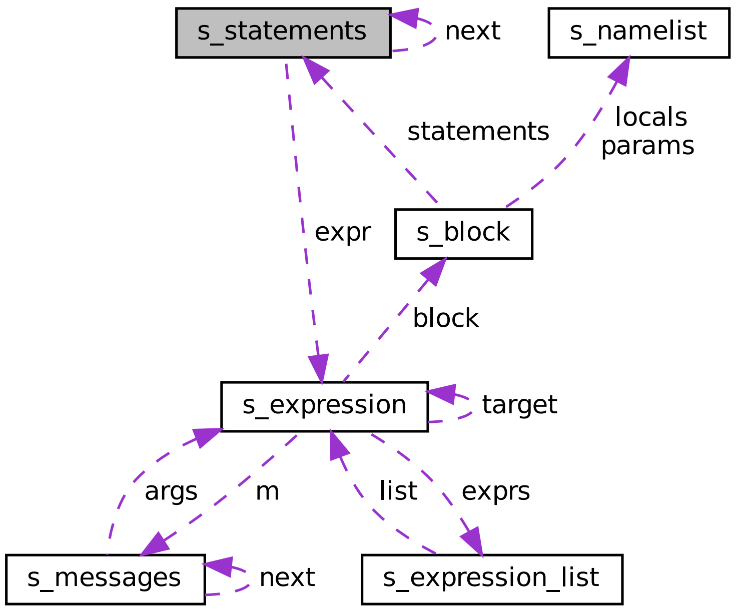
- char ∗ **selector**
- t_names **params**

The documentation for this struct was generated from the following file:

- lib.h

6.22 s_statements Struct Reference

Collaboration diagram for s_statements:



Data Fields

- t_statement_type **type**
- struct s_expression ∗ **expr**
- struct s_statements ∗ **next**

The documentation for this struct was generated from the following file:

- lib.h

6.23 stringinfo Struct Reference

Data Fields

- int **num**

6.23.1 Detailed Description

details of a string

The documentation for this struct was generated from the following file:

- lib.c

6.24 varinfo Struct Reference

Data Fields

- char ∗ **classname**
- char ∗ **name**

6.24.1 Detailed Description

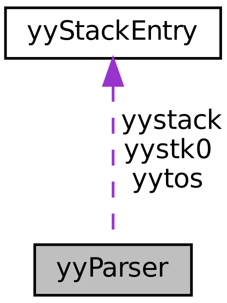
details of a global variable

The documentation for this struct was generated from the following file:

- lib.c

6.25 yyParser Struct Reference

Collaboration diagram for yyParser:



Data Fields

- yyStackEntry ∗ **yytos**
- int **yyerrcnt**
- ParseARG_SDECL ParseCTX_SDECL int **yystksz**
- yyStackEntry ∗ **yystack**
- yyStackEntry **yystk0**

The documentation for this struct was generated from the following file:

- lempar.c

6.26 yyStackEntry Struct Reference

Data Fields

- YYACTIONTYPE **stateno**
- YYCODETYPE **major**
- YYMINORTYPE **minor**

The documentation for this struct was generated from the following file:

- lempar.c