BEA WebLogic Server®

Using WebLogic Logging Services for Application Logging

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CHAPTER 1

Introduction and Roadmap

This section describes the contents and organization of this guide—*Using WebLogic Logging Services*.

- "Document Scope and Audience" on page 1-1
- "Guide to This Document" on page 1-2
- "Related Documentation" on page 1-3
- "Logging Samples and Tutorials" on page 1-3
- "New and Changed Application Logging Features in This Release" on page 1-4

Document Scope and Audience

This document describes how you use BEA WebLogic Server® logging services to monitor application events. It describes WebLogic support for internationalization and localization of log messages, and shows you how to use the templates and tools provided with WebLogic Server to to create or edit message catalogs that are locale-specific.

This document is a resource for Java Platform, Enterprise Edition (Java EE) application developers who want to use WebLogic message catalogs and logging services as a way for their applications to produce log messages and want to integrate their application logs with WebLogic Server logs. This document is relevant to all phases of a software project, from development through test and production phases.

This document does not address how you configure logging, subscribe to and filter log messages. For links to information on these topics, see Related Documentation.

It is assumed that the reader is familiar with Java EE and Web technologies, object-oriented programming techniques, and the Java programming language.

Guide to This Document

The document is organized as follows:

- This chapter, "Introduction and Roadmap," describes the scope of this guide and lists related documentation.
- Chapter 2, "Application Logging and WebLogic Logging Services," discusses how to use WebLogic logging services to monitor application events.
- Chapter 3, "Internationalization and Localization for WebLogic Server," summarizes the processes required for internationalization and localization.
- Chapter 4, "Using Message Catalogs with WebLogic Server," describes message catalog types, message definitions, elements, and arguments.
- Chapter 5, "Writing Messages to the WebLogic Server Log," describes how to create and use message catalogs and how to use the `NonCatalogLogger` class to write log messages.
- Chapter 6, "Using the WebLogic Server Message Editor," explains how to use the Message Editor that is included with WebLogic Server.
- Chapter 7, "Using the WebLogic Server Internationalization Utilities," explains how to use the internationalization utilities included with WebLogic Server.
- Appendix A, "Localizer Class Reference for WebLogic Server," describes `Localizer` classes, `Localizer` methods, key values for `Localizers`, and lookup properties for `Localizers`.
- Appendix B, "Loggable Object Reference for WebLogic Server," describes `loggable objects` and how they are used.
- Appendix C, "TextFormatter Class Reference for WebLogic Server," provides an example of an application that uses a `TextFormatter` class.
- Appendix D, "Logger Class Reference for WebLogic Server," describes `Logger` classes and provides an example of a message catalog and its corresponding `Logger` class.

Related Documentation

The BEA corporate Web site provides all documentation for WebLogic Server. Specifically, "View and Configure Logs" in the *Administration Console Online Help* describes configuring log files and log messages that a WebLogic Server instance generates, and "Configuring Log Files and Filtering Log Messages" describes configuring WebLogic Server to write messages to log files, filtering message output, and listening for the log messages that WebLogic Server broadcasts.

For general information about internationalization and localization, refer to the following sources:

- The Java Developer Connection™ at `java.sun.com`
- The Internationalization section of the World Wide Web Consortium (W3C) Web Site at `http://www.w3.org`

Logging Samples and Tutorials

In addition to this document, BEA Systems provides a variety of logging code samples and tutorials that show logging configuration and API use.

Avitek Medical Records Application (MedRec) and Tutorials

MedRec is an end-to-end sample Java EE application shipped with WebLogic Server that simulates an independent, centralized medical record management system. The MedRec application provides a framework for patients, doctors, and administrators to manage patient data using a variety of different clients.

MedRec demonstrates WebLogic Server and Java EE features, and highlights BEA-recommended best practices. MedRec is included in the WebLogic Server distribution, and can be accessed from the Start menu on Windows machines. For Linux and other platforms, you can start MedRec from the *`WL_HOME`*`\samples\domains\medrec` directory, where *`WL_HOME`* is the top-level installation directory for WebLogic Server.

Logging Examples in the WebLogic Server Distribution

WebLogic Server 9.0 optionally installs API code examples in *`WL_HOME`*`\samples\server\examples\src\examples`, where *`WL_HOME`* is the top-level directory of your WebLogic Server installation. You can start the examples server, and obtain information about the samples and how to run them from the WebLogic Server 9.0 Start menu.

Internationalizing Applications Using Simple Message Catalogs Example

This example shows various methods for displaying localized text using simple message catalogs. Using any of the languages supported by the example requires the appropriate operating system localization software and character encoding. The package that contains this example is:

```
java examples.i18n.simple.HelloWorld [lang [country]]
```

where `lang` is a two-character ISO language code (for example, en for English) and `country` is a two-character ISO country code (for example, US for the United States).

The files are located in *`WL_HOME`*`\samples\server\examples\src\examples\i18n\simple`, where *`WL_HOME`* is the top-level directory of your WebLogic Server installation. The default path is `c:\bea\wlserver_10.0`, however, you are not required to install this directory under *`BEA_HOME`*.

New and Changed Application Logging Features in This Release

There are no new or changed application logging features in this release. For more information about the new and changed features in this release, seeWhat's New in WebLogic Server 10.0.

CHAPTER 2

Application Logging and WebLogic Logging Services

The following sections describe how to use WebLogic logging services for your application logging:

- "About WebLogic Logging Services" on page 2-1
- "Integrating Application Logging with WebLogic Logging Services: Main Steps" on page 2-2
- "Accessing the WebLogic Server Logger" on page 2-3

About WebLogic Logging Services

WebLogic logging services provide information about server and application events. You can use WebLogic logging services to keep a record of which user invokes specific application components, to report error conditions, or to help debug your application before releasing it to a production environment. Your application can also use them to communicate its status and respond to specific events. See "Understanding WebLogic Logging Services" in *Configuring Log Files and Filtering Log Messages*.

Two features of WebLogic logging services from which your application can benefit are its extensibility and support for internationalization.

You can create your own catalog of log messages and use WebLogic utilities to generate Java classes that you can use in your application code. The log messages generated from your applications will be integrated with and treated in the same way as log messages generated by the server. See "Writing Messages to the WebLogic Server Log" on page 5-1.

Log message catalogs you create can be written in any language and can be accompanied by translations for different locales. WebLogic support for internationalization ensures that the log messages are present in the appropriate language for the current locale under which WebLogic Server is running. See "Internationalization and Localization for WebLogic Server" on page 3-1.

A major advantage of integrating your application logging with WebLogic logging framework is ease of management. The Administration Console lets you manage all of the log files and related options. See "View and Configure Logs" in the *Administration Console Online Help*.

Integrating Application Logging with WebLogic Logging Services: Main Steps

There are several ways to generate log messages from your applications and integrate them with WebLogic logging:

- Use WebLogic tools to build custom log message catalogs and their associated Java APIs. Applications can invoke the log methods exposed by these interfaces to generate log messages. The message catalogs can be easily internationalized. See "Using Message Catalogs with WebLogic Server" on page 4-1.
- Use the WebLogic non-catalog logger to generate log messages. With `NonCatalogLogger`, instead of calling messages from a catalog, you place the message text directly in your application code. See "Using the NonCatalogLogger APIs" on page 5-8.
- Use a `log()` method available to servlets and JSPs in `javax.servlet.ServletContext`. See "Using ServletContext" on page 5-10.

Application developers who do not use WebLogic message catalogs, `NonCatalogLogger`, or servlet logging can do the following:

- Use the Java Logging APIs to produce and distribute messages.
- Use Log4J to produce messages and configure the server to use Log4J or the default, Java Logging, to distribute messages.
- Use the Commons API to produce messages.

  For more information, see `org.apache.commons.logging` at http://jakarta.apache.org/commons/logging/api/index.html.

Accessing the WebLogic Server Logger

The WebLogic logging infrastructure supports a logger on each server which collects the log events generated by your own applications and subsystems. WebLogic Server provides direct access to the logger on each server, as well as to the domain logger on the Administration server.

By default, WebLogic logging services use an implementation based on the Java Logging APIs. The `LoggingHelper` class provides access to the `java.util.logging.Logger` object used for server logging. See the `LoggingHelper` Javadoc.

Alternatively, you can direct WebLogic logging services to use Log4j instead of Java Logging. When Log4j is enabled, you get a reference to the `org.apache.log4j.Logger` that the server is using from the `weblogic.logging.log4j.Log4jLoggingHelper` class. With a Log4j `Logger` reference, you can attach you own custom appender (handler) to receive the log events or you can use the `Logger` reference to issue log requests to WebLogic logging services. See the `Log4jLoggingHelper` Javadoc.

In addition, WebLogic logging services provide an implementation of the Jakarta Commons `LogFactory` and `Log` interface, so you can program to the Commons API and direct log messages to the server log file or any of the registered destinations. This API provides you with an abstraction that insulates you from the underlying logging implementation, which could be Log4j or Java Logging.

