Service Architecture Leveraging Tuxedo (SALT)

Reference Guide

12*c* Release 2 (12.2.2)

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Oracle Service Architecture Leveraging Tuxedo (SALT) Reference Guide, 12*c* Release 2 (12.2.2)

SALT Command Reference

SALT Web Service Definition File Reference

SALT WS-SecurityPolicy Assertion 1.2 Reference

SALT WS-SecurityPolicy Assertion 1.0 Reference

SALT Command Reference

The SALT Command Reference describes system processes and commands delivered with the SALT software.

Table 1 lists SALT commands and functions.

Table 1 SALT Commands and Functions

Name	Description
`GWWS(5)`	Web service gateway server.
`jsoncvt(1)`	JSON object to service metadata converter.
`tmscd(1)`	Command line utility used to activate and deactivate service contract discovery.
`tmwsdlgen`	WSDL document generator.
`wsadmin`	SALT administration command interpreter.
`wscobolcvt`	Generates SALT artifacts from COBOL copybook for exposing COBOL service as a web service.
`wsdlcvt`	WSDL document converter.

Table 1 SALT Commands and Functions

Name	Description
wsloadcf	Reads SALT Deployment file and other referenced artifacts. Loads a binary SALTCONFIG file.
wsunloadcf	Reads a binary SALTCONFIG file, creates a SALT deployment file and other referenced files (WSDF files, WS-Policy files).

GWWS(5)

Name

GWWS – Web service gateway server.

Synopsis

```
GWWS SRVGRP="identifier" SRVID=number [other_parms]
CLOPT="-A -- -i InstanceID [-a <scheme>://<host>:<port>]"
```

Description

The GWWS server is the Web service gateway for Tuxedo applications, the core component of SALT. The GWWS gateway server provides communication with Web service programs via SOAP 1.1/1.2 protocols. The GWWS server has bi-directional (inbound/outbound) capability. It can accept SOAP requests from Web service applications and passes Tuxedo native calls to Tuxedo services (inbound). It also accepts Tuxedo ATMI requests and passes SOAP calls to Web service applications (outbound). GWWS servers are used as Tuxedo system processes and are described in the *SERVERS section of the UBBCONFIG file.

The CLOPT option is a string of command-line options passed to the GWWS server when it is booted. The GWWS server accepts the following CLOPT options:

`-i InstanceID`

Specifies the GWWS instance unique ID. It is used to distinguish multiple GWWS instances provided in the same Tuxedo domain. This value *must* be unique among multiple GWWS items within the UBBCONFIG file.

Note: The InstanceID value must be pre-defined in the <WSGateway> section of the SALT Deployment File.

`-a <scheme>://<host>:<port>`

Web administration is disabled by default. In order to enable admin capabilities, the GWWS server must be configured in the `UBBCONFIG` file using the `-a` option as follows: `-a <scheme>://<host>:<port>`.

Note: Use the following URL to access the Web Admin Console: `<scheme>://<host>:<port>/admin`

`<scheme>`

Can be 'http' or 'https'. If using 'https', GWWS must be configured for SSL capabilities by adding private-key and certificates in the same manner as securing application Web Services with SSL.

`<host>`

The name or IP address of the admin URL listening endpoint.

`<port>`

The port value of the admin URL listening endpoint.

Environment Variables

The `SALTCONFIG` environment variable must be set before the GWWS server is booted.

`Accesslog(5)` can be enabled by setting environment variable `TMENABLEALOG=y`.

Note: Windows platforms: Add `%TUXDIR%\bin\ssllibs to PATH`.

Deprecation

The following SALT 1.1 `GWWS` parameter is deprecated in the current release.

`-c Config_file`

Specifies the SALT 1.1 configuration file.

Note: Starting with the SALT 2.0 release, the `GWWS` server loads the SALT configuration from the binary `SALTCONFIG` file instead of the XML-based configuration file. The configuration file is no longer a GWWS server input parameter. The `SALTCONFIG` file must be generated using `wsloadcf` before booting `GWWS` servers.

Diagnostics

For inbound call, if an error occurs during SOAP message processing, the error is logged. The error is also translated into appropriate SOAP fault and/or HTTP error status code and returned to the Web service client.

For outbound call, if an error occurs during processing, the error is logged. The error is also translated into appropriate Tuxedo system error code (`tperrno`) and returned to the Tuxedo client.

Example(s)

Listing 1 GWWS Description in the UBBCONFIG File

```
*SERVERS

GWWS SRVGRP=GROUP1 SRVID=10
      CLOPT="-A -- -i GW1"
GWWS SRVGRP=GROUP1 SRVID=11
      CLOPT="-A -- -i GW2"
GWWS SRVGRP=GROUP2 SRVID=20
      CLOPT="-A -- -i GW3"
```

See Also

`UBBCONFIG(5)`

`tmwsdlgen`

SALT Deployment File Reference

SALT Web Service Definition File Reference

jsoncvt(1)

Name

`jsoncvt` – JSON object to service metadata converter.

Synopsis

```
jsconcvt [-f inout.json [-f inout2.json ...]] [-i input.json [-i input2.json
...]] [-o output.json [-o output2.json ...]] -s servicename -m(POST / GET /
PUT / DELETE) -a serviceaddres
```

Description

The `jsconcvt` command generates service metadata from JSON content, which can be used to construct service interfaces for easier application development. The command also generates fml32 tables and SALT deployment service definitions.

It is possible to mention more than 1 of each input and output payload samples by either separating the file names with spaces and enclosing the list in double-quotes, or specifying "`-i`" or "`-o`" multiple times.The corresponding definitions are concatenated in the metadata and fml32. This is to accommodate services that may return or accept data in different formats.

Input and output are optional, although specifying neither is not accepted. The metadata and fml32 files are generated using the service name as the base name. For example, a switch of "`-s service1`" generates files with names "`service1.mif`" and "`service1.fml32`".

Note: `jsoncvt` does not support long double value.

Parameters/Options

`-f`
: Sample input and output json content. `-jsoncvt` uses this to generate a metadata service structure for the data received and returned by this service.

`-i`
: Sample input json content. `-jsoncvt` uses this to generate a metadata service structure for the data received by this service.

`-o`
: Sample output json content - `jsoncvt` uses this to generate a metadata service structure for the data returned by this service.

`-s`
: Name of the service generated. Specified in metadata and SALT deploy file.

`-m`
: Method for the service. Can be one of the following: `POST`, `GET`, `PUT`, or `DELETE`.

`-a`
: Address of the external service.

Diagnostics

Error, warning or information messages are output to standard output.

Environment Variables

The `TUXDIR` and `LANG` environment variables must be set correctly.

Examples

Given the following JSON examples.

- Input/Output

- Running the Command
- Results

Input/Output

Input and output file examples are shown in Listing 2 and Listing 3.

Listing 2 Input

```
$ cat balance.json
{
        "account":5563909,
        "location":"US"
}
```

Listing 3 Output

```
$ cat result.json
{
        "account":5563909,
        "location":"US",
        "accounts": [
                {
                        "type":"savings",
                        "currency":"US Dollars",
                        "balance":35000.34
                },
                {
                        "type":"checking",
                        "currency":"US Dollars",
                        "balance":500.15
                }
        ]
}
```

Running the Command

An example of running the comand is shown in Listing 4.

Listing 4 Running the command

```
$ jsoncvt -i balance.json -o result.json -s balance -m POST -a
http://bank.com:4434/online_banking
Files balance.mif, balance.fml32 and balance.dep generated.
Please add the generated service definition – balance.dep – to the SALT
deploy configuration file.
```

Results

The end results are shown in Listing 5, Listing 6, and Listing 7.

Listing 5 MIF

```
service=balance
tuxservice=balance
export=y
servicetype=service
servicemode=webservice
inbuf=FML32
outbuf=FML32

param=account
access=in
type=long

param=location
access=in
type=string

param=account
access=out
```

```
type=long
param=location
access=out
type=string
param=accounts
access=out
type=fml32
(
       param=type
       access=out
       type=string

       param=currency
       access=out
       type=string

       param=balance
       access=out
       type=double
```

Listing 6 fml32 Table

```
# FML32 JSON Mapping Generated by jsoncvt

*base 30000 # Customize base number if necessary.

#name     rel-number  type     flags  comment

#----     ----------  ----     -----  -------

account       1       long     -      param

location      2       string   -      param

options       3       string   -      param

accounts      4       fml32    -      structured parameter

type          5       string   -      param

currency      6       string   -      param
```

```
balance        7        long      -       param
```

Listing 7 SALT Deploy Definition

```
       <service name=balance
              content-type="JSON" output-buffer="FML32"
              address="http://bank.com:4434/online_banking"/>
```

See Also

Creating the Oracle Tuxedo Service Metadata Repository

`field_tables(5)`

SALT Web Service Definition File Reference

tmscd(1)

Name

`tmscd(1)` – Activates and deactivates service contract discovery.

Synopsis

```
tmscd start|stop|status [-e] [-f <file>][id1 [ id2 [ ...]]]
```

Description

`The tmscd` command line utility is used to activate and deactivate service contract discovery.

Parameters and Options

`tmscd` accepts following parameters and options:

`start|stop|status`
Required. Starts, stops, or displays service contract dictionary settings for specific services, or all services if none are specified. A `start` or `stop` request for a service that has already activated or deactivated contract discovery is ignored. Effective service information is displayed when handling the requests.

Note: `start|stop|status` must occur after `-e` and `-f` , if either of those options are specified.

`[-e]`

Specifies the service scope as a regular expression.

`[-f <file>]`

The service scope is defined in the given `<file>`. The file may contain sections to group related definitions together. All entries for a section must be written together line-by-line.

Empty lines or lines starting with '#' are ignored. Lines starting with '*' are section lines. Other lines are `"id=content"` definitions.

`id1 id2 ...`

Indicates one or more services. If `-e` is specified, a regular expression is used to match the service name. If `-e` is not specified, the service name is matched exactly.

Example(s)

Example 1 - start discovery for `TOUPPER`, `TOLOWER`:

```
tmscd start TOUPPER TOLOWER
```

Example 2 - start discovery for services started with `TO` and `BR`:

```
tmscd -e start TO.* BR.*
```

Example 3 - same request as example 1 but via file:

```
tmscd -f svcfile start id1 id2
```

Note: The first found definition is used if section is not provided:

Example 4 - same request as example 2 but via file:

```
tmscd -e -f svcfile start case4.svcs
```

Listing 8 shows content of the file named "`svcfile`".

Listing 8 svcfile Content

```
# file: svcfile
*case3
id1     = TOUPPER
id2     = TOLOWER
```

```
*case4
svcs    = TO.*|BR.*
```

Diagnostics

`tmscd` fails if `TMMETADATA` is not booted or booted using the `-r` (readonly) option without the `-o` option.

See Also

`TMMETADATA(5)`

Configuring Service Contract Discovery in the SALT *Configuration Guide*

SALT Web Service Definition File Reference

tmwsdlgen

Name

`tmwsdlgen` – WSDL document generator.

Synopsis

```
tmwsdlgen -c wsdf_file [-y] [-o wsdl_file] [-m {pack|raw|mtom}] [-t
{wls|axis}]
```

Description

`tmwsdlgen` generates a WSDL document file from a Tuxedo native Web Service Definition File (WSDF). The generated WSDL document is WSDL 1.1 specification compliant, and represents both the service contracts and policies. `tmwsdlgen` collects Tuxedo service contract information throughout the Tuxedo Service Metadata Repository management (`TMMETADATA)` process. `tmwsdlgen` works as a Tuxedo native client and requires the following:

- the `TUXCONFIG` environment variable must be set correctly
- the relevant Tuxedo application using `TMMETADATA` must be booted prior to executing `tmwsdlgen`.

WARNING: The given WSDF must be a Tuxedo native WSDF. *Do not* use a `wsdlcvt` converted non-native WSDF file as input.

`tmwsdlgen` accepts the following parameters:

-c wsdf_file

Mandatory. Used to specify the SALT WSDF local path.

`tmwsdlgen` accepts the following optional parameters:

-o wsdl_file

Used to specify the output WSDL document file path. If the option is not present, the default file, `tuxedo.wsdl`, is created in the *current directory*. If the specified WSDL document file already exists, then a prompt displays to confirm to overwriting the existing file.

-y

Overwrites the existing WSDL document file without prompting.

-m

Used to specify the WSDL data mapping policy for certain Tuxedo typed buffers. Currently, it applies to the Tuxedo CARRAY buffer type. If `raw` mode is specified, CARRAY is represented to the MIME attachment. If `pack` mode is specified, `xsd:base64Binary` is used to represent CARRAY. The default value is `pack` mode.

Note: `raw` mode cannot be used for .Net clients. The .Net Framework does not support MIME attachments.

If `mtom` is specified, CARRAY is mapped to the MTOM SOAP message.

-t

This option takes effect only when the `-m` option is specified in `raw` mode. It accepts two options, `wls` or `axis`:

- `wls` indicates `tmwsdlgen` generates the WSDL document file in compliance with WebLogic 9.x. The default is `wls`.
- `axis` indicates the WSDL document file format can be recognized by the Apache Axis toolkit.

Deprecation

The following SALT 1.1 `tmwsdlgen` parameters are deprecated in the current release.

-c Config_file

Mandatory. Used to specify the SALT Configuration File path.

Note: In the current SALT release, the SALT 1.1 configuration file is specified as the `tmwsdlgen` input using the following optional parameters:

-s

Used to specify the encoding style used for Web service SOAP messages. Specifies rpc for RPC/encoded style and doc for Doc/literal encoded style. If this option is not present or the specified value is invalid, Doc is the default style.

