

# **GT 4.2.1 Index Service: User's Guide**

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## **GT 4.2.1 Index Service: User's Guide**

### **Introduction**

This guide contains information for end-users of the WS MDS Index Service. The Index Service collects information about grid resources and publishes them as service group entries.

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# Table of Contents

|   |    |
|---|----|
| Index Service How-tos .....                             | 5  |
| 1. Getting Information from the MDS Index Service ..... | 1  |
| 1. Simple usage .....                                   | 1  |
| I. WS MDS Index User Commands .....                     | ?  |
| wsrf-query .....  | 3  |
| wsrf-get-property .....                                 | 5  |
| wsrf-get-properties .....                               | 7  |
| globus-wsrf-query .....                                 | 9  |
| globus-wsrf-get-property .....                          | 12 |
| globus-wsrf-get-properties .....                        | 14 |
| 2. Graphical User Interface .....                       | 16 |
| 3. Troubleshooting .....                                | 17 |
| 1. Error Messages .....                                 | 17 |
| 2. General troubleshooting information .....            | 17 |
| Glossary .....  | 18 |
| Index .....   | 19 |

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# List of Tables

- 1. Common options ..... 4
- 2. Common options ..... 6
- 3. Common options ..... 8
- 4. Application-specific options ..... 9
- 5. Common options ..... 10
- 6. Common options ..... 12
- 7. Common options ..... 14
- 3.1. WS MDS Index Service Error Messages ..... 17

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# Index Service How-tos

## E

errors,

## G

getting information from the Index Service (end users),

## R

resource

- globus-wsrf-query,
- querying resource properties,

resource properties

- getting a single resource property from a resource,
- getting multiple resource properties from a resource,
- getting multiple values,
- getting value,
- globus-wsrf-get-properties,
- globus-wsrf-get-property,
- querying,
- querying the resource property document of a resource,
- wsrf-get-properties,
- wsrf-get-property,
- wsrf-query,

## T

troubleshooting,

## U

usage

- simple,

using,

- basic,

## W

wsrf-query,

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# Chapter 1. Getting Information from the MDS Index Service

To view the information contained in an Index Service, you can use either Java WS Core commands (outlined below) or [WebMDS](#).

## 1. Simple usage

A typical example of using the default Index Service is with the [wsrf-query](#) Java WS Core command. For example:

```
$GLOBUS_LOCATION/bin/wsrf-query -s https://localhost:8443/wsrf/services/DefaultIndexService
```

displays all the resource properties collected by the default Index Service on your local host.

You can also use an XPath query to drill down your search as well as other Java WS Core commands such as [wsrf-get-property](#) and [wsrf-get-properties](#). For more information, review the [User's Guide](#).

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# WS MDS Index User Commands

The index service exposes information via service groups and is accessed using the same command-line tools used to query other WSRF services for information. These tools are part of [Java WS Core](#) .

- [wsrf-query](#)
- [wsrf-get-property](#)
- [wsrf-get-properties](#)

A set of functionally equivalent tools exist written using WS C core. They tend to be faster alternatives to the above java programs. These tools are part of [C WS Core](#) .

- [globus-wsrf-query\(1\)](#)
- [globus-wsrf-get-property\(1\)](#)
- [globus-wsrf-get-properties\(1\)](#)

The following commands are originally documented under their respective component guides, but are reproduced here for convenience.

---

## Name

wsrf-query -- Performs query on a resource property document

wsrf-query

## Tool description

Queries the resource property document of a resource. By default, a simple XPath query is assumed that returns the entire resource property document.