For more information, see the following sections in *Configuring Log Files and Filtering Log Messages*:

- "How to Use Log4j with WebLogic Logging Services"
- "How to Use the Commons API with WebLogic Logging Services"
- "Best Practices: Integrating Java Logging or Log4j with WebLogic Logging Services"

CHAPTER 3

Internationalization and Localization for WebLogic Server

The following sections provide an overview of localization and internationalization:

- "About Internationalization and Localization Standards" on page 3-1
- "Understanding Internationalization and Localization for WebLogic Server" on page 3-2
- "Understanding Message Catalogs" on page 3-2
- "Understanding Java Interfaces for Internationalization" on page 3-3
- "Main Steps for Creating an Internationalized Message" on page 3-3

About Internationalization and Localization Standards

BEA has adopted the World Wide Web Consortium's (W3C) recommendations for standard formats and protocols that are usable worldwide in all languages and in all writing systems. These standards are part of the Java internationalization APIs that are used by WebLogic Server. *Internationalization* (I18N) refers to the process of designing software so that it can be adapted to various languages and regions easily, cost-effectively, and, in particular, without engineering changes to the software. *Localization* (L10N) is the use of locale-specific language and constructs at run time.

Understanding Internationalization and Localization for WebLogic Server

Localization covers not only language, but collation, date and time formats, monetary formats, and character encoding. Messages that are logged to the WebLogic server log can be localized to meet your particular requirements.

WebLogic Server internationalization supports localization of two types of data:

- **Log messages**—Log messages are informational messages that are written to the server log, and may also contain error messages if the appropriate message arguments are included in the message definition. See "Elements of a Log Message Catalog" on page 4-6.
- **Simple text**—Simple text is any text other than log messages and exceptions that the server must display, such as the output from a utility. Examples of simple text include usage messages, graphical user interface (GUI) labels, and error messages. See "Elements of a Simple Text Catalog" on page 4-14.

Understanding Message Catalogs

All internationalized text is defined in message catalogs, each of which defines a collection of log messages or simple text. Log messages contain data that is written to the log file. This data is predominantly dynamic and contains information that is specific to the current state of the application and system. When merged with text in a localized log message catalog, this data results in well-formatted, localized messages that describe the error condition in the language of the user. The output sent to the WebLogic Server Administration Console is simple text. As with log messages, simple text can be merged with dynamic data.

To create an internationalized message, you externalize all message strings in a message catalog so that the strings can be converted to multiple locales without changing or recompiling the code. The application code supplies run-time values to the logging methods. The logging methods merge the code with the message string in the catalog according to the current locale. The application code then prints a localized message in the log files.

There are three types of message catalogs:

- **Log message catalogs**—Collections of log messages. See "Elements of a Log Message Catalog" on page 4-6.
- **Simple text message catalogs**—Collections of simple text messages. See "Elements of a Simple Text Catalog" on page 4-14.

- **Locale message catalogs**—Collections of locale-specific messages corresponding to a top-level log message or simple text catalog. See "Elements of a Locale-Specific Catalog" on page 4-18.

Message IDs in log message catalogs or locale message catalogs are unique across all log message or locale message catalogs. Within the message catalog file, each localized version of the message is assigned a unique message ID and message text specific to the error. Ideally, a message is logged from only one location within the system so that a support team can easily find it. Message IDs in simple text catalogs are unique within each simple text catalog.

See "Using Message Catalogs with WebLogic Server" on page 4-1 for more detailed information about message catalogs.

To view the WebLogic Server message catalogs, see the "Index of Messages by Message Range."

Understanding Java Interfaces for Internationalization

WebLogic Server uses the Java internationalization interfaces to provide internationalization and localization. In addition to understanding how WebLogic Server handles internationalization, you should be familiar with the Java internationalization interfaces and the following classes included in the Java Development Kit (JDK).

Class	Description
`java.util.Locale`	Represents a specific geographical, political, or cultural region.
`java.util.ResourceBundle`	Provides containers for locale-specific objects.
`java.text.MessageFormat`	Produces concatenated messages in a language-neutral way.

Main Steps for Creating an Internationalized Message

The following steps summarize how you create an internationalized message to use with WebLogic Server. Later sections of this guide describe these steps in more detail.

1. Create or edit a top-level log message catalog or simple text message catalog by defining the messages in the catalog.

   In addition to message text, include information about the type and placement of any run-time values that the message contains. For details, see "Using the WebLogic Server Message Editor" on page 6-1.

2. Run `weblogic.i18ngen` to validate the catalog you created or edited in Step 1 and generate runtime classes.

   The generated classes contain a method for each message. The class is defined according to information specified in the message catalog entry. The classes include methods for logging or getting message text, depending on the type of catalog. The class name ends with `Logger` or `TextFormatter`. For details, see "weblogic.i18ngen Utility" on page 7-3.

3. Create locale-specific catalogs as required for the message catalog you created in Step 1. See "Example Locale-Specific Catalog" on page 4-17.

4. Run `weblogic.l10ngen` to process the locale-specific catalogs. For details, see "weblogic.l10ngen Utility" on page 7-5.

5. Configure your application to use the `Logger` or `TextFormatter` classes you generated in Step 2. When the application logs or returns a message, the message is written using the localized version of the text according to the `Logger` or `TextFormatter` classes used.

For more detailed information, see "Writing Messages to the WebLogic Server Log" on page 5-1.

CHAPTER 4

Using Message Catalogs with WebLogic Server

The following sections describe message catalogs and how to use them:

- "Overview of Message Catalogs" on page 4-1
- "Message Catalog Hierarchy" on page 4-2
- "Guidelines for Naming Message Catalogs" on page 4-3
- "Using Message Arguments" on page 4-3
- "Message Catalog Formats" on page 4-5

Overview of Message Catalogs

A message catalog is a single XML file that contains a collection of text messages, with each message indexed by a unique identifier. You compile these XML files into classes using `weblogic.i18ngen` during the build process. (See "weblogic.i18ngen Utility" on page 7-3 for more information). The methods of the resulting classes are the objects used to log messages at runtime.

Message catalogs support multiple locales or languages. For a specific message catalog there is exactly one default version, known as the top-level catalog, which contains the English version of the messages. Then there are corresponding locale-specific catalogs, one for each additional supported locale.

The top-level catalog (English version) includes all the information necessary to define the message. The locale-specific catalogs contain only the message ID, the date changed, and the translation of the message for the specific locale.

The message catalog files are defined by an XML document type definition (DTD). The DTDs are stored in the `weblogic\msgcat` directory of *`WL_HOME`*`\server\lib\weblogic.jar`, where *`WL_HOME`* represents the top-level installation directory for WebLogic Server. The default path is `c:\bea\wlserver_10.0`, however, you are not required to install this directory under *`BEA_HOME`*.

You can also download the DTDs at:
`http://www.bea.com/servers/wls90/dtd/msgcat.dtd`.

Two DTDs are included in the WebLogic Server installation:

- `msgcat.dtd`—Describes the syntax of top-level, default catalogs.
- `l10n_msgcat.dtd`—Describes the syntax of locale-specific catalogs.

The `weblogic\msgcat` directory of *`WL_HOME`*`\server\lib\weblogic.jar` contains templates that you can use to create top-level and locale-specific message catalogs.

You can create a single log message catalog for all logging requirements, or create smaller catalogs based on a subsystem or Java package. BEA recommends using multiple subsystem catalogs so you can focus on specific portions of the log during viewing.

For simple text catalogs, BEA recommends creating a single catalog for each utility being internationalized. You create message catalogs using the Message Editor as described in "Using the WebLogic Server Message Editor" on page 6-1.

Message Catalog Hierarchy

All messages must be defined in the default, top-level catalog. The WebLogic Server installation includes a collection of sample catalogs in the *`SAMPLES_HOME`*`\server\examples\src\examples\i18n\msgcat` directory, where *`SAMPLES_HOME`* represents the WebLogic Server examples home directory at *`WL_HOME`*`\samples`.

Catalogs that provide different localizations of the base catalogs are defined in `msgcat` subdirectories named for the locale (for example, `msgcat/de` for Germany). You might have a top-level catalog named `mycat.xml`, and a German translation of it called `..de/mycat.xml`. Typically the top-level catalog is English. However, English is not required for any catalogs, except for those in the *`SAMPLES_HOME`*`\server\examples\src\examples\i18n\msgcat` directory.

Locale designations (for example, `de`) also have a hierarchy as defined in the `java.util.Locale` documentation. A locale can include a language, country, and variant. Language is the most common locale designation. Language can be extended with a country code. For instance, `en\US`, indicates American English. The name of the associated catalog is `..en\US\mycat.xml`. Variants are vendor or browser-specific and are used to introduce minor differences (for example, collation sequences) between two or more locales defined by either language or country.

Guidelines for Naming Message Catalogs

Because the name of a message catalog file (without the `.xml` extension) is used to generate runtime class and property names, you should choose the name carefully.

Follow these guidelines for naming message catalogs:

- Do not choose a message catalog name that conflicts with the names of existing classes in the target package for which you are creating the message catalog.
- The message catalog name should only contain characters that are allowed in class names.
- Follow class naming standards.

For example, the resulting class names for a catalog named `Xyz.xml` are `XyzLogLocalizer` and `XyzLogger`.

The following considerations also apply to message catalog files:

- Message IDs are generally six-character strings with leading zeros. Some interfaces also support integer representations.

  Note: This only applies to log message catalogs. Simple text catalogs can have any string value.

