

# globus rsl

## 7.2

Generated by Doxygen 1.6.1

Fri Sep 10 21:08:03 2010

# Contents

<b>1</b>	<b>Main Page</b>	<b>1</b>
<b>2</b>	<b>Module Index</b>	<b>2</b>
2.1	Modules . . . . .	2
<b>3</b>	<b>Module Documentation</b>	<b>2</b>
3.1	RSL Predicates . . . . .	2
3.1.1	Detailed Description . . . . .	2
3.1.2	Function Documentation . . . . .	2
3.2	RSL Constructors . . . . .	7
3.2.1	Function Documentation . . . . .	7
3.3	RSL Memory Management . . . . .	9
3.3.1	Function Documentation . . . . .	10
3.4	RSL Accessor Functions . . . . .	13
3.4.1	Function Documentation . . . . .	13
3.5	List Functions . . . . .	18
3.5.1	Function Documentation . . . . .	18
3.6	RSL Value Accessors . . . . .	18
3.6.1	Function Documentation . . . . .	19
3.7	RSL Display . . . . .	21
3.7.1	Function Documentation . . . . .	21
3.8	RSL Parsing . . . . .	22
3.8.1	Function Documentation . . . . .	22

## 1 Main Page

The Globus RSL library is provides the following functionality:

- [RSL Predicates](#)
- [RSL Constructors](#)
- [RSL Memory Management](#)
- [RSL Accessor Functions](#)
- [RSL Value Accessors](#)
- [RSL Display](#)
- [RSL Parsing](#)
- [List Functions](#)

## 2 Module Index

### 2.1 Modules

Here is a list of all modules:

<b>RSL Predicates</b>	<b><a href="#">2</a></b>
<b>RSL Constructors</b>	<b><a href="#">7</a></b>
<b>RSL Memory Management</b>	<b><a href="#">9</a></b>
<b>RSL Accessor Functions</b>	<b><a href="#">13</a></b>
<b>List Functions</b>	<b><a href="#">18</a></b>
<b>RSL Value Accessors</b>	<b><a href="#">18</a></b>
<b>RSL Display</b>	<b><a href="#">21</a></b>
<b>RSL Parsing</b>	<b><a href="#">22</a></b>

## 3 Module Documentation

### 3.1 RSL Predicates

The functions in this group return boolean values indicating whether an RSL syntax tree is of a particular type.

#### Functions

- int [globus\\_rsl\\_is\\_relation](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_boolean](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_relation\\_eq](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_relation\\_lessthan](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_relation\\_attribute\\_equal](#) (globus\_rsl\_t \*ast, char \*attribute)
- int [globus\\_rsl\\_is\\_boolean\\_and](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_boolean\\_or](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_is\\_boolean\\_multi](#) (globus\_rsl\_t \*ast)
- int [globus\\_rsl\\_value\\_is\\_literal](#) (globus\_rsl\_value\_t \*ast)
- int [globus\\_rsl\\_value\\_is\\_sequence](#) (globus\_rsl\_value\_t \*ast)
- int [globus\\_rsl\\_value\\_is\\_variable](#) (globus\_rsl\_value\_t \*ast)
- int [globus\\_rsl\\_value\\_is\\_concatenation](#) (globus\_rsl\_value\_t \*ast)

#### 3.1.1 Detailed Description

The functions in this group return boolean values indicating whether an RSL syntax tree is of a particular type.

#### 3.1.2 Function Documentation

##### 3.1.2.1 int [globus\\_rsl\\_is\\_relation](#) (globus\_rsl\_t \* *ast*)

RSL relation test. The [\*globus\\_rsl\\_is\\_relation\(\)\*](#) function tests whether the the RSL pointed to by the *ast* parameter is a relation. The RSL syntax supports the following relation operations:

= Equal

!= Not Equal

> Greater Than

>= Greater Than or Equal

< Less Than

<= Less Than or Equal

<= Less Than or Equal

Some examples of RSL relations are

```
"queue" = "debug"
"queue" != "slow"
"min_memory" > "1000"
"max_wall_time" >= "60"
"count" < "10"
"host_count" <= "5"
```

GRAM only supports equality relations.

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [\*globus\\_rsl\\_is\\_relation\(\)\*](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a relation; otherwise, it returns GLOBUS\_FALSE.

#### 3.1.2.2 int globus\_rsl\_is\_boolean (globus\_rsl\_t \* ast)

RSL boolean test. The [\*globus\\_rsl\\_is\\_boolean\(\)\*](#) function tests whether the the RSL pointed to by the *ast* parameter is a boolean composition of other RSL parse trees. The syntactically understood boolean compositions are "&" (conjunction), "|" (disjunction), and "+" (multi-request). Some bexamples of RSL booleans are

```
& ( "queue" = "debug" ) ( "max_time" = "10000" )
| ( "count" = "1" ) ( "count" = "10" )
+ ( & ( "executable" = "1.exe" ) ) ( & ( "executable" = "2.exe" ) )
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [\*globus\\_rsl\\_is\\_boolean\(\)\*](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a boolean composition; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.3 int globus\_rsl\_is\_relation\_eq (globus\_rsl\_t \* *ast*)

RSL equality operation test. The [\*globus\\_rsl\\_is\\_relation\\_eq\(\)\*](#) function tests whether the RSL pointed to by the *ast* parameter is an equality relation. An example of an equality relation is

```
"queue" = "debug"
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [\*globus\\_rsl\\_is\\_relation\\_eq\(\)\*](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is an equality relation; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.4 int globus\_rsl\_is\_relation\_lessthan (globus\_rsl\_t \* *ast*)

RSL less than operation test. The [\*globus\\_rsl\\_is\\_relation\\_lessthan\(\)\*](#) function tests whether the RSL pointed to by the *ast* parameter is a less-than relation. An example of a less-than relation is

```
"count" = "10"
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [\*globus\\_rsl\\_is\\_relation\\_lessthan\(\)\*](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a less-than relation; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.5 int globus\_rsl\_is\_relation\_attribute\_equal (globus\_rsl\_t \* *ast*, char \* *attribute*)

RSL attribute name test. The [\*globus\\_rsl\\_is\\_relation\\_attribute\\_equal\(\)\*](#) function tests whether the RSL pointed to by the *ast* parameter is a relation with the attribute name which matches the string pointed to by the *attribute* parameter. This attribute name comparison is case-insensitive.

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

*attribute* Name of the attribute to test

#### Returns:

The [\*globus\\_rsl\\_is\\_relation\\_attribute\\_equal\(\)\*](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a relation and its attribute name matches the *attribute* parameter; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.6 int globus\_rsl\_is\_boolean\_and (globus\_rsl\_t \* ast)

RSL boolean and test. The [globus\\_rsl\\_is\\_boolean\\_and\(\)](#) function tests whether the the RSL pointed to by the *ast* parameter is a boolean "and" composition of RSL trees. An example of a boolean and relation is

```
& ( "queue" = "debug" ) ( "executable" = "a.out" )
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [globus\\_rsl\\_is\\_boolean\\_and\(\)](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a boolean and of RSL parse trees; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.7 int globus\_rsl\_is\_boolean\_or (globus\_rsl\_t \* ast)

RSL boolean or test. The [globus\\_rsl\\_is\\_boolean\\_or\(\)](#) function tests whether the the RSL pointed to by the *ast* parameter is a boolean "or" composition of RSL trees. An example of a boolean or relation is

```
| ( "count" = "2" ) ( "count" = "4" )
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [globus\\_rsl\\_is\\_boolean\\_or\(\)](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a boolean or of RSL parse trees; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.8 int globus\_rsl\_is\_boolean\_multi (globus\_rsl\_t \* ast)

RSL boolean multi test. The [globus\\_rsl\\_is\\_boolean\\_multi\(\)](#) function tests whether the the RSL pointed to by the *ast* parameter is a boolean "multi-request" composition of RSL trees. An example of a boolean multi-request relation is