## Command syntax

```
wsrf-query [options] [query expression] [dialect]
```

Table 1. Common options

|   |  |
|---|--|
| <b>-h, --help</b>                           | Displays help information about the command.   |
| <b>-d, --debug</b>                          | Enables debug mode. For example, full stack traces of errors will be displayed.  |
| <b>-e, --eprFile &lt;file&gt;</b>           | Specifies an <i>XML</i> file that contains the <i>WS-Addressing</i> endpoint reference.  |
| <b>-s, --service &lt;url&gt;</b>            | Specifies the service URL.   |
| <b>-k, --key &lt;name value&gt;</b>         | Specifies the resource key. The <b>name</b> is the QName of the resource key in the string form: <b>{namespaceURI}localPart</b> , while the <b>value</b> is the simple value of the key. For complex keys, use the <b>--eprFile</b> option. Example:<br><br>-k "{http://www.globus.org}MyKey"<br>123 |
| <b>-f, --descriptor &lt;file&gt;</b>        | Specifies a client security descriptor. Overrides all other security settings.   |
| <b>-a, --anonymous</b>                      | Enables anonymous authentication. Only supported with transport security or the GSI Secure Conversation authentication mechanism.  |
| <b>-g, --delegation &lt;mode&gt;</b>        | Enables delegation. <b>mode</b> can be either <b>'limited'</b> or <b>'full'</b> . Only supported with the GSI Secure Conversation authentication mechanism.  |
| <b>-l, --contextLifetime &lt;value&gt;</b>  | Sets the lifetime of the client security context. <b>value</b> is in milliseconds. Only supported with the GSI Secure Conversation authentication mechanism.   |
| <b>-m, --securityMech &lt;type&gt;</b>      | Specifies the authentication mechanism. <b>type</b> can be <b>'msg'</b> for GSI Secure Message, or <b>'conv'</b> for GSI Secure Conversation.  |
| <b>-c, --serverCertificate &lt;file&gt;</b> | Specifies the server's <i>certificate</i> file used for encryption. Only needed for the GSI Secure Message authentication mechanism.   |
| <b>-p, --protection &lt;type&gt;</b>        | Specifies the protection level. <b>type</b> can be <b>'sig'</b> for signature or <b>'enc'</b> for encryption.  |
| <b>-x, --proxyFilename &lt;value&gt;</b>    | Sets the proxy file to use as client credential.   |
| <b>-z, --authorization &lt;type&gt;</b>     | Specifies authorization type. <b>type</b> can be <b>'self'</b> , <b>'host'</b> , <b>'none'</b> , or a string specifying the expected identity of the remote party.   |
| <b>-t, --timeout &lt;timeout&gt;</b>        | Specifies client timeout (in seconds). The client will wait maximum of the timeout value for a response from the server before returning an error. By default the timeout value is 10 minutes.   |

Examples:

```
$ wsrif-query -s https://127.0.0.1:8443/wsrif/services/DefaultIndexService \
  "count(//*[local-name()='Entry'])"
```

```
$ wsrif-query -s https://127.0.0.1:8443/wsrif/services/DefaultIndexService \
  "number(//*[local-name()='GLUECE']/glue:ComputingElement/glue:State/@glue:FreeCPUs)=0"
```

```
$ wsrif-query -s http://localhost:8080/wsrif/services/ContainerRegistryService \
  "/*/*/*/*[local-name()='Address']"
```

---

# Name

`wsrf-get-property --` Gets values of a single resource property

`wsrf-get-property`

## Tool description

Gets a single resource property from a resource.

## Command syntax

`wsrf-get-property [options] <property>`

The `<property>` is a QName of the resource property in the string form: `{namespaceURI}localPart`.