- Java lets you group classes into a collection called a *package*. A package name should be consistent with the name of the subsystem in which a particular catalog resides.
- The log Localizer "classes" are actually `ResourceBundle` property files.

Using Message Arguments

The message body, message detail, cause, and action sections of a log message can include message arguments, as described by `java.text.MessageFormat`. Make sure your message contents conform to the patterns specified by `java.text.MessageFormat`. Only the message

body section in a simple text message can include arguments. Arguments are values that can be dynamically set at runtime. These values are passed to routines, such as printing out a message. A message can support up to 10 arguments, numbered 0-9. You can include any subset of these arguments in any text section of the message definition (Message Body, Message Detail, Probable Cause), although the message body must include all of the arguments. You insert message arguments into a message definition during development, and these arguments are replaced by the appropriate message content at runtime when the message is logged.

The following excerpt from an XML log message definition shows how you can use message arguments. The argument number must correspond to one of the arguments specified in the *method* attribute. Specifically, `{0}` with the first argument, `{1}` with the second, and so on. In Listing 4-1, `{0}` represents the file that cannot be opened, while `{1}` represents the file that will be opened in its place.

Listing 4-1 Example of Message Arguments

```
<messagebody>Unable to open file, {0}. Opening {1}. All arguments must be in
body.</messagebody>

    <messagedetail> File, {0} does not exist. The server will restore the file
    contents from {1}, resulting in the use of default values for all future
    requests. </messagedetail>

    <cause>The file was deleted</cause>

    <action>If this error repeats then investigate unauthorized access to the
    file system.</action>
```

An example of a `method` attribute is as follows:

```
-method="logNoFile(String name, String path)"
```

The message example in Listing 4-1 expects two arguments, `{0}` and `{1}`:

- Both are used in the `<messagebody>`
- Both are used in the `<messagedetail>`
- Neither is used in `<cause>` or `<action>`

Note: A message can support up to 10 arguments, numbered 0-9. You can include any subset of these arguments in any text section of the message definition (message detail, cause, action), although the message body must include all of the arguments.

In addition, the arguments are expected to be strings, or representable as strings. Numeric data is represented as `{n,number}`. Dates are supported as `{n,date}`. You must assign a severity level for log messages. Log messages are generated through the generated `Logger` methods, as defined by the `method` attribute.

Message Catalog Formats

The catalog format for top-level and locale-specific catalog files is slightly different. The top-level catalogs define the textual messages for the base locale (by default, this is the English language). Locale-specific catalogs (for example, those translated to Spanish) only provide translations of text defined in the top-level version. Log message catalogs are defined differently from simple text catalogs.

Examples and elements of each type of message catalog are described in the following sections:

- "Example Log Message Catalog" on page 4-5
- "Elements of a Log Message Catalog" on page 4-6
- "Example Simple Text Catalog" on page 4-13
- "Elements of a Simple Text Catalog" on page 4-14
- "Example Locale-Specific Catalog" on page 4-17
- "Elements of a Locale-Specific Catalog" on page 4-18

Example Log Message Catalog

The following example shows a log message catalog, `MyUtilLog.xml`, containing one log message. This log message illustrates the usage of the `messagebody`, `messagedetail`, `cause`, and `action` elements.

Listing 4-2 Example of a Log Message Catalog

```
<?xml version="1.0"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
"http://www.bea.com/servers/wls90/dtd/msgcat.dtd">
```

```
<message_catalog
  l10n_package="programs.utils"
  i18n_package="programs.utils"
  subsystem="MYUTIL"
  version="1.0"
  baseid="600000"
  endid="600100"
  <log_message
    messageid="600001"
    severity="warning"
    method="logNoAuthorization(String arg0, java.util.Date arg1,
       int arg2)"
    <messagebody>
      Could not open file, {0} on {1,date} after {2,number} attempts.
    </messagebody>
    <messagedetail>
      The configuration for this application will be defaulted to
      factory settings. Custom configuration information resides
      in file, {0}, created on {1,date}, but is not readable.
    </messagedetail>
    <cause>
      The user is not authorized to use custom configurations. Custom
     configuration information resides in file, {0}, created on
     {1,date}, but is not readable.The attempt has been logged to
     the security log.
    </cause>
    <action>
      The user needs to gain approriate authorization or learn to
      live with the default settings.
    </action>
  </log_message>
</message_catalog>
```

Elements of a Log Message Catalog

This section provides reference information for the following elements of a log message catalog:

- "message_catalog Element" on page 4-7
- "log_message Element" on page 4-9
- "Child Elements of log_message Element" on page 4-12

message_catalog Element

The `message_catalog` element represents the log message catalog. The following table describes the attributes that you can define for the `message_catalog` element.

Attribute	Default Value	Required/ Optional	Description
`i18n_package`	`weblogic.i18n`	Optional	Java package containing generated Logger classes for this catalog. The classes are named after the catalog file name. For example, for a catalog using `mycat.xml`, a generated Logger class would be called *<i18n_package>*`.mycatLogger.class`. Syntax: standard Java package syntax Example: `i18n_package="programs.utils"`
`l10n_package`	`weblogic.i18n`	Optional	A Java package containing generated `LogLocalizer` properties for the catalog. For example, for a catalog called `mycat.xml`, the following property files would be generated: *<l10n_package>*`.mycatLogLocalizer.properties` and *<l10n_package>*`mycatLogLocalizerDetail.properties`. Syntax: standard Java package syntax Example: `l10n_package="programs.utils"`
`subsystem`	None	Required	An acronym identifying the subsystem associated with this catalog. The name of the subsystem is included in the server log and is used for message isolation purposes. Syntax: a String Example: `subsystem="MYUTIL"`
`version`	None	Required	Specifies the version of the `msgcat.dtd` being used. Use: Must be `"1.0"` Syntax: x.y where x and y are numeric. Example: `version="1.0"`

Attribute	Default Value	Required/ Optional	Description
`baseid`	`000000` for WebLogic Server catalogs `500000` for user-defined catalogs	Optional	Specifies the lowest message ID used in this catalog. Syntax: one to six decimal digits. Example: `baseid="600000"`
`endid`	`499999` for WebLogic Server catalogs `999999` for user-defined catalogs	Optional	Specifies the highest message ID used in this catalog. Syntax: one to six decimal digits. Example: `endid="600100"`
`loggable`	false	Optional	Indicates whether to generate additional methods that return loggable objects. Syntax: `"true"` or `"false"` Example: `loggable="true"`

Attribute	Default Value	Required/ Optional	Description
`prefix`	Null for user-defined catalogs "BEA" for WebLogic Server catalogs	Optional	Specifies a String to be prepended to message IDs when logged. Server messages default to "BEA" as the prefix and may not specify a different prefix. User messages can specify any prefix. A prefixed message ID is presented in a log entry as follows: `<[prefix-]id>` where `prefix` is this attribute and `id` is the six-digit message ID associated with a specific message. For example, if `prefix` is "XYZ", then message 987654 would be shown in a log entry as `<XYZ-987654>`. If the prefix is not defined, then the log entry would be `<987654>`. Syntax: any String (should be limited to five characters) Example: `prefix="BEA"`
`description`	Null (no description)	Optional	An optional attribute that serves to document the catalog content. Syntax: any String Example: `description="Contains messages logged by the foobar application"`

log_message Element

The following table describes the attributes that you can define for the `log_message` element.

Attribute	Default Value	Required/ Optional	Description
`messageid`	None	Required	Unique identifier for this log message. Uniqueness should extend across all catalogs. Value must be in range defined by `baseid` and `endid` attributes. Use: Value must be in the range defined by the `baseid` and `endid` attributes defined in the message_catalog attribute. Syntax: one to six decimal digits. Example: `messageid="600001"`
`datelastchanged`	None	Optional	Date/time stamp used for managing modifications to this message. The date is supplied by utilities that run on the catalogs. The syntax is: `Long.toString(new Date().getTime());` Use: The date is supplied by utilites (such as MessageEditor), that run on the catalogs. Syntax: `Long.toString(new Date().getTime());`
`severity`	None	Required	Indicates the severity of the log message. Must be one of the following: `debug`, `info`, `warning`, `error`, `notice`, `critical`, `alert`, or `emergency`. User-defined catalogs may only use `debug`, `info`, `warning`, and `error`. Example: `severity="warning"`

Attribute	Default Value	Required/ Optional	Description
`method`	None	Required	Method signature for logging this message. The syntax is the standard Java method signature, without the qualifiers, semicolon, and extensions. Argument types can be any Java primitive or class. Classes must be fully qualified if not in `java.lang`. Classes must also conform to `java.text.MessageFormat` conventions. In general, class arguments should have a useful `toString()` method. Arguments can be any valid name, but should follow the convention of `argn` where `n` is 0 through 9. There can be no more than 10 arguments. For each `argn` there should be at least one corresponding placeholder in the text elements described in "Child Elements of log_message Element" on page 4-12. Placeholders are of the form `{n}`, `{n,`*`number`*`}` or `{n,`*`date`*`}`.
`methodtype`	`logger`	Optional	Specifies type of method to generate. Methods can be loggers or getters. Logger methods format the message body into the default locale and log the results. Getter methods return the message body prefixed by the subsystem and messageid, as follows: `[susbsystem:msgid]text` Syntax: values are "`logger`" and "`getter`"
`stacktrace`	`true`	Optional	Indicates whether to generate a stack trace for Throwable arguments. Possible values are `true` or `false`. When the value is `true`, a trace is generated. Syntax: `stacktrace="true"`
`retired`	`false`	Optional	Indicates whether message is retired. A retired message is one that was used in a previous release but is now obsolete and not used in the current version. Retired messages are not represented in any generated classes or resource bundles. Syntax: values are "`true`" and "`false`" Example: `retired="true"`

Child Elements of log_message Element

The following table describes the child elements of the log_message element.