-v

Used to specify the SOAP protocol version that the WSDL file supports. Specify 1.1 for SOAP 1.1 protocol and 1.2 for SOAP 1.2 protocol. If this option is not present or the specified value is invalid, SOAP 1.1 is used as the default.

Note: In the current SALT release, the SOAP version and message style attribute are specified in the SALT WSDF.

Diagnostics

If a syntax error is detected in the given WSDF, an "ERROR" or "FATAL" message indicating that problem is printed to the standard error, and no WSDL file is generated and `tmwsdlgen` exits with exit code 1.

A "WARN" message is printed to the console if:

1. WSDF content may result in a potential run-time risk, or
2. default values are used because they are not specified in the WSDF. "WARN" messages do not interrupt `tmwsdlgen` execution.

Upon successful completion, `tmwsdlgen` exits with exit code 0.

Example(s)

The following command generates a WSDL document file, `Salt.wsdl`, from the specified SALT WSDF, `tux.wsdf`.

```
tmwsdlgen -c tux.wsdf -o Salt.wsdl
```

The following command generates a default WSDL document file with SOAP w/Attachment capability from the specified SALT WSDF, `app_wsdf.xml`.

```
tmwsdlgen -c app_wsdf.xml -m raw
```

SEE ALSO

`GWWS(5)`

`wsdlcvt`

SALT Web Service Definition File Reference

wsadmin

Name

`wsadmin` – SALT administration command interpreter.

Synopsis

```
wsadmin [-v]
```

Description

`wsadmin` uses specific commands to monitor and administrate active GWWS processes in the specified Tuxedo domain. The `TUXCONFIG` environment variable is used to determine the location where the Tuxedo configuration file is loaded. wsadmin is used in the same manner as `tmadmin(1)` or `dmadmin(1)`.

`wsadmin` accepts below optional parameter:

`-v`
: Causes wsadmin to display the SALT version number, SALT Patch Level and license information. `wsadmin` exits after print out.

wsadmin Commands

Commands may be entered using either their full name or their abbreviation (as given in parentheses), followed by any appropriate arguments. Arguments appearing in brackets [ ], are optional; arguments in braces, {}, indicate a selection from mutually exclusive options.

Note: Command line options that are not in brackets do not need to appear in the command line if the corresponding default has been set via the default command.

`wsadmin` supports the following commands:

`reload (reload) -i gwws_instance_id`
: Reload configuration for the specified GWWS gateway instance. The configuration file may have previously been modified using wsloadcf, this command is used to make the changes active.

`configstats(cstat) -i gwws_instance_id`
: Displays the current configuration status for the specified GWWS process. The `-i` parameter must be specified.

`default(d) [-i gwws_instance_id]`
: Sets the corresponding argument to the default GWWS Instance ID. The defaults can be changed by specifying `*` as an argument. If the default command is entered without arguments, the current defaults are printed.

`echo(e) [{off | on}]`

Repeats input command lines when set to on. If no option is given, the current setting is toggled, and the new setting is printed. The initial setting is off.

`forgettrans (ft) -i gateway_instance_id [-c Coord_context]`

Forgets one or all heuristic log records for the named GWWS instance. If the transaction identifier `tran_id` or `coord_context` coordination context is specified, only the heuristic log record for that transaction is forgotten. The coordination context (`coord_context`) can be obtained from the `printtrans` command or from the ULOG file.

`help (h) [command]`

Prints help messages. If command is specified, the abbreviation, arguments, and description for that command are printed.

Omitting all arguments causes the syntax of all commands to be displayed.

`gwstats(gws) -i gwws_instance_id [-s serviceName]`

Displays global level run time statistics information for the specified GWWS processes including fail, success, pending number for both inbound and outbound call, average processing time, active thread number, etc. If -s `serviceName` specified, the service-level information is displayed.

`-i` is mandatory. **`-s`** is optional.

`paginate(page) [{off | on}]`

Paginates output. If no option is given, the current setting is toggled, and the new setting is printed. The initial setting is on, unless either standard input or standard output is a non-tty device. Pagination may be turned on only when both standard input and standard output are tty devices.

The default paging command is indigenous to the native operating system environment. In a UNIX operating system environment, for example, the default paging command is `pg`. The shell environment variable PAGER may be used to override the default command used for paging output.

`printtrans (pt) -i gateway_instance_id`

Prints transaction information for the named GWWS instance. The output for each transaction record contains the following colon-delimited string fields:

```
process ID:GWWS instance id:service name:local GTRID:remote
coordination context ID:record type:timestamp.
```

`quit (q)`

Terminates the session.

saml create [-p password]

"saml create" is used to create a key file with the name "saml_key_meta" in the current working directory.

-p password

"saml create" command will use this as password to protect the key file. This tool will prompt user to enter password if this option is not given as part of command line argument.

The password option must be given whether to create the key file or in other operation to update the key file. The "password" is an administrative password for this key file. All the operations targeted at a key file must given the same password when the key file was first created.

Example(s):

Here is an example to create a key metadata file protected by password "password".

```
saml create -p password
```

saml add {-g -s shared_secret |-i -n issuer_name [-l issuer_local_id]{[-c] [-s shared_secret]}} [-p password]

"saml add" can be used to add an entry to an existing GWWS key file. The key file must have the name "saml_key_meta" in the current working directory. Either one of the "-g" and "-i" option must be given.

-g

Add an entry for GWWS to the key file. If the GWWS record already exists then this operation will fail. When "-g" option is given then "-n", "-l" and "-c" options are not allowed, if anyone of them is given the operation will fail.

-i

Add an entry for trusted SAML issuer. When this option is specified then "-n" option for SAML issuer name must also be specified.

-n

The trusted SAML issuer name as it appears in the "issuer" subelement or attribute of a SAML assertion.

-l

The local reference id of the trusted issuer. It is a short-hand name for easier reference.

-s

The shared secret. It is the symmetric key used by issuer to sign the assertion.

-c

This indicate that the public key certificate for trusted SAML issuer is installed. If this is not specified in the command line then GWWS will not be able to use public key to verify the signature if such signing is done if binary security token is not attached to the SOAP message.

-p

The password for accessing the key file. This is not optional and must be the same password given when this key file is created. This tool will prompt user to enter password if it is not given as part of command line argument.

Example(s):

Here is an example to add a GWWS record to a key file that is protected by password "password".

```
saml add -g -s mysecret  -p password
```

The following is an example to add a trusted issuer record to a key file that is protected by password "password". The trusted issuer is configured with both public key certificate and a shared secret.

```
tSaml add -i -n saml.abc.com -l abc -s accessabc -c -p password
```

If the add operation target is trusted issuer and "-l" option is not given then the operation will use issuer name as local reference name by default. Also in this case either "-c" or "-s" must be given; if both are given then both information will be stored in the key file as part of trusted issuer record.

Both "-n" and "-l" option must be unique in the key file this means that no other trusted issuer has the same issuer name or local reference name. If a record with the same issuer name or same local reference exists then the operation will fail.

saml modify {-g -s shared_secret |-i {[-n issuer_name][-l issuer_local_id]}{[-c][-s shared_secret]} [-p password]

"saml modify" can be used to modify an entry to an existing GWWS key file; the entry can be either GWWS entry or trusted issuer entry. The key file must have the name "saml_key_meta" in the current working directory. Either one of the "-g" and "-i" option must be given.

-g

Modify the GWWS entry in the key file. If the GWWS record does not exists then this operation will fail. When "-g" option is given then "-n", "-l" and "-c" options are not allowed, if anyone of them if given the operation will fail.

-i

Modify the trusted SAML issuer entry in the key file. When this option is specified then either "-n" or "-l" option for the issuer name must also be specified. If both

"-n" and "-l" options are specified and there is no record matches both search criteria then the operation will fail.

-n

The trusted SAML issuer name as it appears in the "issuer" subelement or attribute of a SAML assertion.

-l

The local reference id of the trusted issuer. It is a short-hand name for easier reference.

-s

The shared secret. It is the symmetric key used by issuer to sign the assertion.

-c

This indicate that the public key certificate for trusted SAML issuer is installed. If this is not specified in the command line then GWWS will not be able to use public key to verify the signature if such signing is done if the binary security token is not attached to the SOAP message.

-p

The password for accessing the key file. This is not optional and must be the same password given when this key file is created. This tool will prompt user to enter the password if this option is not given as part of command line argument.

Example(s):

Here is an example to add a shared secret to the GWWS record in the key file that is protected by password "password".

```
saml modify -g -s mysecret  -p password
```

The following is an example to add or modify a shared secret to a trusted issuer record in the key file that is protected by password "password".

```
saml modify -i -l abc -s accessabc -p password
```

The following is an example to remove a shared secret from a trusted issuer in the key file that is protected by password "password".

```
saml modify -i -l abc -s -p password
```

If the modify operation target is trusted issuer then only one of the "-n" and "-l" options is needed because both issuer name and local reference must be unique in the key file. If both "-n" and "-l" options are given then the record must match both; if no record matches both criteria then the operation will fail. If issuer is the target, i.e. "-i" option is given, and "-c" is not given then it will remove the certificate information from the record. If issuer is the target and "-c" is given then it will add the certificate information if it is not in the record originally.

If the "-s" option is given and the existing record already contains shared secret then the new shared secret will replace the old one. The "-s" option must be given with shared secret value specified. When the "-s" option is given with shared secret and the existing record does not have shared secret, then shared secret will be added to the record.

`saml delete {-g|-i {-n issuer_name | -l issuer_local_id}} [-p password]`

"saml delete" is used to delete an entry from an existing GWWS key file. The key file must have the name "saml_key_meta" in the current working directory. The entry can be either the GWWS entry or trusted issuer entry. Either "-g" or "-i" option must be given.

`-g`

Delete a GWWS entry from the key file. If the GWWS record does not exists then no operation will be performed. When this option is given then "-n" and "-l" options are not allowed.

`-i`

Delete a trusted SAML issuer entry from key file. When this option is specified then either "-n" or "-l" option for SAML issuer name must also be specified.

`-n`

The trusted SAML issuer name as it appears in the "issuer" subelement or attribute of a SAML assertion.

`-l`

The local reference id of the trusted issuer. It is a short-hand name for easier reference.

`-p`

The password for accessing the key file. This is not optional and must be the same password given when this key file is created. This tool will prompt user to enter password if this option is not part of command line argument.

Example(s):

Here is an example to delete a GWWS record from a key file that is protected by password "password".

```
saml delete -g  -p password
```

The following is an example to delete a trusted issuer record from a key file that is protected by password "password".

```
Saml add -i  -l abc -p password
```

`verbose (v) [{off | on}]`

Produces output in verbose mode. If no option is given, the current setting is toggled, and the new setting is printed. The initial setting is off.

! shellcommand

Escapes to the shell and executes shell command.

! !

Repeats previous shell command.

# [text]

Specifies comments. Lines beginning with # are ignored.

<CR>

Repeats the last command.

Example(s)

1. The following command inspects run time statistics for both inbound and outbound service on GW2:

```
wsadmin
> gws -i GW2
GWWS Instance : GW2

Inboud Statistics :

---------------------------------
Request Response Succ :   3359
Request Response Fail :      0
              Oneway Succ :      0
              Oneway Fail :      0

              Total Succ :   3359

              Total Fail :      0

Avg. Processing Time : 192.746 (ms)
---------------------------------



Outboud Statistics :

---------------------------------

Request Response Succ :   4129
Request Response Fail :      0
              Oneway Succ :      0
              Oneway Fail :      0
```

```
                 Total Succ :   4129
                 Total Fail :      0

Avg. Processing Time : 546.497 (ms)

-----------------------------------

   Total request Pending :     36

Outbound request Pending :      0

    Active Thread Number :    141
```

2. The following command inspects run time statistics for the `ToUpperWS` service on GW1 and gets output in verbose mode.

```
wsadmin
> > verbose
Verbose now on.
> gws -i GW1 -s ToUpperWS
GWWS Instance : GW1

Service : ToUpperWS

Outboud Statistics :

----------------------------------
              Oneway Succ :      0
              Oneway Fail :      0
---------------------------------

 Avg. Processing Time :  0.000 (ms)
```

See Also

`GWWS(5)`

SALT Administration Guide

wscobolcvt

Name

`wscobolcvt` – Generates SALT artifacts from COBOL copybook for exposing COBOL service as a web service.

Synopsis

```
wscobolcvt -c <copybook> -s <mainframe svc name> -r <metadata.repos> -S <MIF
web service name> [-L <local domain name:group> -R <remote domain name> -A
<CRM address>]
```

Description

`wscobolcvt` parses a COBOL copybook file to generate service metadata that reflects the structure of the COBOL record present in the file.

It also optionally adds TMA configuration in the form of local and remote domain definitions, as well as SNACRM definitions to the /Domains configuration.

Parameters

`wscobolcvt` uses the following options:

`-c[ioe] <copybook>`
: Specifies the copybook file to parse. The optional [`ioe`] suboptions are used to specify different copybooks for input, output and error respectively. Suboptions can be combined, i.e., use -`cioe <copybook>` to use the same copybook for all instances, `-cio` for using the same copybook for input or output (no error buffer generated), `-c`, `-ci` or `-co` used alone defaults to the same copybook being used for both input and output. Valid `-c[ioe]` combinations are:

  - -c, `-ci`, `-co` or `cio <copybook>`: Copybook used for input and output buffers, no error buffer.
  - -ce, `-cie` or `-coe <copybook>`: Copybook used for input, output and error buffers. `-ci <copybook1> -co <copybook2> [-ce <copybook3>]: copybook1` used for input and `copybook2` used for output, optionally `copybook3` used for error.