```
+ ( & ( "executable" = "exe.1" ) ( "count" = "2" ) )  
  ( & ( "executable" = "exe.2" ) ( "count" = "2" ) )
```

#### Parameters:

*ast* Pointer to an RSL parse tree structure.

#### Returns:

The [globus\\_rsl\\_is\\_boolean\\_multi\(\)](#) function returns GLOBUS\_TRUE if the RSL parse tree pointed to by *ast* is a boolean multi-request of RSL parse trees; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.9 int globus\_rsl\_value\_is\_literal (globus\_rsl\_value\_t \* *ast*)

RSL literal string test. The [\*globus\\_rsl\\_value\\_is\\_literal\(\)\*](#) function tests whether the RSL value pointed to by the *ast* parameter is a literal string value. An example of a literal string is

```
"count "
```

#### Parameters:

*ast* Pointer to an RSL value structure.

#### Returns:

The [\*globus\\_rsl\\_value\\_is\\_literal\(\)\*](#) function returns GLOBUS\_TRUE if the RSL value pointed to by *ast* is a literal string value; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.10 int globus\_rsl\_value\_is\_sequence (globus\_rsl\_value\_t \* *ast*)

RSL value sequence test. The [\*globus\\_rsl\\_value\\_is\\_sequence\(\)\*](#) function tests whether the RSL value pointed to by the *ast* parameter is a sequence of RSL values. An example of a sequence of values is

```
"1" "2" "3"
```

#### Parameters:

*ast* Pointer to an RSL value structure.

#### Returns:

The [\*globus\\_rsl\\_value\\_is\\_sequence\(\)\*](#) function returns GLOBUS\_TRUE if the RSL value pointed to by *ast* is a value sequence; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.11 int globus\_rsl\_value\_is\_variable (globus\_rsl\_value\_t \* *ast*)

RSL value variable test. The [\*globus\\_rsl\\_value\\_is\\_variable\(\)\*](#) function tests whether the RSL value pointed to by the *ast* parameter is a variable reference. RSL values. An example of a variable reference is

```
$ ( "GLOBUSRUN_GASS_URL" )
```

#### Parameters:

*ast* Pointer to an RSL value structure.

#### Returns:

The [\*globus\\_rsl\\_value\\_is\\_variable\(\)\*](#) function returns GLOBUS\_TRUE if the RSL value pointed to by *ast* is a value sequence; otherwise, it returns GLOBUS\_FALSE.

### 3.1.2.12 int globus\_rsl\_value\_is\_concatenation (globus\_rsl\_value\_t \* ast)

RSL value concatenation test. The [globus\\_rsl\\_value\\_is\\_concatenation\(\)](#) function tests whether the RSL value pointed to by the *ast* parameter is a concatenation of RSL values. An example of an RSL value concatenation is