Element	Parent Element	Required/ Optional	Description
`messagebody`	`log_message`	Required	A short description for this message. The `messagebody` element can contain a 0 to 10 placeholder as {n}, to be replaced by the appropriate argument when the log message is localized. The message body must include placeholders for all arguments listed in the corresponding method attribute, unless the last argument is throwable or a subclass. Be careful when using single quotes, because these are specially parsed by `java.text.MessageFormat`. If it is appropriate to quote a message argument, use double quotes (as in the example below). If a message has one or more placeholders, in order for a single quote to appear correctly (for example, as an apostrophe), it must be followed by a second single quote. Syntax: a String Example: `<messagebody>Could not open file "{0}" created on {1,date}.</messagebody>`
`messagedetail`	`log_message`	Optional	A detailed description of the event. This element may contain any argument place holders. Syntax: a String Example: `<messagedetail>The configuration for this application will be defaulted to factory settings.</messagedetail>`

Element	Parent Element	Required/ Optional	Description
cause	log_message	Optional	The root cause of the problem. This element can contain any argument place holders. Syntax: a String Example: <cause>The user is not authorized to use custom configurations. The attempt has been logged to the security log.</cause>
action	log_message	Optional	The recommended resolution. This element can contain any argument place holders. Syntax: a String Example: <action>The user needs to gain appropriate authorization or learn to live with the default settings.</action>

Example Simple Text Catalog

The following example shows a simple text catalog, MyUtilLabels.xml, with one simple text definition:

```
<messagebody>
    File
</messagebody>
```

Listing 4-3 Example of a Simple Text Catalog

```
<?xml version="1.0"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
    "http://www.bea.com/servers/wls90/dtd/msgcat.dtd">
<message_catalog>
 l10n_package="programs.utils"
 i18n_package="programs.utils"
 subsystem="MYUTIL"
 version="1.0"
 <message>
```

```
  messageid="FileMenuTitle"
  <messagebody>
    File
  </messagebody>
 </message>
</message_catalog>
```

Elements of a Simple Text Catalog

This section provides reference information for the following simple text catalog elements:

- "message_catalog Element" on page 4-14
- "message Element" on page 4-15
- "messagebody Element" on page 4-16

message_catalog Element

The following table describes the attributes that you can define for the `message_catalog` element.

Attribute	Default Value	Required/ Optional	Description
`l10n_package`	`weblogic.i18n`	Optional	Java package containing generated `TextFormatter` classes and `TextLocalizer` properties for this catalog. The classes are named after the catalog file name. `mycat.xml` would have the properties file, `<l10n_package>.mycatLogLocalizer.properties` generated. Syntax: standard Java package syntax Example: `l10n_package="programs.utils"`
`subsystem`	None	Required	An acronym identifying the subsystem associated with this catalog. The name of the subsystem is included in the server log and is used for message isolation purposes. Syntax: a String Example: `subsystem="MYUTIL"`

Attribute	Default Value	Required/ Optional	Description
`version`	None	Required	Specifies the version of the `msgcat.dtd` being used. The format is *`n.n`*, for example, `version="1.0"`. Must be at least "1.0". Example: `version="1.0"`
`description`	Null	Optional	An optional attribute that documents the catalog content. Syntax: a String Example: `description="Contains labels used in the foobar GUI"`

message Element

The following table describes the attributes that you can define for the `message` element.

Attribute	Default Value	Required/ Optional	Description
`messageid`	None	Required	Unique identifier for this log message in alpha-numeric string format. Uniqueness is required only within the context of this catalog. `message` is a child element of `message_catalog`.

Attribute	Default Value	Required/ Optional	Description
`datelastchanged`	None	Optional	Date/time stamp useful for managing modifications to this message.

`method`	None	Optional	Method signature for formatting this message.
			The syntax is a standard Java method signature, less return type, qualifiers, semicolon, and extensions. The return type is always `String`. Argument types can be any Java primitive or class. Classes must be fully qualified if not in `java.lang`. Classes must also conform to `java.text.MessageFormat` conventions. In general, class arguments should have a useful `toString()` method, and the corresponding `MessageFormat` placeholders must be strings; they must be of the form `{n}`. Argument names can be any valid name. There can be no more than 10 arguments.
			For each argument there must be at least one corresponding placeholder in the `messagebody` element described below. Placeholders are of the form `{n}`, `{n,number}` or `{n,date}`.
			Example:
			`method="getNoAuthorization (String filename, java.util.Date creDate)"`
			This example would result in a method in the `TextFormatter` class as follows:
			`public String getNoAuthorization (String filename, java.util.Date creDate)`

messagebody Element

The following table describes the child element of the message element.

Element	Parent Element	Required/ Optional	Description
messagebody	message	Required	The text associated with the message. This element may contain zero or more placeholders {n} that will be replaced by the appropriate arguments when the log message is localized.

Example Locale-Specific Catalog

The following example shows a French translation of a message that is available in ...\msgcat\fr\MyUtilLabels.xml.

The translated message appears as shown in Listing 4-4.

Listing 4-4 Example of a Message Translated to French

```
<?xml version="1.0"?>
<!DOCTYPE message_catalog PUBLIC
   "weblogic-locale-message-catalog-dtd"
   "http://www.bea.com/servers/wls90/dtd/l10n_msgcat.dtd">
<locale_message_catalog
  l10n_package="programs.utils"
  subsystem="MYUTIL"
  version="1.0">
  <message>
    <messageid="FileMenuTitle">
    <messagebody> Fichier </messagebody>
  </message>
</locale_message_catalog>
```

When entering text in the messagebody, messagedetail, cause, and action elements, you must use a tool that generates valid Unicode Transformation Format-8 (UTF-8) characters, and have appropriate keyboard mappings installed. UTF-8 is an efficient encoding of Unicode character-strings that optimizes the encoding ASCII characters. Message catalogs always use UTF-8 encoding. The MessageLocalizer utility that is installed with WebLogic Server is a tool that can be used to generate valid UTF-8 characters.

Elements of a Locale-Specific Catalog

The locale-specific catalogs are subsets of top-level catalogs. They are maintained in subdirectories named for the locales they represent. The elements and attributes described in the following sections are valid for locale-specific catalogs.

locale_message_catalog Element

The following table describes the attributes that you can define for the `locale_message_catalog` element.

Attribute	Default Value	Required/ Optional	Description
`l10n_package`	`weblogic.i18n`	Optional	Java package containing generated `LogLocalizer` or `TextLocalizer` properties for this catalog.properties file are named after the catalog file name. For example, for a French log message catalog called `mycat.xml`, a properties file called `<l10n_package>.mycatLogLocalizer_fr_FR.properties` is generated.
`version`	None	Required	Specifies the version of the `msgcat.dtd` being used. The format is *n.n*, for example, `version="1.0"`. Must be at least "1.0".

log_message Element

The locale-specific catalog uses the attributes defined for the `log_message` element in the top-level log message catalog so this element does not need to be defined.

Other locale_message_catalog Elements

The locale-specific catalog uses the `messagebody`, `messagedetail`, `cause`, and `action` catalog elements defined for the top-level log message catalog so these elements do not need to be defined.

CHAPTER 5

Writing Messages to the WebLogic Server Log

The following sections describe how you can facilitate the management of your application by writing log messages to the WebLogic server log file:

- "Using the I18N Message Catalog Framework: Main Steps" on page 5-1
- "Using the NonCatalogLogger APIs" on page 5-8
- "Using ServletContext" on page 5-10
- "Configuring Servlet and Resource Adapter Logging" on page 5-11
- "Writing Messages from a Client Application" on page 5-13
- "Writing Debug Messages" on page 5-14

Using the I18N Message Catalog Framework: Main Steps

The internationalization (I18N) message catalog framework provides a set of utilities and APIs that your application can use to send its own set of messages to the WebLogic server log.

To write log messages using the I18N message catalog framework, complete the following tasks:

- Step 1: Create Message Catalogs
- Step 2: Compile Message Catalogs
- Step 3: Use Messages from Compiled Message Catalogs

Step 1: Create Message Catalogs

A message catalog is an XML file that contains a collection of text messages. Usually, an application uses one message catalog to contain a set of messages in a default language and optionally, additional catalogs to contain messages in other languages.

To create and edit a properly formatted message catalog, use the WebLogic Message Editor utility, which is a graphical user interface (GUI) that is installed with WebLogic Server. To create corresponding messages in local languages, use the Message Localizer, which is also a GUI that WebLogic Server installs.

