

**Oracle® Email**

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Oracle Email Application Developer's Guide, Release 2 (9.0.4)

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## Oracle Email Application Developer's Guide, Release 2 (9.0.4)

### Part No. B10721-01

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# Preface

## Audience

The Oracle Email Application Developer's Guide is intended for application designers and developers. It is assumed that you have some experience programming in PL/SQL.

## Organization

### **Chapter 1, "PL/SQL API Reference"**

This chapter contains the set of Oracle Email PL/SQL APIs that can be used to access and manage e-mail on the Oracle Email system.

### **Chapter 2, "JAVA API Reference"**

This chapter contains the Oracle Email JAVA APIs that can be used to create customized clients, integrate applications, and support certain extensions.

## Related Documentation

Oracle Email documentation is available in HTML and PDF.

The following documents are available on the Oracle Collaboration Suite documentation library:

- *Oracle Email Administrator's Guide*
- *Oracle Email Migration Tool Guide*
- *Oracle Email API Reference (Java Doc)*
- *Oracle Voicemail & Fax Administrator's Guide*

## Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- Conventions in Text
- Conventions in Code Examples

### Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

Convention	Meaning	Example
<b>Bold</b>	Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.	When you specify this clause, you create an <b>index-organized table</b> .
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	<i>Oracle9i Database Concepts</i> Ensure that the recovery catalog and target database do <i>not</i> reside on the same disk.
UPPERCASE monospace (fixed-width) font	Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, and roles.	You can specify this clause only for a NUMBER column. You can back up the database by using the BACKUP command. Query the TABLE_NAME column in the USER_TABLES data dictionary view. Use the DBMS_STATS.GENERATE_STATS procedure.

Convention	Meaning	Example
lowercase monospace (fixed-width) font	Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, usernames and roles, program units, and parameter values.  <b>Note:</b> Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	Enter <code>sqlplus</code> to open SQL*Plus.  The password is specified in the <code>orapwd</code> file.  Back up the datafiles and control files in the <code>/disk1/oracle/dbs</code> directory.  The <code>department_id</code> , <code>department_name</code> , and <code>location_id</code> columns are in the <code>hr.departments</code> table.  Set the <code>QUERY_REWRITE_ENABLED</code> initialization parameter to <code>true</code> .  Connect as <code>oe</code> user.  The <code>JRepUtil</code> class implements these methods.
<i>lowercase italic monospace (fixed-width) font</i>	Lowercase italic monospace font represents placeholders or variables.	You can specify the <i>parallel_clause</i> .  Run <code>Uold_release.SQL</code> where <i>old_release</i> refers to the release you installed prior to upgrading.

## Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL\*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

The following table describes typographic conventions used in code examples and provides examples of their use.

Convention	Meaning	Example
[ ]	Brackets enclose one or more optional items. Do not enter the brackets.	DECIMAL ( <i>digits</i> [ , <i>precision</i> ])
{ }	Braces enclose two or more items, one of which is required. Do not enter the braces.	{ENABLE   DISABLE}
	A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.	{ENABLE   DISABLE} [COMPRESS   NOCOMPRESS]

Convention	Meaning	Example
...	Horizontal ellipsis points indicate either: <ul style="list-style-type: none"> <li>That we have omitted parts of the code that are not directly related to the example</li> <li>That you can repeat a portion of the code</li> </ul>	<pre>CREATE TABLE ... AS subquery;  SELECT col1, col2, ... , coln FROM employees;</pre>
. . . .	Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.	<pre>SQL&gt; SELECT NAME FROM V\$DATAFILE; NAME ----- /fsl/dbs/tbs_01.dbf /fsl/dbs/tbs_02.dbf . . . /fsl/dbs/tbs_09.dbf 9 rows selected.</pre>
Other notation	You must enter symbols other than brackets, braces, vertical bars, and ellipsis points as shown.	<pre>acctbal NUMBER(11,2); acct CONSTANT NUMBER(4) := 3;</pre>
<i>Italics</i>	Italicized text indicates placeholders or variables for which you must supply particular values.	<pre>CONNECT SYSTEM/system_password DB_NAME = database_name</pre>
UPPERCASE	Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.	<pre>SELECT last_name, employee_id FROM employees; SELECT * FROM USER_TABLES; DROP TABLE hr.employees;</pre>
lowercase	Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.  <b>Note:</b> Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	<pre>SELECT last_name, employee_id FROM employees; sqlplus hr/hr CREATE USER mjones IDENTIFIED BY ty3MU9;</pre>

## Documentation Accessibility

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<http://www.oracle.com/accessibility/>

### **Accessibility of Code Examples in Documentation**

JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

### **Accessibility of Links to External Web Sites in Documentation**

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# PL/SQL API Reference

The Oracle Email PL/SQL APIs are a set of application program interfaces that can be used to access and manage e-mail on the Oracle Email system.

This chapter contains the following topics:

- Overview
- Concepts
- Mail Objects
- MAIL\_RECOVERY Package
- MAIL\_SESSION Package
- MAIL\_FOLDER Package
- MAIL\_MESSAGE Package
- Exceptions
- Examples

## Overview

The PL/SQL APIs described in this chapter expose Oracle Email system functionality that can be customized to suit your business and application requirements. They are organized into the following PL/SQL packages:

- `MAIL_SESSION`
- `MAIL_FOLDER`
- `MAIL_MESSAGE`
- `MAIL_RECOVERY`

All the packages are part of the Oracle Collaboration Suite installation. The first three are public packages used to manipulate the e-mail user's mail account. The `MAIL_RECOVERY` package is a feature provided to the administrators to recovery e-mails that are accidentally deleted by the users.

### **`MAIL_SESSION` Package**

The `MAIL_SESSION` package provides functions for authentication, logging out and user session related functionalities, such as fetching quota and usage information.

### **`MAIL_FOLDER` Package**

Mail folders are used to help organize e-mail messages. During e-mail user creation, the `INBOX` folder is created by default to contain all incoming messages. Once the messages are in the `INBOX` folder, the user can use mail folders to organize the messages. The `MAIL_FOLDER` package provides folder management and message list operations.

Folder management operations are:

- List folder
- Create folder
- Delete folder
- Rename folder
- Expunge folder

Message list operations are:

- Retrieve message objects

- Copy messages
- Change message flags
- Delete messages
- Search messages
- Sort messages

### **MAIL\_MESSAGE Package**

The `MAIL_MESSAGE` package provides functions for accessing messages and creating new messages. The package enables users to do the following:

- Retrieve message attributes, headers, structures and content
- Change message flags
- Compose new messages for sending and appending
- Retrieve message highlight, themes, markups, and filtered text

### **MAIL\_RECOVERY Package**

The `mail_recovery` package provides functions to recover deleted e-mails, using the Oracle log miner feature. The `mail_recovery` package procedures are:

- `SETUP_LOGMINER`
- `RECOVER_MESSAGES`

## **Concepts**

This section discusses the following e-mail related concepts:

- Folder UIDL
- Message UID
- Message Flags
- New and Recent Messages
- MIME Level

## Folder UIDL

When a folder is created, a validity value is assigned to the folder guaranteeing that as long as the value does not change, the message unique identifier (UID) assigned to the messages in the folder is valid. This value is called folder unique identifier validity (UIDL).

## Message UID

Each message in a folder is assigned a unique identifier validity (UID) value. The UID value persists across sessions, so application may cache these message UID values for message reference in the future. Message UID is always assigned in ascending order in the folder. As each message is added to the folder, it is assigned a higher UID value. The maximum UID permitted is  $2^{32} - 1 = 4$  billion. Once the maximum has been reached the message UIDs in the folder are re-assigned. The holes in the message UID sequence created by messages deletion are compacted. To reflect this, the folder validity value (`folder UIDL`) is changed. When the folder validity value is changed, the application must discard any message UID cache for this folder and re-fetch the message UID values.

## Message Flags

Message content cannot be modified, but mail users can change the flag property. When a message is delivered into the user's `INBOX` folder, the message is not marked with any flag. After the user read a message, the application marks the message with the `seen` flag.

The supported flags are described below. How they are used is up to the application:

**Table 1-1**

Flag	Description
<code>MAIL_MESSAGE.GC_SEEN_FLAG</code>	The message has been read
<code>MAIL_MESSAGE.GC_FLAGGED_FLAG</code>	Marks messages for urgent or special attention
<code>MAIL_MESSAGE.GC_ANSWERED_FLAG</code>	The message has been replied to
<code>MAIL_MESSAGE.GC_DELETED_FLAG</code>	The message is marked to be removed later with the expunge command
<code>MAIL_MESSAGE.GC_DRAFT_FLAG</code>	The message has not completed composition

## New and Recent Messages

New and recent messages only differ when there are multiple client sessions accessing the same mail folder at the same time. A message is considered recent when no other mail client session has retrieved the message. A message is considered new if the current mail user session has not seen the message.

## MIME Level

A message MIME level is a string used to identify a specific part of a message. The application does not have to know anything about it. The MIME level is incorporated as part of the message and body-part objects that are passed around. It is for internal use to identify a specific message part.

## Mail Objects

There are three distinct mail objects in the Oracle Email Server:

- mail account or session
- mail folder
- mail message

A mail account contains many mail folders. A mail folder contains many mail messages. An `INBOX` mail folder is a special folder created when the mail user account is created. The `INBOX` folder cannot be deleted. All incoming messages are delivered into the `INBOX` folder.

A mail user must be authenticated before performing mail operations. The `MAIL_SESSION` package provides the functions. When a user is authenticated, a valid session identifier is returned from the authentication routine. This session identifier is passed around to other mail operations that require a valid authenticated session. The mail user session identifier is only valid in the same database session that it has been authenticated in. Multiple mail user sessions are supported so that multiple mail users can authenticate on the same database session. Each authenticated session is associated with a unique identifier.

To access any message in a folder, the user must open the folder. There is only one opened folder in a mail session at any given time. Once a folder is opened, all message accesses are done on the currently opened folder. The currently opened folder changes when the folder is closed or another folder is opened.

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**Note:** The PL/SQL API contains references to `dbms_sql.varchar2_table` and `dbms_sql.number_table` types

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**See Also:** The *Oracle Supplied Packages Reference* manual for the description of these two types.

## MAIL\_FOLDER\_OBJ

The `MAIL_FOLDER_OBJ` object uniquely identifies a mail folder. It is defined as follows:

```
MAIL_FOLDER_OBJ(  
  name VARCHAR2(1024),  
  id NUMBER  
);  
MAIL_FOLDER_LIST AS TABLE OF MAIL_FOLDER_OBJ;
```

- `name` is the full path of the folder name.
- `id` is a unique folder identifier.
- `MAIL_FOLDER_LIST` is a nested table of `MAIL_FOLDER_OBJ` objects.

## MAIL\_FOLDER\_DETAIL

The `MAIL_FOLDER_DETAIL` object contains information pertaining to a specific folder. It is defined as follows:

```
MAIL_FOLDER_DETAIL (  
  uidl NUMBER,  
  num_voice_recent NUMBER,  
  num_fax_recent NUMBER,  
  total_recent NUMBER,  
  num_voice_unseen NUMBER,  
  num_fax_unseen NUMBER,  
  total_unseen NUMBER,  
  total_msgs NUMBER  
);
```

The `MAIL_FOLDER_DETAIL` object contains information on the folder UIDL, number of messages, total number of unseen and recent messages, and number of unseen and recent voice and fax messages.

## MAIL\_SORT\_CRITERIA\_ELEMENT

The MAIL\_SORT\_CRITERIA\_ELEMENT object is used to represent a sort criteria. It is defined as follows:

```
MAIL_SORT_CRITERIA_ELEMENT(  
    sort_header VARCHAR2(240),  
    sort_order  INTEGER  
);  
MAIL_SORT_CRITERIA AS TABLE OF MAIL_SORT_CRITERIA_ELEMENT;
```

- `sort_header` is the message header used to perform the sort. The supported header names are:
  - CC
  - DATE
  - SUBJECT
  - SIZE
  - INTERNAL\_DATE
- `sort_order` indicates whether to sort the header field in ascending or descending order. The values are:
  - MAIL\_FOLDER.SORT\_ASC
  - MAIL\_FOLDER.SORT\_DESC
- MAIL\_SORT\_CRITERIA is a nested table of MAIL\_SORT\_CRITERIA\_ELEMENT objects.

## MAIL\_MESSAGE\_OBJ

The MAIL\_MESSAGE\_OBJ object uniquely identifies a mail message. It is defined as follows:

```
MAIL_MESSAGE_OBJ (  
    folder_id NUMBER,  
    msg_uid  NUMBER,  
    mime_level VARCHAR2(240)  
);  
MAIL_MESSAGE_LIST IS TABLE OF MAIL_MESSAGE_OBJ;
```

- `folder_id` is a unique folder identifier.
- `msg_uid` uniquely identifies a message within the folder.

- `mime_level` either has the value 0 to indicate that this message object is a top-level message, or other value to indicate an included message object.
- `MAIL_MESSAGE_LIST` is a nested table of `MAIL_MESSAGE_OBJ` objects.

## MAIL\_BODYPART\_OBJ

The `MAIL_BODYPART_OBJ` object uniquely identifies a mail message part. It is defined as follows:

```
MAIL_BODYPART_OBJ (  
  content_type VARCHAR2(240),  
  mime_level VARCHAR2(240),  
  folder_id NUMBER,  
  msg_uid NUMBER,  
  smime_ind NUMBER  
);  
MAIL_BODYPART_LIST IS TABLE OF MAIL_BODYPART_OBJ;
```

- `folder_id` is a unique folder identifier.
- `msg_uid` uniquely identifies a message within the folder.
- `mime_level` identifies the specific body-part of the message.
- `content_type` contains the main Content-Type header value for this body-part.
- `smime_ind` is a value of 1 that indicates that the body-part is from a decrypted message.
- `mail_bodypart_list` is a nested table of `MAIL_BODYPART_OBJ` objects.

## VARCHAR2\_TABLE

`VARCHAR2_TABLE` defines a nested table of a variable-length character string that has a maximum length of 2000 as follows:

```
VARCHAR2_TABLE IS TABLE OF VARCHAR2(2000);
```

## MAIL\_HEADER\_OBJ

The `MAIL_HEADER_OBJ` object is used to store a message header name and value pair. It is defined as follows:

```
MAIL_HEADER_OBJ (  
  header_prompt VARCHAR2(1000),
```



```

header_value      VARCHAR2_TABLE
);

```

- header\_prompt is the name of the header.
- header\_value is the value of the header. It is a VARCHAR2\_TABLE, which is a table of 2000 variable-length character strings. When the length of header value is greater than 2000, it is broken into multiple strings of 2000 length.
- MAIL\_HEADER\_LIST is a nested table of MAIL\_HEADER\_OBJ objects:
- MAIL\_HEADER\_LIST is a table of MAIL\_HEADER\_OBJ ;

## MAIL\_RECOVERY Package

The mail\_recovery package is provided to recover deleted e-mails, using the Oracle log miner feature.

The redo list file is used by the mail\_recovery package to retrieve the list of redo logs. This file must be provided by an administrator, and can be created manually through a text editor or by outputting a directory list command on UNIX or Windows NT.

The file contains redo log filenames with their full path, and must be listed in separate lines. The redo logs can either be online redo logs, archived logs or both.

It is important to verify that init.ora parameter UTL\_FILE\_DIR is set to access the redo list file. For example:

```

/oracle/database/redo01.log
/oracle/database/redo02.log
/oracle/database/redo03.log

```

The MAIL\_RECOVERY package contains the following procedures:

- SETUP\_LOGMNR Procedure
- RECOVER\_MESSAGES Procedure

## SETUP\_LOGMNR Procedure

The setup\_logmnr procedure initializes the logminer for recovery.

### Syntax

```

PROCEDURE setup_logmnr(

```

```

p_dictionary_filename IN VARCHAR2,
p_redolist_location   IN VARCHAR2,
p_redolist_filename   IN VARCHAR2
p_starttime           IN DATE DEFAULT '01-jan-1988',
p_endtime              IN DATE DEFAULT '01-jan-2099');

```

## Parameters

**Table 1–2** *setup\_logmnr parameters*

Parameter	Description
p_dictionary_filename	Name of the log miner data dictionary file with the full path
p_redolist_location	Directory location of redo list file
p_redolist_filename	File name of redo list file
p_starttime	Start time of the redo list. Only consider redo records with the time stamp greater than or equal to the start time specified
p_endtime	End time of the redo list. Only consider redo records with time stamp less than or equal to the end time specified

## RECOVER\_MESSAGES Procedure

The `recover_messages` procedure performs the recovery for a user and restores the messages in a specified folder.

### Syntax

```

PROCEDURE recover_messages(
  p_domainname IN VARCHAR2,
  p_username   IN VARCHAR2,
  p_foldername IN VARCHAR2,
  p_autocommit IN BOOLEAN DEFAULT TRUE);

```

**Table 1–3** *recover\_messages parameters*

Parameter	Description
p_domainname	Domain name of the user
p_username	Oracle Email user name for which recovery is performed
p_foldername	Folder name where recovered messages are restored. If NULL, it is passed, and <code>recover_messages</code> creates a new folder with name <code>RECMSG_current_date_time</code>

**Table 1–3** *recover\_messages parameters*

Parameter	Description
<code>p_autocommit</code>	If True: Frequent commits are performed within <code>recover_messages</code> . If False: No commits are performed inside the <code>recover_messages</code> procedure. The <code>end_logmnr</code> procedure finishes the logminer session.

## MAIL\_SESSION Package

The `MAIL_SESSION` package provides user authentication and log out functionality. A user can create multiple mail sessions using the same database session by calling `MAIL_SESSION.login()` multiple times. Each session ID identifies one valid mail session.

The `MAIL_SESSION` package contains the following procedures:

- LOGIN Procedure
- LOGOUT Procedure
- GET\_CURRENT\_USAGE Procedure
- IS\_OVER\_QUOTA Procedure

### LOGIN Procedure

This procedure authenticates a user by the user's user name and password.

#### Throws Exceptions

`mail_errors.login_err`

#### Syntax

```
PROCEDURE login (
  user_name  IN VARCHAR2,
  password  IN VARCHAR2,
  domain    IN VARCHAR2,
  ldap_host  IN VARCHAR2,
  session_id OUT NUMBER,
  ldap_port  IN NUMBER DEFAULT 389
);
PROCEDURE login (
```

```
user_address IN VARCHAR2,  
password IN VARCHAR2,  
ldap_host IN VARCHAR2,  
session_id OUT NUMBER,  
ldap_port IN NUMBER DEFAULT 389  
);
```

## Parameter

**Table 1–4** *login parameters*

Parameter	Description
user_name	User account name, without the domain part
password	User password
user_address	User Internet address: <i>user_name@domain</i>
domain	User domain
ldap_host	The host name where Oracle Internet Directory is configured
ldap_port	The port Oracle Internet Directory is listening to; the default is 389
session_id	An unique identifier that represents this user authenticated session

## LOGOUT Procedure

This procedure releases all resources associated with this user session.

### Syntax

```
PROCEDURE logout (  
session_id IN NUMBER  
);
```

## Parameters

**Table 1–5** *logout parameter*

Parameter	Description
session_id	An identifier that represents a user's authenticated session

## GET\_CURRENT\_USAGE Procedure

This procedure returns the current user's usage amount.

### Throws Exceptions

mail\_errors.unauthenticated\_err

### Syntax

```
PROCEDURE get_current_usage (
  session_id      IN NUMBER,
  usage          OUT NUMBER
);
```

### Parameters

**Table 1–6** *get\_current\_usage parameters*

Parameters	Description
session_id	An identifier that represents a user's authenticated session
usage	User's current usage in bytes

## IS\_OVER\_QUOTA Procedure

This function returns true if the user is currently over-quota, and false otherwise.

### Throws Exceptions

mail\_errors.unauthenticated\_err

### Syntax

```
FUNCTION is_over_quota (
  session_id      IN NUMBER
) RETURN boolean;

FUNCTION is_over_quota (
  session_id      IN NUMBER,
  quota          OUT NUMBER,
  usage          OUT NUMBER
) RETURN boolean;
```

## Parameters

**Table 1–7** *is\_over\_quota parameters*

<b>Parameter</b>	<b>Description</b>
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>quota</code>	User's quota in bytes
<code>usage</code>	User's current usage in bytes

## MAIL\_FOLDER Package

The MAIL\_FOLDER package provides folder-related functionality. The validity of the session is checked before performing any operation. The search and sort features are based on the IMAP4 protocol. The search feature includes Oracle Text based searches.

The MAIL\_FOLDER contains the following procedures and functions:

- GET\_FOLDER\_OBJ Procedure
- LIST\_TOPLEVEL\_FOLDERS Procedure
- LIST\_FOLDERS Procedure
- LIST\_TOPLEVEL\_SUBDFLDRS Procedure
- LIST\_SUBSCRIBED\_FOLDERS Procedure
- IS\_FOLDER\_SUBSCRIBED Function
- SUBSCRIBE\_FOLDER Procedure
- UNSUBSCRIBE\_FOLDER Procedure
- HAS\_FOLDER\_CHILDREN Function
- GET\_FOLDER\_DETAILS Procedure
- CREATE\_FOLDER Procedure
- DELETE\_FOLDER Procedure
- RENAME\_FOLDER Procedure
- OPEN\_FOLDER Procedure
- GET\_FOLDER\_MESSAGES Procedure
- GET\_MESSAGE Procedure
- CLOSE\_FOLDER Procedure
- GET\_MSG\_FLAGS Procedure
- SET\_MSG\_FLAGS Procedure
- DELETE\_MESSAGES Procedure
- EXPUNGE\_FOLDER Procedure
- IS\_FOLDER\_OPEN Function

- CHECK\_NEW\_MESSAGES Function
- CHECK\_RECENT\_MESSAGES Function
- GET\_NEW\_MESSAGES Procedure
- COPY\_MESSAGES Procedure
- IS\_FOLDER\_MODIFIED Function
- SORT\_FOLDER Procedure
- SEARCH\_FOLDER Procedure

## GET\_FOLDER\_OBJ Procedure

This procedure returns a folder object, given a folder name. If the folder does not exist on the mail store, a FOLDER\_NOT\_FOUND exception is raised.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_not_found_err`

### Syntax

```
PROCEDURE get_folder_obj (  
  session_id IN NUMBER,  
  folder_name IN VARCHAR2,  
  folder_obj OUT MAIL_FOLDER_OBJ  
);
```

### Parameters

**Table 1–8** *get\_folder\_obj parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_name</code>	The full path of a folder name
<code>folder_obj</code>	The MAIL_FOLDER_OBJ returned



## LIST\_TOPLEVEL\_FOLDERS Procedure

This procedure returns a list of top-level folder objects.

### Throws Exceptions

mail\_errors.unauthenticated\_err

### Syntax

```
PROCEDURE list_toplevel_folders (
  session_id  IN NUMBER,
  folder_list OUT MAIL_FOLDER_LIST
);
```

### Parameters

**Table 1–9** *list\_toplevel\_folders parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_list	A list of top-level folder objects

## LIST\_FOLDERS Procedure

This procedure returns a list of direct child folder objects, given the parent folder.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_not\_found\_err

### Syntax

```
PROCEDURE list_folders (
  session_id  IN NUMBER,
  parent_name IN VARCHAR2,
  folder_list OUT MAIL_FOLDER_LIST
);
PROCEDURE list_folders (
  session_id  IN NUMBER,
  parent_obj  IN MAIL_FOLDER_OBJ,
  folder_list OUT MAIL_FOLDER_LIST
);
```

```
);
```

## Parameters

**Table 1–10** *list\_folders parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>parent_name</code>	The full path of the parent folder
<code>parent_obj</code>	The MAIL_FOLDER_OBJ representing the parent folder
<code>folder_list</code>	The list of child folder objects under the parent folder

## LIST\_TOPLEVEL\_SUBDFLDRS Procedure

This procedure returns a list of top-level subscribed folders.

### Throws Exceptions

`mail_errors.unauthenticated_err`

### Syntax

```
PROCEDURE list_toplevel_subdfldrs (  
  session_id IN NUMBER,  
  foldername_list OUT DBMS_SQL.VARCHAR2_TABLE  
);
```

## Parameters

**Table 1–11** *list\_toplevel\_subfldrs parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>foldername_list</code>	A list of top-level subscribed folders

## LIST\_SUBSCRIBED\_FOLDERS Procedure

This procedure returns a list of subscribed child folders, given the parent folder.