`-s <mainframe service name>`
: Specifies the mainframe service name.

`-r <metadata repository file>`
: Specifies the name of the Tuxedo service repository file.

`-S <MIF web service name>`
: Specifies the name of the web service that will be generated.

`-L <local domain name:group>`
: Optional. Specifies a local domain ID to be added to `DMCONFIG`, including `UBBCONFIG` group to which it will belong.

`-R <remote domain name>`
: Optional. Specifies a remote domain ID to be added to `DMCONFIG.`

`-A <CRM address>`

Optional. Specifies the address of the SNA CRM.

Note: You must be an Oracle Tuxedo administrator in order to perform /Domains automatic configuration.

Examples

The following example is a COBOL copybook record:

Listing 9

```
* customer.cpy

         01    CUSTOMER.

             05       name        PIC X(10).

             05       balance     PIC S9(9) COMP-5.

             05       address     PIC X(80).
```

The following example generates Tuxedo service metadata from a COBOL copybook file:

```
$ wscobolcvt -c customer.cpy -s CUST -r meta.repos -S wsCUST
```

See Also

SALT Mainframe Transaction Publisher in Configuring a SALT Application

wsdlcvt

Name

`wsdlcvt` – WSDL document converter.

Synopsis

```
wsdlcvt -i WSDL_URL -o output_basename [-f] [-m] [-v] [-y] [-w][-sh] [-sp]
[-C][-D]
```

Description

`wsdlcvt` is used to convert an existing WSDL 1.1 document to a Metadata Input File, FML32 mapping File and SALT Web Service Definition File (WSDF). It is a wrapper script for `wsdl2mif.xsl`, `wsdl2fml32*.xsl` and `wsdl2wsdf.xsl` for Xalan. Apache Xalan 2.7 libraries are bundled with SALT product.

JRE 1.5 or higher is required to run `wsdlcvt`.

Parameters

`wsdlcvt` accepts the following parameters:

`-i`

Specifies the URL of the input WSDL document. The URL can be a local file path or a downloadable HTTP URL link.

`-o`

Specifies the output files basename. The following suffixes are appended after the basename:

Table 2 wsdlcvt-Created File Suffixes

Suffix	Output File
`.mif`	Tuxedo Service Metadata Input File
`.fml32`	FML32 Field Table Definition File
`.wsdf`	SALT Web Service Definition File
`.xsd`	The WSDL Document embedded XML Schema File

`wsdlcvt` accepts the following optional parameters:

`-f`

Forces generation of service metadata information necessary for the conversion of Oracle Tuxedo fields into/from XML attributes (which is not done by default).

`-y`

Specifies that all the output destination files are overwritten without prompting if they exist. If this parameter is not specified, a prompt message is output.

`-m`

Specifies that the "`xsd:string`" data type is mapped to an FML32 typed buffer Tuxedo `FLD_MBSTRING` data type. If this parameter is not specified, Tuxedo `FLD_STRING` data type is mapped by default.

`-v`

Specifies that `wsdlcvt` works in verbose mode. In particular, it shows context information in the message and output context as FML32 field comments.

`-w`

If the given WSDL document is published using Microsoft .NET WCF, and it includes the `wsdl:import` tag, this parameter is specified to ensure that it is correctly handled by wsdlcvt.

`-sh`

Specifies the SOCKS proxy host name to use when a network connection needs to be established (for instance to download the WSDL document from a remote host). This can be a hostname or an IP address. If the proxy name is incorrect and a connection can not be established, wsdlcvt will attempt to connect directly.

`-sp`

Specifies the SOCKS proxy host port number to use if necessary in conjunction with the -sh option. The default value is 1080.

`-C`

Indicates that COBOL copybooks are generated from the processed WSDL. One record (i.e., lowest level structure), is generated per direction of message in a single file name `<output_basename>.cpy`.

Optionally (and only if `-C` is used), users with Oracle Tuxedo administrator permissions are also able to add /Domains configuration in the form of the following arguments:

`-L <local domain name:group>`

Optional. Specifies a local domain ID to be added to `DMCONFIG`, including `UBBCONFIG` group to which it will belong

`-R <remote domain name>`

Optional. Specifies a remote domain ID to be added to `DMCONFIG`

`-A <CRM address>`

Optional. Specifies the address of the SNA CRM

`-D`

Default COBOL char maxlength. When `xsd:string` types are not size-constrained, they are generated with a default of `256 (PIC X(256))` if -D is not specified, or the value specified by this option. Value is a positive integer between `1 - 2 147 483 647`.

Environment Variable(s)

The `TUXDIR` and `LANG` environment variables must be set correctly.

The `PATH` environment variable must be set appropriately to execute "java".

Diagnostics

Error, warning or information messages are output to standard output.

Example(s)

The following command converts the local WSDL file, `sample.wsdl`.

```
wsdlcvt -i sample.wsdl -o sample
```

The following command converts a WSDL document from a HTTP URL link. The "`xsd:string`" data type is mapped to the Tuxedo `FLD_MBSTRING` field type.

```
wsdlcvt -i http://api.google.com/GoogleSearch.wsdl -o GSearch -m
```

See Also

Creating the Oracle Tuxedo Service Metadata Repository

field_tables(5)

SALT Web Service Definition File Reference

wsloadcf

Name

`wsloadcf` – Reads SALT Deployment file and other referenced artifacts. Loads a binary `SALTCONFIG` file.

Synopsis

```
Usage 1: wsloadcf [-n][-y][-D loglevel] saltdeploy_file
Usage 2: wsloadcf [-n][-y][-D loglevel] -1 [-s rpc|doc]
[-v 1.1|1.2] salt_1.1_config
```

Description

`wsloadcf` reads a SALT deployment file and other referenced files (WSDF files, WS-Policy files), checks the syntax, and optionally loads a binary `SALTCONFIG` file. The `SALTCONFIG` environment variable points to the `SALTCONFIG` file where the information should be stored. The generated `SALTCONFIG` file is necessary to boot `GWWS` servers.

`wsloadcf` accepts the following optional parameters:

`-n`
: Do validation only *without* generating the `SALTCONFIG` file.

`-y`
: After checking the syntax, `tmloadcf` checks whether: (a) the file referenced by `SALTCONFIG` exists; (b) it is a valid Oracle Tuxedo system file system; and (c) it contains `SALTCONFIG` tables. If these conditions are not true, `wsloadcf` prompts you to indicate whether you want the command to create and initialize `SALTCONFIG`.
```
Initialize SALTCONFIG file: path [y, q]?
```
Prompting is suppressed if the -y option is specified on the command line.

`-D`
: Used to specify the configuration parsing log level.

For SALT 1.1 backward compatibility, `wsloadcf` can also read a SALT 1.1 configuration file. Besides generating the `SALTCONFIG` binary file, `wsloadcf` also generates one SALT Web Service Definition File (WSDF) and one SALT Deployment file according to the given SALT 1.1 configuration file.

`-1`
: Turns on the SALT 1.1 compatible mode. To pass the SALT 1.1 configuration file to `wsloadcf`, you must specify this flag first.

`-v`
: Only takes effect when a SALT 1.1 configuration file is used. This option is used to specify which SOAP version is applied to the generated WSDF file.

`-s`
: Only takes effect when a SALT 1.1 configuration file is used. This option is used to specify which SOAP message style is applied to the generated WSDF file.

Environment Variables

The `SALTCONFIG` environment variable must be set before executing `wsloadcf`.

Diagnostics

If a syntax error is detected in the given configuration files, an “ERROR” or “FATAL” message indicating that problem is printed to the console, and no information is updated in the `SALTCONFIG` file. `wsloadcf` exits with exit code 1.

A “WARN” message is printed to the console if: (1) configuration files may result in a potential run-time risk or (2) default values are used because they are not specified in the configuration files. “WARN” messages do not interrupt `wsloadcf` execution.

Upon successful completion, `wsloadcf` exits with exit code 0. If the `SALTCONFIG` file is updated, a userlog message is generated.

See Also

SALT Web Service Definition File Reference

SALT Deployment File Reference

wsunloadcf

Name

`wsunloadcf` – Reads a binary `SALTCONFIG` file, creates a SALT deployment file and other referenced files (WSDF files, WS-Policy files).

Synopsis

```
Usage: wsunloadcf
```

Description

`wsunloadcf` reads a binary `SALTCONFIG` file, creates a SALT deployment file and other referenced files (WSDF files, WS-Policy files). The `SALTCONFIG` environment variable points to the `SALTCONFIG` file where the information should be stored.

Environment Variables

The `SALTCONFIG` environment variable must be set before executing `wsunloadcf`.

See Also

SALT Web Service Definition File Reference

SALT Deployment File Reference

SALT Web Service Definition File Reference

The following sections provide SALT Web Service Definition File (WSDF) reference information:

- Overview
- SALT WSDF Format
- XML Schema
- SALT WSDF Examples
- SALT WSDF Element Descriptions

Overview

The SALT Web Service Definition File (`WSDF`) is an XML-based file used to define SALT Web service components (for example, Web Service Bindings, Web Service Operations, Web Service Policies, and so on). `WSDF` is a SALT specific representation of the Web Service Definition Language data model. There are two `WSDF` types:

- Native `WSDF` (Tuxedo generated)

  A native `WSDF` is composed manually. You must define a set of Tuxedo services and how they are exposed as Web services in a native `WSDF`. The native `WSDF` is similar to the SALT 1.1 configuration file.

  Note: A native `WSDF` is the input file used by the SALT WSDL generator (`tmwsdlgen`).

- Non-native `WSDF` (Externally generated)

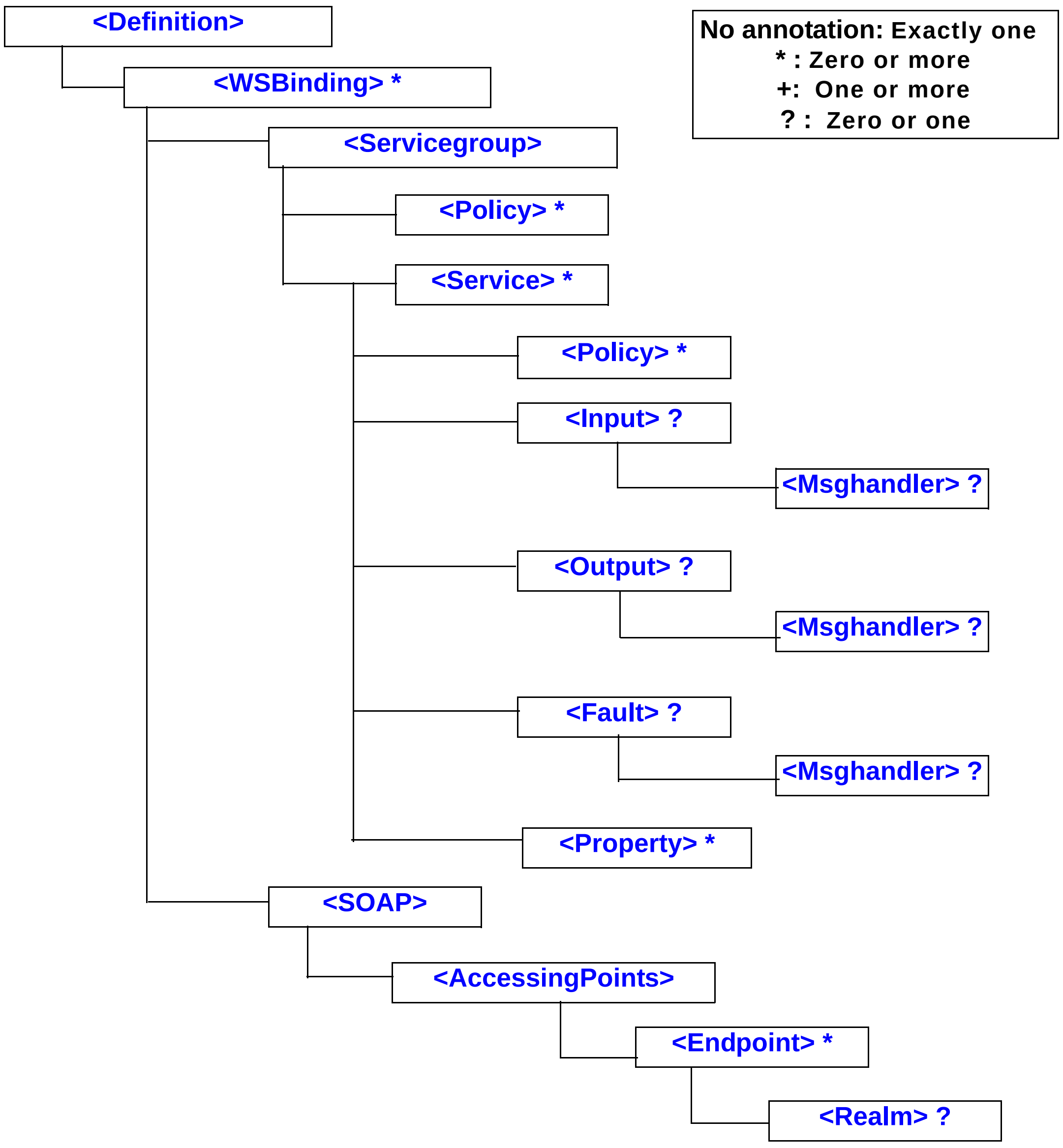
  A non-native `WSDF` is generated from an external WSDL file via the SALT WSDL converter (`wsdlcvt`). In most cases, you do not need to change the generated WSDF except for configuring advanced features.

For more information, see `tmwsdlgen` and `wsdlcvt` in the SALT *Command Referenc*e.