To access the Message Editor, do the following from a WebLogic Server host:

1. Set the classpath by entering *WL_HOME*`\server\bin\setWLSEnv.cmd` (`setWLSEnv.sh` on UNIX), where *WL_HOME* is the directory in which you installed WebLogic Server.
2. Enter the following command: `java weblogic.MsgEditor`
3. To create a new catalog, choose File→New Catalog.

   For information on using the Message Editor, see "Using the WebLogic Server Message Editor" on page 6-1.
4. When you finish adding messages in the Message Editor, select File→Save Catalog.
5. Then select File→Exit.

To access the Message Localizer, do the following from a WebLogic Server host:

1. Set the classpath by entering *WL_HOME*`\server\bin\setWLSEnv.cmd` (`setWLSEnv.sh` on UNIX), where *WL_HOME* is the directory in which you installed WebLogic Server.
2. Enter the following command: `java weblogic.MsgLocalizer`
3. Use the Message Localizer GUI to create locale-specific catalogs.

   For basic command line help, type: `java weblogic.MsgEditor -help`

Step 2: Compile Message Catalogs

After you create message catalogs, you use the `i18ngen` and `l10ngen` command-line utilities to generate properties files and to generate and compile Java class files. The utilities take the message catalog XML files as input and create compiled Java classes. The Java classes contain methods that correspond to the messages in the XML files.

For more information, see "Using the WebLogic Server Internationalization Utilities" on page 7-1.

To compile the message catalogs, do the following:

1. From a command prompt, use *WL_HOME*\server\bin\setWLSEnv.cmd (setWLSEnv.sh on UNIX) to set the classpath, where *WL_HOME* is the directory in which you installed WebLogic Server.
2. Enter the following command:

   ```
   java weblogic.i18ngen -build -d targetdirectory source-files
   ```

   where:

   – *targetdirectory* is the root directory in which you want the i18ngen utility to locate the generated and compiled files. The Java files are placed in sub-directories based on the i18n_package and l10n_package values in the message catalog.

   The catalog properties file, i18n_user.properties, is placed in the *targetdirectory*. The default target directory is the current directory.

   – *source-files* specifies the message catalog files that you want to compile. If you specify one or more directory names, i18ngen processes all XML files in the listed directories. If you specify file names, the names of all files must include an XML suffix. All XML files must conform to the msgcat.dtd syntax.

   Note that when the i18ngen generates the Java files, it appends Logger to the name of each message catalog file.

3. If you created locale-specific catalogs in Step 1: Create Message Catalogs, do the following to generate properties files:

   a. In the current command prompt, add the *targetdirectory* that you specified in step 2 to the CLASSPATH environment variable. To generate locale-specific properties files, all of the classes that the i18ngen utility generated must be on the classpath.

   b. Enter the following command:
   ```
   java weblogic.l10ngen -d targetdirectory source-files
   ```

   where:

   – *targetdirectory* is the root directory in which you want the l10ngen utility to locate the generated properties files. Usually this is the same *targetdirectory* that you specified in step 2 The properties files are placed in sub-directories based on the l10n_package values in the message catalog.

  - *source-files* specifies the message catalogs for which you want to generate properties files. You must specify top-level catalogs that the Message Editor creates; you do not specify locale-specific catalogs that the Message Localizer creates. Usually this is the same set of *source-files* or source directories that you specified in step 2

4. In most cases, the recommended practice is to include the message class files and properties files in the same package hierarchy as your application.

   However, if you do not include the message classes and properties in the application's package hierarchy, you must make sure the classes are in the application's classpath.

For complete documentation of the `i18ngen` commands, see "Using the WebLogic Server Internationalization Utilities" on page 7-1.

Example: Compiling Message Catalogs

In this example, the Message Editor created a message catalog that contains one message of type `loggable`. The Message Editor saves the message catalog as the following file: `c:\MyMsgCat\MyMessages.xml`.

Listing 5-1 shows the contents of the message catalog.

Listing 5-1 Sample Message Catalog

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
"http://www.bea.com/servers/wls90/dtd/msgcat.dtd">

<message_catalog
   i18n_package="com.xyz.msgcat"
   l10n_package="com.xyz.msgcat.l10n"
   subsystem="MyClient"
   version="1.0"
   baseid="700000"
   endid="800000"
   loggables="true"
   prefix="XYZ-"
>
<!--  Welcome message to verify that the class has been invoked-->
   <logmessage
     messageid="700000"
     datelastchanged="1039193709347"
     datehash="-1776477005"
     severity="info"
     method="startup()"
```

```
>
     <messagebody>
         The class has been invoked.
      </messagebody>
      <messagedetail>
         Verifies that the class has been invoked
         and is generating log messages
      </messagedetail>
      <cause>
         Someone has invoked the class in a remote JVM.
      </cause>
      <action> </action>
   </logmessage>
</message_catalog>
```

In addition, the Message Localizer creates a Spanish version of the message in `MyMessages.xml`. The Message Localizer saves the Spanish catalog as `c:\MyMsgCat\es\ES\MyMessages.xml`.

Listing 5-2 Locale-Specific Catalog for Spanish

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE locale_message_catalog PUBLIC
"weblogic-locale-message-catalog-dtd"
"http://www.bea.com/servers/wls90/dtd/l10n_msgcat.dtd">

<locale_message_catalog
version="1.0"
>
<!-- Mensaje agradable para verificar que se haya invocado la clase. -->
<logmessage
    messageid="700000"
   datelastchanged="1039546411623"
   >
      <messagebody>
         La clase se haya invocado.
      </messagebody>
      <messagedetail>
         Verifica que se haya invocado la clase y está
         generando mensajes del registro.
      </messagedetail>
      <cause>Alguien ha invocado la clase en un JVM alejado.</cause>
      <action> </action>
   </logmessage>
</locale_message_catalog>
```

To compile the message catalog that the Message Editor created, enter the following command:

```
java weblogic.i18ngen -build -d c:\MessageOutput c:\MyMsgCat\MyMessages.xml
```

The `i18ngen` utility creates the following files:

- `c:\MessageOutput\i18n_user.properties`
- `c:\MessageOutput\com\xyz\msgcat\MyMessagesLogger.java`
- `c:\MessageOutput\com\xyz\msgcat\MyMessagesLogger.class`
- `c:\MessageOutput\com\xyz\msgcat\l10n\MyMessagesLogLocalizer.properties`
- `c:\MessageOutput\com\xyz\msgcat\l10n\MyMessagesLogLocalizerDetails.properties`

To create properties files for the Spanish catalog, you do the following:

1. Add the `i18n` classes to the command prompt's classpath by entering the following:
   ```
   set CLASSPATH=%CLASSPATH%;c:\MessageOutput
   ```
2. Enter
   ```
   java weblogic.l10ngen -d c:\MessageOutput c:\MyMsgCat\MyMessages.xml
   ```

The `l10ngen` utility creates the following files:

- `c:\MessageOutput\com\xyz\msgcat\l10n\MyMessagesLogLocalizer_es_ES.properties`
- `c:\MessageOutput\com\xyz\msgcat\l10n\MyMessagesLogLocalizerDetails_es_ES.properties`

Step 3: Use Messages from Compiled Message Catalogs

The classes and properties files generated by `i18ngen` and `l10ngen` provide the interface for sending messages to the WebLogic server log. Within the classes, each log message is represented by a method that your application calls.

To use messages from compiled message catalogs:

1. In the class files for your application, import the `Logger` classes that you compiled in Step 2: Compile Message Catalogs.

To verify the package name, open the message catalog XML file in a text editor and determine the value of the `i18n_package` attribute. For example, the following segment of the message catalog in Listing 5-1 indicates the package name:

```
<message_catalog
    i18n_package="com.xyz.msgcat"
```

To import the corresponding class, add the following line:

```
import com.xyz.msgcat.MyMessagesLogger;
```

2. Call the method that is associated with a message name.

   Each message in the catalog includes a `method` attribute that specifies the method you call to display the message. For example, the following segment of the message catalog in Listing 5-1 shows the name of the method:

   ```
   <logmessage
        messageid="700000"
        datelastchanged="1039193709347"
        datehash="-1776477005"
        severity="info"
        method="startup()"
   >
   ```

Listing 5-3 illustrates a simple class that calls this `startup` method.

Listing 5-3 Example Class That Uses a Message Catalog

```
import com.xyz.msgcat.MyMessagesLogger;

public class MyClass {
     public static void main (String[] args) {
     MyMessagesLogger.startup();
     }
}
```

If the JVM's system properties specify that the current location is Spain, then the message is printed in Spanish.

Using the NonCatalogLogger APIs

In addition to using the I18N message catalog framework, your application can use the `weblogic.logging.NonCatalogLogger` APIs to send messages to the WebLogic server log. With `NonCatalogLogger`, instead of calling messages from a catalog, you place the message text directly in your application code. BEA Systems recommends that you do not use this facility as the sole means for logging messages if your application needs to be internationalized.

`NonCatalogLogger` is also intended for use by client code that is running in its own JVM (as opposed to running within a WebLogic Server JVM). A subsequent section, "Writing Messages from a Client Application" on page 5-13, provides more information.