## Throws Exceptions

mail\_errors.unauthenticated\_err

## Syntax

```
PROCEDURE list_subscribed_folders (
  session_id  IN  NUMBER,
  parent_name IN  VARCHAR2,
  foldername_list OUT DBMS_SQL.VARCHAR2_TABLE
);
PROCEDURE list_subscribed_folders (
  session_id  IN  NUMBER,
  parent_obj  IN  MAIL_FOLDER_OBJ,
  foldername_list OUT DBMS_SQL.VARCHAR2_TABLE
);
```

## Parameters

**Table 1–12** *list\_subscribed\_folders parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
parent_name	The full path of the parent folder name
parent_obj	The MAIL_FOLDER_OBJ representing the parent folder
foldername_list	The list of subscribed child folder objects under the parent folder

## IS\_FOLDER\_SUBSCRIBED Function

This function tests to see if the folder is subscribed.

## Throws Exceptions

mail\_errors.unauthenticated\_err

## Syntax

```
FUNCTION is_folder_subscribed (
  session_id  IN  NUMBER,
  folder_name IN  VARCHAR2
) return BOOLEAN;
```

## Parameters

**Table 1–13** *is\_folders\_subscribed parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_name</code>	The full path of the folder name

## SUBSCRIBE\_FOLDER Procedure

This procedure subscribes the specified folder. Errors are not returned if the folder has already been subscribed.

### Throws Exceptions

`mail_errors.unauthenticated_err`

### Syntax

```
PROCEDURE subscribe_folder (  
  session_id  IN  NUMBER,  
  folder_name IN  VARCHAR2  
);
```

## Parameters

**Table 1–14** *subscribe\_folder parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_name</code>	The full path of the folder name

## UNSUBSCRIBE\_FOLDER Procedure

This procedure unsubscribes the specified folder. Errors are not returned if the folder has not been subscribed at the time of the call.

### Throws Exceptions

`mail_errors.unauthenticated_err`

## Syntax

```
PROCEDURE unsubscribe_folder (
  session_id  IN NUMBER,
  folder_name IN VARCHAR2
);
```

## Parameters

**Table 1–15** *unsubscribe\_folder* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_name	The full path of the folder name

## HAS\_FOLDER\_CHILDREN Function

This function tests to see if any child folders exist.

## Throws Exceptions

mail\_errors.unauthenticated\_err

## Syntax

```
FUNCTION has_folder_children (
  session_id  IN NUMBER,
  folder_obj  IN MAIL_FOLDER_OBJ
) return BOOLEAN;
```

## Parameters

**Table 1–16** *has\_folder\_children* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_obj	The folder object

## GET\_FOLDER\_DETAILS Procedure

This procedure returns folder information, such as the folder UIDL identifier, total message count, number of unseen messages, and number of recent messages.

### Throws Exceptions

`mail_errors.unauthenticated_err`

### Syntax

```
PROCEDURE get_folder_details (  
  session_id IN NUMBER,  
  folder_obj IN MAIL_FOLDER_OBJ,  
  folder_detail_obj OUT MAIL_FOLDER_DETAIL  
);
```

### Parameters

**Table 1–17** *get\_folder\_details parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_obj</code>	The folder object
<code>folder_detail_obj</code>	A folder detail object that contains information about the folder

## CREATE\_FOLDER Procedure

This procedure creates a folder with the given name, returning a folder object representing it. A `FOLDER_TYPE_ERR` is returned if the parent folder does not enable any subfolder creation.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_already_exists_err`  
`mail_errors.folder_type_err`

### Syntax

```
PROCEDURE create_folder (  
  session_id IN NUMBER,
```

```

folder_name  IN  VARCHAR2,
folder_obj   OUT MAIL_FOLDER_OBJ
);

```

## Parameters

**Table 1–18** *create\_folder parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_name	The full path of a folder name
folder_obj	The MAIL_FOLDER_OBJ returned

## DELETE\_FOLDER Procedure

This procedure deletes the specified folder. If a recursive flag is set to true, all the messages in the folder, all sub-folders and their messages, and the folder itself are removed. A recursive flag set to false performs the following actions:

- If no sub-folder exists, the messages in the folder and the folder itself are removed.
- If sub-folders exist, the messages in the folder are removed, and the folder is marked as not selectable (the OPEN\_FOLDER operation on this folder can fail).
- If the DELETE\_FOLDER procedure is called with a folder that is marked as not selectable and contains a subfolder, the MAIL\_ERRORS.FOLDER\_TYPE\_ERR is thrown.

## Throws Exceptions

```

mail_errors.unauthenticated_err
mail_errors.operation_not_allowed
mail_errors.folder_type_err
mail_errors.folder_not_found_err

```

## Syntax

```

PROCEDURE delete_folder (
  session_id  IN  NUMBER,
  folder_name IN  VARCHAR2,
  recursive   IN  BOOLEAN DEFAULT false
);
PROCEDURE delete_folder (

```

```
session_id  IN NUMBER,  
folder_obj  IN MAIL_FOLDER_OBJ,  
recursive  IN BOOLEAN DEFAULT false  
);
```

## Parameters

**Table 1–19 delete\_folder parameters**

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_name	The full path of the folder name
folder_obj	The MAIL_FOLDER_OBJ representing the folder
recursive	If set to true, it deletes the folder and any sub-folders

## RENAME\_FOLDER Procedure

This procedure renames the specified folder and returns the new folder object. Renaming the INBOX moves all of the messages in the INBOX to a new folder, leaving the INBOX folder empty.

### Throws Exceptions

```
mail_errors.unauthenticated_err  
mail_errors.folder_not_found_err  
mail_errors.folder_already_exists_err  
mail_errors.operation_not_allowed
```

### Syntax

```
PROCEDURE rename_folder (  
  session_id  IN NUMBER,  
  folder_name IN VARCHAR2,  
  new_folder_name IN VARCHAR2,  
  folder_obj  OUT MAIL_FOLDER_OBJ  
);  
  
PROCEDURE rename_folder (  
  session_id  IN NUMBER,  
  folder_obj  IN OUT MAIL_FOLDER_OBJ,  
  new_folder_name IN VARCHAR2  
);
```



## Parameters

**Table 1–20** *rename\_folder parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_name</code>	The full path of the folder name
<code>new_folder_name</code>	The new name for the folder
<code>folder_obj</code>	The MAIL_FOLDER_OBJ representing the folder

## OPEN\_FOLDER Procedure

This procedure opens the specified folder and returns the folder object if the folder is opened successfully. If the folder is marked with a NOSELECT flag, a MAIL\_ERRORS.FOLDER\_TYPE\_ERR is thrown. If a folder has already been opened prior to this call, it is closed without being expunged (messages with the DELETED message flags are not removed from that folder).

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_not_found_err`  
`mail_errors.folder_type_err`

### Syntax

```
PROCEDURE open_folder (
  session_id  IN  NUMBER,
  folder_name IN  VARCHAR2,
  folder_obj  OUT MAIL_FOLDER_OBJ
);
```

## Parameters

**Table 1–21** *open\_folder parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_name</code>	The full path of the folder name

**Table 1–21** *open\_folder parameters*

Parameter	Description
folder_obj	The MAIL_FOLDER_OBJ representing the folder

## GET\_FOLDER\_MESSAGES Procedure

This procedure returns all of the messages with the specified message type in the current open folder.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_closed\_err

### Syntax

```
PROCEDURE get_folder_messages (
  session_id IN NUMBER,
  message_list OUT MAIL_MESSAGE_LIST,
  message_type IN NUMBER DEFAULT MAIL_MESSAGE.GC_ALL_MAIL
);
```

### Parameters

**Table 1–22** *get\_folder\_messages parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_list	A list of message objects that belongs to the folder
message_type	The type of message to be retrieved. The default is to retrieve all types. The message types are defined in the MAIL_MESSAGE package specification. Values are: <ul style="list-style-type: none"> <li>■ MAIL_MESSAGE.GC_ALL_MAIL</li> <li>■ MAIL_MESSAGE.GC_EMAIL</li> <li>■ MAIL_MESSAGE.GC_VOICE_MAIL</li> <li>■ MAIL_MESSAGE.GC_FAX_MAIL</li> <li>■ MAIL_MESSAGE.GC_NEWS_MAIL</li> </ul>

## GET\_MESSAGE Procedure

This procedure returns the message object corresponding to the message UID specified in the current open folder.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_closed\_err

### Syntax

```
PROCEDURE get_message (
  session_id  IN NUMBER,
  message_uid IN NUMBER,
  message_obj OUT MAIL_MESSAGE_OBJ
);
```

### Parameters

**Table 1–23** *get\_message parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_uid	The message identifier
message_obj	The MAIL_MESSAGE_OBJ type that corresponds to the specified UID

## CLOSE\_FOLDER Procedure

This procedure closes the current open folder. If the EXPUNGE\_FLAG is set to true, all messages in the folder that are marked with the Deleted flag are removed.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_closed\_err

### Syntax

```
PROCEDURE close_folder (
  session_id  IN NUMBER,
```

```
expunge_flag IN BOOLEAN  
);
```

## Parameters

**Table 1–24** *close\_folder parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
expunge_flag	A flag indicating whether to expunge the folder before closing

## GET\_MSG\_FLAGS Procedure

This procedure returns message flags belonging to the message list specified in the current open folder.

### Throws Exceptions

```
mail_errors.unauthenticated_err  
mail_errors.folder_closed_err
```

### Syntax

```
PROCEDURE get_msg_flags (  
  session_id IN NUMBER,  
  message_list IN MAIL_MESSAGE_LIST,  
  message_flags OUT DBMS_SQL.NUMBER_TABLE  
);  
PROCEDURE get_msg_flags (  
  session_id IN NUMBER,  
  message_uid_list IN DBMS_SQL.NUMBER_TABLE,  
  message_flags OUT DBMS_SQL.NUMBER_TABLE  
);
```

## Parameters

**Table 1–25**

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_list	A list of message objects that belongs to the folder

**Table 1–25**

Parameter	Description
<code>message_uid_list</code>	A list of message UIDs identifying messages in the folder
<code>message_flags</code>	A list of message flags corresponding to the list of requested messages. Flag values are defined in the <code>MAIL_MESSAGE</code> package specification. Values are: <ul style="list-style-type: none"> <li>▪ <code>MAIL_MESSAGE.GC_SEEN_FLAG</code></li> <li>▪ <code>MAIL_MESSAGE.GC_FLAGGED_FLAG</code></li> <li>▪ <code>MAIL_MESSAGE.GC_ANSWERED_FLAG</code></li> <li>▪ <code>MAIL_MESSAGE.GC_DELETED_FLAG</code></li> <li>▪ <code>MAIL_MESSAGE.GC_DRAFT_FLAG</code></li> </ul>

## SET\_MSG\_FLAGS Procedure

This procedure sets or unsets the message flags belonging to the list of messages specified in the current open folder.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_closed_err`

### Syntax

```
PROCEDURE set_msg_flags (
  session_id IN NUMBER,
  message_list IN MAIL_MESSAGE_LIST,
  flags IN NUMBER,
  set_flag IN BOOLEAN
);
PROCEDURE set_msg_flags (
  session_id IN NUMBER,
  message_uid_list IN DBMS_SQL.NUMBER_TABLE,
  flags IN NUMBER,
  set_flag IN BOOLEAN
);
```

## Parameters

**Table 1–26** *set\_msg\_flags* parameters

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_list</code>	A list of message objects that belongs to the folder
<code>message_uid_list</code>	A list of message UIDs identifying messages in the folder
<code>flags</code>	A list of message flags corresponding to the list of requested messages. Flag values are defined in the MAIL_MESSAGE package specification. Values are: <ul style="list-style-type: none"><li>■ <code>MAIL_MESSAGE.GC_SEEN_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_FLAGGED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_ANSWERED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_DELETED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_DRAFT_FLAG</code></li></ul>
<code>set_flag</code>	If true, sets the value of flags. Otherwise, it unsets the value of flags.

## DELETE\_MESSAGES Procedure

This procedure deletes the list of messages specified in the current open folder. This is equivalent to marking the messages as deleted and performing an expunge operation on the folder.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_closed_err`

### Syntax

```
PROCEDURE delete_messages (  
  session_id IN NUMBER,  
  message_uid_list IN DBMS_SQL.NUMBER_TABLE  
);  
PROCEDURE delete_messages (  
  session_id IN NUMBER,  
  message_list IN MAIL_MESSAGE_LIST
```

```
);
```

## Parameters

**Table 1–27** *delete\_messages parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_uid_list	A list of message UIDs identifying messages in the folder
message_list	A list of message objects that belongs to the folder.

## EXPUNGE\_FOLDER Procedure

This procedure removes all messages in the current open folder if the `gc_deleted_flag` flag is set.

### Throws Exceptions

```
mail_errors.unauthenticated_err  
mail_errors.folder_closed_err
```

### Syntax

```
PROCEDURE expunge_folder (  
  session_id IN NUMBER,  
);
```

## Parameters

**Table 1–28** *expunge\_folder parameter*

Parameter	Description
session_id	An identifier that represents a user's authenticated session

## IS\_FOLDER\_OPEN Function

This function tests to see if the folder is the same folder currently selected in the user's session.

### Throws Exceptions

`mail_errors.unauthenticated_err`

### Syntax

```
FUNCTION is_folder_open (  
  session_id IN NUMBER,  
  folder_obj IN MAIL_FOLDER_OBJ  
) return BOOLEAN;
```

### Parameters

**Table 1–29** *is\_folder\_open* parameters

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>folder_obj</code>	The folder object

## CHECK\_NEW\_MESSAGES Function

This function tests to see if there are any new messages in the currently selected folder. New messages are messages not seen by the folder since the last `GET_NEW_MESSAGES` call. When the folder is first opened, the last message considered retrieved is the message last seen by any mail client. After that the last message is changed accordingly by calls to `GET_FOLDER_MESSAGE` and `GET_NEW_MESSAGES`.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_closed_err`

### Syntax

```
FUNCTION check_new_messages (  
  session_id IN NUMBER,  
  message_type IN NUMBER DEFAULT MAIL_MESSAGE.GC_ALL_MAIL  
) return BOOLEAN;
```



## Parameters

**Table 1–30** *check\_new\_messages parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_type</code>	The type of message to be retrieved. The default is to get all types. The message types are defined in the <code>MAIL_MESSAGE</code> package specification. Values are: <ul style="list-style-type: none"> <li>▪ <code>MAIL_MESSAGE.GC_ALL_MAIL</code></li> <li>▪ <code>MAIL_MESSAGE.GC_EMAIL</code></li> <li>▪ <code>MAIL_MESSAGE.GC_VOICE_MAIL</code></li> <li>▪ <code>MAIL_MESSAGE.GC_FAX_MAIL</code></li> <li>▪ <code>MAIL_MESSAGE.GC_NEWS_MAIL</code></li> </ul>

## CHECK\_RECENT\_MESSAGES Function

This function tests to see if there are any recent messages in the specified folder. Recent messages are messages that have not been retrieved by any mail client. This procedure can be called on a closed folder.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_not_found_err`

### Syntax

```
FUNCTION check_recent_messages (
  session_id IN NUMBER,
  folder_name IN VARCHAR2,
  message_type IN NUMBER DEFAULT MAIL_MESSAGE.GC_ALL_MAIL
) return BOOLEAN;
```

## Parameters

**Table 1–31** *check\_recent\_messages parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session

**Table 1–31** *check\_recent\_messages parameters*

Parameter	Description
folder_name	The full path of the folder name
message_type	The type of message to be retrieved. The default is to retrieve all types. Message types are defined in the MAIL_MESSAGE package specification.  Values are: <ul style="list-style-type: none"><li>■ MAIL_MESSAGE.GC_ALL_MAIL</li><li>■ MAIL_MESSAGE.GC_EMAIL</li><li>■ MAIL_MESSAGE.GC_VOICE_MAIL</li><li>■ MAIL_MESSAGE.GC_FAX_MAIL</li><li>■ MAIL_MESSAGE.GC_NEWS_MAIL</li></ul>

## GET\_NEW\_MESSAGES Procedure

This procedure returns all the new messages in the currently selected folder. New messages are messages not seen by the folder since last message retrieval. When the folder is first opened, the last message considered retrieved is the last message seen by any mail client after the last message is changed accordingly by calls to GET\_FOLDER\_MESSAGES and GET\_NEW\_MESSAGES. If MESSAGE\_TYPE is specified, then only messages in the specified type are returned.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_closed\_err

### Syntax

```
PROCEDURE get_new_messages (  
  session_id IN NUMBER,  
  message_list OUT MAIL_MESSAGE_LIST,  
  message_type IN NUMBER DEFAULT MAIL_MESSAGE.GC_ALL_MAIL  
);
```

## Parameters

**Table 1–32** *get\_new\_messages parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_list</code>	A list of new message objects
<code>message_type</code>	The type of message to be retrieved. The default is to retrieve all types. Message types are defined in the <code>MAIL_MESSAGE</code> package specification. Values are: <ul style="list-style-type: none"> <li>■ <code>MAIL_MESSAGE.GC_ALL_MAIL</code></li> <li>■ <code>MAIL_MESSAGE.GC_EMAIL</code></li> <li>■ <code>MAIL_MESSAGE.GC_VOICE_MAIL</code></li> <li>■ <code>MAIL_MESSAGE.GC_FAX_MAIL</code></li> <li>■ <code>MAIL_MESSAGE.GC_NEWS_MAIL</code></li> </ul>

## COPY\_MESSAGES Procedure

This procedure copies messages in the currently selected folder to another folder. If the destination folder has the `NOSELECT` flag set, the `MAIL_ERRORS.FOLDER_TYPE_ERR` exception is thrown. If the specified message does not belong to the current open folder, the `MAIL_ERRORS.PARAM_PARSE_ERR` exception is thrown.

### Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.folder_closed_err
mail_errors.folder_not_found_err
mail_errors.folder_type_err
mail_errors.param_parse_err
```

### Syntax

```
PROCEDURE copy_messages (
  session_id  IN NUMBER,
  message_list IN MAIL_MESSAGE_LIST,
  to_folder_name IN VARCHAR2
);
PROCEDURE copy_messages (
  session_id  IN NUMBER,
```

```
message_uid_list IN DBMS_SQL.NUMBER_TABLE,  
to_folder_name IN VARCHAR2  
);
```

## Parameters

**Table 1–33** *copy\_messages parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_list	A list of message objects
message_uid_list	A list of message UIDs
to_folder_name	The full path of the destination folder name

## IS\_FOLDER\_MODIFIED Function

This function tests to see if any messages in the currently selected folder have been modified from another session. A folder is modified if any changes in message flags or deletion of messages were made in the folder by another client or session. If the folder was modified, users have to re-issue the `GET_NEW_MESSAGES` procedure to be synchronized with the mail store.

## Throws Exceptions

```
mail_errors.unauthenticated_err  
mail_errors.folder_closed_err
```

## Syntax

```
FUNCTION is_folder_modified (  
session_id IN NUMBER  
);
```

## Parameters

**Table 1–34** *is\_folder\_modified parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session

## SORT\_FOLDER Procedure

This procedure sorts the folder given the sort criteria and returns an ordered list of message UIDs.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.param\_parse\_err

### Syntax

```
PROCEDURE sort_folder (
  session_id  IN NUMBER,
  folder_obj  IN MAIL_FOLDER_OBJ,
  sort_criteria  IN MAIL_SORT_CRITERIA,
  message_uid_list  OUT DBMS_SQL.NUMBER_TABLE
);
PROCEDURE sort_folder (
  session_id  IN NUMBER,
  folder_obj  IN MAIL_FOLDER_OBJ,
  sort_criteria  IN MAIL_SORT_CRITERIA,
  message_list  OUT MAIL_MESSAGE_LIST
);
```

### Parameters

**Table 1–35** *sort\_folder* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_obj	The MAIL_FOLDER_OBJ representing the folder
sort_criteria	A list of sort criterion Values are: <ul style="list-style-type: none"> <li>■ Subject</li> <li>■ Cc</li> <li>■ From</li> <li>■ Date</li> <li>■ Internal_date</li> <li>■ Size</li> </ul>

**Table 1–35** *sort\_folder parameters*

Parameter	Description
message_list	An ordered list of message objects
message_uid_list	An ordered list of message UIDs

## SEARCH\_FOLDER Procedure

This procedure searches the folder and returns a list of message objects that meet the specified criteria. The format of the search criteria is the same as the format in the IMAP4 protocol [RFC 2060], except when specifying to search within a set of messages, the set is passed in as a parameter.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.param\_parse\_err

### Syntax

```
PROCEDURE search_folder (  
  session_id IN NUMBER,  
  folder_obj IN MAIL_FOLDER_OBJ,  
  search_criteria IN VARCHAR2,  
  message_list OUT MAIL_MESSAGE_LIST  
);  
  
PROCEDURE search_folder (  
  session_id IN NUMBER,  
  folder_obj IN MAIL_FOLDER_OBJ,  
  search_criteria IN VARCHAR2,  
  in_message_list IN MAIL_MESSAGE_LIST,  
  message_list OUT MAIL_MESSAGE_LIST  
);
```

### Parameters

**Table 1–36** *search\_folder parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
folder_obj	The MAIL_FOLDER_OBJ representing the folder

**Table 1–36** *search\_folder parameters*

Parameter	Description
<code>search_criteria</code>	A list of search criterion per IMAP4 standard
<code>in_message_list</code>	A list of message objects to search from
<code>message_list</code>	The list of message objects that meets the search criteria

## MAIL\_MESSAGE Package

The MAIL\_MESSAGE package provides message retrieval, message composition, and Oracle Text related functionality. The validity of the session is checked before performing any operation, except for composing send operations. Users can only compose one message at a time, and a MSG\_COMPOSE\_LIMIT\_ERR is thrown if a violation occurs.

The MAIL\_MESSAGE package contains the following message retrieval procedures:

- GET\_MESSAGE\_OBJ Procedure
- GET\_INCLUDED\_MESSAGE Procedure
- GET\_HEADER Procedure
- GET\_HEADERS Procedure
- GET\_CONTENT\_TYPE Procedure
- GET\_REPLY\_TO Procedure
- GET\_SENT\_DATE Procedure
- GET\_SUBJECT Procedure
- GET\_FROM Procedure
- GET\_MESSAGEID Procedure
- GET\_CONTENTID Procedure
- GET\_CONTENTLANG Procedure
- GET\_COTENTMD5 Procedure
- GET\_CHARSET Procedure
- GET\_CONTENTDISP Procedure
- GET\_ENCODING Procedure

- GET\_CONTENT\_FILENAME Procedure
- GET\_MSG\_SIZE Procedure
- GET\_RECEIVED\_DATE Procedure
- GET\_BODYPART\_SIZE Procedure
- GET\_CONTENT\_LINECOUNT Procedure
- GET\_MULTIPART\_BODYPARTS Procedure
- GET\_MSG Procedure
- GET\_MSG\_BODY Procedure
- GET\_BODYPART\_CONTENT Procedure
- GET\_MSGS\_FLAGS Procedure
- SET\_MSGS\_FLAGS Procedure
- GET\_AUTH\_INFO Procedure

The MAIL\_MESSAGE package contains the following message composition procedures:

- COMPOSE\_MESSAGE Procedure
- SET\_MSGHEADER Procedure
- SET\_BPHEADER Procedure
- SET\_HEADER Procedure
- ADD\_BODYPART Procedure
- ADD\_INCLMSG\_BODYPART Procedure
- SET\_INCLMSG\_BODYPART Procedure
- SET\_CONTENT Procedure
- SEND\_MESSAGE Procedure
- APPEND\_MESSAGE Procedure
- DECRYPT\_MESSAGE Procedure
- VERIFY\_MESSAGE Procedure

The MAIL\_MESSAGE package contains the following Oracle Text procedures:

- GET\_THEMES Procedure



- GET\_THEMES Procedure
- GET\_HIGHLIGHT Procedure
- GET\_MARKUPTTEXT Procedure
- GET\_FILTERED\_TEXT Procedure
- GET\_TOKENS Procedure

## GET\_MESSAGE\_OBJ Procedure

This procedure returns a message object given the message UID in the current open folder.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.folder\_closed\_err

### Syntax

```
PROCEDURE get_message_obj (
  session_id   IN NUMBER,
  message_uid  IN NUMBER,
  message_obj  OUT MAIL_MESSAGE_OBJ);
```

### Parameters

**Table 1–37** *get\_message\_obj parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_uid	The message UID
message_obj	The MAIL_MESSAGE_OBJ returned

## GET\_INCLUDED\_MESSAGE Procedure

This procedure returns a message object representing the included message. The message type of the specified message or body-part object must be Content-Type; otherwise the MAIL\_ERRORS.PARAM\_PARSE\_ERR exception is thrown.

## Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.param\_parse\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var

## Syntax