SALT WSDF Format

Figure A-1 shows a graphical representation of the WSDF format.

Figure A-1 SALT Web Service Definition File Format


<Definition>
<WSBinding> *
<Servicegroup>
<Policy> *
<Service> *
<Policy> *
<Input> ?
<Msghandler> ?
<Output> ?
<Msghandler> ?
<Fault> ?
<Msghandler> ?
<Property> *
<SOAP>
<AccessingPoints>
<Endpoint> *
<Realm> ?
No annotation: Exactly one
* : Zero or more
+: One or more
? : Zero or one

XML Schema

An XML Schema is associated with the `WSDF`. The XML Schema file that describes the `WSDF` format is located in the following directory: `$TUXDIR/udataobj/salt/wsdf.xsd`.

SALT WSDF Examples

Listing A-1 and Listing A-2 show native and non-native `WSDF` examples.

Listing A-1 Native WSDF (Composed Manually)

```
<Definition name="bankapp"
  xmlns=http://www.bea.com/Tuxedo/WSDF/2007 >
  <WSBinding id="bankapp_binding" >
    <Servicegroup id="bankapp">
      <Policy location="/home/user/rm.xml" />
      <Service name="inquiry" />
      <Service name="deposit" />
    </Servicegroup>
    <SOAP>
      <AccessingPoints>
        <Endpoint id="HTTP1" address="http://myhost:7001" />
        <Endpoint id="HTTPS1" address="https://myhost:7002/bankapp" />
      </AccessingPoints>
    </SOAP>
  </ WSBinding >
</Definition>
```

Listing A-2 Non-Native WSDF (Generated from an External WSDL Document)

```
<Definition name="myWebservice"
  wsdlNamespace="http://www.example.org/myWebservice"
  xmlns=http://www.bea.com/Tuxedo/WSDF/2007 >
  <WSBinding id="A_binding">
    <Servicegroup id="portType">
      <Service name="operation_1" soapAction="op1" />
      <Service name="operation_2" soapAction="op2" />
    </Servicegroup>
    <SOAP version="1.1" style="rpc" use="encoded">
      <AccessingPoints>
        <Endpoint id="example_http_port"
                  address="http://www.example.org/abc" />
        <Endpoint id="example_https_port"
                  address="https://www.example.org/abcssl" />
      </AccessingPoints>
    </SOAP>
  </WSBinding>
  <WSBinding id="B_binding">
    <Servicegroup id="portType">
      <Service name="operation_3" soapAction="op3" />
      <Service name="operation_4" soapAction="op4" />
    </Servicegroup>
    <SOAP version="1.2">
      <AccessingPoints>
        <Endpoint id="another_http_port"
                  address="http://www.example.org/def" />
      </AccessingPoints>
    </SOAP>
  </WSBinding>
</Definition>
```

SALT WSDF Element Descriptions

WSDF format elements and their attributes are listed and described in the following section.

- `<Definition>`
- `<WSBinding>`
- `<Servicegroup>`
- `<Service>`
- `<Input>`
- `<Output>`

- `<Fault>`
- `<Msghandler>`
- `<Policy>`
- `<Property>`
- `<SOAP>`
- `<AccessingPoints>`
- `<Endpoint>`
- `<Realm>`

<Definition>

The `WSDF` file root element.

Table A-1 <Definition> Attributes

Attribute	Description	Required
`name`	The `WSDF` name. This attribute value may contain a maximum of 30 characters (excluding the terminating NULL character). Native `WSDF`: you must manually provide a distinct application name. Non-native `WSDF`: this value is the same as the WSDL converter (wsdlcvt) command line input parameter “`output_basename`.	Yes
`wsdlNamespace`	The corresponding WSDL document target namespace for the WSDF. Native WSDF: you can optionally specify a distinct URI string so that the generated WSDL can use this as the target namespace. If not specified, the default WSDL target namespace is as follows: "`urn:<wsdf_name>.wsdl`". For example, if the WSDF name is “*`simpapp`*”, then the default WSDL target namespace is “*`urn:simpapp.wsdl`*”. Non-native WSDF: the value is the WSDL target namespace of the external WSDL document.	No

<WSBinding>

Defines concrete protocol binding information. Zero or more WSBinding objects can be specified in one WSDF file.

Native WSDF: you can set SOAP version, encoding style, several endpoints for Web Service Client connection through sub element <SOAP> and a set of Tuxedo services to be exposed for invocation through sub element <Servicegroup>.

Non-native WSDF: each SOAP binding object (i.e., `wsdl:binding` object with `soap:binding` extension) in the external WSDL document is translated into one WSBinding object.

Table A-2 <WSBinding> Attributes

Attribute	Description	Required
`id`	Identifies the WSBinding object. The value must be unique within the WSDF. This attribute value may contain a maximum of 78 characters (excluding the terminating NULL character). Native WSDF: the value is specified by customers and is used as the `wsdl:binding` name in the generated WSDL document. Non-native WSDF: the value is the `wsdl:binding` name defined in the external WSDL document.	Yes

<Servicegroup>

Defines a Servicegroup object for one WSBinding object. Each WSBinding object must have exactly one Servicegroup. The Servicegroup object is used to encapsulate a set of Tuxedo services.

Table A-3 <Servicegroup> Attributes

Attribute	Description	Required
`id`	Specifies the service group id. This attribute value may contain a maximum of 78 characters (excluding the terminating NULL character). Native WSDF: the value is specified by customers and is used as the `wsdl:portType` name in the generated WSDL document. Non-native WSDF: the value is the `wsdl:portType` name defined in the external WSDL document.	Yes

<Service>

Specifies a service for the WSBinding object.

- Native WSDF: Each service is a Tuxedo service.
- Non-native WSDF: Each service represents a converted Tuxedo service from a `wsdl:operation` object defined in the external WSDL document.

Table A-4 <Service> Attributes

Attribute	Description	Required
`name`	Specifies the service name. This attribute value may contain a maximum of 255 characters (excluding the terminating NULL character). Native WSDF: the service name value is used as the `wsdl:operation` name in the generated WSDL document. Non-native WSDF: the service name is equal to the `wsdl:operation` name defined in the external WSDL document.	Yes
`tuxedoRef`	An optional attribute used to reference the service definition in the Tuxedo Service Metadata Repository. If not specified, attribute "`name`" value is used as the reference value.	No
`soapAction`	Specifies the service soapAction attribute. This is a *non-native* WSDF attribute. It is used to save the soapAction setting for each `wsdl:operation` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No

Table A-4 <Service> Attributes

Attribute	Description	Required
`namespace`	Specifies service namespace attribute. For non-native WSDF, it is used to save the namespace setting for each wsdl:operation defined in the external WSDL document. For native WSDF, all elements in SOAP message response use this namespace unless "`paramschema`" is specified for the matched parameter.	No
`headerMapping`	This service will put/retrieve data to/from SOAP header when invoked/performing an invocation. The data is taken/placed from/to the application buffer based on the service metadata "`access`" parameter settings. See "`inheader/outheader/errheader`" values for "`access`" keyword in service metadata repository documentation.	

<Input>

Specifies Input message attributes for a particular service. This element is optional.

Table A-5 <Input> Attributes

Attribute	Description	Required
`name`	Specifies the service input message name attribute. This is a *non-native* WSDF attribute. It is used is used to save the name for the input `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No
`wsaAction`	Specifies the service input message wsaAction attribute. This is a *non-native* WSDF attribute. It is used is used to save the wsaAction attribute of the input `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No
`encoding`	Specifies the encoding to use when the message is outgoing (outbound request).	

<Output>

Specifies Output message attributes for a particular service. This element is optional.

Table A-6 <Output> Attributes

Attribute	Description	Required
`name`	Specifies the service output message name attribute. This is a *non-native* WSDF attribute. It is used to save the name for the output `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No
`wsaAction`	Specifies the service output message name attribute. This is a *non-native* WSDF attribute. It is used to save the wsaAction attribute of the output `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No
`encoding`	Specifies the encoding to use when the message is outgoing (inbound request).	

<Fault>

Specifies Fault message attributes for a particular service. This element is optional.

Table A-7 <Fault> Attributes

Attribute	Description	Required
`name`	Specifies the service fault message name attribute. This is a *non-native* WSDF attribute. It is used to save the name for the fault `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No
`wsaAction`	Specifies the service fault message wsaAction attribute. This is a *non-native* WSDF attribute. It is used to save the wsaAction attribute of the fault `wsdl:message` defined in the external WSDL document. **Note:** Do not specify this attribute for a native WSDF.	No

<Msghandler>

Specifies a customized message conversion handler. Optional for <Input>, <Output> and/or <Fault> elements of any service. The value of this element is the handler name, which may contain a maximum of 30 characters (excluding the terminating NULL character).

The GWWS server looks for the message conversion handler from all known message conversion plug-in shared libraries using the handler name.The message conversion handler allows you to develop customized Tuxedo buffer and SOAP message payload transformation functions to replace the default GWWS message conversions.

For more information, see “Programming Message Conversion Plug-ins in the SALT *Programming Web Services*.

<Policy>

References one Web Service Policy file applied to one of the following two levels:

- <Servicegroup> level
- <Service> level

At most, 10 Web Service policies can be referenced for each object.

Table A-8 <Policy> Attributes

Attribute	Description	Required
`location`	Specifies the local file path for the referenced WS-Policy file. This attribute value may contain a maximum of 256 characters (excluding the terminating NULL character). Specifically, SALT pre-defines WS-Policy template files for typical WS-* scenarios. These files can be found under the `$TUXDIR/udataobj/salt/policy` directory. You can reference these template files using the string format "`salt:<template_file_name>`". For example, if you want to reference SALT WS-SecurityPolicy 1.0 template file "`wssp1.0-signbody.xml`", you should define the following XML snippet in the WSDF file: <Policy location="salt:wssp1.0-signbody.xml" />	Yes
use	Specifies if the WS-Policy file is applied to the input message, output message, fault message, or the combination of the three. If multiple messages are set, use a space as the delimiter. For example, if you want to configure a WS-Policy file "mypolicy.xml" to be applied to "input" and "output" messages, you should define the following XML snippet in the WSDF file: <Policy location="mypolicy.xml" use="input output"/> SALT limits the applicable messages for each supported WS-Policy assertion. For more information, see the following sections: • "Configuring Advanced Web Service Messaging Features" in the SALT *Configuration Guide* • "Configuring Message-Level Web Service Security" in the SALT *Configuration Guide* • SALT WS-ReliableMessaging Policy Assertion Reference • SALT WS-SecurityPolicy Assertion 1.2 Reference • SALT WS-SecurityPolicy Assertion 1.0 Reference	No

<Property>

Specifies SALT specific properties for each service object.

Table A-9 <Property> Attributes

Attribute	Description	Required
`name`	Specifies the property name. Table A-10 lists all the GWWS server properties.	Yes
`value`	Specifies the property value.	Yes

Table A-10 lists all properties that can be specified for each service object.

Table A-10 <Property> Name List

Property	Description	Values
`async_timeout`	Outbound service: Specifies a time setting to wait for SOAP response. Inbound service: No behavior impact.	`(0-32767] (sec)` Default: `60 secs`.
`disableWSAddressing`	Outbound service: Disables explicit Web Service Addressing requests with this property. Inbound service: No behavior impact.	`{True|False}` Default: `False`
`ignore_namespace`	Removes namespaces from XML typed buffers before they are handed to Tuxedo services and puts them back before a response is sent to a web service client. Only applies to native Tuxedo services exposed as web services.	`{True|False}` Default: `False`

Table A-11 <Property> headerMapping

Property	Description	Values
`headerMapping`	When `true`, puts/retrieves data to/from SOAP header when invoked/performing an invocation. The data wis taken/placed from/to the application buffer based on the service metadata “access” parameter settings. See “`inheader/outheader`” values for “`access`” keyword in service metadata repository documentation.	`{True|False}` Default: `False`

<SOAP>

Specifies SOAP protocol information for the WSBinding object. SOAP version, message style accessing endpoints are specified in this element.

Table A-12 <SOAP> Attributes

Attribute	Description	Required
`version`	Specifies SOAP version for this WSBinding object. The valid values are “`1.1`” and “`1.2`”. If not specified, "`1.1`" is used.	No
`style`	Specifies SOAP message style for this WSBinding object. The valid values are “`rpc`” and “`document`”. If not specified, "`document`" is used.	No
`use`	Specifies SOAP message encoding style for this WSBinding object. The valid values are “`encoded`” and “`literal`”. If not specified explicitly, this value is automatically selected according to “`style`” value. If “`style`” is “`rpc`”, then “`encoded`” is used; if “`style`” is “`document`”, then “`literal`” is used.	No

Note: In the current SALT release, only “`rpc/encoded`” and “`document/literal`” are supported.

<AccessingPoints>

Specifies the endpoint list for the WSBinding object. Each sub element <Endpoint> represents one particular endpoint.

There is no attribute for this element.

<Endpoint>

Specifies each accessing endpoint for the WSBinding object.

Table A-13 <Endpoint> Attributes

Attribute	Description	Required
`id`	Specifies a unique endpoint id value within the WSBinding object. This attribute value may contain a maximum of 78 characters (excluding the terminating NULL character).	Yes
`address`	Specifies the endpoint address. The address value must use the following format: `"http(s)://<host>:<port>/<context_path>"` **Note:** Two endpoints cannot be specified with exact the same address URL value.	Yes

<Realm>

Specifies the HTTP Realm attribute of an HTTP and/or HTTP/S endpoint. If this element is configured for one endpoint, the GWWS tries to incorporate HTTP basic authentication information in the request messages when issuing outbound calls through this endpoint.