To use `NonCatalogLogger` in an application that runs within the WebLogic Server JVM, add code to your application that does the following:

1. Imports the `weblogic.logging.NonCatalogLogger` interface.
2. Uses the following constructor to instantiate a `NonCatalogLogger` object:

   `NonCatalogLogger(java.lang.String` *`myApplication`*`)`

   where *`myApplication`* is a name that you supply to identify messages that your application sends to the WebLogic server log.
3. Calls any of the `NonCatalogLogger` methods.

   Use the following methods to report normal operations:

   – `info(java.lang.String msg)`

   – `info(java.lang.String msg, java.lang.Throwable t)`

   Use the following methods to report a suspicious operation, event, or configuration that does not affect the normal operation of the server or application:

   – `warning(java.lang.String msg)`

   – `warning(java.lang.String msg, java.lang.Throwable t)`

   Use the following methods to report errors that the system or application can handle with no interruption and with limited degradation in service.

   – `error(java.lang.String msg)`

   – `error(java.lang.String msg, java.lang.Throwable t)`

   Use the following methods to provide detailed information about operations or the state of the application. These debug messages are not broadcast as JMX notifications. If you use

this severity level, we recommend that you create a "debug mode" for your application. Then, configure your application to output debug messages only when the application is configured to run in the debug mode. For information about using debug messages, see "Writing Debug Messages" on page 5-14.

- `debug(java.lang.String msg)`
- `debug(java.lang.String msg, java.lang.Throwable t)`

All methods that take a `Throwable` argument can print the stack trace in the server log. For information on the `NonCatalogLogger` APIs, see the `weblogic.logging.NonCatalogLogger` Javadoc.

Listing 5-4 illustrates a servlet that uses `NonCatalogLogger` APIs to write messages of various severity levels to the WebLogic server log.

Listing 5-4 Example NonCatalogLogger Messages

```
import java.io.PrintWriter;
import java.io.IOException;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.ServletException;
import javax.naming.Context;

import weblogic.jndi.Environment;
import weblogic.logging.NonCatalogLogger;

public class MyServlet extends HttpServlet {

     public void service (HttpServletRequest request,
        HttpServletResponse response)
        throws ServletException, IOException {

       PrintWriter out = response.getWriter();
       NonCatalogLogger myLogger = null;

       try {

          out.println("Testing NonCatalogLogger. See
                        WLS Server log for output message.");

// Constructing a NonCatalogLogger instance. All messages from this
// instance will include a <MyApplication> string.
          myLogger = new NonCatalogLogger("MyApplication");
```

```
// Outputting an INFO message to indicate that your application has started.
          mylogger.info("Application started.");

// For the sake of providing an example exception message, the next
// lines of code purposefully set an initial context. If you run this
// servlet on a server that uses the default port number (7001), the
// servlet will throw an exception.
         Environment env = new Environment();
         env.setProviderUrl("t3://localhost:8000");

         Context ctx = env.getInitialContext();

      }

     catch (Exception e){
       out.println("Can't set initial context: " + e.getMessage());

// Prints a WARNING message that contains the stack trace.
      mylogger.warning("Can't establish connections. ", e);
       }
   }
}
```

When the servlet illustrated in the previous example runs on a server that specifies a listen port other than `8000`, the following messages are printed to the WebLogic server log file. Note that the message consists of a series of strings, or fields, surrounded by angle brackets (`< >`).

Listing 5-5 NonCatalogLogger Output

```
####<May 27, 2004 8:45:42 AM EDT> <Error> <MySubsystem> <myhost> <adminServer>
<ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <system>
<> <> <1085661942864> <OBJ-0011> <Test NonCatalogLogger message
java.lang.Exception: Test NonCatalogLogger message
...
>
```

Using ServletContext

The servlet specification provides the following APIs in `javax.servlet.ServletContext` that your servlets and JSPs can use to write a simple message to the WebLogic server log:

- `log(`*`java.lang.String msg`*`)`

- `log(java.lang.String msg, java.lang.Throwable t)`

For more information on using these APIs, see the Javadoc for `javax.servlet.ServletContext` at http://java.sun.com/products/servlet/2.3/javadoc/javax/servlet/ServletContext.html.

Listing 5-6 illustrates JSP logging using the ServletContext.

Listing 5-6 Example JSP Logging

```
<%@ page language="java" %>
<!DOCTYPE HTML PUBLIC "-//w3c//dtd html 4.0 transitional//en">
<html>
<head>
<title>INDEX</title>
</head>
<body bgcolor="#FFFFFF">
<%
config.getServletContext().log("Invoked ServletContext.log() From a JSP");
out.write("Request param arg0 = " + request.getParameter("arg0"));
%>
</body>
</html>
```

Configuring Servlet and Resource Adapter Logging

In this release of WebLogic Server, you can configure Web application and resource adapter logging behavior using WebLogic specific deployment descriptors. The logging configuration deployment descriptor elements define similar attributes used to configure server logging through the `LogMBean` interface, such as the log file name, location, and rotation policy.

When configured, application events are directed to a Web application specific log file. When the deployment descriptor does not include any logging configuration information, the default behavior is to write these events in the server log file.

Similarly, WebLogic logging services are provided to Java EE resource adapters for `ManagedConnectionFactory` scoped logging. You configure the log file name, location, and rotation policy for resource adapter logs through the `weblogic-ra.xml` deployment descriptor. See "weblogic-ra.xml Schema" in *Programming WebLogic Resource Adapters*.

Example: Logging Configuration Deployment Descriptors

Listing 5-7 illustrates a snippet of the deployment descriptor for configuring the logging behavior of Web application and resource adapter logging. The elements of `logging` correspond to attribute definitions on the `LogMBean` interface. All the `LogMBean` attributes are not listed in this example. Logging configuration is defined in the `WEB-INF/weblogic.xml` file for Web applications and in the `META-INF/weblogic-ra.xml` file for resource adapters.

Listing 5-7 Configuring Web Application and Connector Logging

```
<!DOCTYPE weblogic-web-app PUBLIC "-//BEA Systems, Inc.//DTD Web Application
9.0//EN" "http://www.bea.com/servers/wls90/dtd/weblogic90-web-jar.dtd">
<weblogic-web-app>
  <logging>
    <log-filename>d:\tmp\mywebapp.log</log-filename>
    <rotation-type>bySize</rotation-type>
    <number-of-files-limited>true</number-of-files-limited>
    <file-count>3</file-count>
    <file-size-limit>50</file-size-limit>
    <rotate-log-on-startup>true</rotate-log-on-startup>
    <log-file-rotation-dir>config/MedRecDomain/WebApp</log-file-rotation-dir>
  </logging>
</weblogic-web-app>

<weblogic-connector xmlns="http://www.bea.com/ns/weblogic/90">
  <jndi-name>eis/900BlackBoxNoTxConnector</jndi-name>
  <outbound-resource-adapter>
    <connection-definition-group>
      <connection-factory-interface>javax.sql.DataSource</connection-factory-i
nterface>
      <connection-instance>
        <jndi-name>eis/900BlackBoxNoTxConnectorJNDINAME</jndi-name>
        <connection-properties>
          <pool-params>
            <initial-capacity>5</initial-capacity>
            <max-capacity>10</max-capacity>
            <capacity-increment>1</capacity-increment>
            <shrinking-enabled>true</shrinking-enabled>
            <shrink-frequency-seconds>60</shrink-frequency-seconds>
            <highest-num-waiters>1</highest-num-waiters>
            <highest-num-unavailable>3</highest-num-unavailable>
            <connection-reserve-timeout-seconds>11</connection-reserve-timeout
-seconds>
          </pool-params>
```

```
          <logging>
            <log-filename>900BlackBoxNoTxOne.log</log-filename>
            <logging-enabled>true</logging-enabled>
            <rotation-type>bySize</rotation-type>
            <number-of-files-limited>true</number-of-files-limited>
            <file-count>3</file-count>
            <file-size-limit>100</file-size-limit>
            <rotate-log-on-startup>true</rotate-log-on-startup>
            <log-file-rotation-dir>c:/mylogs</log-file-rotation-dir>
            <rotation-time>3600</rotation-time>
            <file-time-span>7200</file-time-span>
          </logging>

          <properties>
            <property>
              <name>ConnectionURL</name>
              <value>jdbc:oracle:thin:@bcpdb:1531:bay920</value>
            </property>
            <property>
              <name>unique_ra_id</name>
              <value>blackbox-notx.oracle.810</value>
            </property>
          </properties>
        </connection-properties>
      </connection-instance>
    </connection-definition-group>
  </outbound-resource-adapter>
</weblogic-connector>
```

Writing Messages from a Client Application

If your application runs in a JVM that is separate from a WebLogic Server, it can use message catalogs and `NonCatalogLogger`, but the messages are not written to the WebLogic server log. Instead, the application's messages are written to the client JVM's standard out.

If you want the WebLogic logging service to send these messages to a log file that the client JVM maintains, include the following argument in the command that starts the client JVM:

`-Dweblogic.log.FileName=`*`logfilename`*

where *`logfilename`* is the name that you want to use for the remote log file.

If you want a subset of the message catalog and `NonCatalogLogger` messages to go to standard out as well as the remote JVM log file, include the following additional startup argument:

`-Dweblogic.log.StdoutSeverityLevel=`*`String`*

where valid values for `StdoutSeverityLevel` are:

`Debug`, `Info`, `Warning`, `Error`, `Notice`, `Critical`, `Alert`, `Emergency`, and `Off`.