```
PROCEDURE get_included_message (  
  session_id      IN NUMBER,  
  message_obj     IN MAIL_MESSAGE_OBJ,  
  incl_message_obj OUT MAIL_MESSAGE_OBJ);  
PROCEDURE get_included_message (  
  session_id      IN NUMBER,  
  bodypart_obj    IN MAIL_BODYPART_OBJ,  
  incl_message_obj OUT MAIL_MESSAGE_OBJ);
```

## Parameters

**Table 1–38** *get\_included\_message parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object with message Content-Type
bodypart_obj	The body-part object with message Content-Type
incl_message_obj	The MAIL_MESSAGE_OBJ returned

## GET\_HEADER Procedure

This procedure returns the corresponding header value given in the header prompt.

If a message object is passed in, the header value refers to the top-level message header.

If a body-part object is passed in, the header value refers to that specific body-part header.

When the header prompt is not found in the headers, a null value is returned. When the returned value is a VARCHAR2 type, it is truncated to 2000 in length if the length of the value is longer than 2000. If there are multiple headers with the same prompt, the returned value is the first header. When the returned value is a MAIL\_HEADER\_

LIST object list, all headers with the specified prompt name are returned. Each name and value pair is represented by a MAIL\_HEADER\_OBJ object.

## Throws Exceptions

mail\_errors.unauthenticated\_err  
 mail\_errors.bad\_message\_var  
 mail\_errors.bad\_msgpart\_var

## Syntax

```
PROCEDURE get_header (
  session_id    IN NUMBER,
  message_obj   IN MAIL_MESSAGE_OBJ,
  header_prompt IN VARCHAR2,
  header_value  OUT VARCHAR2);
PROCEDURE get_header (
  session_id    IN NUMBER,
  bodypart_obj  IN MAIL_BODYPART_OBJ,
  header_prompt IN VARCHAR2,
  header_value  OUT VARCHAR2);
PROCEDURE get_header (
  session_id    IN NUMBER,
  message_obj   IN MAIL_MESSAGE_OBJ,
  header_list   OUT MAIL_HEADER_LIST);
PROCEDURE get_header (
  session_id    IN NUMBER,
  bodypart_obj  IN MAIL_BODYPART_OBJ,
  header_list   OUT MAIL_HEADER_LIST);
```

## Parameters

**Table 1–39** *get\_header* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
header_prompt	The message header
header_value	The corresponding header value
header_list	A list of header objects with the specified prompt

## GET\_HEADERS Procedure

This procedure returns all of the header values of the given message part. If a message object is passed in, the header value refers to the top-level message header.

If a body-part object is passed in, the header value is referred to that specific body-part header.

When the returned value is a `dbms_sql.varchar2_table` type, all header values are truncated to 2000 in length if the length of the value is longer than 2000. When the headers are returned in a `MAIL_HEADER_LIST` object list, each name and value pair is represented by a `MAIL_HEADER_OBJ` object.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.bad_message_var`  
`mail_errors.bad_msgpart_var`

### Syntax

```
PROCEDURE get_headers (  
  session_id      IN NUMBER,  
  message_obj     IN MAIL_MESSAGE_OBJ,  
  header_prompts  IN dbms_sql.varchar2_table,  
  header_values   OUT dbms_sql.varchar2_table);  
PROCEDURE get_headers (  
  session_id      IN NUMBER,  
  bodypart_obj    IN MAIL_BODYPART_OBJ,  
  header_prompts  IN dbms_sql.varchar2_table,  
  header_values   OUT dbms_sql.varchar2_table);  
PROCEDURE get_headers (  
  session_id      IN NUMBER,  
  message_obj     IN MAIL_MESSAGE_OBJ,  
  header_list     OUT MAIL_HEADER_LIST);  
PROCEDURE get_headers (  
  session_id      IN NUMBER,  
  bodypart_obj    IN MAIL_BODYPART_OBJ,  
  header_list     OUT MAIL_HEADER_LIST);
```

## Parameters

**Table 1–40** *get\_headers parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
header_prompts	An array of header names belonging to this part
header_values	An array of corresponding header values
header_list	A list of header objects belonging to this part

## GET\_CONTENT\_TYPE Procedure

This procedure is used to obtain the Content-Type header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
 mail\_errors.bad\_message\_var  
 mail\_errors.bad\_msgpart\_var

### Syntax

```
PROCEDURE get_content_type (
  session_id IN NUMBER,
  message_obj IN MAIL_MESSAGE_OBJ,
  content_type OUT VARCHAR2);
PROCEDURE get_content_type (
  session_id IN NUMBER,
  bodypart_obj IN MAIL_BODYPART_OBJ,
  content_type OUT VARCHAR2);
```

## Parameters

**Table 1–41** *get\_content\_type parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session

**Table 1–41** *get\_content\_type parameters*

Parameter	Description
message_obj	The message object
bodypart_obj	The body-part object
content_type	The Content-Type header value

## GET\_REPLY\_TO Procedure

This procedure is used to obtain the Reply-To header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var

### Syntax

```
PROCEDURE get_reply_to (  
  session_id IN NUMBER,  
  message_obj IN MAIL_MESSAGE_OBJ,  
  replyTo_str OUT VARCHAR2);
```

### Parameters

**Table 1–42** *get\_reply\_to parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
replyTo_str	The Reply-To header value

## GET\_SENT\_DATE Procedure

This procedure is used to obtain the Date header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_sent_date (
  session_id IN NUMBER,
  message_obj IN MAIL_MESSAGE_OBJ,
  sent_date OUT VARCHAR2);
```

## Parameters

**Table 1–43** *get\_sent\_date parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
sent_date	The Date header value

## GET\_SUBJECT Procedure

This procedure is used to obtain the Subject header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_subject (
  session_id IN NUMBER,
  message_obj IN MAIL_MESSAGE_OBJ,
  subject_str OUT VARCHAR2);
```

## Parameters

**Table 1–44** *get\_subject parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
subject_str	The subject header value

## GET\_FROM Procedure

This procedure is used to obtain the From header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var

### Syntax

```
PROCEDURE get_from (  
  session_id IN NUMBER,  
  message_obj IN MAIL_MESSAGE_OBJ,  
  from_str OUT VARCHAR2);
```

## Parameters

**Table 1–45** *get\_from parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
from_str	The From header value

## GET\_MESSAGEID Procedure

This procedure is used to obtain the Message-ID header value. It internally calls the GET\_HEADER procedure with the specific header prompt.



## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_messageID (
  session_id    IN NUMBER,
  message_obj   IN MAIL_MESSAGE_OBJ,
  messageID_str OUT VARCHAR2);
```

## Parameters

**Table 1–46** *get\_messageid parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
messageID_str	The Message-ID header value

## GET\_CONTENTID Procedure

This procedure is used to obtain the Content-ID header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_contentID (
  session_id    IN NUMBER,
  bodypart_obj  IN MAIL_BODYPART_OBJ,
  contentID_str OUT VARCHAR2);
```

## Parameters

**Table 1–47**

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>bodypart_obj</code>	The body-part object
<code>contentID_str</code>	The Content-ID header value

## GET\_CONTENTLANG Procedure

This procedure is used to obtain the Content-Language header value. It internally calls the `GET_HEADER` procedure with the specific header prompt.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.bad_message_var`  
`mail_errors.bad_msgpart_var`

### Syntax

```
PROCEDURE get_contentLang (  
  session_id IN NUMBER,  
  bodypart_obj IN MAIL_BODYPART_OBJ,  
  language OUT VARCHAR2);
```

## Parameters

**Table 1–48** *get\_contentlang parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>bodypart_obj</code>	The body-part object
<code>language</code>	The Content-Language header value

## GET\_COTENTMD5 Procedure

This procedure is used to obtain the Content-MD5 header value. It internally calls the `GET_HEADER` procedure with the specific header prompt.

## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_contentMD5 (
  session_id  IN  NUMBER,
  bodypart_obj IN  MAIL_BODYPART_OBJ,
  md5         OUT VARCHAR2);
```

## Parameters

**Table 1–49** *get\_contentmd5 parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
md5	The Content-MD5 header value

## GET\_CHARSET Procedure

This procedure is used to obtain the Content-Type header value, and extract the CHARSET attribute value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
```

## Syntax

```
PROCEDURE get_charset (
  session_id  IN  NUMBER,
  bodypart_obj IN  MAIL_BODYPART_OBJ,
  charset     OUT VARCHAR2);
```

## Parameters

**Table 1–50** *get\_charset parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
charset	The character set attribute value

## GET\_CONTENTDISP Procedure

This procedure is used to obtain the Content-Disposition header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var

### Syntax

```
PROCEDURE get_contentDisp (  
  session_id IN NUMBER,  
  bodypart_obj IN MAIL_BODYPART_OBJ,  
  disposition OUT VARCHAR2);
```

## Parameters

**Table 1–51** *get\_contentdisp*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
disposition	The Content-Disposition header value

## GET\_ENCODING Procedure

This procedure is used to obtain the Content-Transfer-Encoding header value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

mail\_errors.unauthenticated\_err  
 mail\_errors.bad\_message\_var  
 mail\_errors.bad\_msgpart\_var

## Syntax

```
PROCEDURE get_encoding (
  session_id  IN  NUMBER,
  message_obj IN  MAIL_MESSAGE_OBJ,
  encoding    OUT VARCHAR2);
PROCEDURE get_encoding (
  session_id  IN  NUMBER,
  bodypart_obj IN MAIL_BODYPART_OBJ,
  encoding    OUT VARCHAR2);
```

## Parameters

**Table 1–52** *get\_encoding parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
encoding	The Content-Transfer-Encoding header value

## GET\_CONTENT\_FILENAME Procedure

This procedure is used to obtain the Content-Disposition header value and extract the filename attribute value. It internally calls the GET\_HEADER procedure with the specific header prompt.

## Throws Exceptions

mail\_errors.unauthenticated\_err  
 mail\_errors.bad\_message\_var  
 mail\_errors.bad\_msgpart\_var

## Syntax

```
PROCEDURE get_content_filename (
```

```
session_id  IN  NUMBER,  
bodypart_obj IN  MAIL_BODYPART_OBJ,  
filename    OUT VARCHAR2);
```

## Parameters

**Table 1–53** *get\_content\_filename parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
filename	The filename attribute value

## GET\_MSG\_SIZE Procedure

This procedure returns the message size.

### Throws Exceptions

mail\_errors.unauthenticated\_err

### Syntax

```
PROCEDURE get_msg_id (  
  session_id  IN  NUMBER,  
  message_obj IN  MAIL_MESSAGE_OBJ,  
  message_size OUT NUMBER);
```

## Parameters

**Table 1–54** *get\_msg\_size parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
message_size	The message size

## GET\_RECEIVED\_DATE Procedure

This procedure is used to obtain the time the message is received at the mail store.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var

### Syntax

```
PROCEDURE get_rcvd_date (
  session_id   IN NUMBER,
  message_obj  IN MAIL_MESSAGE_OBJ,
  date_format  IN VARCHAR2,
  date_str     OUT VARCHAR2);
PROCEDURE get_rcvd_date (
  session_id   IN NUMBER,
  message_obj  IN MAIL_MESSAGE_OBJ,
  received_date OUT DATE);
```

### Parameters

**Table 1–55** *get\_received\_date parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
date_format	The date to string format
date_str	The received date in the string format specified
received_date	The received date in Oracle date format

## GET\_BODYPART\_SIZE Procedure

This procedure returns the size of the body-part.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var

## Syntax

```
PROCEDURE get_bodypart_size (  
  session_id IN NUMBER,  
  bodypart_obj IN MAIL_BODYPART_OBJ,  
  bodypart_size OUT NUMBER);
```

## Parameters

**Table 1–56** *get\_bodypart\_size*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
bodypart_size	The body-part size

## GET\_CONTENT\_LINECOUNT Procedure

This procedure returns the line count of the body-part.

## Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var

## Syntax

```
PROCEDURE get_content_linecount (  
  session_id IN NUMBER,  
  bodypart_obj IN MAIL_BODYPART_OBJ,  
  line_count OUT NUMBER);
```

## Parameters

**Table 1–57** *get\_content\_lineout parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
line_count	The total number of lines in the body-part



## GET\_MULTIPART\_BODYPARTS Procedure

This procedure returns a list of body-parts that belong to the specified multipart message or body-part. If the message or body-part object passed in is not of a multipart MIME type, a `PARAM_PARSE_ERR` exception is raised.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.param_parse_err`  
`mail_errors.bad_message_var`

### Syntax

```
PROCEDURE get_multipart_bodyparts (
  session_id    IN NUMBER,
  message_obj   IN MAIL_MESSAGE_OBJ,
  bodypart_list OUT MAIL_BODYPART_LIST);
PROCEDURE get_multipart_bodyparts (
  session_id    IN NUMBER,
  bodypart_obj  IN MAIL_BODYPART_OBJ,
  bodypart_list OUT MAIL_BODYPART_LIST);
```

### Parameters

**Table 1–58** *get\_multipart\_bodyparts parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_obj</code>	The message object
<code>bodypart_obj</code>	The body-part object
<code>bodypart_list</code>	A list of body-parts

## GET\_MSG Procedure

This procedure returns a BLOB locator to the entire encoded message. Storage does not need to be allocated beforehand.

### Throws Exceptions

`mail_errors.unauthenticated_err`

## Syntax

```
PROCEDURE get_msg (  
    session_id    IN NUMBER,  
    message_obj   IN MAIL_MESSAGE_OBJ,  
    message_source OUT BLOB);
```

## Parameters

**Table 1–59** *get\_msg parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
message_source	The whole message content in its original encoded form

## GET\_MSG\_BODY Procedure

This procedure copies the message body into the specified BLOB locator. The locator must have enough storage for the data. If the message is not a simple MIME type, no data is returned. If the message body's Content-Transfer-Encoding header specifies that the data is encoded, using base64 or quoted-printable encodings, the content is decoded before returning.

## Throws Exceptions

```
mail_errors.unauthenticated_err  
mail_errors.bad_message_var
```

## Syntax

```
PROCEDURE get_msg_body (  
    session_id    IN NUMBER,  
    message_obj   IN MAIL_MESSAGE_OBJ,  
    content       OUT BLOB);
```

## Parameters

**Table 1–60** *get\_msg\_body parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
content	The entire decoded message content

## GET\_BODYPART\_CONTENT Procedure

This procedure copies the content of the body-part into the specified BLOB locator. If the body-part object is not a simple MIME type, no data is returned. If the body-part's Content-Transfer-Encoding header specifies that the data is encoded, using base64 or quoted-printable encodings, the content is decoded before returning.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.bad\_message\_var

### Syntax

```
PROCEDURE get_bodypart_content (
  session_id  IN NUMBER,
  bodypart_obj IN MAIL_BODYPART_OBJ,
  content     OUT BLOB);
```

## Parameters

**Table 1–61** *get\_bodypart\_content parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
content	The entire decoded message content

## GET\_MSGS\_FLAGS Procedure

This procedure returns the message's flags.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_closed_err`

### Syntax

```
PROCEDURE get_msgs_flags (  
  session_id    IN NUMBER,  
  message_obj  IN MAIL_MESSAGE_OBJ,  
  message_flags OUT NUMBER);
```

### Parameters

**Table 1–62** *get\_msgs\_flags parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_obj</code>	A message object
<code>message_flags</code>	<p>A list of message flags corresponding to the list of requested messages. Flag values are defined in the MAIL_MESSAGE package specification.</p> <p>Values are:</p> <ul style="list-style-type: none"><li>■ <code>MAIL_MESSAGE.GC_SEEN_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_FLAGGED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_ANSWERED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_DELETED_FLAG</code></li><li>■ <code>MAIL_MESSAGE.GC_DRAFT_FLAG</code></li></ul>

## SET\_MSGS\_FLAGS Procedure

This procedure sets and unsets the message flags for the specified message object.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.folder_closed_err`

## Syntax

```
PROCEDURE set_msgs_flags (
  session_id    IN NUMBER,
  message_obj  IN MAIL_MESSAGE_OBJ,
  message_flags IN NUMBER,
  set_flag      IN BOOLEAN);
```

## Parameters

**Table 1–63** *set\_msgs\_flags* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	A message object
message_flags	A list of message flags corresponding to the list of requested messages. Flag values are defined in the MAIL_MESSAGE package specification. Values are: <ul style="list-style-type: none"> <li>▪ MAIL_MESSAGE.GC_SEEN_FLAG</li> <li>▪ MAIL_MESSAGE.GC_FLAGGED_FLAG</li> <li>▪ MAIL_MESSAGE.GC_ANSWERED_FLAG</li> <li>▪ MAIL_MESSAGE.GC_DELETED_FLAG</li> <li>▪ MAIL_MESSAGE.GC_DRAFT_FLAG</li> </ul>
set_flag	If true, sets the specified flags, otherwise, unsets the specified flags

## GET\_AUTH\_INFO Procedure

This procedure returns authenticated user information, if available. The authenticated user information is stored when a user authenticates before sending an e-mail.

## Throws Exceptions

mail\_errors.unauthenticated\_err

## Syntax

```
PROCEDURE get_auth_info (
  session_id    IN NUMBER,
```

```
message_obj IN MAIL_MESSAGE_OBJ,  
auth_info OUT VARCHAR2);
```

## Parameters

**Table 1–64** *get\_authinfo parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
auth_info	The authenticated user information

## COMPOSE\_MESSAGE Procedure

This procedure initializes a message composition. There can be at most one message in composition at any given time.

### Throws Exceptions

```
mail_errors.msg_compose_limit_err  
mail_errors.param_parse_err
```

### Syntax

```
PROCEDURE compose_message (  
message_obj OUT MAIL_MESSAGE_OBJ);
```

## Parameters

**Table 1–65** *compose\_message parameters*

Parameter	Description
message_obj	A message object

## SET\_MSGHEADER Procedure

This procedure sets a list of common message headers. If null is specified, the header is not included. If the sent date is null, it is set to the current time.

### Throws Exceptions

```
mail_errors.msg_compose_limit_err
```

## Syntax

```
PROCEDURE set_msgheader (
message_obj  IN  MAIL_MESSAGE_OBJ,
to_str       IN  VARCHAR2,
from_str     IN  VARCHAR2,
cc_str       IN  VARCHAR2 DEFAULT null,
replyto_str IN  VARCHAR2 DEFAULT null,
sent_date   IN  DATE DEFAULT null,
subject_str  IN  VARCHAR2 DEFAULT null,
mime_version IN  VARCHAR2 DEFAULT '1.0',
content_type IN  VARCHAR2 DEFAULT 'text/plain',
charset      IN  VARCHAR2 DEFAULT 'us-ascii',
encoding    IN  VARCHAR2 DEFAULT '8bit');
```

## Parameters

**Table 1–66** *set\_msgheader parameters*

Parameter	Description
message_obj	A message object
to_str	The To RFC822 header
from_str	The From RFC822 header
cc_str	The Cc RFC822 header
replyto_str	The Reply-to RFC822 header
sent_date	The Date RFC822 header
subject_str	The Subject RFC822 header
mime_version	The MIME-Version RFC822 header
content_type	The Content-Type RFC822 header
charset	The Content-Type RFC822 header charset attribute
encoding	The Content-Transfer-Encodin RFC822 header

## SET\_BPHEADER Procedure

This procedure sets a list of common body-part headers. If null is specified, the header is not included. All header values are limited to 2000 in length; if it exceeds the limit, a `MAIL_ERRORS.PARAM_PARSE_ERR` is thrown.

## Throws Exceptions

mail\_errors.msg\_compose\_limit\_err  
mail\_errors.param\_parse\_err

## Syntax

```
PROCEDURE set_bpheader (  
  bodypart_obj IN MAIL_BODYPART_OBJ,  
  content_type IN VARCHAR2 DEFAULT 'text/plain',  
  charset      IN VARCHAR2 DEFAULT 'us-ascii',  
  encoding     IN VARCHAR2 DEFAULT '8bit',  
  contentID    IN VARCHAR2 DEFAULT null,  
  language     IN VARCHAR2 DEFAULT null,  
  contentMD5   IN VARCHAR2 DEFAULT null,  
  description  IN VARCHAR2 DEFAULT null,  
  disposition  IN VARCHAR2 DEFAULT 'inline',  
  filename     IN VARCHAR2 DEFAULT null);
```

## Parameters

**Table 1–67** *set\_bpheader* parameters

Parameter	Description
message_obj	A message object
content_type	The Content-Type header
charset	The Content-Type header charset attribute
encoding	The Content-Transfer-Encoding header
contentID	The Content-ID header
language	The Content-Language header
contentMD5	The Content-MD5 header
description	The Content-Description header
disposition	The Content-Disposition header
filename	The Content-Disposition header filename attribute



## SET\_HEADER Procedure

This procedure sets the header value, given the header prompt. This does not override any previous headers; it adds to them. All header values are limited to 2000 in length; if it exceeds the limit, a `MAIL_ERRORS.PARAM_PARSE_ERR` is thrown.

### Throws Exceptions

`mail_errors.msg_compose_limit_err`  
`mail_errors.param_parse_err`

### Syntax

```
PROCEDURE set_header (
message_obj  IN  MAIL_MESSAGE_OBJ,
header_prompt IN  VARCHAR2,
header_value IN  VARCHAR2);
PROCEDURE set_header (
bodypart_obj IN  MAIL_BODYPART_OBJ,
header_prompt IN  VARCHAR2,
header_value  IN  VARCHAR2);
```

### Parameters

**Table 1–68** *set\_header parameters*

Parameter	Description
<code>message_obj</code>	The message object
<code>bodypart_obj</code>	The body-part object
<code>header_prompt</code>	The message or body-part header
<code>header_value</code>	The corresponding header value

## ADD\_BODYPART Procedure

This procedure adds a child body-part to the specified parent message or body-part of Content-Type multipart. If the parent message or body-part object is not the same type of multipart message, a `PARAM_PARSE_ERR` exception is thrown.

### Throws Exceptions

`mail_errors.msg_compose_limit_err`  
`mail_errors.param_parse_err`

## Syntax

```
PROCEDURE add_bodypart (  
parent_message_obj IN MAIL_MESSAGE_OBJ,  
bodypart_obj      OUT MAIL_BODYPART_OBJ);  
PROCEDURE add_bodypart (  
parent_bodypart_obj IN MAIL_BODYPART_OBJ,  
bodypart_obj      OUT MAIL_BODYPART_OBJ);
```

## Parameters

**Table 1–69** *add\_bodypart* parameters

Parameter	Description
parent_message_obj	The parent message object
parent_bodypart_obj	The parent body-part object
bodypart_obj	The new child body-part object returned

## ADD\_INCLMSG\_BODYPART Procedure

This procedure adds a new included message to the specified parent message or body-part of Content-Type message. If the parent message or body-part object is not the same type of message, a `PARAM_PARSE_ERR` exception is thrown.

## Throws Exceptions

```
mail_errors.msg_compose_limit_err  
mail_errors.param_parse_err
```

## Syntax

```
PROCEDURE add_inclmsg_bodypart (  
parent_message_obj IN MAIL_MESSAGE_OBJ,  
message_obj      OUT MAIL_MESSAGE_OBJ);  
PROCEDURE add_inclmsg_bodypart (  
parent_bodypart_obj IN MAIL_BODYPART_OBJ,  
message_obj      OUT MAIL_MESSAGE_OBJ);
```

## Parameters

**Table 1–70** *add\_inclmsg\_bodypart parameters*

Parameter	Description
parent_message_obj	The parent message object
parent_bodypart_obj	The parent body-part object
message_obj	The new included message object returned

## SET\_INCLMSG\_BODYPART Procedure

This procedure sets an included message to the specified parent message or body-part of Content-Type message. The included message must already exist in the mail store. If the parent message or body-part object is not the same type of message, a `PARAM_PARSE_ERR` exception is thrown.

### Throws Exceptions

`mail_errors.msg_compose_limit_err`  
`mail_errors.param_parse_err`

### Syntax

```
PROCEDURE set_inclmsg_bodypart (
parent_message_obj IN MAIL_MESSAGE_OBJ,
message_obj       IN MAIL_MESSAGE_OBJ);
PROCEDURE set_inclmsg_bodypart (
parent_bodypart_obj IN MAIL_BODYPART_OBJ,
message_obj       IN MAIL_MESSAGE_OBJ);
```

## Parameters

**Table 1–71** *set\_inclmsg\_bodypart parameters*

Parameter	Description
parent_message_obj	The parent message object
parent_bodypart_obj	The parent body-part object
message_obj	An existing message in mail store

## SET\_CONTENT Procedure

This procedure sets the message or body-part content for the message in the composition. If the message or body-part is not a simple MIME type, a `PARAM_PARSE_ERR` is thrown. This procedure can be called multiple times. The data is connected together. The data should be in decoded form. When the composed message is sent or appended, the data is encoded according to the Content-Transfer-Encoding header specified for this part of the data.

### Throws Exceptions

`mail_errors.msg_compose_limit_err`  
`mail_errors.param_parse_err`

### Syntax