For more information, see "Configuring Transport Level Security" in the SALT *Configuration Guide*.

Note: This element only works for non-native (external) WSDF files.

SALT Deployment File Reference

The following sections provide SALT Deployment File reference information:

- Overview
- SALT SALTDEPLOY Format
- XML Schema

Overview

The SALT Deployment File (SALTDEPLOY) is an XML-based file used to define SALT GWWS server deployment information on a per Tuxedo machine basis. SALTDEPLOY does the following:

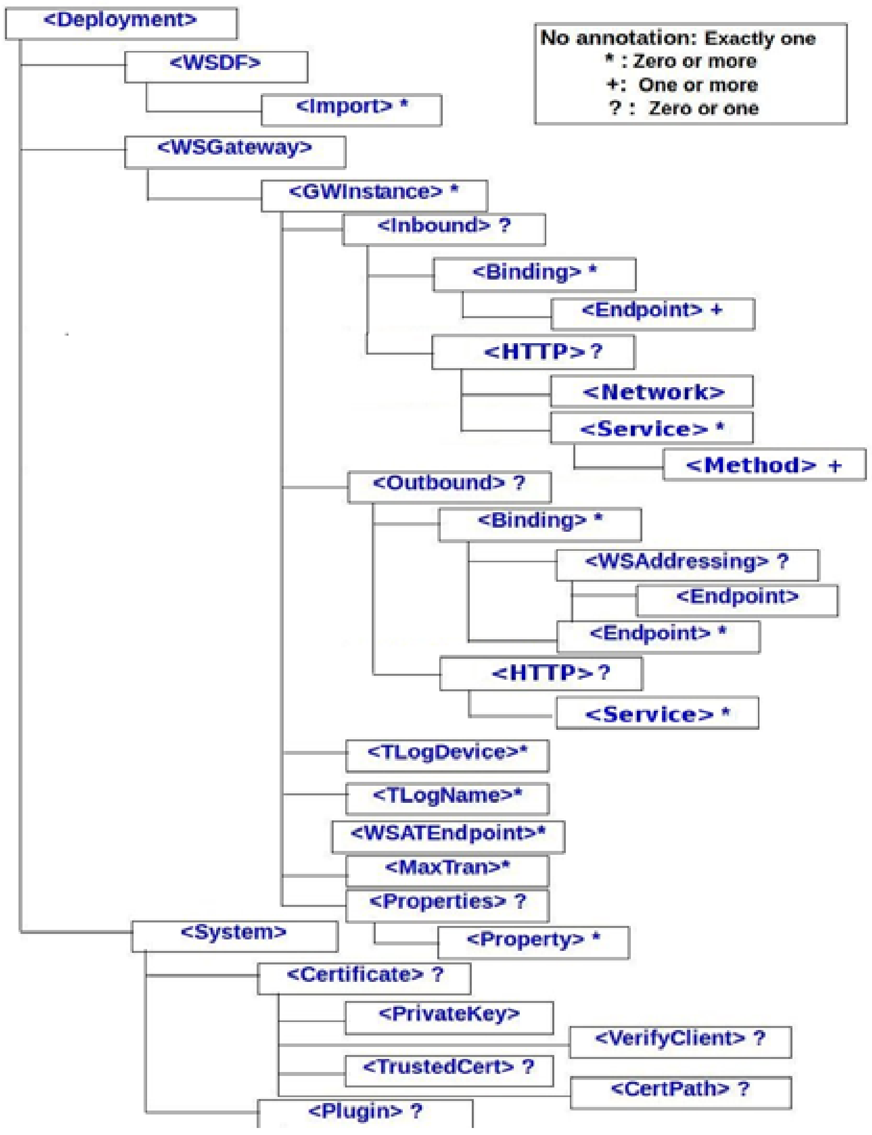
- lists all necessary Web Service Definition Files (WSDF)
- specifies how many GWWS servers are deployed on a Tuxedo machine
- associates inbound and outbound Web Service access endpoints for each GWWS server.

SALTDEPLOY also provides a system section to configure global resources (for example certificates, plug-in load libraries, and so on).

SALT SALTDEPLOY Format

Figure B-1 shows a graphical representation of the SALT SALTDEPLOY file format.

Figure B-1 SALT Deployment File Format



XML Schema

An XML Schema is associated with a SALT SALTDEPLOY file. The XML Schema file that describes the SALT SALTDEPLOY file format is located in the following directory: `$TUXDIR/udataobj/salt/saltdep.xsd`.

SALT SALTDEPLOY Example

SALT SALTDEPLOY Element Descriptions

<Deployment>

SALT SALTDEPLOY Example

Listing B-1 shows a sample SALT SALTDEPLOY File.

Listing B-1 SALT SALTDEPLOY File Example

```
<Deployment xmlns="http://www.bea.com/Tuxedo/SALTDEPLOY/2007">
  <WSDF>
    <Import location="/home/myapp/bankapp.wsdf" />
    <Import location="/home/myapp/amazon.wsdf" />
  </WSDF>
  <WSGateway>
    <GWInstance id="GW1">
      <Inbound>
        <Binding ref="bankapp:bankapp_binding">
          <Endpoint use="http1"/>
          <Endpoint use="https1" />
        </Binding>
      </Inbound>
      <Outbound>
        <Binding ref="amazon:default_binding"/>
      </Outbound>
      <Properties>
        <Property
         name="socksAddrList"
         value="proxy.server.com,10.123.10.10:1080"/>
      </Properties>
    </GWInstance>
  </WSGateway>
  <System>
    <Certificate>
      <PrivateKey>/home/user/cert.pem</PrivateKey>
    </Certificate>
    <Plugin>
      <Interface library="/home/user/mydatahandler.so" />
    </Plugin>
  </System>
</Deployment>
```

SALT SALTDEPLOY Element Descriptions

`SALTDEPLOYF` format elements and their attributes are listed and described in the following section.

<Deployment>

The `SALTDEPLOY` file root element.

There is no attribute for this element.

Three sections must be defined within the `<Deployment>` element:

- `<WSDF>` elements

- `<WSGateway>` element
- `<System>` element.

There can be only one `<Deployment>` element defined in a `SALTDEPLOY` file.

<WSDF>

Top element that encapsulates all imported WSDF files.

There is no attribute for this element.

<Import>

Specifies the `WSDF` to be imported in the `SALTDEPLOY` file. Multiple `WSDF` can be imported at the same time. Each WSDF file can only be imported once. Multiple `WSDF` with the same `WSDF` name cannot be imported in the same `SALTDEPLOY` file.

Table B-1 <Import> Attributes

Attribute	Description	Required
`location`	Specifies the `WSDF` local file path.	Yes

<WSGateway>

Top element that encapsulates all `GWWS` instance definitions.

There is no attribute for this element.

<GWInstance>

Specifies a single `GWWS` instance.

Table B-2 <GWInstance> Attributes

Attribute	Description	Required
`id`	Specifies the GWWS identifier. This attribute value may contain a maximum of 12 characters (excluding the terminating NULL character). The identifier value must be unique within the `SALTDEPLOY` file.	Yes

<Inbound>

Specifies inbound WSBinding objects for the `GWWS` server. Each inbound WSBinding object is specified using the `<Binding>` sub element.

There is no attribute for this element.

<HTTP>

Specifies a list of services accessible in `REST` mode. All Oracle Tuxedo service names specified in this element are callable using HTTP or REST mechanisms. Any URL specifying a service not present on this list results in a 404 error for the caller. Any URL specifying a service present on this list (for which an Oracle Tuxedo service is not advertised), results in a 451 error for the caller.

There is no attribute for this element.

<Network>

This element contains two attributes specifying http or https (for SSL), `HTTP/REST` listening endpoints.Only one `<Network>` element is allowed per GWWS instance.The http and https elements are optional, but at least one must be specified.The http and https attributes are constructed as follows:

`<host>`: The name or IP address of the `HTTP/REST` listening endpoint.

`<port>`: The port value of the `HTTP/REST` listening endpoint.

All `HTTP/REST` requests are performed by the same `<host>:<port>` combination (i.e., it is not possible to use more than one such combination per gateway, per protocol (http and https).

Table B-3 <Network> Attributes

Attribute	Description	Required
`http`	HTTP host and port listening endpoint for REST requests. Format is a string containing a `<host>:<port>` pair corresponding to: `<host>` = name or IP address of the `HTTP/REST` listening endpoint. `<port>` = port value of the `HTTP/REST` listening endpoint.	No*
`https`	SSL HTTP host and port listening endpoint specification. Same format as http attribute.	No*

* While not required, the `<Network>` element must contain either an `http` or `https` attribute.

<Service>

Specifies a single service callable using `HTTP/REST` mechanisms. The actual Oracle Tuxedo service called is further qualified by an `HTTP` method as specified using the `<Method>` element.

Table B-4 <Service> Attributes

Attribute	Description	Required
`name`	Name of Tuxedo service being advertised. **Note:** This is not the actual Oracle Tuxedo service configured using the `<Method>` element.	Yes
`content-type`	"JSON" represent "Content-Type: application/json", "XML" represent "Content-Type: application/xml". If request HTTP header has no content-type field, SALT will use the content-type attribute set here.	No
`charset`	Specifies the character encoding for the outgoing REST network message.	No

<Method>

Specifies the HTTP method mapping to Oracle Tuxedo services. This is designed to model CRUD methods (Create, Read, Update, Delete).

Table B-5 <Service> Attributes

Attribute	Description	Required
`name`	Method identifier, among `GET`, `PUT`, `POST` or `DELETE`. Any other value results in a configuration error.	Yes
`service`	Name of the Oracle Tuxedo service being mapped.	Yes

Table B-5 <Service> Attributes

Attribute	Description	Required
`inputbuffer`	Oracle Tuxedo buffer type/optionally subtype used for input conversion. Values are the same as all existing Oracle Tuxedo buffer types. For VIEW/VIEW32 buffer types, the notion of subtype is conveyed by using the notation: {VIEW|VIEW32}/`<Subtype>`, for example: VIEW32/`customer`.	Yes
`reposservice`	Reference to a metadata repository entry. This is used to associate interface data with an `HTTP/REST` service and method. One use is for the configuration tool to generate automatic test code based on service metadata (interface).	No

<Outbound>

Specifies outbound WSBinding objects for the `GWWS` server. Each outbound WSBinding object is specified using the `<Binding>` sub element.

There is no attribute for this element.

<Binding>

Specifies a concrete WSBinding object as either an inbound or outbound binding, depending on the parent element.

Table B-6 <Binding> Attributes

Attribute	Description	Required
ref	Specifies a concrete WSBinding object using the following Qualified Name format: “`<WSDF_name>:<WSBinding_id>`”	Yes

Note: Please note the following maximum WSBinding object limitations for each GWWS server:

- Each GWWS server may reference at most 64 inbound WSBinding objects.
- Each GWWS server may reference at most 128 outbound WSBinding objects.

For TCP/IP addresses, one of the following formats is used as shown in Table B-7.

Table B-7 Ipv4 and IPv6 Address Formats

IPv4	IPv6
`//IP:port`	`//[IPv6 address]:port`
`//hostname:port_number`	`//hostname:port_number`
`//#.#.#.#:port_number`	`Hex format is not supported`

For more information, see `TMUSEIPV6` in the `TUXENV(5)` environment variable listing found in the *Tuxedo 10g R3 Reference Guide, Section 5 - File Formats, Data Descriptions, MIBs, and System Processes Reference*.

<Endpoint>

Specifies a single WSBinding objects endpoint reference.

If the referenced endpoint is specified as an inbound endpoint, the GWWS server creates the corresponding HTTP and/or HTTPS listen endpoint. At least one inbound endpoint must be specified for one inbound WSBinding object.

If the referenced endpoint is specified as an outbound endpoint, the GWWS server creates HTTP and/or HTTPS connections per SOAP requests for the outbound WSBinding object.

If an outbound endpoint is not specified for the outbound WSBinding object, the first 10 endpoints (at most) are auto-selected.

The referenced endpoint must already be defined in the WSDF.

Table B-8 <Endpoint> Attributes

Attribute	Description	Required
`use`	The referenced endpoint id defined in the WSDF.	Yes

Note: Please note the following maximum endpoints limitations for each GWWS server:

- Each GWWS server may create at most 128 inbound endpoints in all inbound WSBinding objects to accept SOAP requests.

- Each GWWS server may create connectivity with at most 256 outbound endpoints in all outbound WSBinding objects.

<WSAddressing>

Specifies if Web Service Addressing is enabled for the outbound WSBinding object.

If this element is present, by default all SOAP messages are sent out with a Web Service Addressing message header.

Table B-9 <WSAddressing> Attributes

Attribute	Description	Required
`version`	Select `WS-Addressing` on-the-wire version to use 200408 for the "submission" version, and 200508 for version 1. If not defined, version defaults to 200408	No

The `<WSAddressing>` sub element `<Endpoint>` must be specified for the listen endpoint address if this element is present.

<Endpoint>

Specifies the WS-Addressing listen endpoint address for the referenced outbound WSBinding object.

Table B-10 <Endpoint> Attributes

Attribute	Description	Required
`address`	Specifies the WS-Addressing listen endpoint address. The address value must be in the following format: `"http(s)://<host>:<port>/<context_path>"` The GWWS server creates listen endpoints and usage for receiving WS-Addressing SOAP response messages.	Yes

<HTTP>

Specifies a list of outbound services accessible in REST mode.

<Service>

Specifies a outbound service callable using HTTP/REST mechanisms.