```
$ ( "GLOBUSRUN_GASS_URL" ) # "/input"
```

#### Parameters:

*ast* Pointer to an RSL value structure.

#### Returns:

The [globus\\_rsl\\_value\\_is\\_concatenation\(\)](#) function returns GLOBUS\_TRUE if the RSL value pointed to by *ast* is a value concatenation; otherwise, it returns GLOBUS\_FALSE.

## 3.2 RSL Constructors

### Functions

- globus\_rsl\_t \* [globus\\_rsl\\_make\\_boolean](#) (int operator, globus\_list\_t \*children)
- globus\_rsl\_t \* [globus\\_rsl\\_make\\_relation](#) (int operator, char \*attributename, globus\_rsl\_value\_t \*value\_sequence)
- globus\_rsl\_value\_t \* [globus\\_rsl\\_value\\_make\\_literal](#) (char \*string)
- globus\_rsl\_value\_t \* [globus\\_rsl\\_value\\_make\\_sequence](#) (globus\_list\_t \*value\_list)
- globus\_rsl\_value\_t \* [globus\\_rsl\\_value\\_make\\_variable](#) (globus\_rsl\_value\_t \*sequence)
- globus\_rsl\_value\_t \* [globus\\_rsl\\_value\\_make\\_concatenation](#) (globus\_rsl\_value\_t \*left\_value, globus\_rsl\_value\_t \*right\_value)

### 3.2.1 Function Documentation

#### 3.2.1.1 globus\_rsl\_t\* globus\_rsl\_make\_boolean (int operator, globus\_list\_t \* children)

RSL boolean constructor. The [globus\\_rsl\\_make\\_boolean\(\)](#) function creates a boolean composition of the RSL nodes in the list pointed to by *children*. The new RSL node which is returned contains a reference to the list, not a copy.

#### Parameters:

**operator** The boolean RSL operator to use to join the RSL parse tree list pointed to by the *children* parameter. This value must be one of GLOBUS\_RSL\_AND, GLOBUS\_RSL\_OR, GLOBUS\_RSL\_MULTIREQ in order to create a valid RSL tree.

**children** Pointer to a list of RSL syntax trees to combine with the boolean operation described by the *operator* parameter.

#### Returns:

The [globus\\_rsl\\_make\\_boolean\(\)](#) function returns a new RSL parse tree node that contains a shallow reference to the list of values pointed to by the *children* parameter joined by the operator value in the *operator* parameter. If an error occurs, [globus\\_rsl\\_make\\_boolean\(\)](#) returns NULL.



### 3.2.1.2 globus\_rsl\_t\* globus\_rsl\_make\_relation (int operator, char \* attributename, globus\_rsl\_value\_t \* value\_sequence)

RSL relation constructor. The [globus\\_rsl\\_make\\_relation\(\)](#) function creates a relation between the attribute named by the *attributename* parameter and the values pointed to by the *value\_sequence* list. The new RSL relation node which is returned contains a reference to the *attributename* and *value\_sequence* parameters, not a copy.

#### Parameters:

**operator** The RSL operator to use to relate the RSL attribute name pointed to by the *attributename* parameter and the values pointed to by the *value\_sequence* parameter. This value must be one of GLOBUS\_RSL\_EQ, GLOBUS\_RSL\_NEQ, GLOBUS\_RSL\_GT, GLOBUS\_RSL\_GTEQ, GLOBUS\_RSL\_LT, or GLOBUS\_RSL\_LTEQ in order to create a valid RSL node.

**attributename** Pointer to a string naming the attribute of the new RSL relation.

**value\_sequence** Pointer to a sequence of RSL values to use in the new RSL relation.

#### Returns:

The [globus\\_rsl\\_make\\_relation\(\)](#) function returns a new RSL parse tree node that contains a shallow reference to the attribute name pointed to by the *attributename* parameter and the RSL value sequence pointed to by the *value\_sequence* parameter. If an error occurs, [globus\\_rsl\\_make\\_relation\(\)](#) returns NULL.

### 3.2.1.3 globus\_rsl\_value\_t\* globus\_rsl\_value\_make\_literal (char \* string)

RSL literal constructor. The [globus\\_rsl\\_value\\_make\\_literal\(\)](#) function creates a string literal RSL value node containing the value pointed to by the *string* parameter. The new RSL value node which is returned contains a reference to the *string* parameter, not a copy.

#### Parameters:

**string** The literal string to be used in the new value.

#### Returns:

The [globus\\_rsl\\_value\\_make\\_literal\(\)](#) function returns a new RSL value node that contains a shallow reference to the string pointed to by the *string* parameter. If an error occurs, [globus\\_rsl\\_value\\_make\\_literal\(\)](#) returns NULL.

### 3.2.1.4 globus\_rsl\_value\_t\* globus\_rsl\_value\_make\_sequence (globus\_list\_t \* value\_list)

RSL value sequence constructor. The [globus\\_rsl\\_value\\_make\\_sequence\(\)](#) function creates a value sequence RSL node referring to the values pointed to by the *value\_list* parameter. The new node returned by this function contains a reference to the *value\_list* parameter, not a copy.

#### Parameters:

**value\_list** A pointer to a list of globus\_rsl\_value\_t pointers.

#### Returns:

The [globus\\_rsl\\_value\\_make\\_sequence\(\)](#) function returns a new RSL value node that contains a shallow reference to the list pointed to by the *value\_list* parameter. If an error occurs, [globus\\_rsl\\_value\\_make\\_sequence\(\)](#) returns NULL.

### 3.2.1.5 globus\_rsl\_value\_t\* globus\_rsl\_value\_make\_variable (globus\_rsl\_value\_t \* *sequence*)

RSL variable reference constructor. The [globus\\_rsl\\_value\\_make\\_variable\(\)](#) function creates a variable reference RSL node referring to the variable name contained in the value pointed to by *sequence* parameter. The new node returned by this function contains a reference to the *sequence* parameter, not a copy.

#### Parameters:

*sequence* A pointer to a RSL value sequence.

#### Returns:

The [globus\\_rsl\\_value\\_make\\_variable\(\)](#) function returns a new RSL value node that contains a shallow reference to the value sequence pointed to by the *sequence* parameter. If an error occurs, [globus\\_rsl\\_value\\_make\\_variable\(\)](#) returns NULL.

### 3.2.1.6 globus\_rsl\_value\_t\* globus\_rsl\_value\_make\_concatenation (globus\_rsl\_value\_t \* *left\_value*, globus\_rsl\_value\_t \* *right\_value*)

RSL concatenation constructor. The [globus\\_rsl\\_value\\_make\\_concatenation\(\)](#) function creates a concatenation of the values pointed to by the *left\_value* and *right\_value* parameters. The new node returned by this function contains a reference to these parameters' values, not a copy.

#### Parameters:

*left\_value* A pointer to a RSL value to act as the left side of the concatenation. This must be a string literal or variable reference.

*right\_value* A pointer to a RSL value to act as the right side of the concatenation. This must be a string literal or variable reference.

#### Returns:

The [globus\\_rsl\\_value\\_make\\_concatenation\(\)](#) function returns a new RSL value node that contains a shallow reference to the values pointed to by the *left\_value* and *right\_value* parameters. If an error occurs, [globus\\_rsl\\_value\\_make\\_concatenation\(\)](#) returns NULL.

## 3.3 RSL Memory Management

### Functions

- globus\_rsl\_t \* [globus\\_rsl\\_copy\\_recursive](#) (globus\_rsl\_t \*ast\_node)
- globus\_rsl\_value\_t \* [globus\\_rsl\\_value\\_copy\\_recursive](#) (globus\_rsl\_value\_t \*globus\_rsl\_value\_ptr)
- int [globus\\_rsl\\_value\\_free](#) (globus\_rsl\_value\_t \*val)
- int [globus\\_rsl\\_free](#) (globus\_rsl\_t \*ast\_node)
- int [globus\\_rsl\\_value\\_free\\_recursive](#) (globus\_rsl\_value\_t \*globus\_rsl\_value\_ptr)
- int [globus\\_rsl\\_free\\_recursive](#) (globus\_rsl\_t \*ast\_node)
- int [globus\\_rsl\\_value\\_list\\_literal\\_replace](#) (globus\_list\_t \*value\_list, char \*string\_value)
- int [globus\\_rsl\\_value\\_eval](#) (globus\_rsl\_value\_t \*ast\_node, globus\_symboltable\_t \*symbol\_table, char \*\*string\_value, int rsl\_substitution\_flag)
- int [globus\\_rsl\\_eval](#) (globus\_rsl\_t \*ast\_node, globus\_symboltable\_t \*symbol\_table)