```
PROCEDURE set_content (  
message_obj IN MAIL_MESSAGE_OBJ,  
content IN RAW);  
PROCEDURE set_content (  
message_obj IN MAIL_MESSAGE_OBJ,  
content IN BLOB);  
PROCEDURE set_content (  
bodypart_obj IN MAIL_BODYPART_OBJ,  
content IN RAW);  
PROCEDURE set_content (  
bodypart_obj IN MAIL_BODYPART_OBJ,  
content IN BLOB);
```

### Parameters

**Table 1–72** *set\_content parameters*

Parameter	Description
<code>message_obj</code>	The message object
<code>bodypart_obj</code>	The body-part object
<code>content</code>	The message or body-part content

## SEND\_MESSAGE Procedure

This procedure sends the message currently in composition. The message can also be sent encrypted, signed, or both.

## Throws Exceptions

mail\_errors.msg\_compose\_limit\_err  
mail\_errors.smime\_err

## Syntax

```
PROCEDURE send_message (
message_obj      IN MAIL_MESSAGE_OBJ);
PROCEDURE send_message (
message_obj      IN MAIL_MESSAGE_OBJ,
certificate      IN RAW,
private_key      IN RAW,
recipients       IN MAIL_MESSAGE.RAW_TABLE,
inclOrigCert     IN BOOLEAN,
inclOrigAsRecip IN BOOLEAN,
digest_algorithm IN BINARY_INTEGER,
sign_algorithm   IN BINARY_INTEGER,
encrypt_algorithm IN BINARY_INTEGER,
send_option      IN NUMBER);
```

## Parameters

**Table 1–73** *send\_message* parameters

Parameter	Description
message_obj	The message object
certificate	The user's certificate
private_key	The user's private key
recipients	The recipient's certificates
inclOrigCert	Specifies whether to include the user's certificate when encrypting, signing, or both
inclOrigAsRecip	Specifies whether to include the user's certificate in the recipient list
digest_algorithm	The algorithm to use for generating the digest when signing. It is not used if the message is only being encrypted Values are: <ul style="list-style-type: none"> <li>▪ MAIL_MESSAGE.GC_MD5</li> <li>▪ MAIL_MESSAGE.GC_SHA1</li> </ul>

## APPEND\_MESSAGE Procedure

This procedure appends the current message composition to the specified folder. The user must be authenticated and the folder must belong to the user.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.msg\_compose\_limit\_err

### Syntax

```
PROCEDURE append_message (  
  session_id      IN NUMBER,  
  message_obj     IN MAIL_MESSAGE_OBJ,  
  folder_name     IN VARCHAR2,  
  received_date   IN DATE DEFAULT null,  
  message_flags   IN NUMBER DEFAULT 0);  
PROCEDURE append_message (  
  session_id      IN NUMBER,  
  message_obj     IN MAIL_MESSAGE_OBJ,  
  folder_obj      IN MAIL_FOLDER_OBJ,  
  received_date   IN DATE DEFAULT null,  
  message_flags   IN NUMBER DEFAULT 0);
```

### Parameters

**Table 1–74** *append\_message parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
folder_name	The folder to which the message is appended
folder_obj	The folder to which the message is appended
received_date	The message's received date

**Table 1–74** *append\_message parameters*

Parameter	Description
message_flags	<p>A list of message flags corresponding to the list of requested messages. Flag values are defined in the MAIL_MESSAGE package specification.</p> <p>Values are:</p> <ul style="list-style-type: none"> <li>■ MAIL_MESSAGE.GC_SEEN_FLAG</li> <li>■ MAIL_MESSAGE.GC_FLAGGED_FLAG</li> <li>■ MAIL_MESSAGE.GC_ANSWERED_FLAG</li> <li>■ MAIL_MESSAGE.GC_DELETED_FLAG</li> <li>■ MAIL_MESSAGE.GC_DRAFT_FLAG</li> </ul>

## DECRYPT\_MESSAGE Procedure

This procedure decrypts a S/MIME message and returns a list of body-parts that belongs to the encrypted part.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.smime\_err

### Syntax

```
PROCEDURE decrypt_message (
  session_id      IN  NUMBER,
  message_obj     IN  MAIL_MESSAGE_OBJ,
  certificate     IN  RAW,
  private_key     IN  RAW,
  bodypart_list  OUT MAIL_BODYPART_LIST
);

PROCEDURE decrypt_message (
  session_id      IN  NUMBER,
  bodypart_obj    IN  MAIL_MESSAGE_OBJ,
  certificate     IN  RAW,
  private_key     IN  RAW,
  bodypart_list  OUT MAIL_BODYPART_LIST
);
```

## Parameters

**Table 1–75** *decrypt\_message parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part message
certificate	The user's certificate
private_key	The user's private key
bodypart_list	The decrypted body-part list

## VERIFY\_MESSAGE Procedure

This procedure verifies a digitally signed message.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.smime\_err

### Syntax

```
PROCEDURE verify_message (
  session_id      IN  NUMBER,
  certificate     IN  RAW,
  private_key    IN  RAW,
  original_content IN BLOB,
  certificate_list IN ES_CERT_LIST,
  signature      IN  BLOB,
  returned_content OUT BLOB
);
```

## Parameters

**Table 1–76** *verify\_message parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
certificate	The user's certificate



**Table 1–76** *verify\_message parameters*

Parameter	Description
private_key	The user's private key
original_content	The message content
certificate_list	The certificate list
signature	The digitally signed signature

## GET\_THEMES Procedure

This procedure retrieves the theme for the message or body-part. If a message object is specified, the entire message is processed. If a body-part object is specified, the part must be a simple type and not contain any other body-parts.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
 mail\_errors.sql\_err  
 mail\_erros.imt\_err  
 mail\_errors.bad\_message\_var  
 mail\_errors.bad\_msgpart\_var  
 mail\_errors.no\_binary\_err

### Syntax

```
PROCEDURE get_themes (
  session_id      IN NUMBER,
  message_obj     IN MAIL_MESSAGE_OBJ,
  flags           IN INTEGER,
  incl_binary_parts IN BOOLEAN,
  theme_buffer    OUT ES_OT_API.THEME_TABLE);
PROCEDURE get_themes (
  session_id      IN NUMBER,
  bodypart_obj    IN MAIL_BODYPART_OBJ,
  flags           IN INTEGER,
  incl_binary_parts IN BOOLEAN,
  theme_buffer    OUT ES_OT_API.THEME_TABLE);
```

## Parameters

**Table 1–77** *get\_themes parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
flags	Currently not used
incl_binary_parts	If false, the non-text part is ignored
theme_buffer	The theme buffer

## GET\_HIGHLIGHT Procedure

This procedure retrieves the highlights for the message or body-part. If a message object is specified, the entire message is processed. If a body-part object is specified, the part must be a simple type and not contain any other body-parts.

### Throws Exceptions

mail\_errors.unauthenticated\_err  
mail\_errors.sql\_err  
mail\_errros.imt\_err  
mail\_errors.bad\_message\_var  
mail\_errors.bad\_msgpart\_var  
mail\_errors.no\_binary\_err

### Syntax

```
PROCEDURE get_highlight (  
  session_id      IN  NUMBER,  
  message_obj    IN  MAIL_MESSAGE_OBJ,  
  flags          IN  INTEGER,  
  text_query     IN  VARCHAR2,  
  incl_binary_parts IN  BOOLEAN,  
  highlight_buffer OUT ES_OT_API.HIGHLIGHT_TABLE);  
PROCEDURE get_highlight (  
  session_id      IN  NUMBER,  
  bodypart_obj    IN  MAIL_BODYPART_OBJ,  
  flags          IN  INTEGER,  
  text_query     IN  VARCHAR2,  
  incl_binary_parts IN  BOOLEAN,
```

```
highlight_buffer OUT ES_OT_API.HIGHLIGHT_TABLE);
```

## Parameters

**Table 1–78** *get\_highlight parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
flags	The returned buffer format Values are: <ul style="list-style-type: none"> <li>■ MAIL_MESSAGE.GC_TEXT_FORMAT</li> <li>■ MAIL_MESSAGE_GC_HTML_FORMAT</li> </ul>
text_query	The string you want to query
incl_binary_parts	If false, the non-text part is ignored
highlight_buffer	The highlight buffer

## GET\_MARKUPTEXT Procedure

This procedure retrieves the mark-up text for the message or body-part. If a message object is specified, the entire message is processed. If a body-part object is specified, the part must be a simple type and not contain any other body-parts.

### Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.sql_err
mail_errros.imt_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
mail_errors.no_markup
mail_errors.no_binary_err
```

### Syntax

```
PROCEDURE get_markuptext (
  session_id      IN NUMBER,
  message_obj     IN MAIL_MESSAGE_OBJ,
  flags           IN INTEGER,
```

```

text_query      IN  VARCHAR2,
incl_binary_parts IN  BOOLEAN,
tag_set         IN  VARCHAR2 DEFAULT 'TEXT_DEFAULT',
start_tag      IN  VARCHAR2 DEFAULT NULL,
end_tag        IN  VARCHAR2 DEFAULT NULL,
prev_tag       IN  VARCHAR2 DEFAULT NULL,
next_tag       IN  VARCHAR2 DEFAULT NULL,
buffer         OUT CLOB);
PROCEDURE get_markuptext (
session_id     IN  NUMBER,
bodypart_obj  IN  MAIL_BODYPART_OBJ,
flags         IN  INTEGER,
text_query    IN  VARCHAR2,
incl_binary_parts IN  BOOLEAN,
tag_set       IN  VARCHAR2 DEFAULT 'TEXT_DEFAULT',
start_tag    IN  VARCHAR2 DEFAULT NULL,
end_tag      IN  VARCHAR2 DEFAULT NULL,
prev_tag     IN  VARCHAR2 DEFAULT NULL,
next_tag     IN  VARCHAR2 DEFAULT NULL,
buffer       OUT CLOB);

```

## Parameters

**Table 1–79** *get\_markuptext* parameters

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
flags	The returned buffer format. Values are: <ul style="list-style-type: none"> <li>■ MAIL_MESSAGE.GC_TEXT_FORMAT</li> <li>■ MAIL_MESSAGE_GC_HTML_FORMAT</li> </ul>
text_query	The string you want to query
incl_binary_parts	If false, non-text part is ignored
tag_set	Refer to Oracle Text documentation
star_ttag	Refer to Oracle Text documentation
end_tag	Refer to Oracle Text documentation

**Table 1–79** *get\_markuptext parameters*

Parameter	Description
prev_tag	Refer to Oracle Text documentation
next_tag	Refer to Oracle Text documentation
buffer	The mark-up text buffer

## GET\_FILTERED\_TEXT Procedure

This procedure retrieves the filtered text for the message or body-part. If a message object is specified, the entire message is processed. If a body-part object is specified, the part must be a simple type and not contain any other body-parts.

### Throws Exceptions

```
mail_errors.unauthenticated_err
mail_errors.sql_err
mail_errros.imt_err
mail_errors.bad_message_var
mail_errors.bad_msgpart_var
mail_errors.no_binary_err
```

### Syntax

```
PROCEDURE get_filtered_text (
  session_id      IN NUMBER,
  message_obj     IN MAIL_MESSAGE_OBJ,
  flags           IN INTEGER,
  incl_binary_parts IN BOOLEAN,
  buffer          OUT CLOB);
PROCEDURE get_filtered_text (
  session_id      IN NUMBER,
  bodypart_obj    IN MAIL_BODYPART_OBJ,
  flags           IN INTEGER,
  incl_binary_parts IN BOOLEAN,
  buffer          OUT CLOB);
```

## Parameters

**Table 1–80** *get\_filtered\_text parameters*

Parameter	Description
<code>session_id</code>	An identifier that represents a user's authenticated session
<code>message_obj</code>	The message object
<code>bodypart_obj</code>	The body-part object
<code>flags</code>	The returned buffer format Values are: <ul style="list-style-type: none"> <li>■ <code>MAIL_MESSAGE.GC_TEXT_FORMAT</code></li> <li>■ <code>MAIL_MESSAGE_GC_HTML_FORMAT</code></li> </ul>
<code>incl_binary_parts</code>	If false, the non-text part is ignored
<code>buffer</code>	The filtered text buffer

## GET\_TOKENS Procedure

This procedure retrieves the tokens for the message or body-part. If a message object is specified, the entire message is processed. If a body-part object is specified, the part must be a simple type and not contain any other body-parts.

### Throws Exceptions

`mail_errors.unauthenticated_err`  
`mail_errors.sql_err`  
`mail_errros.imt_err`  
`mail_errors.bad_message_var`  
`mail_errors.bad_msgpart_var`  
`mail_errors.no_binary_err`

### Syntax

```
PROCEDURE get_tokens (
  session_id          IN NUMBER,
  message_obj        IN MAIL_MESSAGE_OBJ,
  language            IN VARCHAR2,
  incl_binary_parts  IN BOOLEAN,
  token_buffer       OUT ES_OT_API.TOKEN_TABLE);
PROCEDURE get_tokens (
  session_id          IN NUMBER,
  bodypart_obj       IN MAIL_BODYPART_OBJ,
```

```

language          IN  VARCHAR2,
incl_binary_parts IN  BOOLEAN,
token_buffer      OUT ES_OT_API.TOKEN_TABLE);

```

## Parameters

**Table 1–81** *get\_tokens parameters*

Parameter	Description
session_id	An identifier that represents a user's authenticated session
message_obj	The message object
bodypart_obj	The body-part object
language	The language of the message or body-part data.
incl_binary_parts	If false, the non-text part is ignored
token_buffer	The token buffer

## Exceptions

This section describes the following exceptions for the PL/SQL APIs:

- external\_rule\_err EXCEPTION
- external\_cond\_err EXCEPTION
- too\_many\_rules EXCEPTION
- sql\_err EXCEPTION
- imt\_err EXCEPTION
- bad\_message\_var EXCEPTION
- bad\_msgpart\_var EXCEPTION
- no\_binary\_err EXCEPTION
- unauthenticated\_err EXCEPTION
- folder\_closed\_err EXCEPTION
- msg\_compose\_limit\_err EXCEPTION
- folder\_not\_found\_err EXCEPTION

- `folder_already_exists_err` EXCEPTION
- `operation_not_allowed` EXCEPTION
- `param_parse_err` EXCEPTION
- `internal_err` EXCEPTION
- `folder_name_err` EXCEPTION
- `login_err` EXCEPTION
- `folder_type_err` EXCEPTION
- `smime_err` EXCEPTION

### **`external_rule_err` EXCEPTION**

Error No: 20001

Message: Error executing external rule

Cause: A rule defined as an external PL/SQL procedure failed during execution

Action: Check the correctness of the external PL/SQL procedure

### **`external_cond_err` EXCEPTION**

Error No: 20002

Message: External condition failed

Cause: A condition defined as an external PL/SQL function failed during evaluation

Action: Check the correctness of the external PL/SQL function

### **`too_many_rules` EXCEPTION**

Error No: 20003

Message: Too many rules fired, stop

Cause: Number of rules triggered for a message exceeded the maximum number of rules allowed. The default is 20

Action:

- Check if the rules involved causes infinite looping.



- Reduce the number of rules defined
- Ask the administrator to increase the maximum number of rules allowed

### **sql\_err EXCEPTION**

Error No: 20101

Message: Some SQL error occurred: %s

Cause: An SQL error occurred. See the error text returned for more information

Action: Refer to the *Oracle9i Database Error Messages* guide

### **imt\_err EXCEPTION**

Error No: 20102

Message: interMedia Text error: %s

Cause: Internal Oracle Text error occurred. See the error text returned for more information

Action: Refer to the Oracle Text documentation

### **bad\_message\_var EXCEPTION**

Error No: 20103

Message: No such message: %s

Cause: Exception is raised when the message or body-part object passed in is invalid. The message may have been removed by another mail session

Action: Ensure that the message or body-part object passed in is valid

### **bad\_msgpart\_var EXCEPTION**

Error No: 20104

Message: No such message part: %s

Cause: Exception is raised when the MIME-level of the message or body-part object passed in is invalid

Action: Ensure that the MIME level of the message or body-part object passed in is valid

### **no\_binary\_err EXCEPTION**

Error No: 20106

Message: No binary part: %s

Cause: Exception is raised when the specified message part is binary, but the API option specifies that binary is false

Action: Set the `withbinary` parameter to `True` for Oracle Text

### **unauthenticated\_err EXCEPTION**

Error No: 20201

Message: User needs to be authenticated first!

Cause: User is not currently authenticated

Action: Call the `mail_session.login()` procedure to authenticate the user

### **folder\_closed\_err EXCEPTION**

Error No: 20202

Message: Folder needs to be opened first!

Cause: Certain operations require that the folder involved be opened first

Action: Call the `mail_folder.open_folder()` procedure to open the folder first

### **msg\_compose\_limit\_err EXCEPTION**

Error No: 20203

Message: Compose one message at a time!

Cause: Exception is raised if user tries to compose more than one message at a time

Action: Send or append the current message before starting to compose the second message

### **folder\_not\_found\_err EXCEPTION**

Error No: 20204

Message: Folder does not exist: %s

---

Cause: Exception is raised if user is trying to do an operation on a folder that does not exist on the mail store

Action: Ensure that the folder exists before performing the operation

### **folder\_already\_exists\_err EXCEPTION**

Error No: 20205

Message: Folder already exists: %s

Cause: Exception is raised if user tries to create or rename as a folder name that already exists

Action: Choose a different folder name and retry

### **operation\_not\_allowed EXCEPTION**

Error No: 20206

Message: Operation not allowed: %s

Cause: Possible causes for this exception are:

- Trying to delete the INBOX folder
- Trying to rename a folder to a descendent older name, such as x/y

Action: Do not try to re-arrange a folder hierachy with the rename operation. Use the create and delete operations to achieve the desired folder hierachy

### **param\_parse\_err EXCEPTION**

Error No: 20208

Message: Param parsing error: %s

Cause: Errors in the parameter passed into the API. Possible causes are:

- The specified message UID does not exist in the current folder
- Trying to send or append a message not currently in composition
- Passed in message or bodypart object with wrong Content-Type value
- Invalid sort criteria
- Unmatched parentheses or quote in search string
- Unsupported search criteria

- Unknown search criteria
- The header value exceeds the 2000 length limit
- Trying to create a folder with null foldername

Action: Correct the parameter passed to the API and try again

### **internal\_err EXCEPTION**

Error No: 20209

Message: Internal error: %s

Cause: An internal assertion has failed. Data is in an inconsistent state

Action: Contact Oracle Support

### **folder\_name\_err EXCEPTION**

Error No: 20210

Message: Bad folder name: %s

Cause: Trying to create or rename a folder under another user's name space

Action: Correct the folder name and try again

### **login\_err EXCEPTION**

Error No: 20211

Message: Oracle Internet Directory Login Error: %s

Cause: Exception is raised when an invalid username or password is specified

Action: Check the spelling and try again

### **folder\_type\_err EXCEPTION**

Error No: 20212

Message: Folder type violation: %s

Cause: Possible cause for this error includes:

- Trying to open a non-selectable folder

- Trying to create a folder where the parent folder does not permit sub-folder creation
- Trying to delete a non-selectable folder that still has sub-folders
- Trying to copy messages to a non-selectable folder

Action: Avoid these types of folder violations

## smime\_err EXCEPTION

Error No: 20213

Message: S/MIME error: %s

Cause: Some error in calling S/MIME functions. The S/MIME error code reveals more details.

Action: Refer to the S/MIME documentation for the error code descriptions

## Examples

This section gives examples of how to log in and use the create, list, search, fetch, compose, send functions on folders. It also has an example of how to use the GetTheme API.

This section contains the following topics:

- Login, Create, List, and Search Example
- Login and Fetch All Example
- Compose and Send Example
- GetTheme Example

### Login, Create, List, and Search Example

This example shows how to log in, create, list, and search on a folder.

```
set serveroutput on size 1000000;
```

```
DECLARE
  user_name          VARCHAR2(50) := 'testuser1';
  user_pswd         VARCHAR2(50) := 'welcome';
  user_domain       VARCHAR2(50) := 'oracle.com';
  ldap_server       VARCHAR2(50) := 'test-sun.us.oracle.com';
```

```
ldap_port          NUMBER := 389;

sessionID          NUMBER;
my_folder_obj     MAIL_FOLDER_OBJ;
my_folder_list    MAIL_FOLDER_LIST;
inbox_obj         MAIL_FOLDER_OBJ;
search_string     VARCHAR2(500);
message_list      MAIL_MESSAGE_LIST;

-- declare and define two procedures to recursively print out all folders
PROCEDURE print_folder(session_id IN NUMBER,
                       folder_obj IN MAIL_FOLDER_OBJ);
PROCEDURE print_folderlist(session_id IN NUMBER,
                            flist IN MAIL_FOLDER_LIST);

PROCEDURE print_folder(session_id IN NUMBER,
                       folder_obj IN MAIL_FOLDER_OBJ) IS
    flist MAIL_FOLDER_LIST;
BEGIN
    -- print out the folder name
    dbms_output.put_line(folder_obj.name);

    -- if there are child-folder, print them too
    if mail_folder.has_folder_children(session_id, folder_obj) then
        -- get all the child-folders and prin them
        mail_folder.list_folders(session_id, folder_obj, flist);
        print_folderlist(flist);
    end if;
END;

PROCEDURE print_folderlist(session_id IN NUMBER,
                            flist IN MAIL_FOLDER_LIST) IS
BEGIN
    for i in 1..flist.count loop
        print_folder(session_id, flist(i));
    end loop;
END;

BEGIN
    -- login
    mail_session.login(user_name, user_pswd, user_domain,
                      ldap_server, sessionID, ldap_port);
    dbms_output.put_line(user_name || ' logged-in');

    -- create a new folder called my_folder
```

```
mail_folder.create_folder(sessionID, 'my_folder', my_folder_obj);
dbms_output.put_line('Created my_folder folder');

-- list all folders
mail_folder.list_toplevel_folders(sessionID, my_folder_list);
dbms_output.put_line('My folder list:');
print_folderlist(sessionID, my_folder_list);

-- open INBOX
mail_folder.open_folder(sessionID, 'INBOX', inbox_obj);
dbms_output.put_line('Opened INBOX');

-- search on INBOX for mails from Crosby with subject containing the word
-- White Christmas
search_string := 'from Crosby subject White Christmas';
mail_folder.search_folder(sessionID, inbox_obj, search_string, message_list);
dbms_output.put_line('Search for ' || search_string || ' returns:');
FOR i IN 1..message_list.COUNT LOOP
    dbms_output.put(message_list(i).msg_uid || ' ');
END LOOP;
dbms_output.new_line;

-- logout
mail_session.logout(sessionID);
dbms_output.put_line('Elvis has left the building!');

-- commit
commit;
EXCEPTION
    WHEN mail_errors.login_err THEN
        dbms_output.put_line('Failed to log-in!!!');
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
    WHEN mail_errors.folder_already_exists_err OR
        mail_errors.folder_type_err THEN
        dbms_output.put_line('Failed to create folder!!!');
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
    WHEN OTHERS THEN
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
END;
```