Table 2. Common options

|   |  |
|---|--|
| <b>-h, --help</b>                           | Displays help information about the command.   |
| <b>-d, --debug</b>                          | Enables debug mode. For example, full stack traces of errors will be displayed.  |
| <b>-e, --eprFile &lt;file&gt;</b>           | Specifies an <i>XML</i> file that contains the <i>WS-Addressing</i> endpoint reference.  |
| <b>-s, --service &lt;url&gt;</b>            | Specifies the service URL.   |
| <b>-k, --key &lt;name value&gt;</b>         | Specifies the resource key. The <b>name</b> is the QName of the resource key in the string form: <b>{namespaceURI}localPart</b> , while the <b>value</b> is the simple value of the key. For complex keys, use the <b>--eprFile</b> option. Example:<br><br>-k "{http://www.globus.org}MyKey"<br>123 |
| <b>-f, --descriptor &lt;file&gt;</b>        | Specifies a client security descriptor. Overrides all other security settings.   |
| <b>-a, --anonymous</b>                      | Enables anonymous authentication. Only supported with transport security or the GSI Secure Conversation authentication mechanism.  |
| <b>-g, --delegation &lt;mode&gt;</b>        | Enables delegation. <b>mode</b> can be either <b>'limited'</b> or <b>'full'</b> . Only supported with the GSI Secure Conversation authentication mechanism.  |
| <b>-l, --contextLifetime &lt;value&gt;</b>  | Sets the lifetime of the client security context. <b>value</b> is in milliseconds. Only supported with the GSI Secure Conversation authentication mechanism.   |
| <b>-m, --securityMech &lt;type&gt;</b>      | Specifies the authentication mechanism. <b>type</b> can be <b>'msg'</b> for GSI Secure Message, or <b>'conv'</b> for GSI Secure Conversation.  |
| <b>-c, --serverCertificate &lt;file&gt;</b> | Specifies the server's <i>certificate</i> file used for encryption. Only needed for the GSI Secure Message authentication mechanism.   |
| <b>-p, --protection &lt;type&gt;</b>        | Specifies the protection level. <b>type</b> can be <b>'sig'</b> for signature or <b>'enc'</b> for encryption.  |
| <b>-x, --proxyFilename &lt;value&gt;</b>    | Sets the proxy file to use as client credential.   |
| <b>-z, --authorization &lt;type&gt;</b>     | Specifies authorization type. <b>type</b> can be <b>'self'</b> , <b>'host'</b> , <b>'none'</b> , or a string specifying the expected identity of the remote party.   |
| <b>-t, --timeout &lt;timeout&gt;</b>        | Specifies client timeout (in seconds). The client will wait maximum of the timeout value for a response from the server before returning an error. By default the timeout value is 10 minutes.   |

Example:

```
$ wsrif-get-property -s http://localhost:8080/wsrif/services/CounterService \ -k
  "{http://counter.com}CounterKey" 123 \
  "{http://docs.oasis-open.org/wsrif/2004/06/wsrif-WS-ResourceLifetime-1.2-draft-01.xsd}Cu
```

---

## Name

`wsrf-get-properties --` Gets values of multiple resource properties

`wsrf-get-properties`

## Tool description

Gets multiple resource properties from a resource.

## Command syntax

```
wsrf-get-properties [options] <property1> [<property2>...  
  <propertyN>]
```

Each **<propertyN>** is a QName of the resource property in the string form: **{namespaceURI}localPart**.

Table 3. Common options

|   |  |
|---|--|
| <b>-h, --help</b>                           | Displays help information about the command.   |
| <b>-d, --debug</b>                          | Enables debug mode. For example, full stack traces of errors will be displayed.  |
| <b>-e, --eprFile &lt;file&gt;</b>           | Specifies an <i>XML</i> file that contains the <i>WS-Addressing</i> endpoint reference.  |
| <b>-s, --service &lt;url&gt;</b>            | Specifies the service URL.   |
| <b>-k, --key &lt;name value&gt;</b>         | Specifies the resource key. The <b>name</b> is the QName of the resource key in the string form: <b>{namespaceURI}localPart</b> , while the <b>value</b> is the simple value of the key. For complex keys, use the <b>--eprFile</b> option. Example:<br><br>-k "{http://www.globus.org}MyKey"<br>123 |
| <b>-f, --descriptor &lt;file&gt;</b>        | Specifies a client security descriptor. Overrides all other security settings.   |
| <b>-a, --anonymous</b>                      | Enables anonymous authentication. Only supported with transport security or the GSI Secure Conversation authentication mechanism.  |
| <b>-g, --delegation &lt;mode&gt;</b>        | Enables delegation. <b>mode</b> can be either <b>'limited'</b> or <b>'full'</b> . Only supported with the GSI Secure Conversation authentication mechanism.  |
| <b>-l, --contextLifetime &lt;value&gt;</b>  | Sets the lifetime of the client security context. <b>value</b> is in milliseconds. Only supported with the GSI Secure Conversation authentication mechanism.   |
| <b>-m, --securityMech &lt;type&gt;</b>      | Specifies the authentication mechanism. <b>type</b> can be <b>'msg'</b> for GSI Secure Message, or <b>'conv'</b> for GSI Secure Conversation.  |
| <b>-c, --serverCertificate &lt;file&gt;</b> | Specifies the server's <i>certificate</i> file used for encryption. Only needed for the GSI Secure Message authentication mechanism.   |
| <b>-p, --protection &lt;type&gt;</b>        | Specifies the protection level. <b>type</b> can be <b>'sig'</b> for signature or <b>'enc'</b> for encryption.  |
| <b>-x, --proxyFilename &lt;value&gt;</b>    | Sets the proxy file to use as client credential.   |
| <b>-z, --authorization &lt;type&gt;</b>     | Specifies authorization type. <b>type</b> can be <b>'self'</b> , <b>'host'</b> , <b>'none'</b> , or a string specifying the expected identity of the remote party.   |
| <b>-t, --timeout &lt;timeout&gt;</b>        | Specifies client timeout (in seconds). The client will wait maximum of the timeout value for a response from the server before returning an error. By default the timeout value is 10 minutes.   |