### 3.3.1 Function Documentation

#### 3.3.1.1 `globus_rsl_t* globus_rsl_copy_recursive (globus_rsl_t * ast_node)`

Create a deep copy of an RSL syntax tree. The [`globus\_rsl\_copy\_recursive\(\)`](#) function performs a deep copy of the RSL syntax tree pointed to by the *ast\_node* parameter. All RSL nodes, value nodes, variable names, attributes, and literals will be copied to the return value.

##### Parameters:

*ast\_node* An RSL syntax tree to copy.

##### Returns:

The [`globus\_rsl\_copy\_recursive\(\)`](#) function returns a copy of its input parameter that that can be used after the *ast\_node* and its values have been freed. If an error occurs, [`globus\_rsl\_copy\_recursive\(\)`](#) returns NULL.

#### 3.3.1.2 `globus_rsl_value_t* globus_rsl_value_copy_recursive (globus_rsl_value_t * globus_rsl_value_ptr)`

Create a deep copy of an RSL value. The [`globus\_rsl\_value\_copy\_recursive\(\)`](#) function performs a deep copy of the RSL value pointed to by the *globus\_rsl\_value\_ptr* parameter. All variable names, attributes, literals, and value lists will be copied to the return value.

##### Parameters:

*globus\_rsl\_value\_ptr* A pointer to an RSL value to copy.

##### Returns:

The [`globus\_rsl\_value\_copy\_recursive\(\)`](#) function returns a copy of its input parameter that that can be used after the *globus\_rsl\_value\_ptr* and its values have been freed. If an error occurs, [`globus\_rsl\_value\_copy\_recursive\(\)`](#) returns NULL.

#### 3.3.1.3 `int globus_rsl_value_free (globus_rsl_value_t * val)`

Free an RSL value node. The [`globus\_rsl\_value\_free\(\)`](#) function frees the RSL value pointed to by the *val* parameter. This only frees the RSL value node itself, and not any sequence or string values associated with that node.

##### Parameters:

*val* The RSL value node to free.

##### Returns:

The [`globus\_rsl\_value\_free\(\)`](#) function always returns GLOBUS\_SUCCESS.

#### 3.3.1.4 int globus\_rsl\_free (globus\_rsl\_t \* *ast\_node*)

Free an RSL syntax tree node. The [globus\\_rsl\\_free\(\)](#) function frees the RSL syntax tree node pointed to by the *ast\_node* parameter. This only frees the RSL syntax tree node itself, and not any boolean operands, relation names, or values associated with the node.

##### Parameters:

*ast\_node* The RSL syntax tree node to free.

##### Returns:

The [globus\\_rsl\\_value\\_free\(\)](#) function always returns GLOBUS\_SUCCESS.

#### 3.3.1.5 int globus\_rsl\_value\_free\_recursive (globus\_rsl\_value\_t \* *globus\_rsl\_value\_ptr*)

Free an RSL value and all its child nodes. The [globus\\_rsl\\_free\\_recursive\(\)](#) function frees the RSL value node pointed to by the *globus\_rsl\_value\_ptr*, including all literal strings, variable names, and value sequences. Any pointers to these are no longer valid after [globus\\_rsl\\_value\\_free\\_recursive\(\)](#) returns.

##### Parameters:

*globus\_rsl\_value\_ptr* An RSL value node to free.

##### Returns:

The [globus\\_rsl\\_value\\_free\\_recursive\(\)](#) function always returns GLOBUS\_SUCCESS.

#### 3.3.1.6 int globus\_rsl\_free\_recursive (globus\_rsl\_t \* *ast\_node*)

Free an RSL syntax tree and all its child nodes. The [globus\\_rsl\\_free\\_recursive\(\)](#) function frees the RSL syntax tree pointed to by the *ast\_node* parameter, including all boolean operands, attribute names, and values. Any pointers to these are no longer valid after [globus\\_rsl\\_free\\_recursive\(\)](#) returns.

##### Parameters:

*ast\_node* An RSL parse tree to free.

##### Returns:

The [globus\\_rsl\\_value\\_free\\_recursive\(\)](#) function always returns GLOBUS\_SUCCESS.

#### 3.3.1.7 int globus\_rsl\_value\_list\_literal\_replace (globus\_list\_t \* *value\_list*, char \* *string\_value*)

Replace the first value in a value list with a literal. The [globus\\_rsl\\_value\\_list\\_literal\\_replace\(\)](#) function replaces the first value in the list pointed to by the *value\_list* parameter with a new value node that is a literal string node pointing to the value of the *string\_value* parameter, freeing the old value.

**Parameters:**

***value\_list*** The RSL value list to modify by replacing its first element.

***string\_value*** The new string value to use as a literal first element of the list pointed to by the *value\_list* parameter.

**Returns:**

Upon success, [\*globus\\_rsl\\_value\\_list\\_literal\\_replace\(\)\*](#) returns *GLOBUS\_SUCCESS*, frees the current first value of *value\_list* and replaces it with a new literal string node pointing to the value of the *string\_value* parameter. If an error occurs, [\*globus\\_rsl\\_value\\_list\\_literal\\_replace\(\)\*](#) returns 1.

### 3.3.1.8 `int globus_rsl_value_eval (globus_rsl_value_t * ast_node, globus_symboltable_t * symbol_table, char ** string_value, int rsl_substitution_flag)`

Evaluate RSL substitutions in an RSL value node. The [\*globus\\_rsl\\_value\\_eval\(\)\*](#) function modifies the value pointed to by its *ast\_node* parameter by replacing all RSL substitution variable reference nodes with the literal values those variables evaluate to based on the current scope of the symbol table pointed to by the *symbol\_table* parameter. It also combines string concatenations into literal string values. Any nodes which are replaced by this function are freed using [\*globus\\_rsl\\_value\\_free\\_recursive\(\)\*](#).

**Parameters:**

***ast\_node*** A pointer to the RSL value node to evaluate.

***symbol\_table*** A symbol table containing current definitions of the RSL substitutions which can occur in this evaluation scope.

***string\_value*** An output parameter which is set to point to the value of the string returned by evaluating the value node pointed to by *ast\_node* if it evaluates to a literal value. list pointed to by the *value\_list* parameter.

***rsl\_substitution\_flag*** A flag indicating whether the node pointed to by the *ast\_node* parameter defines RSL substitution variables.

**Returns:**

Upon success, [\*globus\\_rsl\\_value\\_eval\(\)\*](#) returns *GLOBUS\_SUCCESS*, and replaces any RSL substitution values in the node pointed to by the *ast\_node* parameter. If the node evaluates to a single literal, the *string\_value* parameter is modified to point to the value of that literal. If an error occurs, [\*globus\\_rsl\\_value\\_eval\(\)\*](#) returns a non-zero value.

### 3.3.1.9 `int globus_rsl_eval (globus_rsl_t * ast_node, globus_symboltable_t * symbol_table)`

Evaluate an RSL syntax tree. The [\*globus\\_rsl\\_eval\(\)\*](#) function modifies the RSL parse tree pointed to by its *ast\_node* parameter by replacing all RSL substitution variable reference nodes with the literal values those variables evaluate to based on the current scope of the symbol table pointed to by the *symbol\_table* parameter. It also combines string concatenations into literal string values. Any nodes which are replaced by this function are freed using [\*globus\\_rsl\\_value\\_free\\_recursive\(\)\*](#).

**Parameters:**

***ast\_node*** A pointer to the RSL syntax tree to evaluate.

***symbol\_table*** A symbol table containing current definitions of the RSL substitutions which can occur in this evaluation scope.

#### Returns:

Upon success, [\*globus\\_rsl\\_eval\(\)\*](#) returns *GLOBUS\_SUCCESS*, and replaces all RSL substitution values and concatenations in *ast\_node* or its child nodes with the evaluated forms described above. If an error occurs, [\*globus\\_rsl\\_eval\(\)\*](#) returns a non-zero value.

## 3.4 RSL Accessor Functions

### Functions

- int [\*globus\\_rsl\\_boolean\\_get\\_operator\*](#) (globus\_rsl\_t \*ast\_node)
- globus\_list\_t \* [\*globus\\_rsl\\_boolean\\_get\\_operand\\_list\*](#) (globus\_rsl\_t \*ast\_node)