/

## Login and Fetch All Example

This example shows how to log in and fetch all messages from a folder.

```
set serveroutput on size 1000000;

DECLARE
    user_name          VARCHAR2(50) := 'testuser1';
    user_pswd          VARCHAR2(50) := 'welcome';
    user_domain        VARCHAR2(50) := 'oracle.com';
    ldap_server        VARCHAR2(50) := 'test-sun.us.oracle.com';
    ldap_port          NUMBER := 389;

    sessionID          NUMBER;
    inbox_obj          MAIL_FOLDER_OBJ;
    message_list       MAIL_MESSAGE_LIST;

    -- declare and define some sub-programs to print out a message
    PROCEDURE print_message (sessionId IN NUMBER,
                             p_msg_obj IN MAIL_MESSAGE_OBJ);

    PROCEDURE print_bodypart (sessionId IN NUMBER,
                              p_bp_obj IN MAIL_BODYPART_OBJ);

    PROCEDURE print_header (sessionId IN NUMBER,
                             p_msg_obj IN MAIL_MESSAGE_OBJ);

    PROCEDURE print_header (sessionId IN NUMBER,
                              p_bp_obj IN MAIL_BODYPART_OBJ);

    PROCEDURE print_content (sessionId          IN NUMBER,
                             p_msg_obj         IN MAIL_MESSAGE_OBJ,
                             p_content_type    IN varchar2);

    PROCEDURE print_content (sessionId          IN NUMBER,
                              p_bp_obj         IN MAIL_BODYPART_OBJ,
                              p_content_type    IN varchar2);

    PROCEDURE print_message (sessionId IN NUMBER,
                             p_msg_obj IN MAIL_MESSAGE_OBJ) IS
        bp_list          MAIL_BODYPART_LIST;
```



```
content_type      varchar2(500);
incl_msg          MAIL_MESSAGE_OBJ;
BEGIN
  -- print out the message header
  print_header(sessionId, p_msg_obj);

  -- get the message's content-type
  mail_message.get_content_type(sessionId, p_msg_obj, content_type);
  content_type := upper(content_type);

  -- if it is a multipart type, get each of its body-parts and print
  -- it out one by one
  if content_type like 'MULTIPART/%' then
    mail_message.get_multipart_bodyparts(sessionId, p_msg_obj, bp_list);
    for i in 1..bp_list.count loop
      print_bodypart(sessionId, bp_list(i));
    end loop;

  -- if it is a message type, get the included message and print
  -- the included message
  elsif content_type like 'MESSAGE/%' then
    mail_message.get_included_message(sessionId, p_msg_obj, incl_msg);
    print_message(sessionId, incl_msg);

  -- if it is a simple type, print the content
  else
    print_content(sessionId, p_msg_obj, content_type);
  end if;
END;

PROCEDURE print_bodypart (sessionId IN NUMBER,
                        p_bp_obj   IN MAIL_BODYPART_OBJ) IS
  bp_list      MAIL_BODYPART_LIST;
  content_type  varchar2(500);
  incl_msg     MAIL_MESSAGE_OBJ;
BEGIN
  -- print out the body-part header
  print_header(sessionId, p_bp_obj);

  -- get the body-part's content-type
  mail_message.get_content_type(sessionId, p_bp_obj, content_type);
  content_type := upper(content_type);

  -- if it is a multipart type, get each of its body-parts and print
  -- it out one by one
```

```
if content_type like 'MULTIPART/%' then
    mail_message.get_multipart_bodyparts(sessionId, p_bp_obj, bp_list);
    for i in 1..bp_list.count loop
        print_bodypart(sessionId, bp_list(i));
    end loop;

-- if it is a message type, get the included message and print
-- the included message
elsif content_type like 'MESSAGE/%' then
    mail_message.get_included_message(sessionId, p_bp_obj, incl_msg);
    print_message(sessionId, incl_msg);

-- if it is a simple type, print the content
else
    print_content(sessionId, p_bp_obj, content_type);
end if;
END;

--
-- private procedure to print header given a MAIL_HEADER_LIST object
--
PROCEDURE print_hdrlist (hdr_list    IN MAIL_HEADER_LIST)
BEGIN
    dbms_output.put_line('[# message hdr: ' || hdr_list.count || ']');
    for i in 1..hdr_list.count loop
        dbms_output.put(hdr_list(i).header_prompt || ': ');
        for j in 1..hdr_list(i).header_value.count loop
            dbms_output.put_line(hdr_list(i).header_value(j));
        end loop;
    end loop;
END;

PROCEDURE print_header (sessionId    IN NUMBER,
                        p_msg_obj     IN MAIL_MESSAGE_OBJ) IS
    hdr_list             MAIL_HEADER_LIST;
    msg_size             NUMBER;
    msg_flags            NUMBER;
    msg_rcvd_date        VARCHAR2(50);
BEGIN
    if p_msg_obj.mime_level = '0' then -- top level message
        mail_message.get_msg_size(sessionId, p_msg_obj, msg_size);
        mail_message.get_msg_flags(sessionId, p_msg_obj, msg_flags);
        mail_message.get_received_date(sessionId, p_msg_obj,
                                        'DD-Mon-YYYY HH24:MI:SS',
                                        msg_rcvd_date);
    end if;
END;
```

```

        dbms_output.put_line('[MSG_SIZE: ' || msg_size || ']' ||
                             ' [MSG_FLAG: ' || msg_flags || ']');
        dbms_output.put_line('[message header:]');
    else
        dbms_output.put_line('[included message header:]');
    end if;

    -- get all the headers for this message and print them
    mail_message.get_headers(sessionId, p_msg_obj, hdr_list);
    print_hdrlist(hdr_list);

    if p_msg_obj.mime_level = '0' then          -- top level message
        dbms_output.put_line('Received: ' || msg_rcvd_date);
    end if;

    dbms_output.new_line;
END;

PROCEDURE print_header (sessionId      IN NUMBER,
                       p_bp_obj       IN MAIL_BODYPART_OBJ) IS
    hdr_list             MAIL_HEADER_LIST;
BEGIN
    -- get all the headers for this body-part and print them
    dbms_output.put_line('[bodypart header:]');
    mail_message.get_headers(sessionId, p_bp_obj, hdr_list);
    print_hdrlist(hdr_list);
    dbms_output.new_line;
END;

PROCEDURE print_content (sessionId      IN NUMBER,
                        p_msg_obj       IN MAIL_MESSAGE_OBJ,
                        p_content_type  IN varchar2) IS
    msg_data             BLOB;
    l_data               RAW(255);
    l_length             NUMBER;
    l_offset             NUMBER;
    l_size               NUMBER;
BEGIN
    -- create a temporary lob to hold the message body
    dbms_lob.createtemporary(msg_data, TRUE, dbms_lob.session);

    -- get the decoded message body
    mail_message.get_msg_body(sessionId, p_msg_obj, msg_data);
    l_length := dbms_lob.getlength(msg_data);

```

```

dbms_output.put_line('read ' || l_length || ');
dbms_output.new_line;

-- print the decoded message body if it is a text type
if p_content_type like 'TEXT/%' then
    l_offset := 1;
    while l_offset <= l_length loop
        -- sqlplus has a limitation of 255 characters per line.
        -- break the content into 250-character chunks and print.
        if (l_length - l_offset + 1) <= 250 then
            l_size := l_length - l_offset + 1;
        else
            l_size := 250;
        end if;
        l_data := dbms_lob.substr(msg_data, l_size, l_offset);
        l_offset := l_offset + l_size;
        dbms_output.put_line(utl_raw.cast_to_varchar2(l_data));
    end loop;
end if;

-- free the temporary lob allocated
dbms_lob.freetemporary(msg_data);
END;

PROCEDURE print_content (sessionId          IN NUMBER,
                        p_bp_obj           IN MAIL_BODYPART_OBJ,
                        p_content_type     IN varchar2) IS
    bp_data              BLOB;
    l_data               RAW(255);
    l_length             NUMBER;
    l_offset             NUMBER;
    l_size               NUMBER;
BEGIN
    -- create a temporary lob to hold the body-part content
    dbms_lob.createtemporary(bp_data, TRUE, dbms_lob.session);

    -- get the decoded body-part content
    mail_message.get_bodypart_content(sessionId, p_bp_obj, bp_data);
    l_length := dbms_lob.getlength(bp_data);
    dbms_output.put_line('read ' || l_length || ');
    dbms_output.new_line;

    -- print the decoded data if it is a text type
    if p_content_type like 'TEXT/%' then
        l_offset := 1;

```

```

        while l_offset <= l_length loop
            -- sqlplus has a limitation of 255 characters per line.
            -- break the content into 250-character chunks and print.
            if (l_length - l_offset + 1) <= 250 then
                l_size := l_length - l_offset + 1;
            else
                l_size := 250;
            end if;
            l_data := dbms_lob.substr(bp_data, l_size, l_offset);
            l_offset := l_offset + l_size;
            dbms_output.put_line(utl_raw.cast_to_varchar2(l_data));
        end loop;
    end if;

    -- free the temporary lob allocated
    dbms_lob.freetemporary(bp_data);
END;

-- define a bit_on function
FUNCTION bit_on (
    p_flag IN INTEGER,
    p_bit  IN INTEGER
) RETURN INTEGER IS
BEGIN
    IF bitand(p_flag, p_bit) = 0 THEN           -- bit not turned on yet
        RETURN p_flag + p_bit;
    ELSE                                       -- bit already on
        RETURN p_flag;
    END IF;
END;

BEGIN
    -- login
    mail_session.login(user_name, user_pswd, user_domain,
        ldap_server, sessionID, ldap_port);
    dbms_output.put_line(user_name || ' logged-in');

    -- open INBOX
    mail_folder.open_folder(sessionID, 'INBOX', inbox_obj);
    dbms_output.put_line('Opened INBOX');

    -- get all the messages from INBOX
    mail_folder.get_folder_messages(sessionID, message_list);
    dbms_output.put_line('Got ' || message_list.COUNT || ' messages');

```

```
FOR i IN 1..message_list.COUNT LOOP
    dbms_output.put_line('***** Message # ' || i || ' *****');
    print_message(sessionId, message_list(i));

END LOOP;

-- set all the messages flags to be seen and deleted
mail_folder.set_msg_flags(sessionId, message_list,
    bit_on(MAIL_MESSAGE.GC_SEEN_FLAG, MAIL_MESSAGE.GC_DELETED_FLAG),
    true);

-- expunge INBOX to remove all the messages we have fetched
mail_folder.expunge_folder(sessionId);

-- logout
mail_session.logout(sessionID);
dbms_output.put_line('Elvis has left the building!');

-- commit
commit;
EXCEPTION
    WHEN mail_errors.login_err THEN
        dbms_output.put_line('Failed to log-in!!!');
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
    WHEN OTHERS THEN
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
END;
/
```

## Compose and Send Example

This example shows how to compose and send a multipart/alternative message.

```
set serveroutput on size 1000000;

DECLARE
    to_addr          VARCHAR2(100) := 'testuser2@oracle.com';
    from_addr        VARCHAR2(100) := 'testuser1@oracle.com';
    subject_str      VARCHAR2(100) :=
        'Example: send a multipart/alternative message';
```

```
msg_obj          mail_message_obj;
a_bodypart      mail_bodypart_obj;
b_bodypart      mail_bodypart_obj;
msg_data        VARCHAR2(500);

BEGIN
  -- start composing a message
  mail_message.compose_message(msg_obj);
  dbms_output.put_line('start composing...');

  -- set the message's headers
  mail_message.set_msgheader(
    msg_obj, to_addr, from_addr, null, from_addr, sysdate,
    subject_str, '1.0', 'multipart/alternative', null, null
  );
  dbms_output.put_line('set message header');

  -- add the text/plain body-part
  mail_message.add_bodypart(msg_obj, a_bodypart);
  mail_message.set_bpheader(
    a_bodypart, 'text/plain', 'us-ascii', 'quoted-printable',
    null, null, null, null, null, null
  );
  msg_data := 'text/plain data';
  mail_message.set_content(a_bodypart, utl_raw.cast_to_raw(msg_data));
  dbms_output.put_line('set text/plain body');

  -- add the text/html body-part
  mail_message.add_bodypart(msg_obj, b_bodypart);
  mail_message.set_bpheader(
    b_bodypart, 'text/html', 'us-ascii', 'quoted-printable',
    null, null, null, null, null, null
  );
  msg_data := '<html>text/html data</html>';
  mail_message.set_content(b_bodypart, utl_raw.cast_to_raw(msg_data));
  dbms_output.put_line('set text/html body');

  -- now send this message
  mail_message.send_message(msg_obj);
  dbms_output.put_line('send message');

  -- commit
  commit;
EXCEPTION
  when OTHERS then
```

```

        dbms_output.put_line ('send failed!');
        dbms_output.put_line('SQLcode: ' || sqlcode);
        dbms_output.put_line('SQLerrm: ' || sqlerrm);
        rollback;
    END;
/

```

## GetTheme Example

This example shows how to use the GetTheme API.

```

ACCEPT msgid NUMBER DEFAULT 1 PROMPT 'Input message id: ';

set serveroutput on
DECLARE
    themebuf CTXSYS.CTX_DOC.THEME_TAB;
    errmsg   VARCHAR2(254);
    res      INTEGER;
    i        INTEGER;
BEGIN

    res := ES_OT_API.GetThemes(&msgid, '0' , 1,false, themebuf, errmsg);
    IF res != ES_OT_API.ESOTAPI_OK THEN
        DBMS_OUTPUT.PUT_LINE('GetTheme error no: ' || res);
        DBMS_OUTPUT.PUT_LINE(errmsg);
    ELSE
        dbms_output.put_line('found ' || themebuf.count || ' themes');
        FOR i in 1..themebuf.count LOOP
            DBMS_OUTPUT.PUT_LINE(' ( ' || themebuf(i).theme || ', ' ||
                themebuf(i).weight || ') ');
        END LOOP;
        DBMS_OUTPUT.PUT_LINE('Get ' || themebuf.count || ' themes succeed');
    END IF;

EXCEPTION
    WHEN no_data_found THEN
        DBMS_OUTPUT.PUT_LINE('ERROR: ' || errmsg);
END;
/

```

## ABORT\_MESSAGE Procedure

This procedure cleans up after any error during the composition and sending of a new message.



**Syntax**

```
PROCEDURE abort_message;
```

**GET\_BP\_CONTENT\_WITH\_HDRS Procedure**

This procedure copies the encoded body part content along with the part header into the specified BLOB locator. The locator must have enough storage for the data.

**Throws Exceptions**

```
mail_errors.unauthenticated_err
```

## Syntax

```
PROCEDURE get_bp_content_with_hdrs (  
  session_id    IN NUMBER,  
  bodypart_obj  IN MAIL_BODYPART_OBJ,  
  content       IN OUT BLOB  
) RETURN boolean;
```

## Parameters

Parameters	Description
session_id	An identifier that represents a user's authenticated session
bodypart_obj	The body-part object
content	The encoded body part content with its header

---

---

## JAVA API Reference

This chapter describes the Oracle Email JAVA APIs that can be used to create customized clients, integrate applications, and support certain extensions.

This chapter contains the following topics:

- JavaMail API
- Directory Management API
- Rule Management API
- Wireless Filters and Profiles API

**See Also:** The *Oracle Email API Reference (Java Doc)* for information about the JAVA APIs

## JavaMail API

The Oracle Javamail API (OJMA) Service Provider implements the abstract JavaMail™ 1.2 API (JMA) provided by Sun Microsystems, Inc., and is designed to integrate directly with the mail store in the Oracle database. This approach does not depend upon a standards-based protocol server and calls PL/SQL APIs in the mail store over JDBC.

JMA provides a set of abstract classes that model a mail system. The API provides a platform independent and protocol independent framework to build Java technology-based mail and messaging applications. The JMA implementations typically go over a standards-based protocol such as IMAP or POP3. The JMA is implemented as a Java platform optional package and is also available as part of the Java 2 platform, Enterprise Edition. More details are available at the following URL:

<http://java.sun.com/products/javamail>

Within JMA, a user connects to a message store. The store contains a list of folders, and a user can perform folder and message operations based on the IMAP Protocol (RFC 2060).

In addition to the standard functionality available with JMA operating over an IMAP protocol service provider, the Oracle Javamail API Service Provider supports several extensions to the IMAP protocol and JMA. These enhancements do not interfere with the basic JMA interface, and clients using basic JMA can seamlessly integrate with the Oracle Javamail API Service Provider.

Oracle Javamail API Service Provider supports the following enhancements:

- ACL extension support based on RFC2086, which enable mail users to share their folders with other users or groups or lists
- Administrators can create public folders at the domain level that are available to all the users on that domain.
- Message sorting within a folder, based on the IMAP Sort Extension draft
- Integration with the SMIME toolkit, which enables you to encrypt outgoing e-mail, and decrypt and verify incoming e-mail
- Content-based searching using Oracle Text
- Wireless profiles and filters, which enables you to apply a filter and see only a filtered subset of the messages in the store (useful for PDAs and for wireless access to e-mail)

- Message annotations based on the IMAP ANNOTATE Extension draft, which can be used by users to add comments or annotations to messages in their folders

Also, because the Oracle Javamail API Service provider works directly with the Oracle database, system requirements are reduced since there is no overhead involved in conversing with a standards-based server, such as IMAP or POP3, and tasks such as sorting, lookups, and message sharing are efficiently handled by the Oracle database.

**See Also:** The *Oracle Email API Reference (Java Doc)* for information on the OJMA Extensions

**See Also:** The Javamail Web site for Javamail documentation

This section provides the following examples for using the JavaMail API:

- Reading a User's Messages
- Creating a Shared Folder and Granting User Permissions
- Appending Simple Messages
- Basic Folder Operations
- Shared Folder and Message Fetching

## Reading a User's Messages

The following example shows how to read all the messages for a particular user's inbox:

```
import java.util.*;
import javax.mail.*;
import javax.mail.internet.*;
import java.io.*;
import oracle.mail.ldap.ESDSConstants;
import oracle.mail.sdk.esmail.OracleAuthenticator;

public class ReadMessage
{
    static String password = null;
    static String user = null;
    static String ldapHost = null;
    static int ldapPort = -1;
    static String mbox = "INBOX";
```

```
public static void main (String argv[]) throws Exception
{
    for (int i = 0; i < argv.length; i++)
    {
        if (argv[i].equals("-U"))
            user = argv[++i];
        else if (argv[i].equals("-P"))
            password = argv[++i];
        else if (argv[i].equals("-D"))
            ldapHost = argv[++i];
        else if (argv[i].equals("-I"))
            ldapPort = Integer.parseInt(argv[++i]);
        else if (argv[i].equals("--")) {
            i++;
            break;
        }
        else if (argv[i].startsWith("--")) {
            System.out.println(
                "Usage: ReadMessage [-D ldapHost] [-I ldapPort]
                [-U user] [-P password]");
            System.exit(1);
        }
        else {
            break;
        }
    }

    Properties props = System.getProperties();

    // Set system properties - it is necessary to set up these
    // properties to obtain the database connect information
    // from oid. The database connect information is available only
    // to privileged users.
    // NOTE: The password may be different
    // for your installation.
    props.setProperty("oracle.mail.ldap.admin_
dn", "cn=umadmin,cn=emailservercontainer,cn=products,cn=oraclecontext");
    props.setProperty("oracle.mail.ldap.admin_password", "umadmin");

    Session session = Session.getDefaultInstance(props, new
OracleAuthenticator());
    session.setDebug(true);
}
```

```
Store store = null;

store = session.getStore("esmail");

if (user != null && password != null && ldapPort != 0 &&
ldapHost != null){
    store.connect(ldapHost, ldapPort, user, password);

    // Open the folder - after store has connected
    Folder folder = store.getDefaultFolder();

    folder = folder.getFolder(mbox);

    if (folder == null) {
        System.out.println("Invalid folder");
        System.exit(1);
    }
    else {
        System.out.println("Folder name : " + folder.getName());
    }

    // try to open read/write and if that fails try read-only
    try {
        folder.open(Folder.READ_WRITE);
    } catch (MessagingException ex) {
        folder.open(Folder.READ_ONLY);
    }

    int totalMessages = folder.getMessageCount();

    if (totalMessages == 0) {
        System.out.println("Empty folder");
        folder.close(false);
        store.close();
        System.exit(1);
    }
    else
    {
        System.out.println("Total messages: " + totalMessages);

        Message[] msgs = folder.getMessages();
        if (msgs != null)
            System.out.println("ReadMessage: Number of messages: " +
msgs.length);

        int my_uid = 0;
```

```
        for (int i = 0; i < msgs.length; i++)
        {
            System.out.println("-----");
            System.out.println("This is the message uid# : " +
(int)msgs[i].getMessageNumber());
            my_uid = msgs[i].getMessageNumber();

            if (my_uid > 0)
            {
                Message msg = folder.getMessage(my_uid);
                System.out.println("Sent Date: " +
msg.getSentDate());

                System.out.println("Msg Size: " + msg.getSize());
                System.out.println("Received Date: " +
msg.getReceivedDate());

                dumpPart(msg);
            }
            else
            {
                System.out.println("No messages returned");
            }
        } //end for

    }
}

public static void dumpPart(Part p) throws Exception
{
    if (p instanceof Message)
        dumpEnvelope((Message)p);

    System.out.println("-----");
    pr("CONTENT-TYPE: " + p.getContentType());

    if (p.isMimeType("text/plain")) {
        pr("This is plain text");
        pr("-----");
        System.out.println((String)p.getContent());
    } else if (p.isMimeType("multipart/*")) {
        pr("This is a Multipart");
        pr("-----");
        Multipart mp = (Multipart)p.getContent();
```



```

        int count = mp.getCount();
        for (int i = 0; i < count; i++)
            dumpPart(mp.getBodyPart(i));
    } else if (p.isMimeType("message/rfc822")) {
        pr("This is a Nested Message");
        pr("-----");
        dumpPart((Part)p.getContent());
    }
    else if (p.isMimeType("image/jpeg")) {
        pr("-----> image/jpeg");
        Object o = p.getContent();
        if (o instanceof InputStream) {
        }
        InputStream x = (InputStream)o;
        // Construct the required byte array
        System.out.println("x.length = " + x.available());
        int i = 0;
        byte[] bArray = new byte[x.available()];

        while ((i = (int)((InputStream)x.available()) > 0)
        {
            int result = (int)(((InputStream)x).read(bArray));
            if (result == -1) break;
        }
        FileOutputStream f2 = new
FileOutputStream("/tmp/image.jpg");
        f2.write(bArray);
    }
    else {
        Object o = p.getContent();
        if (o instanceof String) {
            pr("This is a string");
            pr("-----");
            System.out.println((String)o);
        } else if (o instanceof InputStream) {
            pr("This is just an input stream");
            pr("-----");
            InputStream is = (InputStream)o;
            is = (InputStream)o;
            int c;
            while ((c = is.read()) != -1)
                System.out.write(c);
        } else {
            pr("This is an unknown type");
            pr("-----");
        }
    }
}

```

```
                pr(o.toString());
            }
        }
    }

    public static void dumpEnvelope(Message m) throws Exception {
        pr("This is the message envelope");
        pr("-----");
        Address[] a;

        // FROM
        if ((a = m.getFrom()) != null) {
            for (int j = 0; j < a.length; j++)
                pr("FROM: " + a[j].toString());
        }

        // TO
        if ((a = m.getRecipients(Message.RecipientType.TO)) != null) {
            for (int j = 0; j < a.length; j++)
                pr("TO: " + a[j].toString());
        }

        // SUBJECT
        if (m.getSubject() != null)
            pr("SUBJECT: " + m.getSubject());

        // DATE
        Date d = m.getSentDate();
        pr("SendDate: " + (d != null ? d.toString() : "UNKNOWN"));
    }

    public static void pr(String s){
        System.out.println(s);
    }
}
```

## Creating a Shared Folder and Granting User Permissions

The following example shows how to create a shared folder and grant permissions to a user. The shared folder name and the user (grantee) are taken in as parameters in addition to the shared folder owner and the owner password.

```
import java.util.*;
import javax.mail.*;
```

```
import javax.mail.internet.*;
import java.io.*;
import oracle.mail.sdk.esmail.*;

public class SharedFolderCreate
{
    static String password = null;
    static String user = null;
    static String aSharedFolderUser = null;
    static String aSharedFolderName = null;
    static String ldapHost = null;
    static int ldapPort = -1;
    static String mbox = "INBOX";

    public static void main (String argv[]) throws Exception
    {
        for (int i = 0; i < argv.length; i++)
        {
            if (argv[i].equals("-U"))
                user = argv[++i];
            else if (argv[i].equals("-P"))
                password = argv[++i];
            else if (argv[i].equals("-S"))
                aSharedFolderUser = argv[++i];
            else if (argv[i].equals("-N"))
                aSharedFolderName = argv[++i];
            else if (argv[i].equals("--")) {
                i++;
                break;
            }
            else if (argv[i].startsWith("-")) {
                System.out.println(
                    "Usage: SharedFolderCreate [-U user] [-P
password] [-S sharedFolderUser] [-N sharedFolderName]");
                System.exit(1);
            }
            else {
                break;
            }
        }

        // This property is used to set the default oracle home
        // in the iasv2 environment. The default ldap host and
        // ldap port information is picked up from the

```

```
// $ORACLE_HOME/config/ias.properties config file
// In the store.connect method, the ldapHost is set to
// null and the ldapPort is set to -1 to make sure that
// the default values are used. In this example, the oracle
// home is retrieved from a system level ORACLE_HOME
// property.
Properties props = System.getProperties();
String orclHome = System.getProperty("ORACLE_HOME");
props.setProperty("oracle.mail.ldap.oracle_home",orclHome);

Session session = Session.getDefaultInstance(props,null);
session.setDebug(true);

Store store = null;

store = session.getStore("esmail");

if (user != null && password != null){
    store.connect(null, -1, user, password);

    // Open the folder - after store has connected
    Folder folder = store.getFolder(aSharedFolderName);

    if (!folder.exists()) {
        System.out.println("Folder does not exist");
        folder.create(Folder.HOLDS_MESSAGES);
    }
    System.out.println("Folder name : " + folder.getName());
    System.out.println("Creating Shared Folder");
    ((OracleFolder)folder).addACI(aSharedFolderUser,
OracleACI.READACI);
    //((OracleFolder)folder).modifyACI(aSharedFolderUser,
OracleACI.READACI + OracleACI.WRITEACI);
    System.out.println("Done Creating Shared Folder");
    }
}
}
```