See the `weblogic.logging.Severities` class for a description of the supported severity levels.

Writing Debug Messages

While your application is under development, you might find it useful to create and use messages that provide verbose descriptions of low-level activity within the application. You can use the `DEBUG` severity level to categorize these low-level messages. All `DEBUG` messages that your application generates are sent to all WebLogic server logging destinations, depending on the configured minimum threshold severity level.

If you use the `DEBUG` severity level, BEA recommends that you create a "debug mode" for your application. For example, your application can create an object that contains a Boolean value. To enable or disable the debug mode, you toggle the value of the Boolean. Then, for each `DEBUG` message, you can create a wrapper that outputs the message only if your application's debug mode is enabled.

For example, the following code can produce a debug message:

```
private static boolean debug = Boolean.getBoolean("my.debug.enabled");
if (debug) {
   mylogger.debug("Something debuggy happened");
}
```

You can use this type of wrapper both for `DEBUG` messages that use the message catalog framework and that use the `NonCatalogLogger` API.

To enable your application to print this message, you include the following Java option when you start the application's JVM:

```
-Dmy.debug.enabled=true
```

CHAPTER 6

Using the WebLogic Server Message Editor

The following sections describe how to use the Message Editor:

- "About the Message Editor" on page 6-1
- "Starting the Message Editor" on page 6-2
- "Working with Catalogs" on page 6-3
- "Adding Messages to Catalogs" on page 6-8
- "Finding Messages" on page 6-11
- "Using the Message Viewer" on page 6-13
- "Editing an Existing Message" on page 6-15
- "Retiring and Unretiring Messages" on page 6-16

About the Message Editor

The Message Editor is a graphical interface tool that lets you create, read, and write XML message catalogs. The Message Editor is installed when you install WebLogic Server. Optionally, you can edit the XML catalogs in a text editor or with any XML editing tool.

Note: WebLogic Server provides its own message catalogs which contain all the messages relating to WebLogic Server subsystems and functionality. You cannot edit these catalogs. For descriptions of WebLogic Server catalogs, see the *Index of Messages by Message Range*.

You use the Message Editor to perform the following tasks:

- Create XML message catalogs
- Create and edit messages
- View all the messages in one catalog
- View the messages in several catalogs simultaneously
- Search for messages
- Validate the XML in catalog entries
- Retire and unretire messages

Note: The Message Editor does not support the editing of localized catalogs.

Starting the Message Editor

Before you start the Message Editor, install and configure your WebLogic Server system and set the environment variables, *SAMPLES_HOME*`\domains\wl_server\setExamplesEnv.cmd`, where *SAMPLES_HOME* represents the WebLogic Server examples home directory at *WL_HOME*`\samples`). Make sure that your classpath is set correctly. For more information on these topics, see the *Installation Guide*.

Sample message catalog files are located in your *SAMPLES_HOME*`/server/examples/src/examples/i18n/msgcat` directory.

Note: The location of your *SAMPLES_HOME* directory might be different, depending on where you installed WebLogic Server.

You can use the sample message catalogs as templates to create your own messages. You simply modify the provided information, such as the package name and class name. Then translate the message text and save the catalog. For more information on this topic, see "Writing Messages to the WebLogic Server Log" on page 5-1.

To start the Message Editor, type:

```
java weblogic.MsgEditor
or
java weblogic.i18ntools.gui.MessageEditor
```

To access basic command line help, type:

```
java weblogic.MsgEditor -help
```

The main WebLogic Message Editor window for **Log Messages** appears, as shown in Figure 6-1.

Figure 6-1 WebLogic Message Editor for Log Messages

Working with Catalogs

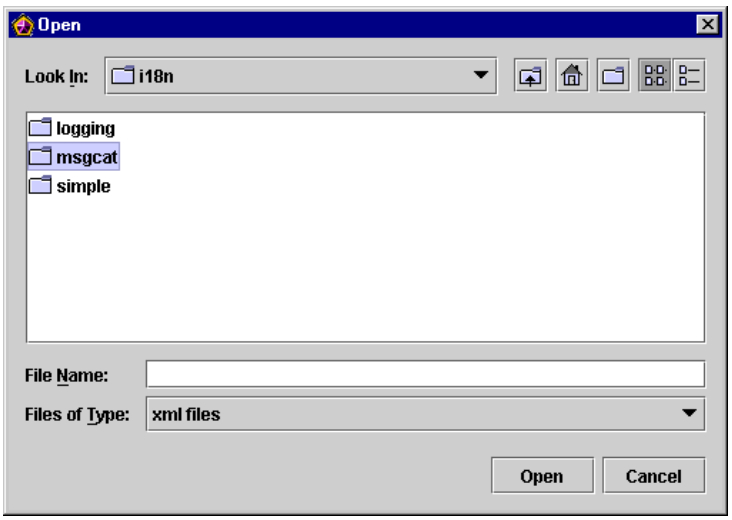
The following sections describe how to use the Message Editor to manage catalogs:

- "Browsing to an Existing Catalog" on page 6-4
- "Creating a New Catalog" on page 6-6

Browsing to an Existing Catalog

To find an existing catalog from the main WebLogic Message Editor window, enter the full pathname in the **Message Catalog** field, or click **Browse** and navigate to the existing catalog from the Open dialog.

Figure 6-2 Navigating to a Catalog



The sample catalogs included with your WebLogic Server installation are in the *SAMPLES_HOME*`/server/examples/src/examples/i18n/msgcat` directory.

Note: Your directory path might be different, depending on where you installed WebLogic Server.

You can place your user-defined catalogs in any directory you designate.

Once you locate the catalog, **Packages**, **Subsystem**, **Version**, **Base ID**, and **End ID** (if any) are displayed, and the displayed catalog is the context catalog in which all other actions are performed.

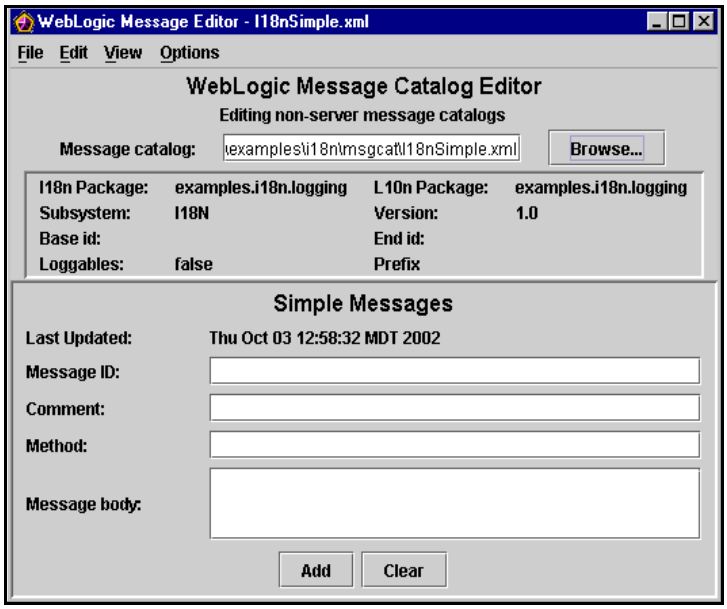
You are now ready to enter new messages, edit existing messages, search for a message, or view all messages in the catalog.

If you select a log message catalog in the **Message catalog** field, the WebLogic Message Editor window for **Log Messages** appears, as shown in Figure 6-3.

Figure 6-3 WebLogic Message Editor for Log Messages

If you select a simple messages catalog in the **Message catalog** field, the WebLogic Message Editor window for **Simple Messages** appears, as shown in Figure 6-4.

Figure 6-4 WebLogic Message Editor for Simple Messages



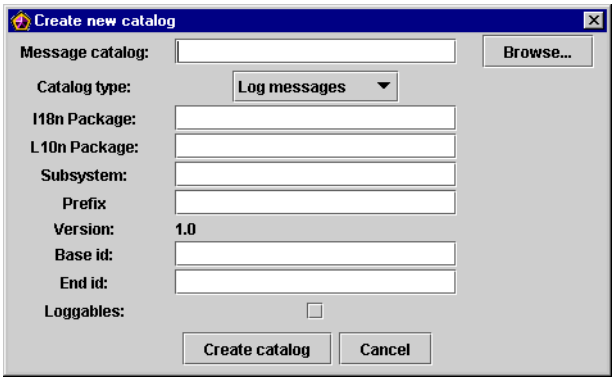
Creating a New Catalog

To create a new catalog, complete the following procedure:

1. From the main menu bar of the WebLogic Message Editor window, choose **File** > **New Catalog**.

   The Create New Catalog dialog appears, as shown in Figure 6-5.

Figure 6-5 Create New Catalog



2. In the **Message Catalog** field, enter the full pathname and the name of the new catalog, which must include the `xml` extension. Or, click **Browse** and navigate to the appropriate catalog directory. (This would be the `msgcat` directory, if you are using WebLogic Server example messages.)

3. Use the drop-down **Catalog type** list to indicate whether your catalog is a **Log messages** or a **Simple messages** catalog.