- globus\_list\_t \*\* [\*globus\\_rsl\\_boolean\\_get\\_operand\\_list\\_ref\*](#) (globus\_rsl\_t \*boolean\_node)
- char \* [\*globus\\_rsl\\_relation\\_get\\_attribute\*](#) (globus\_rsl\_t \*ast\_node)
- int [\*globus\\_rsl\\_relation\\_get\\_operator\*](#) (globus\_rsl\_t \*ast\_node)
- globus\_rsl\_value\_t \* [\*globus\\_rsl\\_relation\\_get\\_value\\_sequence\*](#) (globus\_rsl\_t \*ast\_node)
- globus\_rsl\_value\_t \* [\*globus\\_rsl\\_relation\\_get\\_single\\_value\*](#) (globus\_rsl\_t \*ast\_node)
- char \* [\*globus\\_rsl\\_value\\_literal\\_get\\_string\*](#) (globus\_rsl\_value\_t \*literal\_node)
- globus\_list\_t \* [\*globus\\_rsl\\_value\\_sequence\\_get\\_value\\_list\*](#) (globus\_rsl\_value\_t \*sequence\_node)
- globus\_rsl\_value\_t \* [\*globus\\_rsl\\_value\\_variable\\_get\\_sequence\*](#) (globus\_rsl\_value\_t \*variable\_node)
- char \* [\*globus\\_rsl\\_value\\_variable\\_get\\_name\*](#) (globus\_rsl\_value\_t \*variable\_node)
- char \* [\*globus\\_rsl\\_value\\_variable\\_get\\_default\*](#) (globus\_rsl\_value\_t \*variable\_node)
- int [\*globus\\_rsl\\_value\\_variable\\_get\\_size\*](#) (globus\_rsl\_value\_t \*variable\_node)
- globus\_rsl\_value\_t \* [\*globus\\_rsl\\_value\\_concatenation\\_get\\_left\*](#) (globus\_rsl\_value\_t \*concatenation\_node)
- globus\_rsl\_value\_t \* [\*globus\\_rsl\\_value\\_concatenation\\_get\\_right\*](#) (globus\_rsl\_value\_t \*concatenation\_node)
- globus\_list\_t \*\* [\*globus\\_rsl\\_value\\_sequence\\_get\\_list\\_ref\*](#) (globus\_rsl\_value\_t \*sequence\_node)

#### 3.4.1 Function Documentation

##### 3.4.1.1 int [\*globus\\_rsl\\_boolean\\_get\\_operator\*](#) (globus\_rsl\_t \* *ast\_node*)

Get the RSL operator used in a boolean RSL composition. The [\*globus\\_rsl\\_boolean\\_get\\_operator\(\)\*](#) function returns the operator that is used by the boolean RSL composition.

#### Parameters:

***ast\_node*** The RSL syntax tree to inspect.

#### Returns:

Upon success, [\*globus\\_rsl\\_boolean\\_get\\_operator\(\)\*](#) returns one of GLOBUS\_RSL\_AND, GLOBUS\_RSL\_OR, GLOBUS\_RSL\_MULTIREQ. If an error occurs, [\*globus\\_rsl\\_boolean\\_get\\_operator\(\)\*](#) returns -1.

##### 3.4.1.2 globus\_list\_t\* [\*globus\\_rsl\\_boolean\\_get\\_operand\\_list\*](#) (globus\_rsl\_t \* *ast\_node*)

Get the RSL operand list from a boolean RSL composition. The [\*globus\\_rsl\\_boolean\\_get\\_operand\\_list\(\)\*](#) function returns the list of RSL syntax tree nodes that is joined by a boolean composition.

**Parameters:**

*ast\_node* The RSL syntax tree to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_boolean\\_get\\_operand\\_list\(\)](#) returns a pointer to a list of RSL syntax tree nodes that are the operand of a boolean composition operation. If an error occurs, [globus\\_rsl\\_boolean\\_get\\_operand\\_list\(\)](#) returns NULL.

**3.4.1.3 globus\_list\_t\*\* globus\_rsl\_boolean\_get\_operand\_list\_ref (globus\_rsl\_t \* *boolean\_node*)**

Get a reference to the RSL operand list from a boolean RSL composition. The [globus\\_rsl\\_boolean\\_get\\_operand\\_list\\_ref\(\)](#) function returns a pointer to the list of RSL syntax tree nodes that is joined by a boolean composition. If this list is modified, then the value of boolean syntax tree is modified.

**Parameters:**

*boolean\_node* The RSL syntax tree to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_boolean\\_get\\_operand\\_list\\_ref\(\)](#) returns a pointer to the list pointer in the RSL syntax tree data structure. This list can be modified to change the operands of the boolean operation. If an error occurs, [globus\\_rsl\\_boolean\\_get\\_operand\\_list\\_ref\(\)](#) returns NULL.

**3.4.1.4 char\* globus\_rsl\_relation\_get\_attribute (globus\_rsl\_t \* *ast\_node*)**

Get an RSL relation attribute name. The [globus\\_rsl\\_relation\\_get\\_attribute\(\)](#) function returns a pointer to the name of the attribute in an RSL relation. This return value is a shallow reference to the attribute name.

**Parameters:**

*ast\_node* The RSL relation node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_relation\\_get\\_attribute\(\)](#) returns a pointer to the name of the attribute of the relation. If an error occurs, [globus\\_rsl\\_relation\\_get\\_attribute\(\)](#) returns NULL.

**3.4.1.5 int globus\_rsl\_relation\_get\_operator (globus\_rsl\_t \* *ast\_node*)**

Get an RSL relation operator. The [globus\\_rsl\\_relation\\_get\\_operator\(\)](#) function returns the operation type represented by the RSL relation node pointed to by the *ast\_node* parameter.

**Parameters:**

*ast\_node* The RSL relation node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_relation\\_get\\_operator\(\)](#) returns one of GLOBUS\_RSL\_EQ, GLOBUS\_RSL\_NEQ, GLOBUS\_RSL\_GT, GLOBUS\_RSL\_GTEQ, GLOBUS\_RSL\_LT, or GLOBUS\_RSL\_LTEQ. If an error occurs, [globus\\_rsl\\_relation\\_get\\_operator\(\)](#) returns -1.

#### 3.4.1.6 globus\_rsl\_value\_t\* globus\_rsl\_relation\_get\_value\_sequence (globus\_rsl\_t \* *ast\_node*)

Get the value of an RSL relation. The [globus\\_rsl\\_relation\\_get\\_value\\_sequence\(\)](#) function returns the value of an RSL relation node pointed to by the *ast\_node* parameter.

##### Parameters:

*ast\_node* The RSL relation node to inspect.

##### Returns:

Upon success, [globus\\_rsl\\_relation\\_get\\_value\\_sequence\(\)](#) returns the value sequence pointer in the RSL relation pointed to by the *ast\_node* parameter. If an error occurs, [globus\\_rsl\\_relation\\_get\\_value\\_sequence\(\)](#) returns NULL.

#### 3.4.1.7 globus\_rsl\_value\_t\* globus\_rsl\_relation\_get\_single\_value (globus\_rsl\_t \* *ast\_node*)

Get the single value of an RSL relation. The [globus\\_rsl\\_relation\\_get\\_single\\_value\(\)](#) function returns the value of an RSL relation node pointed to by the *ast\_node* parameter if the value is a sequence of one value.

##### Parameters:

*ast\_node* The RSL relation node to inspect.

##### Returns:

Upon success, [globus\\_rsl\\_relation\\_get\\_single\\_value\(\)](#) returns the value pointer at the head of the RSL relation pointed to by the *ast\_node* parameter. If the value sequence has more than one value or the *ast\_node* points to an RSL syntax tree that is not a relation, [globus\\_rsl\\_relation\\_get\\_value\\_sequence\(\)](#) returns NULL.

#### 3.4.1.8 char\* globus\_rsl\_value\_literal\_get\_string (globus\_rsl\_value\_t \* *literal\_node*)

Get the string value of an RSL literal. The [globus\\_rsl\\_value\\_literal\\_get\\_string\(\)](#) function returns the string value of an RSL literal node pointed to by the *literal\_node* parameter.

##### Parameters:

*literal\_node* The RSL literal node to inspect.

##### Returns:

Upon success, [globus\\_rsl\\_value\\_literal\\_get\\_string\(\)](#) returns a pointer to the string value of the literal pointed to by the *literal\_node* parameter. If the value is not a literal, [globus\\_rsl\\_value\\_literal\\_get\\_string\(\)](#) returns NULL.

#### 3.4.1.9 globus\_list\_t\* globus\_rsl\_value\_sequence\_get\_value\_list (globus\_rsl\_value\_t \* *sequence\_node*)

Get the value list from an RSL value sequence. The [globus\\_rsl\\_value\\_sequence\\_get\\_value\\_list\(\)](#) function returns the list of globus\_rsl\_value\_t pointer values associated with the RSL value sequence pointed to by the *sequence\_node* parameter.



**Parameters:**

*sequence\_node* The RSL sequence node to inspect.

**Returns:**

Upon success, [\*globus\\_rsl\\_value\\_sequence\\_get\\_value\\_list\(\)\*](#) returns a pointer to the list of values pointed to by the *sequence\_node* parameter. If the value is not a sequence, [\*globus\\_rsl\\_value\\_literal\\_get\\_string\(\)\*](#) returns NULL.