## Appending Simple Messages

The following example shows how to append a simple message to a user's inbox.

```
import java.io.*;
import java.net.InetAddress;
```

```
import java.util.Properties;
import java.util.Date;

import javax.mail.*;
import javax.mail.internet.*;

public class TestAppendMime
{

    static String password = null;
    static String user = null;
    static String host = null;
    static String ldapHost = null;
    static int ldapPort = -1;
    static String mbox = "INBOX";

    public static void main(String[] argv) throws Exception{

        BufferedReader in =
            new BufferedReader(new InputStreamReader(System.in));

        for (int i = 0; i < argv.length; i++)
        {
            if (argv[i].equals("-U"))
                user = argv[++i];
            else if (argv[i].equals("-P"))
                password = argv[++i];
            else if (argv[i].equals("-D"))
                ldapHost = argv[++i];
            else if (argv[i].equals("-I"))
                ldapPort = Integer.parseInt(argv[++i]);
            else if (argv[i].equals("--")) {
                i++;
                break;
            }
            else if (argv[i].startsWith("-")) {
                System.out.println(
                    "Usage: TestAppendMime [-D ldapHost] [-I
ldapPort] [-U user] [-P password]");
                System.exit(1);
            }
            else {
                break;
            }
        }
    }
}
```

```
Properties props = System.getProperties();

// Set system properties - it is necessary to set up these
// properties to obtain the database connect information
// from oid. The database connect information is available only
// to privileged users.
// NOTE: The password may be different
// for your installation.
props.setProperty("oracle.mail.ldap.admin_
dn", "cn=umadmin,cn=emailservercontainer,cn=products,cn=oraclecontext");
props.setProperty("oracle.mail.ldap.admin_password", "umadmin");

// Get a Session object
Session session = Session.getDefaultInstance(props, null);
session.setDebug(true);

Store store = null;
store = session.getStore("esmail");

System.out.println(ldapHost + "\n" + ldapPort + "\n" + user + "\n" +
    password);
store.connect(ldapHost, ldapPort, user, password);

// Get record Folder. Create if it does not exist.
Folder folder = store.getFolder("INBOX");
Message msg = new MimeMessage(session);
msg.setFrom(new InternetAddress("oracle@oracle.com"));
msg.setRecipients(Message.RecipientType.TO,
InternetAddress.parse("testuser1@umdev.us.oracle.com", false));
msg.setSubject("Welcome!!!");
//collect(in, msg);
msg.setText("Hello welcome\n");
msg.setSentDate(new Date());

System.out.println("Total Number of messages : " +
folder.getMessageCount());

Message[] msgs = new Message[1];
msgs[0] = msg;
folder.appendMessages(msgs);

System.out.println("Total Number of messages : " +
folder.getMessageCount());
System.out.println("Mail was recorded successfully.");
```

```

    }

    public static void collect(BufferedReader in, Message msg)
        throws MessagingException, IOException {
        String line;
        StringBuffer sb = new StringBuffer();
        while ((line = in.readLine()) != null) {
            sb.append(line);
            sb.append("\n");
        }

        // If the desired charset is known, you can use
        // setText(text, charset)
        msg.setText(sb.toString());
    }
}

```

## Basic Folder Operations

The following example shows folder operations. The basic functionality of creating folder, copying messages to folder, listing folders, renaming folders, and deleting messages are demonstrated through this script.

```

/
public class TestFolder
{
    static String password = null;
    static String user = null;
    static String host = null;
    static int port = -1;
    static String mbox = "INBOX";
    static String root = null;
    static boolean recursive = false;
    static String pattern = "*";
    static boolean verbose = false;
    static String namespace = null;

    public static void main (String argv[]) throws Exception
    {
        for (int i = 0; i < argv.length; i++)
        {
            if (argv[i].equals("-U"))
                user = argv[++i];
            else if (argv[i].equals("-P"))
                password = argv[++i];
        }
    }
}

```

```
else if (argv[i].equals("-D"))
    host = argv[++i];
else if (argv[i].equals("-I"))
    port = Integer.parseInt(argv[++i]);
else if (argv[i].equals("--")) {
    i++;
    break;
}
else if (argv[i].startsWith("-")) {
    System.out.println(
        "Usage: TestFolder [-D ldap_host] [-I ldap_port] [-U user] [-P password]");
    System.exit(1);
}
else {
    break;
}
}

Properties props = System.getProperties();
Session session = Session.getDefaultInstance(props,null);
session.setDebug(false);

Store store = null;

store = session.getStore("esmail");

if (user != null && password != null && port != 0 && host != null){
store.connect(host, port, user, password);

        namespace = user.substring(0, user.indexOf('@'));

// Open the folder - after store has connected
Folder folder = store.getDefaultFolder();

if (folder == null) {
    System.out.println("Invalid folder");
    System.exit(1);
}
else {

        /*** List folders *****/
        Folder[] f = folder.list(pattern);
        for (int i = 0; i < f.length; i++)
        {
            System.out.println("Name: " + f[i].getName());
        }
    }
}
}
```



```

        System.out.println("Full Name: " +
f[i].getFullName());
    }
    /** Create folder *****/
    System.out.println("Creating folder xyz");
    Folder aFolder = store.getFolder("/" + namespace + "/xyz");

    if (!aFolder.exists()) //create
    {
        System.out.println("Creating folder....");
        aFolder.create(Folder.HOLDS_MESSAGES);
    }
    Folder aNewFolder = store.getFolder("/" + namespace +
"/temp");

    /****** Renaming Folder *****/
    System.out.println("Renaming Folder to temp");
    aFolder.renameTo(aNewFolder);
    /****** List folder again *****/
    f = folder.list(pattern);
    for (int i = 0; i < f.length; i++)
    {
        System.out.println("Name: " + f[i].getName());
        System.out.println("Full Name: " +
f[i].getFullName());
    }
    /****** Copy messages into folder *****/
    Folder mbox = store.getFolder("/" + namespace +
"/INBOX");

    mbox.open(Folder.READ_WRITE);
    Message[] msgArray = new Message[3];
    System.out.println("*****" + mbox.getMessageCount());
    //Message[] mboxArray = new
Message[mbox.getMessageCount()];
    for (int j = 0; j < 3; j++)
        msgArray[j] = mbox.getMessage(j+1);

    //msgArray = mbox.getMessages(1,3);
    mbox.copyMessages(msgArray, aFolder);
    /****** Get message count *****/
    System.out.println("Number of messages in folder " +
        aFolder.getFullName() + " is " +
        aFolder.getMessageCount());

    /****** delete messages in folder *****/
    System.out.println("DELETING two MESSAGES ");

```

```
        System.out.println("---> Number of messages in folder
after delete " + aFolder.getFullName() + " is " +
aFolder.getMessageCount());
        aFolder.open(Folder.READ_WRITE);
        Message aMessage = aFolder.getMessage(1);
        Message aMessage2 = aFolder.getMessage(2);
        aMessage.setFlag(Flags.Flag.DELETED,true);
        aMessage2.setFlag(Flags.Flag.DELETED,true);
        /***** expunge folder *****/
        System.out.println("EXPUNGING");
        aFolder.expunge();
        aFolder.close(true);
        System.out.println("---> Number of messages in folder
after expunge " + aFolder.getFullName() + " is " +
aFolder.getMessageCount());
        /***** msg count of folder *****/

        /**** List folder again *****/
        System.out.println("*****LIST *****");
        f = folder.list(pattern);
        for (int i = 0; i < f.length; i++)
        {
            System.out.println("Name: " + f[i].getName());
            System.out.println("Full Name: " +
f[i].getFullName());
        }
        /***** Delete Folder *****/
        System.out.println("***** DELETE *****");
        aFolder.delete(true);
        /**** List folder again *****/
        f = folder.list(pattern);
        for (int i = 0; i < f.length; i++)
        {
            System.out.println("Name: " + f[i].getName());
            System.out.println("Full Name: " +
f[i].getFullName());
        }
    }
}
store.close();
}

public static void dumpFolder(Folder folder, boolean recurse, String tab)
```

```

throws Exception
{
    System.out.println(tab + "Name:          " + folder.getName());
    System.out.println(tab + "Full Name: " + folder.getFullName());
    System.out.println(tab + "URL:          " + folder.getURLName());

    if (verbose) {
        if (!folder.isSubscribed())
            System.out.println(tab + "Not Subscribed");

        if ((folder.getType() & Folder.HOLDS_MESSAGES) != 0) {
            if (folder.hasNewMessages())
                System.out.println(tab + "Has New Messages");
            System.out.println(tab + "Total Messages: " +
                folder.getMessageCount());
            System.out.println(tab + "New Messages:   " +
                folder.getNewMessageCount());
            System.out.println(tab + "Unread Messages: " +
                folder.getUnreadMessageCount());
        }
        if ((folder.getType() & Folder.HOLDS_FOLDERS) != 0)
            System.out.println(tab + "Is Directory");
    }

    System.out.println();

    if ((folder.getType() & Folder.HOLDS_FOLDERS) != 0) {
        if (recurse) {
            Folder[] f = folder.list();
            for (int i = 0; i < f.length; i++)
                dumpFolder(f[i], recurse, tab + "    ");
        }
    }
}
}
}

```

## Shared Folder and Message Fetching

SharedFolderRead.java

```

import java.util.*;
import javax.mail.*;
import javax.mail.internet.*;
import java.io.*;

```

The following example shows basic shared folder and fetch message fetching functionality:

```
public class SharedFolderRead
{
    static String user = null;
    static String password = null;
    static String ldapHost = null;
    static int ldapPort = -1;
    static String mbox = "INBOX";
    static String pattern = "*";

    public static void main (String argv[]) throws Exception
    {
        for (int i = 0; i < argv.length; i++)
        {
            if (argv[i].equals("-U"))
                user = argv[++i];
            else if (argv[i].equals("-P"))
                password = argv[++i];
            else if (argv[i].equals("-D"))
                ldapHost = argv[++i];
            else if (argv[i].equals("-I"))
                ldapPort = Integer.parseInt(argv[++i]);
            else if (argv[i].equals("--")) {
                i++;
                break;
            }
            else if (argv[i].startsWith("-")) {
                System.out.println(
                    "Usage: SharedFolderRead [-D ldap_host] [-I
ldap_port] [-U user] [-P password]");
                System.exit(1);
            }
            else {
                break;
            }
        }

        Properties props = System.getProperties();

        // Set system properties - it is necessary to set up these
        // properties to obtain the database connect information
        // from oid. The database connect information is available only
```

```
// to privileged users.
// NOTE: The password may be different
// for your installation.
props.setProperty("oracle.mail.ldap.admin_
dn", "cn=umadmin,cn=emailservercontainer,cn=products,cn=oraclecontext");
props.setProperty("oracle.mail.ldap.admin_password", "umadmin");

Session session = Session.getDefaultInstance(props, null);
session.setDebug(false);

Store store = null;

store = session.getStore("esmail");

if (user != null && password != null && ldapPort != 0 &&
ldapHost != null) {
    store.connect(ldapHost, ldapPort, user, password);

    Folder aLocalFolder = store.getFolder(mbox);
    if (aLocalFolder == null) {
        System.out.println("NULL FOLDER " + mbox);
        System.exit(1);
    }
    else {
        System.out.println("Folder Name: " +
aLocalFolder.getFullName());
    }

    try {
        aLocalFolder.open(Folder.READ_WRITE);
    } catch (MessagingException ex) {
        aLocalFolder.open(Folder.READ_ONLY);
    }

    int totalMessages = aLocalFolder.getMessageCount();

    System.out.println("Total Number of messages in folder " +
        aLocalFolder.getFullName() + " is " + totalMessages);

    Folder[] aSharedNSArray = store.getSharedNamespaces();

    if (aSharedNSArray == null) {
        System.out.println("No shared namespaces");
        System.exit(1);
    }
}
```

```
        else {
            //For each namespace, list
            System.out.println("Number of shared namespace : " +
aSharedNSArray.length);

            Folder folder = null;
            for (int i = 0; i < aSharedNSArray.length; i++)
            {
                folder = aSharedNSArray[i];
                System.out.println("Folder fullname : " +
folder.getFullName());
            }

            Folder[] f = folder.list(pattern);
            int aNum =0;
            for (int j = 0; j < f.length; j++)
            {
                System.out.println("Name:      " +
f[j].getName());
                System.out.println("Full Name: " +
f[j].getFullName());
                aNum = j;

                try {
                    f[aNum].open(Folder.READ_WRITE);
                } catch (MessagingException ex) {
                    f[aNum].open(Folder.READ_ONLY);
                }

                System.out.println("Shared Folder fullname : " +
f[aNum].getFullName());

                // Select and fetch messages from Shared Folder
                int total_messages = f[aNum].getMessageCount();
                System.out.println("Number of messages in " +
f[aNum].getFullName() + " is " + f[aNum].getMessageCount());

                if (total_messages == 0) {
                    System.out.println("Empty folder " +
f[aNum].getFullName());
                    f[aNum].close(false);
                }
            }
            else {
                int my_uid = 0;
                Message[] msgs = f[aNum].getMessages();
                if (msgs != null)
```

```

        System.out.println("Number of messages :
" + msgs.length);
        for (int i = 0; i < msgs.length; i++)
        {
            my_uid = msgs[i].getMessageNumber();
            System.out.println("MSG_NUMBER : " + my_uid);
            if (my_uid > 0)
            {
                System.out.println("Retrieving msg_num : " +
my_uid);
                Message msg = f[aNum].getMessage(my_uid);
                dumpPart(msg);
            }
        }
        // Copy message from shared folder to local
        folder
        //System.out.println("----- BEFORE COPY
        -----");
        //f[aNum].copyMessages(msgs, aLocalFolder);
        //System.out.println("----- AFTER COPY -----");
    }
}
}
}
store.close();
}

//Fetch message part by part
public static void dumpPart(Part p) throws Exception
{
    if (p instanceof Message)
        //pr("Envelope out of order----->");
        dumpEnvelope((Message)p);

    //InputStream is = p.getInputStream();
    //System.out.println("SIZE of INPUT STREAM : " + is.available());
    System.out.println("-----");
    pr("CONTENT-TYPE: " + p.getContentType());

    if (p.isMimeType("text/plain")) {
        pr("This is plain text");
        pr("-----");
        System.out.println((String)p.getContent());
    } else if (p.isMimeType("multipart/*")) {

```

```
pr("This is a Multipart");
pr("-----");
Multipart mp = (Multipart)p.getContent();
int count = mp.getCount();
for (int i = 0; i < count; i++)
    dumpPart(mp.getBodyPart(i));
} else if (p.isMimeType("message/rfc822")) {
    pr("This is a Nested Message");
    pr("-----");
    dumpPart((Part)p.getContent());
}
else {
    Object o = p.getContent();
    if (o instanceof String) {
        pr("This is a string");
        pr("-----");
        System.out.println((String)o);
    }
    else if (o instanceof InputStream) {
        pr("This is just an input stream");
        pr("-----");
        InputStream is = (InputStream)o;
        //is = (InputStream)o;
        int c;
        while ((c = is.read()) != -1)
            System.out.write(c);
    } else {
        pr("This is an unknown type");
        pr("-----");
        pr(o.toString());
    }
}
}

public static void dumpEnvelope(Message m) throws Exception {
    pr("This is the message envelope");
    pr("-----");
    Address[] a;

    // FROM
    if ((a = m.getFrom()) != null) {
        for (int j = 0; j < a.length; j++)
            pr("FROM: " + a[j].toString());
    }
}
```



---

```

// TO
if ((a = m.getRecipients(Message.RecipientType.TO)) != null) {
    for (int j = 0; j < a.length; j++)
        pr("TO: " + a[j].toString());
}

// SUBJECT
pr("SUBJECT: " + m.getSubject());

// DATE
Date d = m.getSentDate();
pr("SendDate: " +
    (d != null ? d.toString() : "UNKNOWN"));
}

public static void pr(String s){
    System.out.println(s);
}
}
}

```

## Directory Management API

The directory management API is a set of Java classes that can be used to create, access, and manage various entries, such as mail users, public distribution lists, and private address book entries (contact information and private distribution lists). The entries are stored in Oracle Internet Directory for a given domain.

This section contains the following topics:

- Directory Components
- Authentication
- Retrieving the MetaData and Validation
- Directory Management Code Examples

**See Also:** The *Oracle Email API Reference (Java Doc)* for information about Directory Management APIs

### Directory Components

In Oracle Email, an e-mail system can contain more than one domain. Mail users and public distribution lists exist for a particular domain. A mail user for a given domain is a valid user in that domain who can send and receive e-mail and use all of the exposed e-mail server functionality.

A public distribution list is a mailing list that has its own e-mail ID and contains a group of e-mail IDs or other mailing lists. When an e-mail is sent to a public distribution list, all the members of the list receive the e-mail. A valid mail user can subscribe to any public distribution list.

Private address book entries consist of private contacts and private mailing lists belonging to a particular mail user.

A private distribution list consists of private contact information, such as the contact's phone number, e-mail ID, and address. Users can use the private address book entries from WebMail to send and receive e-mails. These entries are also used by the Calendar application.

### Authentication

Before a caller can access any of the directory components, they must be authenticated with the Oracle Internet Directory using the `oracle.mail.OESContext` class. Once authenticated, the

`oracle.mail.OESContext` instance representing a trusted session must be passed to all of the directory APIs.

### Authentication Example:

The following example shows how to authenticate an application with the debug option turned off.

```
OESContext oesctx = new OESContext(DirectoryConstants.DS_CALLERTYPE_APP, false);
//Authenticate to the directory
oesctx.authenticate(null, args[0]);
```

## Retrieving the MetaData and Validation

Before an entry is created in the directory, the caller needs to retrieve the metadata for that particular entry from the directory. The metadata for a particular entry consists of the mandatory and optional attributes the caller must set in order to create an entry. It also contains information about all the attributes, such as the syntax, multiplicity of the attributes, and default values for attributes (if any defaults are set in the directory).

When the caller sets the attribute value on the metadata object, validation is performed to ensure that the caller sets the value of an attribute that is present in that particular entry. In UI-based applications using the metadata, the caller can perform any input validations for the data entered.

### Example:

The following example shows how to retrieve the metadata. It assumes that `ldapobj` is an instance of the `DirectoryObject` class.

```
//Getting the mandatory attributes from the metadata
if (ldapobj.getMandatoryAttribs() != null) {
    Enumeration enum = ldapobj.getMandatoryAttribs().elements();
    while (enum.hasMoreElements()) {
        String attr = enum.nextElement().toString(); // Name of the attribute

        //Retrieve the metadata for this attribute
        DirectoryAttributeMetaData mdata = ldapobj.getMetaData(attr);
        // The multiplicity of the attribute returns "SINGLE" or "MULTIPLE"
        String mult = mdata.getMultiplicity();
        // Returns the syntax of the string, "String", "byte", "boolean" or "int"
        String syntax = mdata.getAttributeType();
        //Returns a vector of String values if any default has been set, else
        returns null
    }
}
```

```
        Vector defaultvals = mdata.getDefaultValues();
    }
}
```

Similarly, the `ldapobj.getOptionalAttrs()` method returns the list of optional attributes and in a similar manner, the optional attributes and the metadata can be retrieved. After retrieving the metadata, the user can set the value of an attribute in the following manner. When creating an entry, the attribute value can be set using the `setAttributeValue` method of the `DirectoryObject` class.

### Example:

This example sets the value for the `telephonenumber` attribute to the default values provided `mdata.getDefaultValues()` is not null.

```
ldapobj.setAttributeValue("telephonenumber", mdata.getDefaultValues());
```

```
Vector newVals = new Vector();
newVals.add("408 7394050");
newVals.add("650 7394050");
ldapobj.setAttributeValue("telephonenumber", newVals);
```

While modifying an entry, the attribute value can be set using the `modifyAttributeValue` method of the `DirectoryObject` class. The caller needs to specify the type of modification.

The permitted modifications are:

- `DirectoryConstants.DS_MODIFY_ADD`: This adds the given set of values to the existing values
- `DirectoryConstants.DS_MODIFY_DELETE`: This deletes the given set of values from the existing values
- `DirectoryConstants.DS_MODIFY_REPLACE`: This replaces all the existing values with a new set of values

### Example:

This example adds two new values for the `telephonenumber` attribute.

```
Vector newVals = new Vector();
newVals.add("408 7394050");
newVals.add("650 7394050");
ldapobj.modifyAttributeValue("telephonenumber", newVals, DirectoryConstants.DS_
MODIFY_ADD);
```

## Directory Management Code Examples

This section provides following examples for Directory Management APIs.

---

---

**Note:** To run these examples, the CLASSPATH environment variable must include `jndi.jar`, `ldap.jar`, `providerutil.jar`, `classes12.zip`, `repository.jar`, `esldap.jar`, and `escommon.jar`

---

---

### Mail User Examples

The following examples show how to use the mail user APIs to create, modify, look up, and delete a mail user.