Example:

```
$ wsrfg-get-properties -s http://localhost:8080/wsrfg/services/CounterService \ -k
  "{http://counter.com}CounterKey" 123 \
  "{http://docs.oasis-open.org/wsrfg/2004/06/wsrfg-WS-ResourceLifetime-1.2-draft-01.xsd}Cu
  \
  "{http://docs.oasis-open.org/wsrfg/2004/06/wsrfg-WS-ResourceLifetime-1.2-draft-01.xsd}Te
```

---

# Name

globus-wsrf-query -- Query a WSRF resource's Resource Property document

globus-wsrf-query [OPTIONS]... SERVICE-SPECIFIER QUERY-EXPRESSION

## Tool description

Perform an XPATH query on a resource property document.

## Command syntax

globus-wsrf-query [OPTIONS]... SERVICE-SPECIFIER QUERY-EXPRESSION

**Table 4. Application-specific options**

|  |  |
|--|--|
| <b>-n   ---nsMapFile FILENAME.</b>           | Use the namespace map entries in <i>FILENAME</i> in the XPATH context.   |
| <b>-N   --namespace PREFIX=NAMESPACE-URI</b> | Create a namespace mapping in the XPATH context for the <i>PREFIX</i> string to resolve to the <i>NAMESPACE-URI</i> namespace.   |
| <b>-D   --dialect DIALECT-URI</b>            | Set query dialect to <i>DIALECT-URI</i> . The value <b>targeted</b> will be interpreted as <b>http://wsrf.globus.org/core/query/targetedXPath</b> (default: <b>http://www.w3.org/TR/1999/REC-xpath-19991116</b> ). |

**Table 5. Common options**

|  |  |
|--|--|
| <b>-a   --anonymous</b>                                      | Use anonymous authentication. Requires either <b>-m 'conv'</b> or transport (https) security.  |
| <b>-d, --debug</b>   | Enables debug mode. In debug mode, all SOAP messages will be displayed to stderr and full WSRF Fault messages will be displayed.   |
| <b>-e   --eprFile FILENAME</b>                               | Load service EPR from FILENAME. This EPR is used to contact the WSRF service.  |
| <b>-h   --help</b>   | Displays help information about the command.   |
| <b>-k   --key KEYNAME VALUE</b>                              | Set resource key in the service EPR to be named KEYNAME with VALUE as its value. This can be combined with <b>-s</b> to construct an EPR without having an xml file on hand. The <b>KEYNAME</b> is a QName string in the format <b>{namespaceURI}localPart</b> . while the <b>VALUE</b> is a literal string to place in the element. For example, the option <b>-k '{http://www.globus.org}MyKey' 128</b> would be rendered as <b>&lt;MyKey xmlns="http://www.globus.org"&gt;128&lt;/MyKey&gt;</b> |
| <b>-m, --securityMech TYPE</b>                               | Set authentication mechanism. TYPE is one of <b>msg</b> for WS-SecureMessage or <b>conv</b> for WS-SecureConversation.   |
| <b>-p, --protection LEVEL</b>                                | Set message protection level. LEVEL is one of <b>sig</b> for digital signature or <b>enc</b> for encryption. The default is 'sig'.   |
| <b>-s   --service ENDPOINT</b>                               | Set ENDPOINT the service URL to use. Will be composed with the <b>-k</b> parameter if present to add ReferenceProperties to the ENDPOINT   |
| <b>-t   --timeout SECONDS</b>                                | Set client timeout to SECONDS.   |
| <b>-u   --usage</b>  | Print short usage message.   |
| <b>-V   --version</b>  | Show version information and exit.   |
| <b>-v   --certKeyFiles CERTIFICATE-FILENAME KEY-FILENAME</b> | Use credentials located in <b>CERTIFICATE-FILENAME</b> and <b>KEY-FILENAME</b> . The key file must be unencrypted.   |
| <b>-x   --proxyFilename FILENAME</b>                         | Use proxy credentials located in <b>FILENAME</b> .   |
| <b>-z   --authorization TYPE</b>                             | Set authorization mode. <b>TYPE</b> can be <b>self</b> , <b>host</b> , <b>none</b> , or a string specifying the identity of the remote party. The default is <b>self</b> .   |
| <b>--versions</b>  | Show version information for all loaded modules and exit.  |