### 3.4.1.10 `globus_rsl_value_t* globus_rsl_value_variable_get_sequence (globus_rsl_value_t * variable_node)`

Get the value sequence from an RSL variable reference. The [\*globus\\_rsl\\_value\\_variable\\_get\\_sequence\(\)\*](#) function returns the sequence value associated with the RSL variable reference pointed to by the *variable\_node* parameter.

**Parameters:**

*variable\_node* The RSL variable node to inspect.

**Returns:**

Upon success, [\*globus\\_rsl\\_value\\_variable\\_get\\_sequence\(\)\*](#) returns a pointer to the rsl value sequence pointed to by the *variable\_node* parameter. If the value is not a variable reference, [\*globus\\_rsl\\_value\\_variable\\_get\\_sequence\(\)\*](#) returns NULL.

### 3.4.1.11 `char* globus_rsl_value_variable_get_name (globus_rsl_value_t * variable_node)`

Get the name of an RSL variable reference. The [\*globus\\_rsl\\_value\\_variable\\_get\\_name\(\)\*](#) function returns a pointer to the name of the RSL variable name pointed to by the *variable\_node* parameter.

**Parameters:**

*variable\_node* The RSL variable node to inspect.

**Returns:**

Upon success, [\*globus\\_rsl\\_value\\_variable\\_get\\_name\(\)\*](#) returns a pointer to the string containing the name of the variable referenced by the *variable\_node* parameter. If the node is not a variable reference, [\*globus\\_rsl\\_value\\_variable\\_get\\_name\(\)\*](#) returns NULL.

### 3.4.1.12 `char* globus_rsl_value_variable_get_default (globus_rsl_value_t * variable_node)`

Get the default value of an RSL variable reference. The [\*globus\\_rsl\\_value\\_variable\\_get\\_default\(\)\*](#) function returns a pointer to the default value of the RSL variable pointed to by the *variable\_node* parameter to use if the variable's name is not bound in the current evaluation context.

**Parameters:**

*variable\_node* The RSL variable node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_value\\_variable\\_get\\_default\(\)](#) returns a pointer to the string containing the default value of the variable referenced by the *variable\_node* parameter. If the node is not a variable reference or no default value exists in the RSL node, [globus\\_rsl\\_value\\_variable\\_get\\_default\(\)](#) returns NULL.

**3.4.1.13 int globus\_rsl\_value\_variable\_get\_size (globus\_rsl\_value\_t \* *variable\_node*)**

Get the size of the value list within an RSL variable reference node. The [globus\\_rsl\\_value\\_variable\\_get\\_size\(\)](#) function returns the number of nodes in the RSL variable reference node pointed to by the *variable\_node* parameter.

**Parameters:**

*variable\_node* The RSL variable node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_value\\_variable\\_get\\_size\(\)](#) returns the list of values within a RSL variable reference, or -1 if the node pointed to by *variable\_node* is not a variable reference. If the return value is 1, then the variable has no default value included in the reference.

**3.4.1.14 globus\_rsl\_value\_t\* globus\_rsl\_value\_concatenation\_get\_left (globus\_rsl\_value\_t \* *concatenation\_node*)**

Get the left side of a concatenation value. The [globus\\_rsl\\_value\\_concatenation\\_get\\_left\(\)](#) function returns the left side of an RSL value concatenation pointed to by the *concatenation\_node* parameter.

**Parameters:**

*concatenation\_node* The RSL concatenation node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_value\\_concatenation\\_get\\_left\(\)](#) returns a pointer to the left value of the concatenation values pointed to by the *concatenation\_node* parameter. If an error occurs, [globus\\_rsl\\_value\\_concatenation\\_get\\_left\(\)](#) returns NULL.

**3.4.1.15 globus\_rsl\_value\_t\* globus\_rsl\_value\_concatenation\_get\_right (globus\_rsl\_value\_t \* *concatenation\_node*)**

Get the right side of a concatenation value. The [globus\\_rsl\\_value\\_concatenation\\_get\\_right\(\)](#) function returns the right side of an RSL value concatenation pointed to by the *concatenation\_node* parameter.

**Parameters:**

*concatenation\_node* The RSL concatenation node to inspect.

**Returns:**

Upon success, [globus\\_rsl\\_value\\_concatenation\\_get\\_right\(\)](#) returns a pointer to the right value of the concatenation values pointed to by the *concatenation\_node* parameter. If an error occurs, [globus\\_rsl\\_value\\_concatenation\\_get\\_right\(\)](#) returns NULL.

### 3.4.1.16 globus\_list\_t\*\* globus\_rsl\_value\_sequence\_get\_list\_ref (globus\_rsl\_value\_t \* *sequence\_node*)

Get a reference to the list of values in a sequence. The [globus\\_rsl\\_value\\_sequence\\_get\\_list\\_ref\(\)](#) function returns a reference to the list of values in a value sequence. Any changes to the elements of this list will affect the *sequence\_node* parameter.

#### Parameters:

*sequence\_node* The RSL sequence node to inspect.

#### Returns:

Upon success, [globus\\_rsl\\_value\\_sequence\\_get\\_list\\_ref\(\)](#) returns a pointer to the list of the globus\_rsl\_value\_t pointer values contained in the *sequence\_node* parameter. If an error occurs, [globus\\_rsl\\_value\\_sequence\\_get\\_list\\_ref\(\)](#) returns NULL.

## 3.5 List Functions

### Functions

- globus\_list\_t \* [globus\\_list\\_copy\\_reverse](#) (globus\_list\_t \*orig)

#### 3.5.1 Function Documentation

##### 3.5.1.1 globus\_list\_t\* globus\_list\_copy\_reverse (globus\_list\_t \* *orig*)

Create a reverse-order copy of a list. The [globus\\_list\\_copy\\_reverse\(\)](#) function creates and returns a copy of its input parameter, with the order of the list elements reversed. This copy is a shallow copy of list nodes, so both the list pointed to by *orig* and the returned list point to the same list element data.

#### Parameters:

*orig* A pointer to the list to copy.

#### Returns:

Upon success, [globus\\_list\\_copy\\_reverse\(\)](#) returns a new list containing the same elements as the list pointed to by *orig* in reverse order. If an error occurs, [globus\\_list\\_copy\\_reverse\(\)](#) returns NULL.

## 3.6 RSL Value Accessors

### Functions

- int [globus\\_rsl\\_value\\_concatenation\\_set\\_left](#) (globus\_rsl\_value\_t \*concatenation\_node, globus\_rsl\_value\_t \*new\_left\_node)
- int [globus\\_rsl\\_value\\_concatenation\\_set\\_right](#) (globus\_rsl\_value\_t \*concatenation\_node, globus\_rsl\_value\_t \*new\_right\_node)
- int [globus\\_rsl\\_value\\_list\\_param\\_get](#) (globus\_list\_t \*ast\_node\_list, int required\_type, char \*\*\*value, int \*value\_ctr)
- globus\_list\_t \* [globus\\_rsl\\_param\\_get\\_values](#) (globus\_rsl\_t \*ast\_node, char \*param)
- int [globus\\_rsl\\_param\\_get](#) (globus\_rsl\_t \*ast\_node, int param\_type, char \*param, char \*\*\*values)

### 3.6.1 Function Documentation

#### 3.6.1.1 `int globus_rsl_value_concatenation_set_left (globus_rsl_value_t * concatenation_node, globus_rsl_value_t * new_left_node)`

Set the left-hand value of a concatenation. The `globus_rsl_value_concatenation_set_left()` sets the left hand side of a concatenation pointed to by `concatenation_node` to the value pointed to by `new_left_node`. If there was any previous value to the left hand side of the concatenation, it is discarded but not freed.

##### Parameters:

***concatenation\_node*** A pointer to the RSL value concatenation node to modify.

***new\_left\_node*** A pointer to the new left hand side of the concatenation.

##### Returns:

Upon success, `globus_rsl_value_concatenation_set_left()` returns `GLOBUS_SUCCESS` and modifies the value pointed to by the `concatenation_node` parameter to use the value pointed to by the `new_left_node` parameter as its left hand side value. If an error occurs, `globus_rsl_value_concatenation_set_left()` returns -1.