#### Mail User Creation Example

This example creates a mail user. The attributes of the mail user are set to default values. This example shows how to set values of an attribute to a non default value by setting the `orclMailVoiceQuota` parameter.

```
*/
import java.util.Enumeration;
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryAttributeMetaData;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class CreateMailUser
{
    public static void main(String[] args)
    {
        if (args.length < 3)
        {
            System.out.println("Usage: java CreateMailUser <ORAHOME> <mailid>
<publicuserdn>");
            System.exit(1);
        }
    }
}
```

```
try
{
    OESContext oesctx = new OESContext(
        DirectoryConstants.DS_CALLERTYPE_APP,
        false);

    //Authenticate to the directory
    if (oesctx.authenticate(null, args[0]) != true)
    {
        System.err.println("APP authentication failed");
        System.exit(1);
    }
    else
    {
        DirectoryAccess access = new DirectoryAccess();
        String mail = args[1];
        String domain = null;

        if (mail.indexOf('@') != -1)
        {
            domain = mail.substring(mail.indexOf('@') + 1,
                mail.length());

            //Retrieve Metadata
            DirectoryObject ldapobj = access.GetMailUserMetaData(
                oesctx, domain);
            System.out.println("Retrieved Metadata.");
            System.out.println("Setting mandatory attributes of the
mailuser.");

            //Set mandatory and optional attributes of a mailuser to
defaults

            if (ldapobj.getMandatoryAttribs() != null)
            {
                Enumeration enum =
ldapobj.getMandatoryAttribs().elements();

                while (enum.hasMoreElements())
                {
                    String attr = enum.nextElement().toString();
                    DirectoryAttributeMetaData mdata =
                        ldapobj.getMetaData(attr);

                    if (attr.equalsIgnoreCase("mail"))
                    {
```

```

        Vector vals = new Vector();
        vals.add(mail);
        ldapobj.setAttributeValue(attr, vals);
        continue;
    }
    else
    {
        ldapobj.setAttributeValue(attr,

mdata.getDefaultValues());
        continue;
    }
}

System.out.println("Setting optional attributes of the
mailuser.");

if (ldapobj.getOptionalAttribs() != null)
{
    Enumeration enum =
ldapobj.getOptionalAttribs().elements();

    while (enum.hasMoreElements())
    {
        String attr = enum.nextElement().toString();
        DirectoryAttributeMetaData mdata =
            ldapobj.getMetaData(attr);

        if (mdata.getDefaultValues() != null)
            ldapobj.setAttributeValue(attr,

mdata.getDefaultValues());
    }
}

//Setting voice quota to 40MB
Vector vals = new Vector();
vals.add("40000000");
ldapobj.setAttributeValue("orclMailVoiceQuota", vals);
System.out.println("Creating Mailuser .." + mail);

//Create the mailuser
access.CreateMailUser(oesctx, args[2], ldapobj);
System.out.println("Created Mailuser ..");

```

```
        }  
    }  
  
    System.gc();  
}  
catch (Exception e)  
{  
    System.err.println("Error Occured " + e.getMessage());  
    System.gc();  
}  
}  
}
```

## Mail User Modification Example

This example performs a lookup for the mail user.

```
*/  
  
import java.util.Vector;  
  
import oracle.mail.OESContext;  
  
import oracle.mail.sdk.ldap.DirectoryAccess;  
import oracle.mail.sdk.ldap.DirectoryAttributeMetaData;  
import oracle.mail.sdk.ldap.DirectoryConstants;  
import oracle.mail.sdk.ldap.DirectoryException;  
import oracle.mail.sdk.ldap.DirectoryObject;  
  
class ModifyMailUser  
{  
    public static void main(String[] args)  
    {  
        if (args.length < 2)  
        {  
            System.out.println("Usage: java ModifyMailUser <ORAHOME> <mailid>");  
            System.exit(1);  
        }  
  
        try  
        {  
            OESContext oesctx = new OESContext(  
                DirectoryConstants.DS_CALLERTYPE_APP,
```



```
        false);

//Authenticate to the directory
if (oesctx.authenticate(null, args[0]) != true)
{
    System.err.println("APP authentication failed");
    System.exit(1);
}
else
{
    DirectoryAccess access = new DirectoryAccess();
    DirectoryObject ldapObj = access.LookupMailUser(oesctx,
                                                    args[1]);

    if (ldapObj != null)
    {
        //Retrieving Metadata of orclMailQuota attribute
        DirectoryAttributeMetaData mdata = ldapObj.getMetaData(
                                                    "orclMailQuota");

        //Retrieving the values of this attribute
        Vector values = mdata.getDefaultValues();

        if (values != null)
        {
            for (int i = 0; i < values.size(); i++)
                System.out.println("orclMailQuota Values --> " +
                                    (String)values.elementAt(i));
        }

        //Use DirectoryConstants.DS_MODIFY_DELETE to delete the given set of
        //values from the existing values of the attribute
        //DirectoryConstants.DS_MODIFY_REPLACE to replace the existing values
        // of the attribute with the new set of values
        //DirectoryConstants.DS_MODIFY_ADD to add the given set of values to
        //the existing values of the attribute
        //Setting mail quota to 100MB, this replaces the existing mail quota
        //with the new values
        values = new Vector();
        values.add("100000000");
        ldapObj.modifyAttributeValue("orclMailQuota", values,
                                    DirectoryConstants.DS_MODIFY_
REPLACE);

        System.out.println("Modifying Mailuser ..");
        access.ModifyMailUser(oesctx, args[1], ldapObj);
    }
}
```

```
        System.out.println("Modified Mailuser ..");
    }
}

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}
```

### Mail User Deletion Example:

This example deletes a mail user.

```
import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class DeleteMailUser
{
    public static void main(String[] args)
    {
        if (args.length < 2)
        {
            System.out.println("Usage: java DeleteMailUser <ORAHOME> <mailid>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
            }
        }
    }
}
```

```

        System.exit(1);
    }
    else
    {
        DirectoryAccess access = new DirectoryAccess();
        System.out.println("Deleting User " + args[1]);

        //Deleting the mailuser
        access.DeleteMailUser(oesctx, args[1]);
        System.out.println("Deleted User ");
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}

```

## Mail User Query Example

This example queries for all mail users in a domain.

```

import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class QueryMailUsers
{
    public static void main(String[] args)
    {
        if (args.length < 2)
        {
            System.out.println("Usage: java QueryMailUsers <ORAHOME> <domain>");
            System.exit(1);
        }
    }
}

```

```
    }  
  
    try  
    {  
        OESContext oesctx = new OESContext(  
            DirectoryConstants.DS_CALLERTYPE_APP,  
            false);  
  
        //Authenticate to the directory  
        if (oesctx.authenticate(null, args[0]) != true)  
        {  
            System.err.println("APP authentication failed");  
            System.exit(1);  
        }  
        else  
        {  
            DirectoryAccess access = new DirectoryAccess();  
            System.out.println("Querying Users ");  
  
            //Query for all mailusers, similarly other search criteria could  
also  
            //be given for the query, for example, t*  
            Vector users = access.QueryMailUsers(oesctx, "*", args[1]);  
  
            if (users != null)  
            {  
                for (int i = 0; i < users.size(); i++)  
                    System.out.println("User " + (i + 1) + " " +  
                        (String)users.elementAt(i));  
            }  
            else  
            {  
                System.out.println("Nothing matches the search criteria ");  
            }  
        }  
  
        System.gc();  
    }  
    catch (Exception e)  
    {  
        System.err.println("Error Occured " + e.getMessage());  
        System.gc();  
    }  
}
```

## Distribution List Creation Example

This example creates a public distribution list in the directory. The attributes of the distribution list are set to the default values.

```
import java.util.Enumeration;
import java.util.Hashtable;
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryAttributeMetaData;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class CreateDistributionList
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java CreateDistributionList <ORAHOME>
<domain> <dl_mailid> <user_member_mailid>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                DirectoryAccess access = new DirectoryAccess();
```

```
DirectoryObject ldapobj = access.GetDistributionListMetaData(
                                oesctx, args[1]);
System.out.println("Retrieved Metadata.");
System.out.println("Setting mandatory attributes of the DL.");

if (ldapobj.getMandatoryAttribs() != null)
{
    Enumeration enum = ldapobj.getMandatoryAttribs().elements();

    while (enum.hasMoreElements())
    {
        String attr = enum.nextElement().toString();
        DirectoryAttributeMetaData mdata = ldapobj.getMetaData(
                                attr);

        if (attr.equalsIgnoreCase("mail"))
        {
            Vector vals = new Vector();
            vals.add(args[2]);
            ldapobj.setAttributeValue(attr, vals);
            continue;
        }
        else
        {
            ldapobj.setAttributeValue(attr,
                                mdata.getDefaultValues());
            continue;
        }
    }
}

System.out.println("Setting optional attributes of the DL.");

if (ldapobj.getOptionalAttribs() != null)
{
    Enumeration enum = ldapobj.getOptionalAttribs().elements();

    while (enum.hasMoreElements())
    {
        String attr = enum.nextElement().toString();
        DirectoryAttributeMetaData mdata = ldapobj.getMetaData(
                                attr);

        if (mdata.getDefaultValues() != null)
            ldapobj.setAttributeValue(attr,
```

```

        mdata.getDefaultValues());
    }
}

System.out.println("Creating DL .." + args[2]);

//Creating DL with one user member, similarly other types of
members
//could also be added
Hashtable members = new Hashtable();
Vector usrs = new Vector();
usrs.add(args[3]);
members.put(DirectoryConstants.DS_USER, usrs);

// returns a hashtable of elements that couldn't be added
Hashtable failed = access.CreateDistributionList(oesctx,
                                                ldapobj,
                                                members);

System.out.println("Created DL ..");

if (failed != null)
{
    System.out.println("Some member additions failed.");
}
else
{
    System.out.println("Successfully added all members.");
}
}

System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}
}

```

### Distribution List Modification Example:

This example looks up the given distribution list and modifies an attribute of this existing public distribution list.

```
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class ModifyDistributionList
{
    public static void main(String[] args)
    {
        if (args.length < 2)
        {
            System.out.println("Usage: java ModifyDistributionList <ORAHOME>
<dl_mailid>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                DirectoryAccess access = new DirectoryAccess();
                System.out.println("Looking up DL.. " + args[1]);

                DirectoryObject ldapObj = access.LookupDistributionList(oesctx,
args[1]);

                System.out.println("Found DL \n Printing Old Values of
orclMailGroupInfoText");
```



```

        Vector values =
ldapObj.getAttributeValue("orclmailgroupinfotext");

        if (values != null)
        {
            for (int i = 0; i < values.size(); i++)
                System.out.println("orclMailGroupInfoText Values --> " +
                    (String)values.elementAt(i));
        }
        else
        {
            System.out.println("No value set for
orclMailGroupInfoText");
        }

        System.out.println("Adding orclmailgroupinfotext to this DL");

        //Use DirectoryConstants.DS_MODIFY_DELETE to delete the given
set of
        //values from the existing values of the attribute
values
        //DirectoryConstants.DS_MODIFY_REPLACE to replace the existing
values to
        // of the attribute with the new set of values
        //DirectoryConstants.DS_MODIFY_ADD to add the given set of
        //the existing values of the attribute
        //Setting orclmailgroupinfotext to some new values
        values = new Vector();
        values.add("Test DL");
        ldapObj.modifyAttributeValue("orclmailgroupinfotext", values,
            DirectoryConstants.DS_MODIFY_ADD);
        System.out.println("Modifying DL ..");
        access.ModifyDistributionList(oesctx, args[1], ldapObj);
        System.out.println("Modified DL ..");
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}

```

**Distribution List Deletion Example:**

This example deletes a public Distribution List.

```
import java.util.Enumeration;
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class DeleteDistributionList
{
    public static void main(String[] args)
    {
        if (args.length < 2)
        {
            System.out.println("Usage: java DeleteDistributionList <ORAHOME>
<mailid>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                DirectoryAccess access = new DirectoryAccess();
                System.out.println("Deleting DL " + args[1]);

                //Deleting the DL
                access.DeleteDistributionList(oesctx, args[1]);
                System.out.println("Deleted DL");
            }
        }
    }
}
```

```

        System.gc();
    }
    catch (Exception e)
    {
        System.err.println("Error Occured " + e.getMessage());
        System.gc();
    }
}
}
}

```

### Distribution List Resolution Example:

This example shows how to resolve a public distribution list.

```

*/

import java.util.Hashtable;
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class ResolveDistributionList
{
    public static void main(String[] args)
    {
        if (args.length < 2)
        {
            System.out.println("Usage: java ResolveDistributionList <ORAHOME>
<dl_mailid>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)

```

```
        {
            System.err.println("APP authentication failed");
            System.exit(1);
        }
        else
        {
            DirectoryAccess access = new DirectoryAccess();
            Hashtable members = access.ResolveDistributionList(oesctx,
                                                            args[1]);

            System.out.println("Printing Members..");

            //Key of the hashtable is the type of member and value is a
vector of //values
            if (members != null)
            {
                Vector users = (Vector)members.get(DirectoryConstants.DS_
USER);

                if (users != null)
                {
                    for (int i = 0; i < users.size(); i++)
                        System.out.println("User Member :: " +
users.elementAt(i).toString());
                }

                Vector dls = (Vector)members.get(DirectoryConstants.DS_
LIST);

                if (dls != null)
                {
                    for (int i = 0; i < dls.size(); i++)
                        System.out.println("DL Member :: " +
dls.elementAt(i).toString());
                }

                Vector foreign = (Vector)members.get(DirectoryConstants.DS_
FOREIGN);

                if (foreign != null)
                {
                    for (int i = 0; i < foreign.size(); i++)
                        System.out.println("DL Member :: " +
foreign.elementAt(i).toString());
                }
            }
        }
    }
}
```

```

        Vector aliases = (Vector)members.get(DirectoryConstants.DS_
ALIAS);

        if (aliases != null)
        {
            for (int i = 0; i < aliases.size(); i++)
                System.out.println("DL Member :: " +
aliases.elementAt(i).toString());
        }
        else
        {
            System.out.println("DL doesn't contain any member");
        }
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}

```

### Private Address Book Contact Information Example

The following example shows how to use the private address book contact information APIs to create, modify, look up, resolve, and search contacts.

Getting Contact Info Metadata And Creating A New Contact Info  
`**/`

```
ESDSLdapObject ldapobj = dirAccess.GetContactInfoMetaData(oesctx);
```

This example sets the name and e-mail ID of the new contact. Other attributes can be set in a similar way.

```
ldapobj.setAttributeValue("name", "myfriend1");
```

```
ldapobj.setAttributeValue("orclmailemail", "test@hotmail.com");
```

```
// Now Create The Contact
```

```
dirAccess.CreateContactInfo(oesctx, ldapobj);

/**
Looking up a Contact Info
**/

ldapobj = dirAccess.LookupContactInfo(oesctx, "myfriend1");

/**
Modifying a Contact
**/

//Modifying the given name of the contact
Vector modify = new Vector();
modify.add ("myfriend_name");
ldapobj.modifyAttributeValue("givenname",
modify,
ESDSConstants.DS_MODIFY_ADD);

dirAccess.ModifyContactInfo(oesctx, "myfriend1", ldapobj);

/**
Delete A Contact Info
**/

dirAccess.DeleteContactInfo(oesctx, "friend ");

/**
Get All Contacts
**/

String[] contacts = dirAccess.GetAllContacts(oesctx);
```

```

/**
Get All Contacts For a Given Filter
**/

contacts = dirAccess.SearchContacts(oesctx, "name=t*");

```

### Private Distribution List Example

The following example shows how to use the private distribution list APIs to create, modify, look up, resolve, and search contacts.

### Contact Creation Example:

This example creates a private contact for a given user.

```

import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class CreateContact
{
    public static void main(String[] args)
    {
        if (args.length < 3)
        {
            System.out.println("Usage: java CreateContact <ORAHOME> <user_
mailid> <user_password>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory

```

```
        if (oesctx.authenticate(null, args[0]) != true)
        {
            System.err.println("APP authentication failed");
            System.exit(1);
        }
        else
        {
            //Authenticate the user now
            OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
            clientCtx.authenticate(args[1], args[2], oesctx);

            DirectoryAccess access = new DirectoryAccess();
            DirectoryObject ldapobj = access.GetContactInfoMetaData(
                clientCtx);
            System.out.println("Retrieved Metadata.");

            //Setting some attributes of the contact
            ldapobj.setAttributeValue("name", "friend1");
            ldapobj.setAttributeValue("givenname", "myfriend");
            ldapobj.setAttributeValue("orclmailemail", "test1@abc.com");

            Vector tel = new Vector();
            tel.add("405 7777777");
            tel.add("650 7777777");

            ldapobj.setAttributeValue("telephonenumber", tel);
            access.CreateContactInfo(clientCtx, ldapobj);
            System.out.println("Created Contact ..");
        }

        System.gc();
    }
    catch (Exception e)
    {
        System.err.println("Error Occured " + e.getMessage());
        System.gc();
    }
}
}
```



### Contact Modification Example:

This example looks up a contact and modifies it.

```
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class ModifyContact
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java ModifyContact <ORAHOME> <user_
mailid> <user_password> <user_contact_name>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                //Authenticate the user now
                OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
                clientCtx.authenticate(args[1], args[2], oesctx);

                DirectoryAccess access = new DirectoryAccess();
                DirectoryObject ldapobj = access.LookupContactInfo(clientCtx,
```

```
args[3]);
System.out.println("Found Contact");

Vector values = ldapobj.getAttributeValue("telephonenumber");
System.out.println("Printing old values of telephonenumber of
the contact");

if (values != null)
{
    for (int i = 0; i < values.size(); i++)
        System.out.println("telephonenumber Values --> " +
            (String)values.elementAt(i));
}
else
{
    System.out.println("No values set for telephonenumber");
}

values = new Vector();
values.add("6506070000");
ldapobj.modifyAttributeValue("telephonenumber", values,
    DirectoryConstants.DS_MODIFY_ADD);

Vector tel = new Vector();
tel.add("408 7431234");
tel.add("650 0000000");
ldapobj.setAttributeValue("mobile", tel);
access.ModifyContactInfo(clientCtx, ldapobj);
System.out.println("Modified Contact ..");
}

System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}
```

## Contact Deletion Example

This example deletes a contact info.

```
import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class DeleteContact
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java DeleteContact <ORAHOME> <user_
mailid> <user_password> <user_contact_name>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                //Authenticate the user now
                OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
                clientCtx.authenticate(args[1], args[2], oesctx);

                DirectoryAccess access = new DirectoryAccess();
                System.out.println("Deleting Contact " + args[3]);

                //Deleting the contact
                access.DeleteContactInfo(clientCtx, args[3]);
                System.out.println("Deleted Contact");
            }
        }
    }
}
```

```
        System.gc();
    }
    catch (Exception e)
    {
        System.err.println("Error Occured " + e.getMessage());
        System.gc();
    }
}
```

## Contact Query Example

This example shows various queries for contacts in a user's private addressbook.

```
import java.util.Enumeration;
import java.util.Hashtable;
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class QueryContacts
{
    public static void main(String[] args)
    {
        if (args.length < 3)
        {
            System.out.println("Usage: java QueryContacts <ORAHOME> <user_
mailid> <user_password>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);
```

```
//Authenticate to the directory
if (oesctx.authenticate(null, args[0]) != true)
{
    System.err.println("APP authentication failed");
    System.exit(1);
}
else
{
    //Authenticate the user now
    OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
    clientCtx.authenticate(args[1], args[2], oesctx);

    DirectoryAccess access = new DirectoryAccess();
    System.out.println("Retrieving All Contacts");

    //Retrieving all contacts in the user's addressbook
    String[] contacts = access.GetAllContacts(clientCtx);

    if (contacts != null)

        for (int i = 0; i < contacts.length; i++)
            System.out.println("Contact " + (i + 1) + " " +
                contacts[i]);

    //Retrieves all Contacts for the user logged on for the given
search
//criteria. "name=t*" returns all the contacts starting with
"t".

    System.out.println("Retrieving Contacts Matching name=friend*");
    contacts = access.SearchContacts(clientCtx, "name=friend*");

    if (contacts != null)

        for (int i = 0; i < contacts.length; i++)
System.out.println("Contact " + (i + 1) + " " +
                contacts[i]);
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
}
```

```
        System.gc();
    }
}
}
```

## Private List Examples

The following examples show how to use the private list APIs to create, modify, look up, and delete lists.

### Private List Creation Example:

This example creates a private distribution list for a given user.

```
import java.util.Vector;
import oracle.mail.OESContext;
import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class CreatePrivateDL
{
    public static void main(String[] args)
    {
        if (args.length < 3)
        {
            System.out.println("Usage: java CreatePrivateDL <ORAHOME> <user_
mailid> <user_password>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
```

```

    {
        //Authenticate the user now
        OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
        clientCtx.authenticate(args[1], args[2], oesctx);

        DirectoryAccess access = new DirectoryAccess();
        DirectoryObject ldapobj = access.GetPrivateListMetaData(
            clientCtx);
        System.out.println("Retrieved Metadata.");

        //Setting some attributes of the dl
        ldapobj.setAttributeValue("name", "friends");
        ldapobj.setAttributeValue("orclmailemail", "School Friends");

        Vector vect = new Vector();
        vect.add("test1@abc.com");
        vect.add("test2@abc.com");
        vect.add("test1@hotmail.com");
        ldapobj.setAttributeValue("orclmailemail", vect);
        access.CreatePrivateList(clientCtx, ldapobj);
        System.out.println("Created 1st List ..");

        //Now it will create another list and add the first list to this
one.
        ldapobj = access.GetPrivateListMetaData(clientCtx);

        //Setting some attributes of the dl
        ldapobj.setAttributeValue("name", "staff");
        ldapobj.setAttributeValue("orclmailemail", "Staff");
        vect = new Vector();
        vect.add("test1@yahoo.com");
        vect.add("test2@yahoo.com");
        ldapobj.setAttributeValue("orclmailemail", vect);

        //Add friends to staff, Similarly contact infos also can be
added to a
        //private DL
        ldapobj.setAttributeValue("uniquemember", "friends");
        access.CreatePrivateList(clientCtx, ldapobj);
        System.out.println("Created 2nd List ..");
    }

    System.gc();
}

```

```
        catch (Exception e)
        {
            System.err.println("Error Occured " + e.getMessage());
            System.gc();
        }
    }
}
```

## Private List Modification Example

This example looks up a private distribution list and modifies it.

```
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;
import oracle.mail.sdk.ldap.DirectoryObject;

class ModifyPrivateDL
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java ModifyPrivateDL <ORAHOME> <user_
mailid> <user_password> <PrivateDL_name>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
        }
    }
}
```



```
    }
    else
    {
        //Authenticate the user now
        OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
        clientCtx.authenticate(args[1], args[2], oesctx);

        DirectoryAccess access = new DirectoryAccess();
        DirectoryObject ldapobj = access.LookupPrivateList(clientCtx,
                                                                    args[3]);

        System.out.println("Found PrivateDL");

        Vector values = ldapobj.getAttributeValue("orclmailemail");
        System.out.println("Printing old values of mail ids of the
PrivateDL members");

        if (values != null)
        {
            for (int i = 0; i < values.size(); i++)
                System.out.println("Mail ids of members --> " +
                                                                    (String)values.elementAt(i));
        }

        values = new Vector();
        values.add("user1@test.net");
        values.add("user2@oracle.com");
        ldapobj.modifyAttributeValue("orclmailemail", values,
                                                                    DirectoryConstants.DS_MODIFY_ADD);
        access.ModifyPrivateList(clientCtx, ldapobj);
        System.out.println("Modified PrivateDL ..");
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
```

## Private List Deletion Example

This example deletes a private distribution list from the user's addressbook.

```
import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class DeletePrivateDL
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java DeletePrivateDL <ORAHOME> <user_
mailid> <user_password> <user_DL_name>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                //Authenticate the user now
                OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
                clientCtx.authenticate(args[1], args[2], oesctx);

                DirectoryAccess access = new DirectoryAccess();
                System.out.println("Deleting private list " + args[3]);

                //Deleting the DL
                access.DeletePrivateList(clientCtx, args[3]);
            }
        }
    }
}
```

```

        System.out.println("Deleted private list");
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
}

```

### Private List Query Example:

This example queries for private distribution lists based on the query criteria.

```

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class QueryPrivateDLs
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java QueryPrivateDLs <ORAHOME> <user_
mailid> <user_password> <ldap_query_filter_(eg. name=friend*)>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)

```

```
    {
        System.err.println("APP authentication failed");
        System.exit(1);
    }
    else
    {
        //Authenticate the user now
        OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
        clientCtx.authenticate(args[1], args[2], oesctx);

        DirectoryAccess access = new DirectoryAccess();
        System.out.println("Retrieving All DLs");

        //Retrieve all private dls present in the user's addressbook
        String[] dls = access.GetAllPrivateLists(clientCtx);

        if (dls != null)

            for (int i = 0; i < dls.length; i++)
                System.out.println("DL " + (i + 1) + " " + dls[i]);

        //Retrieves all DLs for the user logged on for the given search
        //criteria. "name=t*" returns all the DLs starting with "t".
        System.out.println("Retrieving DLs Matching " + args[3]);
        dls = access.SearchPrivateLists(clientCtx, args[3]);

        if (dls != null)

            for (int i = 0; i < dls.length; i++)
                System.out.println("DL " + (i + 1) + " " + dls[i]);
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
```

### Private List Resolution Example:

This example resolves the given private list for e-mail addresses.

```
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class ResolvePrivateList
{
    public static void main(String[] args)
    {
        if (args.length < 4)
        {
            System.out.println("Usage: java ResolvePrivateLists <ORAHOME> <user_
mailid> <user_password> <private_dl_name>");
            System.exit(1);
        }

        try
        {
            OESContext oesctx = new OESContext(
                DirectoryConstants.DS_CALLERTYPE_APP,
                false);

            //Authenticate to the directory
            if (oesctx.authenticate(null, args[0]) != true)
            {
                System.err.println("APP authentication failed");
                System.exit(1);
            }
            else
            {
                //Authenticate the user now
                OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
                clientCtx.authenticate(args[1], args[2], oesctx);

                DirectoryAccess access = new DirectoryAccess();
```

```
        System.out.println("Resolving this DL for email ids..");

        Vector resolved = access.ResolvePrivateList(clientCtx, args[3],
                                                    "orclmailemail");

        if (resolved != null)

            for (int i = 0; i < resolved.size(); i++)
                System.out.println("Email" + (i + 1) + " " +
                                   (String)resolved.elementAt(i));
    }

    System.gc();
}
catch (Exception e)
{
    System.err.println("Error Occured " + e.getMessage());
    System.gc();
}
}
```

### Retrieving User State Example

This example retrieves the user state from the user context. This can be helpful when both e-mail servers are running and caller applications need to decide which system to connect to.

```
import java.util.Vector;

import oracle.mail.OESContext;

import oracle.mail.sdk.ldap.DirectoryAccess;
import oracle.mail.sdk.ldap.DirectoryConstants;
import oracle.mail.sdk.ldap.DirectoryException;

class RetrieveUserState
{
    public static void main(String[] args)
    {
        if (args.length < 3)
        {
```

```
        System.out.println("Usage: java RetrieveUserState <ORAHOME> <user_
mailid> <user_password> ");
        System.exit(1);
    }

    try
    {
        OESContext oesctx = new OESContext(
            DirectoryConstants.DS_CALLERTYPE_APP,
            false);

        //Authenticate to the directory
        if (oesctx.authenticate(null, args[0]) != true)
        {
            System.err.println("APP authentication failed");
            System.exit(1);
        }
        else
        {
            //Authenticate the user now
            OESContext clientCtx = new OESContext(DirectoryConstants.DS_
CALLERTYPE_MAILUSER);
            clientCtx.authenticate(args[1], args[2], oesctx);

            DirectoryAccess access = new DirectoryAccess();
            System.out.println("Retrieving user state");

            Vector state = access.RetrieveAttribValueFromCache(clientCtx,
"orclmailuserstate");

            if (state != null)
                System.out.println("User State is " +
(String)state.elementAt(0));
                //Callers can check if the state is "active" or
"migrating" and decide their action based on that.
        }

        System.gc();
    }
    catch (Exception e)
    {
        System.err.println("Error Occured " + e.getMessage());
        System.gc();
    }
}
```

## Rule Management API

The rule management API is a set of Java classes that can be used to create, access and manage server side rules. Rules are represented as Java objects and can be saved persistently in the Oracle Internet Directory as an attribute of a user.