SERVICE-SPECIFIER: [-s URI [-k KEY VALUE] | -e FILENAME]

QUERY-EXPRESSION: XPath-Expression-String

*Examples:*

```
% globus-wsrf-query -e widget.epr "//*[local-name() = 'CurrentTime']"
<ns0:CurrentTime
  xmlns:ns0="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ns1="http://www.w3.org/2001/XMLSchema"
  xmlns:ns2="http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft
  ns0:type="ns1:dateTime">2006-05-30T13:53:15Z</ns0:CurrentTime>
```

```
% globus-wsrf-query -e widget.epr "//*[local-name() = 'CurrentTime']/text()"
2006-05-30T13:53:35Z
```

```
% globus-wsrf-query -e widget.epr \
  -N wsrl=http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft-
  "//*[wsrl:CurrentTime/text()]"
2006-05-30T13:54:36Z
```

Contents of *widget.epr*:

```
<ns01:EndpointReference xmlns:ns01="http://schemas.xmlsoap.org/ws/2004/03/addressing">
  <ns01:Address>http://globus.my.org:8080/wsrf/services/WidgetService</ns01:Address>
  <ns01:ReferenceProperties>
    <ResourceID xmlns:ns02="http://www.w3.org/2001/XMLSchema-instance" xmlns:ns03="http://
  </ns01:ReferenceProperties>
</ns01:EndpointReference>
```

## Limitations

- The namespace mapping option and use of namespace prefixes in the *XPath-Expression-String* does not work when communicating with the Java container unless the *http://wsrf.globus.org/core/query/targetedXPath* dialect is used.

## Output and Exit Code

If the query is successful, the program displays the output of the query to *stdout* and terminates with exit code 0. In the case of an error, the type of error will be displayed to *stderr* and the program will terminate with a non-0 exit code.

---

# Name

globus-wsrf-get-property -- Get a resource property's value

globus-wsrf-get-property [OPTIONS]... SERVICE-SPECIFIER PROPERTY-NAME

## Tool description

Get the value of a resource property from a WSRF resource.

## Command syntax

globus-wsrf-get-property [OPTIONS]... SERVICE-SPECIFIER PROPERTY-NAME

**Table 6. Common options**

|  |  |
|--|--|
| <b>-a   --anonymous</b>                                      | Use anonymous authentication. Requires either <b>-m 'conv'</b> or transport (https) security.  |
| <b>-d, --debug</b>   | Enables debug mode. In debug mode, all SOAP messages will be displayed to stderr and full WSRF Fault messages will be displayed.   |
| <b>-e   --eprFile FILENAME</b>                               | Load service EPR from FILENAME. This EPR is used to contact the WSRF service.  |
| <b>-h   --help</b>   | Displays help information about the command.   |
| <b>-k   --key KEYNAME VALUE</b>                              | Set resource key in the service EPR to be named KEYNAME with VALUE as its value. This can be combined with <b>-s</b> to construct an EPR without having an xml file on hand. The <b>KEYNAME</b> is a QName string in the format <b>{namespaceURI}localPart</b> . while the <b>VALUE</b> is a literal string to place in the element. For example, the option <b>-k '{http://www.globus.org}MyKey' 128</b> would be rendered as <b>&lt;MyKey xmlns="http://www.globus.org"&gt;128&lt;/MyKey&gt;</b> |
| <b>-m, --securityMech TYPE</b>                               | Set authentication mechanism. TYPE is one of <b>msg</b> for WS-SecureMessage or <b>conv</b> for WS-SecureConversation.   |
| <b>-p, --protection LEVEL</b>                                | Set message protection level. LEVEL is one of <b>sig</b> for digital signature or <b>enc</b> for encryption. The default is 'sig'.   |
| <b>-s   --service ENDPOINT</b>                               | Set ENDPOINT the service URL to use. Will be composed with the <b>-k</b> parameter if present to add ReferenceProperties to the ENDPOINT   |
| <b>-t   --timeout SECONDS</b>                                | Set client timeout to SECONDS.   |
| <b>-u   --usage</b>  | Print short usage message.   |
| <b>-V   --version</b>  | Show version information and exit.   |
| <b>-v   --certKeyFiles CERTIFICATE-FILENAME KEY-FILENAME</b> | Use credentials located in <b>CERTIFICATE-FILENAME</b> and <b>KEY-FILENAME</b> . The key file must be unencrypted.   |
| <b>-x   --proxyFilename FILENAME</b>                         | Use proxy credentials located in <b>FILENAME</b> .   |
| <b>-z   --authorization TYPE</b>                             | Set authorization mode. <b>TYPE</b> can be <b>self</b> , <b>host</b> , <b>none</b> , or a string specifying the identity of the remote party. The default is <b>self</b> .   |
| <b>--versions</b>  | Show version information for all loaded modules and exit.  |