Table B-11 <Service> Attributes

Attribute	Description	Required
`name`	Name of Tuxedo service being advertised.	Yes
`content-type`	"JSON" represent "Content-Type: application/json", "XML" represent "Content-Type: application/xml". If request HTTP header has no content-type field, SALT will use the content-type attribute set here.	No
`charset`	Specifies the character encoding for the outgoing REST network message.	No

<TLogDevice>

One attribute "location" describes the location of the Transaction file. This is required if WS-TX transaction support is required.

<TLogName>

One attribute "`id`" describes the name of the transaction log inside a Transaction file. This is required if WS-TX transaction support is required.

<WSATEndpoint>

One attribute "`address`" describes the WS-AT protocol end point.

<MaxTran>

One attribute "`value`" describes the maximum number of concurrent WS-TX transactions allowed. This is bounded by Oracle Tuxedo `MAXGTT`.

<Properties>

Top element that encapsulates all `GWWS` server property settings using the `<Property>` sub element.

Table B-12 <Properties> Attributes

Attribute	Description	Required
`socksAddrList`	If necessary, endpoints can be grouped by GWInstance to achieve separation between proxy-using endpoints and non-proxy-using ones. **Value**: String type containing a list of proxy server URLs. For example: `proxy.server1.com,10.123.1.1:1080`.	Yes

<Property>

Specifies one `GWWS` property.

Table B-13 <Property> Attributes

Attribute	Description	Required
`name`	Specifies the property name. Table B-14 lists all the GWWS server properties.	Yes
`value`	Specifies the property value.	Yes

Table B-14 GWWS <Property> List

Property	Description	Values
`max_content_length`	Enables the `GWWS` server to deny the HTTP requests when the content length is larger than the property setting. If not specified, the `GWWS` server does not check for it. The string value can be one of the following three formats: 1. Integer number in bytes. No suffix means the unit is bytes. 2. Float number in kilobytes. The suffix must be '`K`'. For instance, `10.4K`, `40K`, etc. 3. Float number in megabytes. The suffix must be '`M`'. For instance, `100M`, `20.6M`, etc.	The equivalent byte size value must be in `[1 byte, 1G byte]` range.
`thread_pool_size`	Specifies the maximum thread pool size for the `GWWS` server. **Note:** This value defines the maximum possible threads that may be spawned in the `GWWS` server. When the `GWWS` server is running, the actual spawned threads may be less than this value.	The valid value is in `[1, 1024]`. Default value: `16`
`timeout`	Specifies the network time-out value, in seconds.	The valid value is in `[1, 65535]`. Default value: `300`
`max_backlog`	Specifies the backlog listen socket value. It controls the maximum queue length of pending connections by operating system. **Note:** Generally no tuning is needed for this value.	The valid value is `[1-255]`. Default value: `16`
`enableMultiEncoding`	Toggles on/off multiple encoding message support for the GWWS server. If multiple encoding support property is turned off, only UTF-8 HTTP / SOAP messages can be accepted by the GWWS server.	The valid values are "`true`", "`false`". Default value: `false`

Table B-14 GWWS <Property> List

Property	Description	Values
`enableSOAPValidation`	Toggles on/off XML Schema validation for inbound SOAP request messages if the corresponding Tuxedo input buffer is associated with a customized XML Schema.	The valid values are “`true`”, “`false`”. Default value: `false`
`internalEncoding`	Mutually exclusive with `enableMultiEncoding`. Allows one-byte encodings such as the ISO-8859 series to map to non-MBSTRING types. When it is set to a value other than "keepSame", SALT converts text in payloads to/from the specified encoding between the Tuxedo side (encoding translated based on the value of internalEncoding attribute) and the network side (SOAP or REST). This property must not be used with multi-byte encodings and in conjunction with `MBSTRING` buffers or fields; otherwise, a runtime error is thrown.	The valid values are "keepSame", one-byte encoding name such as the ISO-8859.

<System>

Specifies global settings, including certificate information, plug-in interfaces.

<Certificate>

Specifies global certificate information using sub elements `<PrivateKey>`, `<VerifyClient>`, `<TrustedCert>` and `<CertPath>`.

There is no attribute for this element.

Note: GWWS converts certificate to wallet when `SEC_PRINCIPAL_PASSWORD` is set. If only X509 certicates are used under HTTP, then there is no conversion.

<PrivateKey>

When using an Oracle wallet, specifes the location of a directory that contains an Oracle Wallet.

Notes: SALT does not have the concept of a security principal name like Oracle Tuxedo does, so the Wallet is located in the specified directory and not in a subdirectory.

To configure server identity certificates (SALT deploy configuration file `<PrivateKey>` element), it is required that the root certificate authority be present in the SSL configuration file. Proper configuration is:

- root CA certificate
- intermediate certificate(s) (if any)
- server certificate
- server private key
- in PEM format.

When using the legacy security credentials format, specifies the `PEM` format private key file. The key file path is specified as the text value for this element. The server certificate is also stored in this private key file. The value of this element may contain a maximum of 256 characters (excluding the terminating NULL character).

With either security credential format, the password for the Oracle Wallet or the GWWS private key file is specifed in the `TUXCONFIG` file using the `SEC_PRINCIPAL_PASSVAR="environment_variable_name`" parameter. The `TUXCONFIG` file must also set the `SEC_PRINCIPAL_NAME="any_non-null_string(not_used)`" parameter so that `SEC_PRINCIPAL_PASSVAR` will be properly processed in the configuration file.

This element is mandatory if the parent `<Certificate>` element is configured.

<VerifyClient>

Specifies if Web service clients are required to send a certificate via HTTP over SSL connections. The valid element values are "`true`" and "`false`".

This element is optional. If not specified, the default value is "`false`".

<TrustedCert>

Specifies the file name of the trusted PEM format certificate files. The value of this element may contain a maximum of 256 characters (excluding the terminating NULL character).

This element is optional.

<CertPath>

Specifies the local directory where the trusted certificates are located. The value of this element may contain a maximum of 256 characters (excluding the terminating NULL character).

This element is optional.

Note: If `<VerifyClient>` is set to "`true`", or if WS-Addressing is used with SSL, trusted certificates must be stored in the directory setting with this element.

<Plugin>

Specifies the global plug-in load library information. Each `<Interface>` sub element specifies one plug-in library to be loaded.

There is no attribute for this element.

<Interface>

Specifies one particular plug-in interface or a plug-in library for all plug-in interfaces inside the library.

Table B-15 <Interface> Attributes

Attribute	Description	Required
`library`	Mandatory. Specifies a local shared library file path. This attribute value may contain a maximum of 256 characters (excluding the terminating NULL character).	Yes
`params`	Optional. Specifies a particular string value that is passed to the library when initialized by the `GWWS` server at boot time. This attribute value may contain a maximum of 256 characters (excluding the terminating NULL character).	No

Note: For more information about how to develop a SALT plug-in interface, see "Using SALT Plug-ins" in the SALT *Programming Web Services*.

SALT WS-AT Assertion Reference

The following sections provide SALT WS-AT Assertion reference information:

- Overview
- Policy File Example

Overview

WS-AT defines a policy assertion that allows requests to indicate whether an operation call *must* or *may* be made as part of an Atomic Transaction. For the configuration impact of Atomic Transaction policy assertions, see the "Configuration Changes" chapter.

Depending on the direction of the calls and meaning of the policy assertion setting, the runtime inbound/outbound transaction behavior is as follows:

- Inbound Transactions

  For inbound transactions, there are no particular runtime behavior changes. The client consuming the WSDL accepts transactions based on the configured value. Runtime behavior is normal.

- Outbound Transactions
  - If an `ATAssertion` element without "`Optional=true`" is configured for a service, the call has to be made in a transaction. If no corresponding XA transaction exists at the time, the WS-TX transaction is initiated (but not associated with any Oracle Tuxedo XA transactions). If an XA transaction exists, there is no change in behavior.

– If an `ATAssertion` element with "`Optional=true`" is configured for a service, an outbound transaction context is requested *only* if a corresponding Oracle Tuxedo XA transaction exists in the context of the call.

– If no `ATAssertion` element is configured for a service, the corresponding service call is made outside of any transaction. When a call is made to an external Web Service in the context of an Oracle Tuxedo XA transaction, the Web Service call does not propagate the transaction. This allows excluding certain Web Service calls from a global transaction, and represents the default for most existing Web Services calls that do not support WS-TX.

Policy File Example

The existing policy file mechanism includes the addition of WS-AT policy elements.WS-AT defines the `ATAssertion` element, with an `Optional` attribute, as follows:

```
/wsat:ATAssertion/@wsp:Optional="true"
```

Listing C-1 shows an example `policy.xml` file with an `ATAssertion` element.

Listing C-1 policy.xml File with an ATAssertion Element

```
<?xml version="1.0"?>

<wsp:Policy wsp:Name="TransactionalServicePolicy"

  xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"

  xmlns:wsat="http://docs.oasis-open.org/ws-tx/wsat/2006/06">

  <wsat:ATAssertion wsp:Optional="true"/>

</wsp:Policy>
```

SALT WS-ReliableMessaging Policy Assertion Reference

The following sections provide SALT WS-ReliableMessaging (WS-RM) Policy Assertion reference information:

Overview

SALT provides support for WS-ReliableMessaging (WS-ReliableMessaging 1.0, Feb., 2005 specification), which allows two Web Service applications running on different GWWS instances to communicate reliably in the event of software component, system, or networks failure.

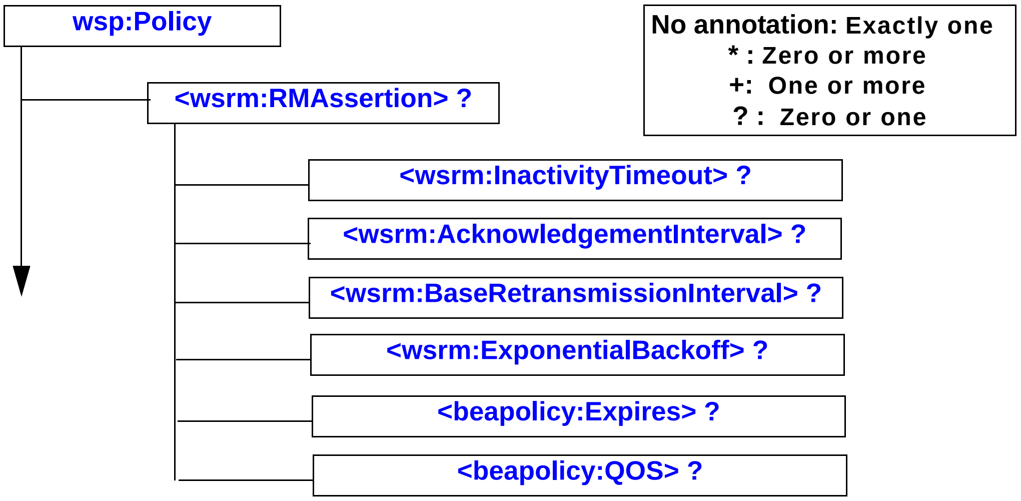
A WS-Policy file containing WS-ReliableMessaging Policy Assertion is used to configure the reliable messaging capabilities of a GWWS server on a destination endpoint. SALT supports the WS-ReliableMessaging Policy Assertion specification to ensure the interoperability with Oracle WebLogic 9.x / 10.

For more information, see "Configuring Advanced Web Service Messaging Features in the SALT *Configuration Guide*.

WS-RM Policy Assertion Format

Figure D-1 shows a graphical representation of the WS-ReliableMessaging Policy Assertion format in a WS-Policy file.

Figure D-1 WS-ReliableMessaging Policy Assertion Format


wsp:Policy
<wsrm:RMAssertion> ?
<wsrm:InactivityTimeout> ?
<wsrm:AcknowledgementInterval> ?
<wsrm:BaseRetransmissionInterval> ?
<wsrm:ExponentialBackoff> ?
<beapolicy:Expires> ?
<beapolicy:QOS> ?
No annotation: Exactly one
* : Zero or more
+: One or more
? : Zero or one

WS-RM Assertion File Example

Listing D-1 shows a sample WS-Policy file that contains WS-RM policy assertion.

Listing D-1 Sample WS-ReliableMessaging Policy Assertion File

```
<?xml version="1.0"?>
<wsp:Policy wsp:Name="ReliableSomeServicePolicy"
  xmlns:wsrm="http://schemas.xmlsoap.org/ws/2005/02/rm"
  xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
  xmlns:beapolicy="http://www.bea.com/wsrm/policy">
  <wsrm:RMAssertion>
```

```
    <wsrm:InactivityTimeout Milliseconds="600000" />
    <wsrm:BaseRetransmissionInterval Milliseconds="500"/>
    <wsrm:ExponentialBackoff />
    <wsrm:AcknowledgementInterval Milliseconds="2000" />
    <beapolicy:Expires Expires="P1D" />
    <beapolicy:QOS QOS="ExactlyOnce InOrder" />
  </wsrm:RMAssertion>
</wsp:Policy>
```

WS-RM Assertion Element Description

All RM assertions are optional, and if not specified, the default value are used. The following definitions describe the RM assertion options.

<wsrm:InactivityTimeout>

Specifies the number of milliseconds, specified with the Milliseconds attribute, which defines an inactivity interval. After time has elapsed, if the destination endpoint has not received a message from the source endpoint, the destination endpoint may terminate current sequence due to inactivity. The source endpoint can also use this parameter.

Sequences never time out by default.

<wsrm:AcknowledgementInterval>

Specifies the maximum interval, in milliseconds, in which the destination endpoint must transmit a stand-alone acknowledgement.

This element is optional. If this element is not specified, There is no time limit by default.