This section contains the following topics:

- Server Side Rules
- Rule Components
- Authentication
- Rule Visibility, Activeness, and Group Affiliation
- External Condition
- Message Templates
- Auto-Reply Effective Duration
- XML Representation

**See Also:** The *Oracle Email API Reference (Java Doc)* for information about Rule Management APIs

### Server Side Rules

A mail rule is a potential action that, when a certain event happens and a certain condition is satisfied, is taken upon an e-mail message on behalf of the owner of the rule. Rules can be created and stored persistently on the mail server.

The following is an example of a rule, expressed in English:

If an e-mail message arrives in my inbox and its subject contains the phrase "Get paid to surf," then delete the message.

In this example:

- The event is the arrival of an e-mail message in the inbox
- The condition is the presence of the phrase in the subject
- The action is the deletion of the message

Each event represents a change of state of a particular message during its lifecycle in the mail server. In the above example, the event changes the state of the message from `To be delivered` to `Delivered`.



Conditions are similar to Boolean expressions, in which relational and logical operations test message attributes. In the example, the subject is the mail attribute to be tested, and the conditional expression is a relational operation that tests whether the attribute contains "Get paid to surf."

Optionally, multiple conditions can be combined using logical operators such as And and Or to form compound conditions. Additionally, a condition can be an external function call that returns a Boolean value.

Actions are operations that can act upon a message, such as the deletion of the message. In addition, an action can be any external procedure that is callable in PL/SQL from within the mail server.

## Rule Components

Rules are owned by either individual users or a group of users collectively. The top-level entity owning the rules can therefore be either a mail user, a domain, or an entire e-mail system, which can contain more than one domain. The top-level entities are referred to as accounts.

For every account, one can have rules defined under a set of events, such as when new mail is delivered or when the message is read. Each event is associated with a rule list, and an account can have several rule lists, with at most one per event. For any event, a rule list can contain a list of rules that are executed sequentially when the event occurs.

A rule is defined by a condition and a list of actions. A rule with no condition is said to be unconditional, therefore the actions are always carried out.

Conditions can be simple and complex. For example, a condition that compares an attribute with a literal value using the relational operator "contains" is a simple condition. A complex condition can combine several sub-conditions. A condition can be also be a user-defined procedure, referred to as an external condition. There is also a special kind of condition, called an InSection condition, which performs a content-based search on a message.

When a rule's conditions are met, actions are taken. Actions are defined by the rule's commands, such as "move message to a folder" or "forward message to a recipient," and associated parameters, such as the name of the folder to which the message is moved or the address of the recipient to whom the message is forwarded. Once all the rules for a user are constructed in Java objects, the RuleParser object can be used to save it.

## Authentication

Before a caller can access a user's rules, it must be authorized. The caller must authenticate with Oracle Internet Directory using the `oracle.mail.OESContext` class. Once authenticated, the instance of the `oracle.mail.OESContext` class representing a trusted session must be passed into the `RuleParser` rule management class using the `setAuthContext()` method.

### Example:

```
RuleParser parser = new RuleParser();
parser.setAuthContext(oesctx);
```

## Validation

Before a rule is created on the server, the content of the rule is validated, preventing illegal rules from being executed at runtime. You can disable validation using the `RuleParser.setValidation()` method, which is useful if you want to temporarily save an incomplete rule. A non-validated rule can be saved persistently, but cannot be run during runtime.

Validation is disabled as follows:

```
parser.setValidation(false);
```

## Rule Visibility, Activeness, and Group Affiliation

A rule has several attributes that are classified as follows:

- Visibility
- Activeness
- Appendix

### Visibility

A rule can be visible or invisible. An invisible rule functions as a normal rule, except that it is not shown to the user. The actual implementation of hiding a rule is left to the caller. The API is able to retrieve both visible and invisible rules.

Visibility is set using the `setVisible()` `RuleType` class method.

### Activeness

A rule can be active or inactive. An inactive rule exists on the server but is not executed at runtime.

Activeness is set using the `setActive()` `RuleType` class method.

### Group Affiliation

A rule can belong to a group. All rules belonging to the same group can be retrieved, activated, and disabled together in one call.

Group affiliation is set using the `setGroup()` `RuleType` class method.

### RuleType Example:

```
RuleType rule_t = new RuleType();
rule_t.setVisible("no");
rule_t.setActive("no");
rule_t.setGroup("group1");
```

## External Condition

An external condition is a PL/SQL function that takes the following format:

```
function <func_name> (p_sessionid in integer,
                     p_msgobj in mail_message_obj) return integer;
```

Given the session ID and a message object, the function should return a number that indicates whether the condition is met.

If the return value is 0, the server regards it as a positive condition match, and if the return value is non-zero, it is regarded as a failed condition match. If a rule uses an external condition function, it must be manually loaded to the database server where the user resides before the condition can take effect.

To set a condition to be an external condition, use the `ConditionType` class method `addProcCall()`.

**External Condition Example:**

```
ConditionType cond_t = new ConditionType();
cond_t.addProcCall("ext_func_name");
```

**External Action**

An external action is a PL/SQL procedure that takes the following format:

```
procedure <proc_name>(p_event in number,
p_sessionid in number,
p_msgobj in mail_message_obj,
p_param1 in varchar2,
p_param2 in varchar2,
p_status out number);
```

The event ID parameter takes the following possible values:

```
es_rule.c_copy
es_rule.c_deliver
es_rule.c_expunge
es_rule.c_flagchange
```

The procedure also takes a session ID, current message object and two user-defined parameters set at rule creation time. After the procedure is completed, it should put a execution result value in the status parameter. A zero value in status indicates a normal execution, and a positive status indicates an abnormal execution.

To set an external action using server-side rules, use the Action Type class `addCommand()` method, then call `addParameter()` three times, with the first added parameter being the procedure name, and the second and third parameters being the user-defined parameters `p_param1` and `p_param2` above.

**External Action Example:**

```
ActionType action_t = new ActionType();
action_t.addCommand("call");
action_t.addParameter("ext_proc_name");
action_t.addParameter("param1");
action_t.addParameter("param2");
```

**Message Templates**

Some rules require an action to generate a new message as a reply or a notification. The reply or notification can be stored in the rule content as templates containing substitutable parameters denoted by a parameter name enclosed by two percent (%) signs.

For example, an auto-reply template can be "Your e-mail regarding %rfc822subject% sent on %rfc822date% has been received." When the rule engine generates the reply message, the %rfc822subject% and %rfc822date% variables are replaced by the actual subject and date sent information obtained from the incoming message. The set of supported parameters is the same as the set of supported message attributes.

**See Also:** The Javadoc for *Oracle Email API Reference (Java Doc)* for information on the `AttributeType` class

Message template text is used as parameter values for rule actions such as `Notify`, `Reply`, `Replyall`, and `Forward`.

### Message Template Example:

```
ActionType action_t = new ActionType();
action_t.addCommand("notify");
action_t.addParameter("jdoe@acme.com");
action_t.addParameter("Message Alert");
action_t.addParameter("You have received email from %rfc822from% regarding
%rfc822subject%");
```

## Auto-Reply Effective Duration

To prevent auto-reply messages from flooding user inboxes, there is an effective duration for a specific reply action. The duration is specified as a number of days. If an auto-reply is sent to a particular address using a particular message template, the same reply is not sent to the same user again for the period of the effective duration, starting from the time when the first reply is sent. The value is required in rule actions `Reply` and `Replyall`.

### Effective Duration Example:

```
ActionType action_t = new ActionType();
action_t.addCommand("reply");
action_t.addParameter("7");
action_t.addParameter("Message received");
action_t.addParameter("Your email regarding %rfc822subject% sent on %rfc822date%
has been received.");
```

## XML Representation

Rule data can be serialized, or converted into plain text format using XML. It can then be easily transported between applications or stored off line. In fact, the rule API internally uses XML as the format to store in the Oracle Internet Directory. To flatten rule Java objects into XML text, use the `print()` method from the `Account` class.

### XML Example:

```
XMLOutputStream out = new XMLOutputStream(System.out);
account.print(out);
out.writeNewLine();
out.flush();
```

The following example shows using the API to compose a simple rule:

```
import oracle.xml.classgen.InvalidContentException;
import oracle.xml.parser.v2.XMLOutputStream;
import java.util.*;
import java.io.*;
import oracle.mail.*;
import oracle.mail.sdk.rule.*;
import oracle.mail.sdk.ldap.*;
public class Demo {
    public static main (String args[]) throws Exception {
        // login to LDAP using Directory APIs
        OESContext appCtx = new OESContext(DirectoryConstants.DS_CALLERTYPE_
APP);
        appCtx.uthenticate(null, "/your/local/oracle/home");

        // authenticate as a rule owner
        OESContext clientCtx = new OESContext(ESDSConstants.DS_CALLERTYPE_
MAILUSER);
        clientCtx.uthenticate("testuser1@oracle.com", null, appLogin);
        // set authentication context in RuleParser
        parser = new RuleParser();
        parser.setAuthContext(clientCtx);
        // first create the top level user account type object
        AccountType acnt_t = new AccountType();

        // set ownerType, either system, domain or user (default)
        acnt_t.setOwnerType("user");

        // for system rules, this is the installation name in LDAP,
```

```
// such as "install1", for domain rules this is the domain
// name, such as "oracle.com", for user rules this is the
// fully qualified username, such as testuser1@oracle.com
acct_t.setQualifiedName("testuser1@oracle.com");
// create a rulelist type object, set the event
RuleListType rlist_t = new RuleListType();
rlist_t.setEvent("deliver");

// create a rule type object
RuleType rule_t = new RuleType();
rule_t.setDescription("a new rule");
rule_t.setGroup("group1");

// create a condition type object
ConditionType cond_t = new ConditionType();

// create a simple attribute:
cond_t.addAttribute("rfc822subject");
// or create an attribute object with parameters:
//
// AttributeType attr_t = new AttributeType("xheader");
// attr_t.setParam("X-Priority");
// cond_t.addAttribute(attr_t);
// create a simple operator:
cond_t.addOperator("contains");
cond_t.addOperand("Hello");

// create an external condition
ConditionType cond_t2 = new ConditionType();
cond_t2.addProcCall("extern_cond");

// create a negation of disjunction of above two conditions
// (i.e. not (cond1 or cond2) )
ConditionType cond_t3 = new ConditionType();
cond_t3.setJunction("or");
cond_t3.setNegation("yes");
cond_t3.addCondition(cond_t);
cond_t3.addCondition(cond_t2);

// add the condition object to the rule type object
rule_t.addCondition(cond_t3);

// create an action type object
ActionType action_t = new ActionType();
action_t.addCommand("moveto");
```

```
        action_t.addParameter("/testuser1/folder1");
        // add the action to the rule object
        rule_t.addAction(action_t);

        // create a second action object and add it in the rule type
        ActionType action2_t = new ActionType();
        action2_t.addCommand("call");
        action_t.addParameter("extern_action");
        action_t.addParameter("param1");
        action_t.addParameter("param2");
        rule_t.addAction(action2_t);

        // add the rule object in the rulelist type object
        rlist_t.addRule(rule_t);

        // add the rulelist object in the account type object
        acct_t.addRulelist(rlist_t);
        // create an account object on based the type object
        Account acct = new Account(acct_t);
        parser.setValidation(true); // default
        parser.setRuleObjects(acct);
    }
}
```

## Wireless Filters and Profiles API

To efficiently access e-mail over mobile devices or over a slow link, it is necessary to have filters on folders that enable only a small subset of e-mails to be downloaded. The wireless filters and profiles feature enables the user to define search criteria on folders. When a search criteria is defined and the folder is opened, only messages that meet the criteria are selected and are visible to the client. In addition, it also enables the user to define multiple criteria on a folder, through the use of profiles for accessing different sets of messages.

The different wireless filters and profiles components are:

- Filter - This is the search criteria defined on a folder, and supports all the search conditions defined in the IMAP protocol. This includes complex conditions joined by "and" and "or."
- Virtual Folder - The folder that has a defined filter. When the folder is opened by the client only the messages meeting the filter criteria are displayed.
- Profile - The name associated with a set of virtual folders, used during log on to inform the server which filters to apply. For example, if a user defines a profile



on the INBOX folder called WP1 with the criteria "show urgent messages," and defines a second profile on the INBOX folder called WP2 with the criteria "show messages from sender *john* and from sender *scott*." When the user logs in as `username#wp1@domain_name` and selects INBOX, the only messages that appear are those marked urgent. However, if the user logs in as `username#wp2@domain_name` and selects INBOX, the messages from sender *ohn* and *scott* are displayed.

The various interfaces supporting virtual folders are:

- Java SDK - As part of the Java SDK, procedures are available for creating and modifying profiles and filters. In addition, the special log on format for accessing the virtual folders is also supported.
- IMAP server - The special log in format for accessing virtual folders is supported. This enables access to virtual folders through standards-based clients such as Outlook Express and Netscape Communicator.

## Listing Wireless Filters

The following example shows how to list wireless filters:

```
import java.util.*;
import javax.mail.*;
import javax.mail.internet.*;
import java.io.*;

import javax.mail.search.*;

import oracle.mail.sdk.esmail.OracleEsProfile;
import oracle.mail.sdk.esmail.OracleEsFilter;
import oracle.mail.sdk.esmail.OracleStore;
public class ListFilter
{
    static String password = null;
    static String user = null;
    static String host = null;
    static int port = -1;
    static String mbox = "INBOX";
    static String root = null;
    static boolean recursive = false;
    static String pattern = "*";
    static boolean verbose = false;
    static String namespace = null;
```

```
public static void main (String argv[]) throws Exception
{
    for (int i = 0; i < argv.length; i++)
    {
        if (argv[i].equals("-U"))
            user = argv[++i];
        else if (argv[i].equals("-P"))
            password = argv[++i];
        else if (argv[i].equals("-D"))
            host = argv[++i];
        else if (argv[i].equals("-I"))
            port = Integer.parseInt(argv[++i]);
        else if (argv[i].equals("--")) {
            i++;
            break;
        }
        else if (argv[i].startsWith("-")) {
            System.out.println(
                "Usage: ListFilter [-D ldap_host] [-I ldap_port]
                [-U user] [-P password]");
            System.exit(1);
        }
        else {
            break;
        }
    }

    Properties props = System.getProperties();
    Session session = Session.getDefaultInstance(props,null);
    session.setDebug(true);

    Store store = null;

    store = session.getStore("esmail");

    if (user != null && password != null && port != 0 && host !=
null){
        store.connect(host, port, user, password);

        OracleEsProfile wp2 = new OracleEsProfile(store, "wp2",
"Wireless Profile 2");
        wp2.create();
        OracleEsProfile[] profiles = ((OracleStore)store).listProfile();
        System.out.println("Number of profiles = " + profiles.length);
    }
}
```

```

        for (int i = 0; i < profiles.length; i++)
        {
            System.out.println("PROFILE " + (i+1));
            System.out.println("profile name = " +
profiles[i].getName());
            System.out.println("profile description = " +
profiles[i].getDescription()+ "\n");
            System.out.println("List the filters:");
            OracleEsFilter[] filtersList = profiles[i].listFilters();
            System.out.println("Number of filters : " +
filtersList.length);
            for (int j = 0; j < filtersList.length; j++)
            {
                System.out.println("filter folder = " +
filtersList[j].getFolder().getFullName());
                System.out.println("filter description = " +
filtersList[j].getDescription());
                SearchTerm st = filtersList[j].getCriteria();
                if (st instanceof FromTerm)
                    System.out.println("from term");
            }
        }
    }
    store.close();
}
}

```

## Adding Filters to a Profile

The following example shows how to add a wireless filter to a profile:

```

import java.util.*;
import javax.mail.*;
import javax.mail.internet.*;
import java.io.*;

import javax.mail.search.*;
import javax.mail.Address;
import javax.mail.internet.InternetAddress;

import oracle.mail.sdk.esmail.OracleEsProfile;
import oracle.mail.sdk.esmail.OracleEsFilter;
import oracle.mail.sdk.esmail.OracleStore;
public class AddFilter

```

```
{
    static String password = null;
    static String user = null;
    static String host = null;
    static int port = -1;
    static String mbox = "INBOX";
    static String root = null;
    static boolean recursive = false;
    static String pattern = "*";
    static boolean verbose = false;
    static String namespace = null;

    public static void main (String argv[]) throws Exception
    {
        for (int i = 0; i < argv.length; i++)
        {
            if (argv[i].equals("-U"))
                user = argv[++i];
            else if (argv[i].equals("-P"))
                password = argv[++i];
            else if (argv[i].equals("-D"))
                host = argv[++i];
            else if (argv[i].equals("-I"))
                port = Integer.parseInt(argv[++i]);
            else if (argv[i].equals("--")) {
                i++;
                break;
            }
            else if (argv[i].startsWith("-")) {
                System.out.println(
                    "Usage: AddFilter [-D ldap_host] [-I ldap_port]
[-U user] [-P password]");
                System.exit(1);
            }
            else {
                break;
            }
        }

        Properties props = System.getProperties();
        Session session = Session.getDefaultInstance(props,null);
        session.setDebug(false);

        Store store = null;
    }
}
```

```
store = session.getStore("esmail");

if (user != null && password != null && port != 0 && host !=
null){
store.connect(host, port, user, password);

OracleEsProfile wp2 = new OracleEsProfile(store, "wp2",
"Wireless Profile 2");
wp2.create();

OracleEsProfile[] profiles = ((OracleStore)store).listProfile();
System.out.println("Number of profiles = " + profiles.length);

for (int i = 0; i < profiles.length; i++)
{
System.out.println("PROFILE " + (i+1));
System.out.println("profile name = " +
profiles[i].getName());
System.out.println("profile description = " +
profiles[i].getDescription()+ "\n");
}
Folder folder = store.getFolder("xyz");
OracleEsFilter filter = new OracleEsFilter(folder, "F2", new
FromTerm(new InternetAddress("tuser1@us.oracle.com")));
profiles[0].addFilter(filter);
}
store.close();
}
}
```



---

---

## SMTP Scanner Interface APIs

This chapter describes the Oracle Email SMTP scanner interface APIs that can be used to create customized clients, integrate applications, and support certain extensions.

This chapter contains the following topics:

- Overview
- Format and Entry
- Scanner Interface APIs
- Callback Routine Descriptions

## Overview

SMTP server can be integrated with custom procedures for filtering and scanning. These procedures are implemented as C language functions and linked with the server. Each filter or scanner must implement a set of functions that the server calls at different stages of processing. Within each scanner, there is a set of callback functions that can be called to retrieve message headers and data.

## Format and Entry

Format and typical entry in the LDAP server parameter specifying the list of scanner interfaces:

```
shared-library-path, when-to-call, [internal | host:port], function set:  
(initialization, register callback, scan message, send, receive,  
close), scanner_flags, system_flags
```

where:

- *shared-library-path* is the full path of the C shared library. This is loaded by the server at startup.
- *when-to-call* is the point at which the C-interface should be called. The possible values are:
  - ENV - After receiving the message envelope
  - DATA - After receiving the complete message and before local delivery
  - RELAY - Just before relaying a message
  - NEVER - Essentially disables using the interface
- *host* and *port* specify the host and port at which a virus scanner maybe listening for input.
- *Internal* is used for scanners that do not talk to any external entity for filtering.
- *scanner\_flag* any flags the scanner needs to pass to the initialization function.
- *system\_flags* are the MTA defined flags. Curently the only value defined is *repairmsg=0/1*. If set to 0, and the message is damaged it is discarded by the scanner interface. If set to True, the message is repaired. If set to False, the MTA behaviour is same as failure for damaged messages.



**Example**

```
/work/orahome/lib/libsym.so,DATA,host9999:6000,(essym_init,essym_registercb,  
essym_scanmsg, essym_send, essym_rcv, essym_close),0, repair_msg=1
```

## Scanner Interface APIs

The following functions must be implemented by each scanner:

- `vgctx`: Virus scanner interface global context. This is the global context that is initialized and managed by the scanner APIs. It is passed to each scanner interface call.
- `vlctx`: Virus scanner interface local context for each message. This is initialized and used for each message.
- `smtplctx`: SMTP server local context. This is for internal use by the server.
- `msgin`: Buffer containing the message, unused in the current release.

## Initialization()

Parameters: `void **vgctx, char *host, sb4 port, char *system_flags, char *scanner_flags`

Retcode: `int`

Description:

This is called once during the lifetime of by the server at startup, once during the lifetime of the process. Perform scanner initialization with minimal step of creating a global context for scanner use (return pointer a `void` in `vgctx` for subsequent use by the framework.

- Store host and port, and optionally establish connections to virus scanner for future use.
- If the `system_flags` parameter is set to `repairmsg=1`, then repair message is turned on
- `Scanner_flags` are the flags set in the scanner definition

## register\_callback()

Parameters: void \*vgctx, int (\*cb)(void\*, void\*, void\*), unsigned int flags)

Retcode: int

Description:

The server provides a set of functions that the scanner can call to get message information. The function names of these are not predefined but are passed by the server to this function. After the call to `initialization()`, the server calls this for each of sever functions available to get message data. Store call back routine cb for later use in scan message.

The flags parameter specifies the kind of callback with following values:

- 0: Retrieve and Send Message
- 1: Receive and Store Message
- 2: Fetch Envelope
- 3: Get Message size
- 4: Get Message Id
- 5: Free memory
- 6: Set Scanner Version definition

## scan\_message()

Parameters: (void \*vgctx, void \*smtplctx, char \*msgin, char \*errmsg)

Retcode: int

Description:

- The server for each message calls this. Perform steps needed to scan message and retrieve results from virus scanner. Use callbacks to `retrieve-send` and `receive-store` message headers and body.
- `msgin` is used to pass the entire message in memory so that callback for `retrieve-send` cannot be used to fetch messages from the mail store.
- For errors, `errmsg` should be populated with description of error. `errmsg` buffer allocated in the server of size 512 bytes.

Return Value:

- 0 (successful)
- 1 (failure)
- 2 (repaired)
- 3, <0 (errors)

## **send()**

Parameters: (void \*vlctx, char \*buf, int buflen)

Retcode: int

Description:

- The scanner should call the callback `retrieve` and `send` message for getting the message body. Internally this callback calls this `Send()` function multiple times to provide the message to the scanner.
- `Buflen` is the length of the buffer `buf`.
- Return: < 0 errors in sending.

## **recv()**

Parameters: (void \*vlctx, char \*buf, int \*buflen)

Retcode: int

Description:

- The scanner should call `receive` and `store` message callback for passing any changed message back to the scanner. The callback internally call `recv()` function to fetch the message data.
- `Buflen` is the number of bytes the scanner `recv()` should put in the buffer `buf`. If fewer than `*buflen` bytes received due to EOF, update `buflen` with the actual number of bytes.
- Return: <0 errors in receiving

## close()

Parameters: (void \*vgctx);

Retcode: void

Description: This is called once at server exit. Perform any cleanup necessary, such as close connections, and free memory.

## Callback Routine Descriptions

These functions are available to retrieve message data. The signature of all callbacks is generic. For example, `int (*cb)(void *, void *, void *)`. The parameter value types are given below for each call back.

### Send Message

Fetches the message for the scanner.

Parameters: (void \*vgctx, void \*vlctx, void \*smtplctx)

### Receive Message

Reads the changed message from the scanner.

Parameters: (void \*vgctx, void \*vlctx, void \*smtplctx)

### Get Envelope

Gets the message envelope.

Parameters: (void \*vgctx, void \*output, void \*smtplctx)

where:

output is of type `char **` (memory allocated in framework) with the envelope information in the format `host=hostname | mailfrom=sender info | rcptto=(rcpt1,rcpt2,...)`.

### Get Message Size

Retrieves the message size.

Parameters: (void \*vgctx, void \*output, void \*smtplctx)

where output is pointer to integer with the result containing the message size.

### Free Memory

Frees the output parameter of the Get Envelope callback.

Parameters: (void \*vgctx, void \*input, void \*smtplctx)

where:

`input` is the pointer to the buffer to be freed. This buffer must have been allocated earlier by the framework.

**Set Version Definition**

Sets the version of the scanner which was used to scan the message.

Parameters: (void \*vgctx, void \*input, void \*smtpctx)

where:

`input` is a string containing version definition string for virus scanner. This routine should be called by the scanner API if the version definition information is available from virus scanner.



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