#### 3.6.1.2 `int globus_rsl_value_concatenation_set_right (globus_rsl_value_t * concatenation_node, globus_rsl_value_t * new_right_node)`

Set the right-hand value of a concatenation. The `globus_rsl_value_concatenation_set_right()` sets the right-hand side of a concatenation pointed to by `concatenation_node` to the value pointed to by `new_right_node`. If there was any previous value to the right-hand side of the concatenation, it is discarded but not freed.

##### Parameters:

***concatenation\_node*** A pointer to the RSL value concatenation node to modify.

***new\_right\_node*** A pointer to the new right hand side of the concatenation.

##### Returns:

Upon success, `globus_rsl_value_concatenation_set_right()` returns `GLOBUS_SUCCESS` and modifies the value pointed to by the `concatenation_node` parameter to use the value pointed to by the `new_right_node` parameter as its right hand side value. If an error occurs, `globus_rsl_value_concatenation_set_right()` returns -1.

#### 3.6.1.3 `int globus_rsl_value_list_param_get (globus_list_t * ast_node_list, int required_type, char ***value, int * value_ctr)`

Get the values of an RSL value list. The `globus_rsl_value_list_param_get()` function copies pointers to literal string values or string pairs associated with the list of `globus_rsl_value_t` pointers pointed to by the `ast_node_list` parameter to the output array pointed to by the `value` parameter. It modifies the value pointed to by the `value_ctr` parameter to be the number of strings copied into the array.

##### Parameters:

***ast\_node\_list*** A pointer to a list of `globus_rsl_value_t` pointers whose values will be copied to the `value` parameter array.

**required\_type** A flag indicating whether the list is expected to contain literal strings or string pairs. This value may be one of *GLOBUS\_RSL\_VALUE\_LITERAL* or *GLOBUS\_RSL\_VALUE\_SEQUENCE*.

**value** An output parameter pointing to an array of strings. This array must be at least as large as the number of elements in the list pointed to by *ast\_node\_list*.

**value\_ctr** An output parameter pointing to an integer that will be incremented for each string copied into the *value* array.

#### Returns:

Upon success, the *globus\_rsl\_value\_list\_param\_get()* function returns *GLOBUS\_SUCCESS* and modifies the values pointed to by the *value* and *value\_ctr* parameters as described above. If an error occurs, *globus\_rsl\_value\_list\_param\_get()* returns a non-zero value.

#### 3.6.1.4 globus\_list\_t\* globus\_rsl\_param\_get\_values (globus\_rsl\_t \* ast\_node, char \* param)

Get the list of values for an RSL attribute. The *globus\_rsl\_param\_get\_values()* function searches the RSL parse tree pointed to by the *ast\_node* parameter and returns the value list that is bound to the attribute named by the *param* parameter.

#### Parameters:

**ast\_node** A pointer to an RSL syntax tree that will be searched. This may be a relation or boolean RSL string.

**param** The name of the attribute to search for in the parse tree pointed to by the *ast\_node* parameter.

#### Returns:

Upon success, the *globus\_rsl\_param\_get\_values()* function returns a pointer to the list of values associated with the attribute named by *param* in the RSL parse tree pointed to by *ast\_node*. If an error occurs, *globus\_rsl\_param\_get\_values()* returns NULL.

#### 3.6.1.5 int globus\_rsl\_param\_get (globus\_rsl\_t \* ast\_node, int param\_type, char \* param, char \*\*\* values)

Get the value strings for an RSL attribute. The *globus\_rsl\_param\_get()* function searches the RSL parse tree pointed to by the *ast\_node* parameter and returns an array of pointers to the strings bound to the attribute named by the *param* parameter.

#### Parameters:

**ast\_node** A pointer to an RSL syntax tree that will be searched. This may be a relation or boolean RSL string.

**param\_type** A flag indicating what type of values are expected for the RSL attribute named by the *param* parameter. This flag value may be *GLOBUS\_RSL\_PARAM\_SINGLE\_LITERAL*, *GLOBUS\_RSL\_PARAM\_MULTI\_LITERAL*, or *GLOBUS\_RSL\_PARAM\_SEQUENCE*.

**param** A string pointing to the name of the RSL attribute to search for.

**values** An output parameter pointing to an array of strings that will be allocated and contain pointers to the RSL value strings if they match the format specified by the *param\_type* flag. The caller is responsible for freeing this array, but not the strings in the array.

#### Returns:

Upon success, the *globus\_rsl\_param\_get()* function returns *GLOBUS\_SUCCESS* and modifies the *values* parameter as described above. If an error occurs, *globus\_rsl\_param\_get()* returns a non-zero value.

## 3.7 RSL Display

### Functions

- int [globus\\_rsl\\_value\\_print\\_recursive](#) (globus\_rsl\_value\_t \*globus\_rsl\_value\_ptr)
- char \* [globus\\_rsl\\_get\\_operator](#) (int my\_op)
- int [globus\\_rsl\\_print\\_recursive](#) (globus\_rsl\_t \*ast\_node)
- char \* [globus\\_rsl\\_unparse](#) (globus\_rsl\_t \*rsl\_spec)
- char \* [globus\\_rsl\\_value\\_unparse](#) (globus\_rsl\_value\_t \*rsl\_value)

### 3.7.1 Function Documentation

#### 3.7.1.1 int globus\_rsl\_value\_print\_recursive (globus\_rsl\_value\_t \* *globus\_rsl\_value\_ptr*)

Print the value of a globus\_rsl\_value\_t to standard output. The [globus\\_rsl\\_value\\_print\\_recursive\(\)](#) function prints a string representation of the RSL value node pointed to by the *globus\_rsl\_value\_ptr* parameter to standard output. This function is not reentrant.

#### Parameters:

*globus\_rsl\_value\_ptr* A pointer to the RSL value to display.

#### Returns:

The [globus\\_rsl\\_value\\_print\\_recursive\(\)](#) function always returns *GLOBUS\_SUCCESS*.

#### 3.7.1.2 char\* globus\_rsl\_get\_operator (int *my\_op*)

Get the string representation of an RSL operator. The [globus\\_rsl\\_get\\_operator\(\)](#) function returns a pointer to a static string that represents the RSL operator passed in via the *my\_op* parameter. If the operator is not value, then [globus\\_rsl\\_get\\_operator\(\)](#) returns a pointer to the string "??"

#### Parameters:

*my\_op* The RSL operator to return.

#### Returns:

The [globus\\_rsl\\_get\\_operator\(\)](#) function returns a pointer to the string representation of the *my\_op* parameter, or "??" if that value is not a value RSL operator.

#### 3.7.1.3 int globus\_rsl\_print\_recursive (globus\_rsl\_t \* *ast\_node*)

Print the value of an RSL syntax tree to standard output. The [globus\\_rsl\\_print\\_recursive\(\)](#) function prints a string representation of the RSL syntax tree pointed to by the *ast\_node* parameter to standard output. This function is not reentrant.

#### Parameters:

*ast\_node* A pointer to the RSL syntax tree to display.

**Returns:**

The [\*globus\\_rsl\\_print\\_recursive\(\)\*](#) function always returns *GLOBUS\_SUCCESS*.

**3.7.1.4 char\* globus\_rsl\_unparse (globus\_rsl\_t \* rsl\_spec)**

Convert an RSL parse tree to a string. The [\*globus\\_rsl\\_unparse\(\)\*](#) function returns a new string which can be parsed into the RSL syntax tree passed as the *rsl\_spec* parameter. The caller is responsible for freeing this string.

**Parameters:**

*rsl\_spec* A pointer to the RSL syntax tree to unparse.

**Returns:**

Upon success, the [\*globus\\_rsl\\_unparse\(\)\*](#) function returns a new string which represents the RSL parse tree passed as the *rsl\_spec* parameter. If an error occurs, [\*globus\\_rsl\\_unparse\(\)\*](#) returns NULL.