<wsrm:BaseRetransmissionInterval>

Specifies the interval, in milliseconds, that the source endpoint waits after transmitting a message and before it retransmits the message if it receives no acknowledgment for that message. This value will apply to the GWWS server when it sends a response in an outbound sequence.

The default value is 20000 milliseconds.

<wsrm:ExponentialBackoff>

Specifies that the retransmission interval is adjusted using the exponential back off algorithm. This value applies to the GWWS server when it sends a response in an outbound sequence.

<beapolicy:Expires>

Specifies the amount of time after which the reliable Web service expires and does not accept any new sequence messages.

This element has a single attribute, Expires, whose data type is an XML Schema duration type. For example, if you want to set the expiration time to one day, use the following:

```
< beapolicy:Expires Expires="P1D" />
```

The default value is never expire.

<beapolicy:QOS>

Specifies the delivery assurance. SALT supports the following assurances:

- AtMostOnce - Messages are delivered at most once, without duplication. There is possibility that some messages may not be delivered.
- AtLeastOnce - Every message is delivered at least once. There is possibility that some messages are delivered more than once.
- ExactlyOnce - Each message is delivered exactly once, without duplication.
- InOrder - Messages are delivered in the order that they were sent. This delivery assurance can be combined with one of the preceding three assurances.

The default value is "ExactlyOnce InOrder".

<wsrm:RMAssertion>

Main WS-RM assertion that groups all the other assertions under a single element.

The presence of this assertion in a WS-Policy file indicates that the corresponding Web Service application must be invoked reliably.

SALT WS-SecurityPolicy Assertion 1.2 Reference

The following sections provide SALT WSSP1.2 reference information:

Overview

SALT implements part of WS-Security protocol version 1.1 for inbound services. Authentication with UsernameToken and X509v3Token are supported. To describe how the authentication is carried out, WS-SecurityPolicy is used in WSDL definition.

In order to communicate with Oracle WebLogic Release 10 via WS-Security 1.1, SALT implements the counterparts of WS-SecurityPolicy (WSSP) 1.2 supported by WebLogic 10. But the supported WSSP 1.2 assertions are limited as follows:

- Protection Assertions
  - Integrity Assertion
    - <sp:SignedParts> Assertion (Limited support)
- Token Assertions:
  - <sp:UsernameToken> Assertion (Limited support)

  - <sp:X509Token> Assertion (Limited support)
- Security Binding Assertions:
  - AsysmmetricBinding Assertion (Limited support)
  - <sp:TransportBinding > Assertion (Limited support)
- Supporting Tokens Assertions:
  - SupportingTokens Assertion (Limited support)

For more details about limitations of WS-SecurityPolicy 1.2 assertions, please refer to Oracle SALT WSSP1.2 Assertion Description.

For more information about WSSP 1.2 assertions supported by WebLogic 10, please refer to "Oracle Web Services Security Policy Assertion Reference in the *Oracle WebLogic Web Services Documentation*.

In this document, XML namespace prefix "`sp`" stands for namespace URI "`http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200512`".

SALT WSSP 1.2 Policy File Examples

- WSSP 1.2 Policy File Sample
- Wssp1.2-Wss1.0-X509.xml File Sample

WSSP 1.2 Policy File Sample

Listing E-1 Username token authentication with WSSP 1.2 assertions.

Listing E-1 WSSP 1.2 Policy File Sample

```
<!-Binding Policy -->
<wsp:Policy
  xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
  xmlns:sp="http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200512">
  <sp:TransportBinding>
    <wsp:Policy>
      <sp:TransportToken>
        <wsp:Policy>
```

```
          <sp:HttpToken/>
        </wsp:Policy>
      </sp:TransportToken>
      <sp:AlgorithmSuite>
        <wsp:Policy>
          <sp:Basic256/>
        </wsp:Policy>
      </sp:AlgorithmSuite>
      <sp:Layout>
        <wsp:Policy>
          <sp:Lax/>
        </wsp:Policy>
      </sp:Layout>
      <sp:IncludeTimestamp/>
    </wsp:Policy>
  </sp:TransportBinding>
  <sp:SupportingTokens>
    <wsp:Policy>
      <sp:UsernameToken
          sp:IncludeToken="http://docs.oasis-open.org/ws-sx/ws-securitypol
icy/200512/IncludeToken/AlwaysToRecipient">
        <wsp:Policy>
          <sp:WssUsernameToken10/>
        </wsp:Policy>
      </sp:UsernameToken>
    </wsp:Policy>
  </sp:SupportingTokens>
</wsp:Policy>
```

Wssp1.2-Wss1.0-X509.xml File Sample

Listing E-2

```
<?xml version="1.0"?>

<wsp:Policy
```

```
    xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
    xmlns:sp="http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200512"
    >
    <sp:AsymmetricBinding>
      <wsp:Policy>
        <sp:InitiatorToken>
          <wsp:Policy>
            <sp:X509Token

  sp:IncludeToken="http://docs.oasis-open.org/ws-sx/ws-securitypolicy/200512
  /IncludeToken/AlwaysToRecipient">
              <wsp:Policy>
                <sp:WssX509V3Token10/>
              </wsp:Policy>
            </sp:X509Token>
          </wsp:Policy>
        </sp:InitiatorToken>
        <sp:Layout>
          <wsp:Policy>
            <sp:Lax/>
          </wsp:Policy>
        </sp:Layout>
        <sp:OnlySignEntireHeadersAndBody/>
      </wsp:Policy>
    </sp:AsymmetricBinding>
    <sp:SignedParts>
      <sp:Body/>
    </sp:SignedPart>
```

```
</wsp:Policy>
```

SALT WSSP 1.2 Policy Templates

SALT provides a number of WS-SecurityPolicy 1.2 template files you can use for most typical Web Service applications. These policy files are located in directory `TUXDIR/udataobj/salt/policy`.

Table E-1 SALT WSSP 1.2 Policy Template Files

Policy File	Description
`wssp1.2-UsernameToken-plain-auth.xml`	Username token with plain text password is sent in the request for authentication.
`wssp1.2-x509v3-auth.xml`	X509 V3 binary token (certificate) is sent in the request for authentication. The request is optionally signed with some message parts in the requests.
`wssp1.2-signbody.xml`	The entire SOAP body is signed.

These template files can be referenced directly in the WSDF files with location value format:

```
salt:<template_file_name>
```

For example, if you want to configure signbody, you can specify the followings in your WSDF file:

```
<Policy location="salt:wssp1.2-signbody.xml" />
```

SALT WSSP1.2 Assertion Description

Below are all SALT supported WSSP 1.2 assertions and limitations for each one. Customers should obey the limitation when writing their own customized WSSP 1.2 policy files. SALT does not check any customized WSSP 1.2 policy file against the limitation rules. If something claimed in the customized WSSP 1.2 policy file cannot be supported by SALT, web service client program may result run time errors.

WS-SecurityPolicy 1.2 assertions not listed below are definitely not supported by SALT.

<sp:SignedParts>

Specifies the parts of a SOAP message to be digitally signed. SALT only supports the entire SOAP body to be signed.

Limitations

- Child element <sp:Body> is supported for configuring the entire SOAP body to be signed.
- Child element <sp:Header> is not yet supported.
- No nesting WSSP 1.2 assertion for this assertion.

<sp:UsernameToken>

Specifies username token to be included in the SOAP message. SALT only supports username token with clear text password defined in WS-Security Username Token Profile 1.0. <UsernameToken> assertion must be used as a nested assertion of Security Binding Assertions and Supporting Token Assertions.

Limitations

- Supported Nesting Assertions
  - <sp:WssUsernameToken10>
- Not yet supported Nesting Assertions
  - <sp:WssUsernameToken11>
  - <sp:NoPassword>
  - <sp:HashPassword>

<sp:X509Token>

Specifies a binary security token carrying an X509 token to be included in the SOAP message. <X509Token> assertion must be used as a nested assertion of Security Binding Assertions and Supporting Token Assertions.

Limitations

- Supported Nesting Assertions

  - <sp:WssX509V3Token10>
  - <sp:WssX509V3Token11>
- Non-Supported Nesting Assertions
  - <sp:WssX509Pkcs7Token10>
  - <sp:WssX509Pkcs7Token11>
  - <sp:WssX509PkiPathV1Token10>
  - <sp:WssX509PkiPathV1Token11>
  - <sp:WssX509V1Token10>
  - <sp:WssX509V1Token11>

<sp:AlgorithmSuite>

Specifies the algorithm suite to be used for performing cryptographic operations with security tokens. <AlgorithmSuite> Assertion must be used as a nested assertion of Security Binding Assertions.

Limitations

- Supported Nesting Algorithm Suite
  - <sp:Basic256>
- Non-Supported Nesting Algorithm Suites
  - All the other Algorithm Suite listed in the WS-Security Policy 1.2 specification.

<sp:Layout>

Specifies the layout rules when adding items to the security header. <Layout> Assertion must be used as a nested assertion of Security Binding Assertions.

Limitations

- Supported Nesting Layout rules
  - <sp:Lax>
- Non-Supported Nesting Layout rules

- <sp:Strict>
- <sp:LaxTimestampFirst>
- <sp:LaxTimestampLast>

<sp:TransportBinding >

Specifies the message protection and security correlation is provided using the means of the transport. The <TransportBinding> token is used mainly for carrying isolated Username Token in the SOAP message.

Limitations

- Supported Nesting Assertions
  - <sp:TransportToken>
  - <sp:AlgorithmSuite>
  - <sp:Layout>
  - <sp:IncludeTimestamp>
- Nesting Assertion <sp:TransportToken> only supports <sp:HttpToken>

Listing E-3 shows a SALT supported TransportToken Assertion example.

Listing E-3 Supported TransportToken Assertions

```
<sp:TransportBinding>
  <wsp:Policy>
    <sp:TransportToken>
      <wsp:Policy>
        <sp:HttpToken />
      </wsp:Policy>
    </sp:TransportToken>
    <sp:Algorithm>
      <wsp:Policy>
        <sp:Basic256>
      </wsp:Policy>
    </sp:Algorithm>
  </wsp:Policy>
</sp:TransportBinding>
```

<sp:AsymmetricBinding>

Specifies the message protection is provided by means defined in WS-Security SOAP Message Security, and the request and response message can use distinct keys for encryption and signature, because of their different lifecycles. The <AsymmetricBinding> Assertion is used mainly for carrying X.509 binary security token in the SOAP request messages for inbound calls.

Limitations

- Supported Nesting Assertions
  - <sp:InitiatorToken>
  - <sp:RecipientToken>
  - <sp:AlgorithmSuite>
  - <sp:Layout>
  - <sp:IncludeTimestamp>
  - <sp:ProtectTokens>
  - <sp:OnlySignEntireHeadersAndBody>
- Non-supported Nesting Assertions
  - <sp:InitiatorSignatureToken>
  - <sp:InitiatorEncryptToken>
  - <sp:RecipientSignatureToken>
  - <sp:RecipientEncryptToken>
  - <sp:EncryptBeforeSigning>
  - <sp:EncryptSignature>
- <sp:InitiatorToken> must be associated with <sp:X509Token> and the Token inclusion type must be “AlwaysToRecipient“

- <sp:RecipientToken> must be associated with <sp:X509Token> and the Token inclusion type must be “Never”

Listing E-4 shows a SALT supported AsymmetricBinding assertion example. This assertion indicates the X.509 V3 binary token that defined in WS-Security X.509 Token Profile 1.1 specification is used for digital signature for the SOAP request messages and the X.509 token is always included in the SOAP message security header:

Listing E-4 Supported AsymmetricBinding Assertion

```
  <sp:AsymmetricBinding>
    <wsp:Policy>
      <sp:InitiatorToken>
        <wsp:Policy>
          <sp:X509Token
              sp:IncludeToken="http://docs.oasis-open.org/ws-sx/ws-securit
ypolicy/200512/IncludeToken/AlwaysToRecipient">
            <wsp:Policy>
              <sp:WssX509V3Token11 />
            </wsp:Policy>
          </sp:X509Token>
        </wsp:Policy>
      </sp:InitiatorToken>
      <sp:RecipientToken>
        <wsp:Policy>
          <sp:X509Token
              sp:IncludeToken="http://docs.oasis-open.org/ws-sx/ws-securit
ypolicy/200512/IncludeToken/Never">
            <wsp:Policy>
              <sp:WssX509V3Token11 />
            </wsp:Policy>
          </sp:X509Token>
        </wsp:Policy>
      </sp:RecipientToken>
      <sp:Algorithm>
        <wsp:Policy>
          <sp:Basic256>
        </wsp:Policy>
      </sp:Algorithm>
      <sp:Layout>
        <wsp:Policy>
          <sp:Lax>
        </wsp:Policy>
      </sp:Layout>
      <sp:IncludeTimestamp />
    </wsp:Policy>
  </sp:AsymmetricBinding>
```

<sp:SupportingToken>

Specifies security tokens that are included in the security header and may optionally include additional message parts to sign and/or encrypt. For SALT, <SupportingToken> Assertion is used mainly to include Username Token in the security header when <sp:AsymmetricBinding> Assertion is used.

Limitations

- Supported Nesting Assertions
  - <sp:UsernameToken>
  - <sp:X509Token>
- Not-non Supported Nesting Assertions
  - <sp:SignedParts>
  - <sp:SignedElements
  - <sp:EncryptedParts>
  - <sp:EncryptedElements>
- All supported token assertions must be defined with Token inclusion type "AlwaysToRecipient".