SERVICE-SPECIFIER: [-s URI [-k KEY VALUE] | -e FILENAME]

PROPERTY-NAME: [{Namespace-URI}]Property-Name

*Example:*

```
% globus-wsrf-get-property -e widget.epr \  
    '{http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft-01.xsd  
  
<ns02:CurrentTime  
    xmlns:ns00="http://www.w3.org/2001/XMLSchema-instance"  
    xmlns:ns01="http://www.w3.org/2001/XMLSchema"  
    xmlns:ns02="http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft  
    ns00:type="ns01:dateTime">2006-05-30T14:26:35Z</ns02:CurrentTime>
```

## Output and Exit Code

If the property exists, its values (if any) are displayed to *stdout* and the program terminates with exit code 0. In the case of an error, the type of error will be displayed to *stderr* and the program will terminate with a non-0 exit code.

---

# Name

globus-wsrf-get-properties -- Get multiple resource property value

globus-wsrf-get-properties [OPTIONS]... SERVICE-SPECIFIER PROPERTY-NAME...

## Tool description

Get the value of multiple resource properties from a WSRF resource.

## Command syntax

globus-wsrf-get-properties [OPTIONS]... SERVICE-SPECIFIER PROPERTY-NAME...

**Table 7. Common options**

|  |  |
|--|--|
| <b>-a   --anonymous</b>                                      | Use anonymous authentication. Requires either <b>-m 'conv'</b> or transport (https) security.  |
| <b>-d, --debug</b>   | Enables debug mode. In debug mode, all SOAP messages will be displayed to stderr and full WSRF Fault messages will be displayed.   |
| <b>-e   --eprFile FILENAME</b>                               | Load service EPR from FILENAME. This EPR is used to contact the WSRF service.  |
| <b>-h   --help</b>   | Displays help information about the command.   |
| <b>-k   --key KEYNAME VALUE</b>                              | Set resource key in the service EPR to be named KEYNAME with VALUE as its value. This can be combined with <b>-s</b> to construct an EPR without having an xml file on hand. The <b>KEYNAME</b> is a QName string in the format <b>{namespaceURI}localPart</b> . while the <b>VALUE</b> is a literal string to place in the element. For example, the option <b>-k '{http://www.globus.org}MyKey' 128</b> would be rendered as <b>&lt;MyKey xmlns="http://www.globus.org"&gt;128&lt;/MyKey&gt;</b> |
| <b>-m, --securityMech TYPE</b>                               | Set authentication mechanism. TYPE is one of <b>msg</b> for WS-SecureMessage or <b>conv</b> for WS-SecureConversation.   |
| <b>-p, --protection LEVEL</b>                                | Set message protection level. LEVEL is one of <b>sig</b> for digital signature or <b>enc</b> for encryption. The default is 'sig'.   |
| <b>-s   --service ENDPOINT</b>                               | Set ENDPOINT the service URL to use. Will be composed with the <b>-k</b> parameter if present to add ReferenceProperties to the ENDPOINT   |
| <b>-t   --timeout SECONDS</b>                                | Set client timeout to SECONDS.   |
| <b>-u   --usage</b>  | Print short usage message.   |
| <b>-V   --version</b>  | Show version information and exit.   |
| <b>-v   --certKeyFiles CERTIFICATE-FILENAME KEY-FILENAME</b> | Use credentials located in CERTIFICATE-FILENAME and KEY-FILENAME. The key file must be unencrypted.  |
| <b>-x   --proxyFilename FILENAME</b>                         | Use proxy credentials located in FILENAME.   |
| <b>-z   --authorization TYPE</b>                             | Set authorization mode. TYPE can be <b>self</b> , <b>host</b> , <b>none</b> , or a string specifying the identity of the remote party. The default is <b>self</b> .  |
| <b>--versions</b>  | Show version information for all loaded modules and exit.  |