**3.7.1.5 char\* globus\_rsl\_value\_unparse (globus\_rsl\_value\_t \* rsl\_value)**

Convert an RSL value pointer to a string. The [\*globus\\_rsl\\_value\\_unparse\(\)\*](#) function returns a new string which can be parsed into the value of an RSL relation that has the same syntactic meaning as the *rsl\_value* parameter. The caller is responsible for freeing this string.

**Parameters:**

*rsl\_value* A pointer to the RSL value node to unparse.

**Returns:**

Upon success, the [\*globus\\_rsl\\_value\\_unparse\(\)\*](#) function returns a new string which represents the RSL value node passed as the *rsl\_value* parameter. If an error occurs, [\*globus\\_rsl\\_value\\_unparse\(\)\*](#) returns NULL.

## 3.8 RSL Parsing

**Functions**

- globus\_rsl\_t \* [\*globus\\_rsl\\_parse\*](#) (char \*buf)

**3.8.1 Function Documentation****3.8.1.1 globus\_rsl\_t\* globus\_rsl\_parse (char \* buf)**

Parse an RSL string. The [\*globus\\_rsl\\_parse\(\)\*](#) function parses the string pointed to by the *buf* parameter into an RSL syntax tree. The caller is responsible for freeing that tree by calling [\*globus\\_rsl\\_free\\_recursive\(\)\*](#).

**Parameters:**

*buf* A NULL-terminated string that contains an RSL relation or boolean composition.

**Returns:**

Upon success, the *globus\_rsl\_parse()* function returns the parse tree generated by processing its input. If an error occurs, *globus\_rsl\_parse()* returns NULL.



## Index

- globus\_list
  - globus\_list\_copy\_reverse, 17
- globus\_list\_copy\_reverse
  - globus\_list, 17
- globus\_rsl\_accessor
  - globus\_rsl\_boolean\_get\_operand\_list, 13
  - globus\_rsl\_boolean\_get\_operand\_list\_ref, 13
  - globus\_rsl\_boolean\_get\_operator, 12
  - globus\_rsl\_relation\_get\_attribute, 13
  - globus\_rsl\_relation\_get\_operator, 13
  - globus\_rsl\_relation\_get\_single\_value, 14
  - globus\_rsl\_relation\_get\_value\_sequence, 14
  - globus\_rsl\_value\_concatenation\_get\_left, 16
  - globus\_rsl\_value\_concatenation\_get\_right, 16
  - globus\_rsl\_value\_literal\_get\_string, 14
  - globus\_rsl\_value\_sequence\_get\_list\_ref, 17
  - globus\_rsl\_value\_sequence\_get\_value\_list, 15
  - globus\_rsl\_value\_variable\_get\_default, 16
  - globus\_rsl\_value\_variable\_get\_name, 15
  - globus\_rsl\_value\_variable\_get\_sequence, 15
  - globus\_rsl\_value\_variable\_get\_size, 16
- globus\_rsl\_boolean\_get\_operand\_list
  - globus\_rsl\_accessor, 13
- globus\_rsl\_boolean\_get\_operand\_list\_ref
  - globus\_rsl\_accessor, 13
- globus\_rsl\_boolean\_get\_operator
  - globus\_rsl\_accessor, 12
- globus\_rsl\_constructors
  - globus\_rsl\_make\_boolean, 6
  - globus\_rsl\_make\_relation, 7
  - globus\_rsl\_value\_make\_concatenation, 8
  - globus\_rsl\_value\_make\_literal, 7
  - globus\_rsl\_value\_make\_sequence, 7
  - globus\_rsl\_value\_make\_variable, 8
- globus\_rsl\_copy\_recursive
  - globus\_rsl\_memory, 9
- globus\_rsl\_eval
  - globus\_rsl\_memory, 11
- globus\_rsl\_free
  - globus\_rsl\_memory, 10
- globus\_rsl\_free\_recursive
  - globus\_rsl\_memory, 10
- globus\_rsl\_get\_operator
  - globus\_rsl\_print, 20
- globus\_rsl\_is\_boolean
  - globus\_rsl\_predicates, 2
- globus\_rsl\_is\_boolean\_and
  - globus\_rsl\_predicates, 4
- globus\_rsl\_is\_boolean\_multi
  - globus\_rsl\_predicates, 4
- globus\_rsl\_is\_boolean\_or
  - globus\_rsl\_predicates, 4
- globus\_rsl\_is\_relation
  - globus\_rsl\_predicates, 2
- globus\_rsl\_is\_relation\_attribute\_equal
  - globus\_rsl\_is\_relation\_attribute\_equal, 3
- globus\_rsl\_is\_relation\_eq
  - globus\_rsl\_predicates, 3
- globus\_rsl\_is\_relation\_less\_than
  - globus\_rsl\_predicates, 3
- globus\_rsl\_make\_boolean
  - globus\_rsl\_constructors, 6
- globus\_rsl\_make\_relation
  - globus\_rsl\_constructors, 7
- globus\_rsl\_memory
  - globus\_rsl\_copy\_recursive, 9
  - globus\_rsl\_eval, 11
  - globus\_rsl\_free, 10
  - globus\_rsl\_free\_recursive, 10
  - globus\_rsl\_value\_copy\_recursive, 9
  - globus\_rsl\_value\_eval, 11
  - globus\_rsl\_value\_free, 9
  - globus\_rsl\_value\_free\_recursive, 10
  - globus\_rsl\_value\_list\_literal\_replace, 11
- globus\_rsl\_param
  - globus\_rsl\_param\_get, 19
  - globus\_rsl\_param\_get\_values, 19
  - globus\_rsl\_value\_concatenation\_set\_left, 18
  - globus\_rsl\_value\_concatenation\_set\_right, 18
  - globus\_rsl\_value\_list\_param\_get, 19
- globus\_rsl\_param\_get
  - globus\_rsl\_param, 19
- globus\_rsl\_param\_get\_values
  - globus\_rsl\_param, 19
- globus\_rsl\_parse
  - globus\_rsl\_parse, 22
  - globus\_rsl\_parse, 22
- globus\_rsl\_predicates
  - globus\_rsl\_is\_boolean, 2
  - globus\_rsl\_is\_boolean\_and, 4
  - globus\_rsl\_is\_boolean\_multi, 4
  - globus\_rsl\_is\_boolean\_or, 4
  - globus\_rsl\_is\_relation, 2
  - globus\_rsl\_is\_relation\_attribute\_equal, 3
  - globus\_rsl\_is\_relation\_eq, 3
  - globus\_rsl\_is\_relation\_less\_than, 3
  - globus\_rsl\_value\_is\_concatenation, 6
  - globus\_rsl\_value\_is\_literal, 5
  - globus\_rsl\_value\_is\_sequence, 5
  - globus\_rsl\_value\_is\_variable, 5
- globus\_rsl\_print
  - globus\_rsl\_get\_operator, 20
  - globus\_rsl\_print\_recursive, 21
  - globus\_rsl\_unparse, 21
  - globus\_rsl\_value\_print\_recursive, 20
  - globus\_rsl\_value\_unparse, 21

- globus\_rsl\_print\_recursive
  - globus\_rsl\_print, [21](#)
- globus\_rsl\_relation\_get\_attribute
  - globus\_rsl\_accessor, [13](#)
- globus\_rsl\_relation\_get\_operator
  - globus\_rsl\_accessor, [13](#)
- globus\_rsl\_relation\_get\_single\_value
  - globus\_rsl\_accessor, [14](#)
- globus\_rsl\_relation\_get\_value\_sequence
  - globus\_rsl\_accessor, [14](#)
- globus\_rsl\_unparse
  - globus\_rsl\_print, [21](#)
- globus\_rsl\_value\_concatenation\_get\_left
  - globus\_rsl\_accessor, [16](#)
- globus\_rsl\_value\_concatenation\_get\_right
  - globus\_rsl\_accessor, [16](#)
- globus\_rsl\_value\_concatenation\_set\_left
  - globus\_rsl\_param, [18](#)
- globus\_rsl\_value\_concatenation\_set\_right
  - globus\_rsl\_param, [18](#)
- globus\_rsl\_value\_copy\_recursive
  - globus\_rsl\_memory, [9](#)
- globus\_rsl\_value\_eval
  - globus\_rsl\_memory, [11](#)
- globus\_rsl\_value\_free
  - globus\_rsl\_memory, [9](#)
- globus\_rsl\_value\_free\_recursive
  - globus\_rsl\_memory, [10](#)
- globus\_rsl\_value\_is\_concatenation
  - globus\_rsl\_predicates, [6](#)
- globus\_rsl\_value\_is\_literal
  - globus\_rsl\_predicates, [5](#)
- globus\_rsl\_value\_is\_sequence
  - globus\_rsl\_predicates, [5](#)
- globus\_rsl\_value\_is\_variable
  - globus\_rsl\_predicates, [5](#)
- globus\_rsl\_value\_list\_literal\_replace
  - globus\_rsl\_memory, [11](#)
- globus\_rsl\_value\_list\_param\_get
  - globus\_rsl\_param, [19](#)
- globus\_rsl\_value\_literal\_get\_string
  - globus\_rsl\_accessor, [14](#)
- globus\_rsl\_value\_make\_concatenation
  - globus\_rsl\_constructors, [8](#)
- globus\_rsl\_value\_make\_literal
  - globus\_rsl\_constructors, [7](#)
- globus\_rsl\_value\_make\_sequence
  - globus\_rsl\_constructors, [7](#)
- globus\_rsl\_value\_make\_variable
  - globus\_rsl\_constructors, [8](#)
- globus\_rsl\_value\_print\_recursive
  - globus\_rsl\_print, [20](#)
- globus\_rsl\_value\_sequence\_get\_list\_ref
  - globus\_rsl\_accessor, [17](#)
- globus\_rsl\_value\_sequence\_get\_value\_list
  - globus\_rsl\_accessor, [15](#)

- globus\_rsl\_value\_unparse
  - globus\_rsl\_print, [21](#)
- globus\_rsl\_value\_variable\_get\_default
  - globus\_rsl\_accessor, [16](#)
- globus\_rsl\_value\_variable\_get\_name
  - globus\_rsl\_accessor, [15](#)
- globus\_rsl\_value\_variable\_get\_sequence
  - globus\_rsl\_accessor, [15](#)
- globus\_rsl\_value\_variable\_get\_size
  - globus\_rsl\_accessor, [16](#)

List Functions, [17](#)

RSL Accessor Functions, [12](#)

RSL Constructors, [6](#)

RSL Display, [20](#)

RSL Memory Management, [9](#)

RSL Parsing, [22](#)

RSL Predicates, [1](#)

RSL Value Accessors, [18](#)