Listing E-5 shows a SALT supported SupportingToken assertion example. This assertion indicates the Username token is always included in SOAP request messages:

Listing E-5 Supported SupportingToken Assertion

```
  <sp:SupportingTokens>
    <wsp:Policy>
      <sp:UsernameToken
          sp:IncludeToken="http://docs.oasis-open.org/ws-sx/ws-securitypol
icy/200512/IncludeToken/AlwaysToRecipient">
        <wsp:Policy>
          <sp:WssUsernameToken10/>
        </wsp:Policy>
      </sp:UsernameToken>
    </wsp:Policy>
  </sp:SupportingTokens>
```

SALT WS-SecurityPolicy Assertion 1.0 Reference

The following sections provide SALT WS-SecurityPolicy (WSSP) 1.0 assertion reference information:

Overview

SALT implements part of WS-Security protocol version 1.0 for inbound services. Authentication with UsernameToken and X509v3Token are supported. WS-SecurityPolicy 1.0 assertions are used in WSDL definition to describe how the authentication is carried out. The WS-SecuirtyPolicy1.0 specification (2002) is supported in order to ensure the interoperability with Oracle WebLogic 9.x.

Below are all SALT supported WS-SecurityPolicy 1.0 assertions:

- SecurityToken Assertions:
  - UsernameToken Assertion and X509Token Assertion
- Integrity Assertion

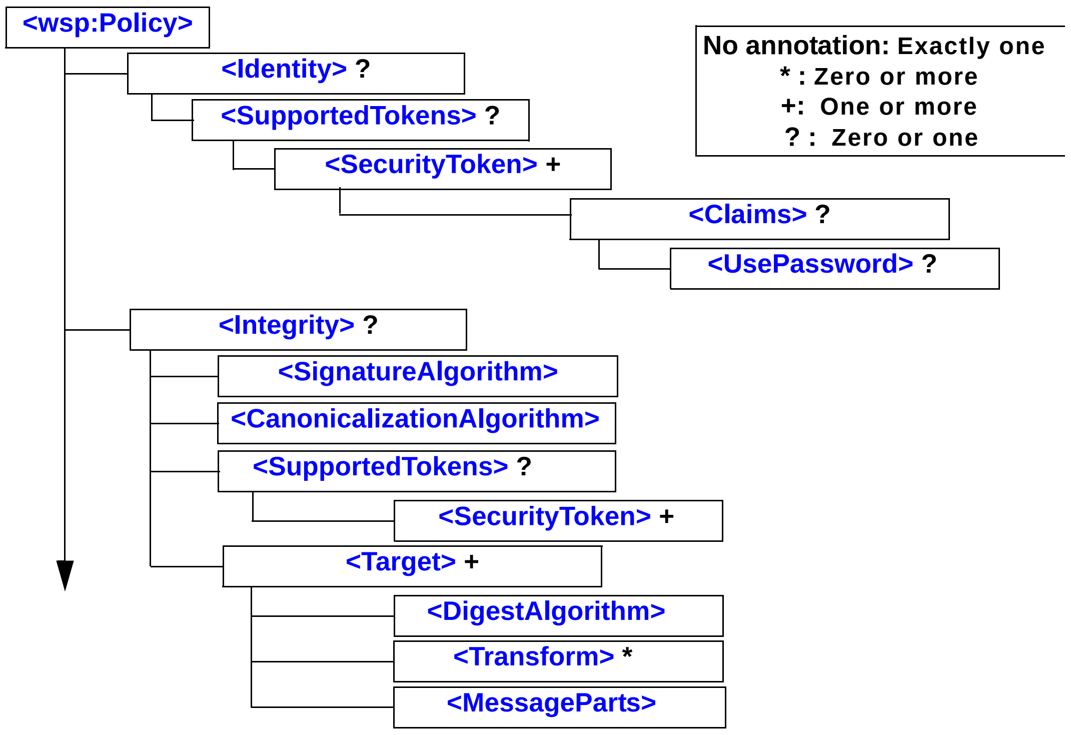
- Identity Assertion

There are some extension assertions used in WebLogic 9.x, SALT only implements a subset of them. Integrity Assertion is only used when using X509v3 token for authentication. And the only message part can be specified for signature is the whole SOAP Body.

SALT WSSP 1.0 Policy Assertion Format

Figure F-1 shows a graphical representation of the SALT supported WS-SecurityPolicy 1.0 Assertion format in a WS-Policy file.

Figure F-1 SALT Supported WS-SecurityPolicy 1.0 Assertion Format



SALT WSSP 1.0 Assertion File Example

Listing F-1 demonstrates how to apply Username token authentication with WSSP 1.0 Assertions.

Listing F-1 WSSP 1.0 Policy File Sample

```
<wsp:Policy xmlns:wsp="http://schemas.xmlsoap.org/ws/2004/09/policy"
  xmlns:wssp="http://www.bea.com/WLS/security/policy"
  xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssec
urity-utility-1.0.xsd">
  <wssp:Identity>
    <wssp:SupportedTokens>
      <wssp:SecurityToken
            TokenType="http://docs.oasis-open.org/wss/2004/01/oasis-200401
-wss-username-token-profile-1.0#UsernameToken">
        <wssp:Claims>
          <wssp:UsePassword>http://docs.oasis-open.org/wss/2004/01/oasis-2
00401-wss-username-token-profile-1.0#PasswordText</wssp:UsePassword>
        </wssp:Claims>
      </wssp:SecurityToken>
    </wssp:SupportedTokens>
  </wssp:Identity>
</wsp:Policy>
```

SALT WSSP 1.0 Policy Templates

SALT provides a number of WS-SecurityPolicy 1.0 template files you can use for most typical Web Service applications. These policy files are located in directory `TUXDIR/udataobj/salt/policy`.

Table F-1 SALT WSSP 1.0 Policy Template Files

Policy File	Description
wssp1.0-UsernameToken-plain-auth.xml	Username token with plain text password is sent in the request for authentication.
wssp1.0-x509v3-auth.xml	X509 V3 binary token (certificate) is sent in the request for authentication. The request is optionally signed with some message parts in the requests.
wssp1.0-signbody.xml	The whole SOAP body is signed.

These template files can be referenced directly in the WSDF files with location value format:

```
salt:<template_file_name>
```

For instance, if you want to configure signbody, you can specify the followings in your WSDF file:

```
<Policy location="salt:wssp1.0-signbody.xml" />
```

SALT WSSP 1.0 Assertion Element Description

SALT implements part of WebLogic 12.x / 10 WS-SecurityPolicy 1.0 assertions. For a complete list of WSSP 1.0 assertions supported by WebLogic, see http://docs.oracle.com/middleware/1212/wls/WSREF/sec_assert.htm#g1077013

<CanonicalizationAlgorithm>

Specifies the algorithm used to canonicalize the SOAP message elements that are digitally signed.

Table F-2 <CanonicalizationAlgorithm> Attribute

Attribute	Description	Required?
URI	The algorithm used to canonicalize the SOAP message being signed. SALT supports only the following canonicalization algorithm: `http://www.w3.org/TR/xml-exc-c14n/`	Yes

<Claims>

Specifies additional metadata information that is associated with a particular type of security token. Depending on the type of security token, you must specify the following child elements:

- For username tokens, you must specify a <UsePassword> child element to specify what kind of the password will be used for in username authentication.

This element does not have any attributes.

<DigestAlgorithm>

Specifies the digest algorithm that is used when digitally signing the specified parts of a SOAP message. Use the <MessageParts> sibling element to specify the parts of the SOAP message you want to digitally sign.

Table F-3 <DigestAlgorithm> Attributes

Attribute	Description	Required?
URI	The digest algorithm that is used when digitally signing the specified parts of a SOAP message. SALT supports only the following digest algorithm: `http://www.w3.org/2000/09/xmldsig#sha1`	Yes

<Identity>

Specifies the type of security tokens (username or X.509) that are supported for authentication.

This element has no attributes.

<Integrity>

Specifies that part or all of the SOAP message must be digitally signed, as well as the algorithms and keys that are used to sign the SOAP message.

For example, a Web Service may require that the entire body of the SOAP message must be digitally signed and only algorithms using SHA1 and an RSA key are accepted.

Table F-4 <Integrity> Attributes

Attribute	Description	Required?
SignToken	Specifies whether the security token, specified using the <SecurityToken> child element of `<Integrity>`, should also be digitally signed, in addition to the specified parts of the SOAP message. The valid values for this attribute are true and false. The default values is true.	No

<MessageParts>

Specifies the parts of the SOAP message that should be signed. SALT only supports certain pre-defined message part function, wsp:Body(), i.e. the entire SOAP body to be digitally signed.

The MessageParts assertion is always a child of a <Target> assertion. The <Target> assertion can be a child of an Integrity assertion (to specify how the SOAP message is digitally signed).

See ?$paratext>? for more information about how to specify the parts of the SOAP message that should be signed.

Table F-5 <MessageParts> Attributes

Attribute	Description	Required?
Dialect	Identifies the dialect used to identity the parts of the SOAP message that should be signed. SALT only supports the following value: • `http://schemas.xmlsoap.org/2002/12/wsse#part` Convenience dialect used to specify parts of SOAP message that should be signed.	Yes

<SecurityToken>

Specifies the security token that is supported for authentication or digital signatures, depending on the parent element.

If this element is defined in the <Identity> parent element, then is specifies that a client application, when invoking the Web Service, must attach a security token to the SOAP request.

For example, a Web Service might require that the client application present a Username token for the Web Service to be able to access Tuxedo service. If this element is part of <Integrity>, then it specifies the token used for digital signature.

The specific type of the security token is determined by the value of its TokenType attribute, as well as its parent element.

Table F-6 <SecurityToken> Attributes

Attribute	Description	Required?
`IncludeInMessage`	Specifies whether to include the token in the SOAP message. Valid values are true or false. The default value of this attribute is true when used in the <Integrity> assertion. The value of this attribute is always true when used in the <Identity> assertion, even if you explicitly set it to false.	No
`TokenType`	Specifies the type of security token. Valid values are: • `http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-x509-token-profile-1.0#X509v3` (To specify a binary X.509 v3 token) • `http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0#UsernameToken` (To specify a username token)	Yes

<SignatureAlgorithm>

Specifies the cryptographic algorithm used to compute the digital signature.

Table F-7 <SignatureAlgorithm> Attributes

Attribute	Description	Required?
`URI`	Specifies the cryptographic algorithm used to compute the signature. **Note:** Be sure that you specify an algorithm that is compatible with the certificates you are using in your enterprise. Valid values are: ● `http://www.w3.org/2000/09/xmldsig#rsa-sha1` ● `http://www.w3.org/2000/09/xmldsig#dsa-sha1`	Yes

<SupportedTokens>

Specifies the list of supported security tokens that can be used for authentication, or digital signatures, depending on the parent element.

This element has no attributes.

<Target>

Encapsulates information about which targets of a SOAP message are to be signed. When used in <Integrity>, you can specify the <DigestAlgorithm>, <Transform>, and <MessageParts> child elements.

Ideally, you can have one or more targets. But at most one target is enough for SALT, since SALT only supports the entire SOAP body to be configured for digital signature.

This element has no attributes.

<Transform>

Specifies the URI of a transformation algorithm that is applied to the parts of the SOAP message that are signed. Only can exist in a child element of the <Integrity> element.

You can specify zero or more transforms, which are executed in the order they appear in the <Target> parent element.

Table F-8 <Transform> Attributes

Attribute	Description	Required?
`URI`	Specifies the URI of the transformation algorithm. SALT only supports the following transformation algorithm: • `http://www.w3.org/2000/09/xmldsig#base64` (Base64 decoding transforms) For detailed information about these transform algorithms, see XML-Signature Syntax and Processing.	Yes

<UsePassword>

Specifies that whether the plaintext or the digest of the password appear in the SOAP messages. This element is used only with username tokens. In SALT, it must be specified as plaintext.

Table F-9 <UsePassword> Attributes

Attribute	Description	Required?
`Type`	Specifies the type of password. SALT only supports cleartext passwords, the value URI is: • `http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0#PasswordText` Specifies that cleartext passwords should be used in the SOAP messages. **Note:** For backward compatibility reasons, the preceding URI can also be specified with an initial "www." For example: – `http://www.docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-profile-1.0#PasswordText`	Yes

Usage of MessageParts

When you use the <Integrity> assertion in your WS-Policy file, you are required to also use the Target child assertion to specify the targets of the SOAP message to digitally sign. The <Target> assertion in turn requires that you use the <MessageParts> child assertion to specify the actual parts of the SOAP message that should be digitally signed. You can use the `Dialect` attribute of <MessageParts> to specify the dialect used to identify the SOAP message parts. SALT Web services security module supports only the following dialect:

- Pre-Defined Message Part Selection Function

Be sure that you specify a message part that actually exists in the SOAP messages that result from a client invoke of a message-secured Web Service. If the Web Services security module encounters an inbound SOAP message that does not include a part that the WS-Policy file indicates should be signed or encrypted, then the Web Services security module returns an error and the invoke fails.

Pre-Defined Message Part Selection Function

This section shows SALT supported functions that are used with the "`http://schemas.xmlsoap.org/2002/12/wsse#part`" dialect for selecting parts of a message:

Table F-10 SALT Supported Message Part Selection Function

Function	Description
wsp:Body()	Specifies the entire SOAP message body to be selected as one part

You can only specify the entire SOAP body to be signed. It is recommended that you use the dialect that pre-defines the `wsp:Body()` function for this purpose.

Listing F-2 shows a `wsp:Body()` function example

Listing F-2   wsp:Body() Function

```
<wssp:MessageParts
    Dialect="http://schemas.xmlsoap.org/2002/12/wsse#part">
      wsp:Body()
</wssp:MessageParts>
```