SERVICE-SPECIFIER: [-s URI [-k KEY VALUE] | -e FILENAME]

PROPERTY-NAME: [{Namespace-URI}]Property-Name

*Example:*

```
% globus-wsrf-get-properties \
  -s http://grid.example.org:8080/wsrf/services/WidgetService \
  -k "{http://www.globus.org/namespaces/2004/06/core}WidgetKey" 123 \
  "{http://widgets.com}foo" \
  "{http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft-01.xsd}foo"
<ns02:foo
  xmlns:ns0="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ns1="http://www.w3.org/2001/XMLSchema"
  xmlns:ns2="http://widgets.com"
  ns0:type="ns01:string">
Foo Value String
</ns02:foo><ns03:CurrentTime
  xmlns:ns0="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ns1="http://www.w3.org/2001/XMLSchema"
  xmlns:ns3="http://docs.oasis-open.org/wsrf/2004/06/wsrf-WS-ResourceLifetime-1.2-draft-01.xsd"
  ns0:type="ns01:dateTime">2006-05-30T16:04:15Z</ns03:CurrentTime>
```

## Output and Exit Code

If the properties exist, their values (if any) are displayed to *stdout* and the program terminates with exit code 0. In the case of an error, the type of error will be displayed to *stderr* and the program will terminate with a non-0 exit code.

---

# Chapter 2. Graphical User Interface

There is no GUI specifically for the Index Service. The release contains WebMDS" which can be used to display monitoring information collected in an Index Service in a normal web browser.

---

# Chapter 3. Troubleshooting

General troubleshooting information is based on Java WS Core and is included below.

For a list of common errors in GT, see [Error Codes](#).

## 1. Error Messages

**Table 3.1. WS MDS Index Service Error Messages**

| Error Code  | Definition       | Possible Solutions |
|---|------------------|--------------------|
| error   | what causes this | possible solutions |
| WS MDS is built on Java WS Core, please see <a href="#">Java WS Core Error Codes</a> for more error code documentation. |                  |                    |

## 2. General troubleshooting information

- In general, if you want to investigate a problem on your own please see [Chapter 10, Debugging](#) for details on how to turn on debugging.
- Most of the command line clients have a `-debug` option that will display more detailed error messages, including the error stack traces.
- [Search the mailing lists](#)<sup>1</sup> such as [gt-user@globus.org](mailto:gt-user@globus.org)<sup>2</sup> or [jwscore-user@globus.org](mailto:jwscore-user@globus.org)<sup>3</sup> (before posting a message).
- If you think you have found a bug please report it in our [Bugzilla](#)<sup>4</sup> system. Please include as much as detail about the problem as possible.

---

<sup>1</sup> <http://www.globus.org/email-archive-search.php>

<sup>2</sup> <mailto:gt-user@globus.org>

<sup>3</sup> <mailto:jwscore-user@globus.org>

<sup>4</sup> <http://bugzilla.globus.org/bugzilla/>



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# Index

## E

errors, 17

## G

getting information from the Index Service (end users), 1

## R

resource

- globus-wsrf-query, 9

- querying resource properties, 9

resource properties

- getting a single resource property from a resource, 5

- getting multiple resource properties from a resource, 7

- getting multiple values, 14

- getting value, 12

- globus-wsrf-get-properties, 14

- globus-wsrf-get-property, 12

- querying, 9

- querying the resource property document of a resource, 3

- wsrf-get-properties, 7

- wsrf-get-property, 5

- wsrf-query, 3

## T

troubleshooting, 17

## U

usage

- simple, 1

using, 1

- basic, 1

## W

wsrf-query, 1