   If you select a log message catalog, the **Base ID** and **End ID** fields are displayed. These fields indicate the range of ID numbers for messages in the catalog. If you select a simple text message catalog, these fields are not present.

4. Enter the name of the package in which you want to place the generated Logger classes in the **I18n Package** field.

   The default is `weblogic.i18n`. If you want to place the logger classes in another package with your application, specify the package name here.

5. Enter the name of the package where you want to place the catalog data in the **L10n Package** field.

   The default is `weblogic.l10n`. If you want to place your catalog data in another package with your application, specify the package name here.

Note: In most cases, the recommended practice is to include the message class files and properties files in the same package hierarchy as your application.

However, if you do not include the message classes and properties in the application's package hierarchy, you must make sure the classes are in the application's classpath.

6. Enter a name in the **Subsystem** field to indicate which part of the system will log the message.

This name is logged with the message. For applications, the application name is typically entered in the **Subsystem** field.

7. In the **Prefix** field, enter a prefix to be prepended to the message ID when logged.

   The default server message prefix is BEA. You can enter any prefix for user messages. (BEA Systems recommends that the prefix be less that 10 characters in length. Also, make sure you use standard java naming conventions.)

8. Click **Create Catalog**.

   The Create New Catalog dialog closes, and the catalog you just created is displayed as the context catalog in the Message Editor window.

Adding Messages to Catalogs

The following sections describe how to use the Message Editor to add messages to catalogs:

- "Entering a New Log Message" on page 6-8
- "Entering a New Simple Text Message" on page 6-10

Entering a New Log Message

To enter a new message into a log catalog:

1. In the WebLogic Message Editor main dialog (Figure 6-6), enter the full pathname in the **Message Catalog** field or click **Browse** and navigate to an existing catalog.

Figure 6-6 Log Messages

2. Click **Get next ID** to generate the next unique numerical ID in the context catalog.

   The ID appears in the **Message ID** field.

3. Enter any relevant comments about the message in the **Comment** field.

4. Enter the appropriate **Method** for your log message, including parentheses and any arguments. For example, `logErrorSavingTimestamps(Exception ioExcep)`

5. Set the **Method Type** for the log message.

   Your options are `logger` and `getter`. The default method type is `logger`, which is used for messages that will be logged. The `getter` option is for messages that are used for non-logging purposes, such as exceptions.

6. Choose a **Severity** from the list of possible levels.

7. Enter text for the **Message body.**

   Parameters are denoted by {*n*}. For example, `"Exception occurred while loading _WL_TIMESTAMP FILE."`

8. Enter text for the **Message detail.**

   Parameters are denoted by {*n*}. For example, `"Exception occurred while loading _WL_TIMESTAMP FILE. Forcing recompilation: {0}."`

9. Enter text for the **Probable Cause.**

   Parameters are denoted by {*n*}. For example, `"There was an error reading this file."`

10. Enter text for the **Action.**

    Parameters are denoted by {*n*}. For example, `"No action required."`

11. Toggle the **Display stacktrace** option by selecting or clearing the check box.

    Use this option to print a stacktrace along with the message when a Logger method takes an exception as one of its arguments.

12. Toggle the **Retired message** option by selecting or clearing the check box.

    Use this option to retire (hide) obsolete messages. Retired messages are deleted in the sense that they are not represented in the generated classes. However, the message data does remain in the `.xml` file.

13. Click **Add**.

    The message is added and the entire catalog is immediately written to disk.

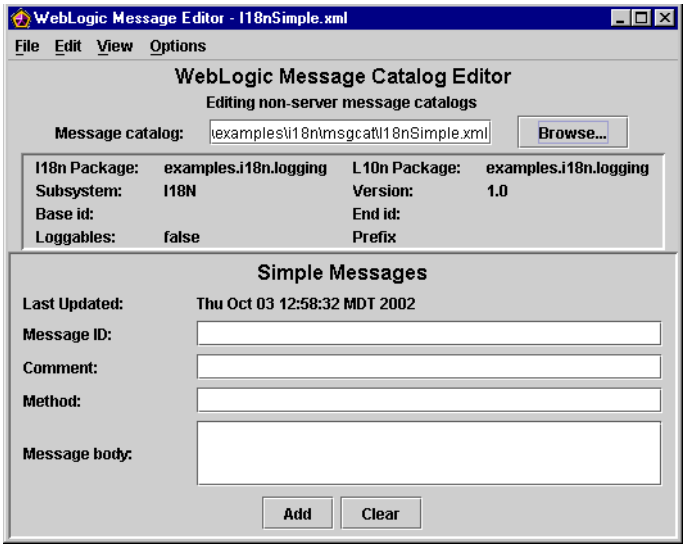
Entering a New Simple Text Message

To enter a simple text message into a simple messages catalog:

1. In the WebLogic Message Editor main dialog, enter the full pathname in the **Message Catalog** field or click **Browse** and navigate to the existing catalog.

   The WebLogic Message Editor for Simple Messages dialog appears, as shown in Figure 6-7.

Figure 6-7 Simple Messages



2. Enter a unique alphanumeric **Message ID**.
3. Enter a **Comment** if required.
4. Enter the appropriate **Method** for your simple message, including parentheses and any arguments. For example, `startingClusterService()`
5. Enter the **Message body** text. For example, `startingClusterService`
6. Click **Add.**

   The message is added and the entire catalog is immediately written to disk.

Finding Messages

The following sections describe how to use the Message Editor to find messages:

- "Finding a Log Message" on page 6-11
- "Finding a Simple Text Message" on page 6-12

Finding a Log Message

To find a log message:

1. Make sure that the context catalog is a log message catalog and the WebLogic Message Editor **Log Messages** window appears, as shown in Figure 6-3.
2. Choose **Edit** from the main menu bar.
3. Choose **Search** to display the Search for Log Message dialog, as shown in Figure 6-8.

Figure 6-8 Search for Log Message

4. Enter the **Message ID** and the **Method** name.
5. Enter as much information as needed in the **Message text search** field to find the correct message.

   The search for text does a partial match in any of the text fields.
6. Click **Find first** or **Find next**.

   The fields are strung together to find the message. If a matching message is found, it is displayed in the Message Editor window, as shown in Figure 6-1.

Finding a Simple Text Message

To find a simple text message, complete the following procedure:

1. Make sure that the context catalog is a simple text message catalog and the WebLogic Message Editor **Simple Messages** window appears, as shown in Figure 6-4.
2. Choose **Edit** from the main menu bar.
3. Choose **Search** to display the Search for Simple Message dialog, as shown in Figure 6-9.

Figure 6-9 Search for Simple Message

4. Enter the **Message ID**.
5. Enter as much information as needed in the **Message text search** field to find the correct message.

   The search for text does a partial match in any of the text fields.
6. Click **Find first** or **Find next**.

   The fields are strung together to find the message. If a matching message is found, it is displayed in the Message Editor window, as shown in Figure 6-4.

Using the Message Viewer

The WebLogic Message Editor contains a Message Viewer that lets you view all messages in a catalog, view all messages in multiple catalogs, and select any message to edit.

The following sections describe how to use the Message Viewer to view and select messages to edit:

- Viewing All Messages in a Catalog
- Viewing All Messages in Several Catalogs
- Selecting a Message to Edit from the Message Viewer

Viewing All Messages in a Catalog

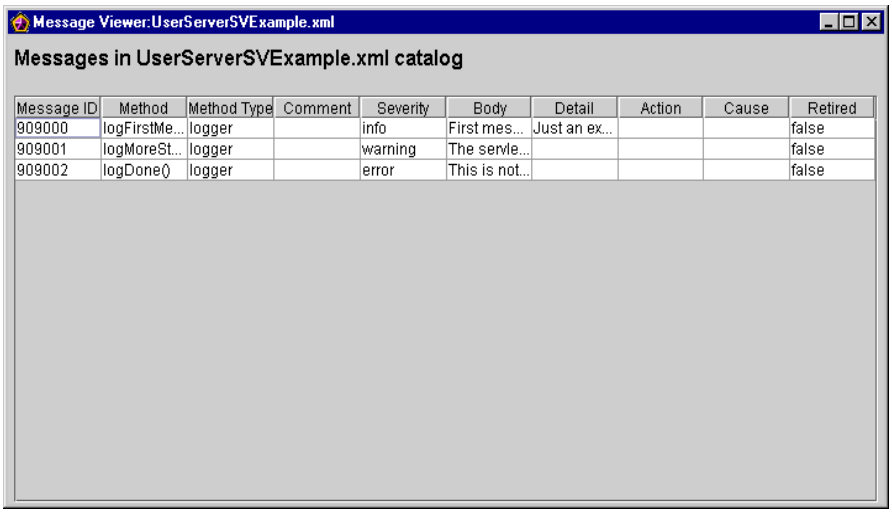
To view all the messages in a catalog:

1. Open the WebLogic Message Editor.

   The WebLogic Message Editor window displays the catalog for the last message viewed as the current context catalog.
2. Choose **View** from the menu bar.
3. Choose **All messages**.

All the messages for the current context catalog are displayed in the Message Viewer window, as shown in Figure 6-10. The Message Editor window remains open.

Figure 6-10 Message Viewer



Viewing All Messages in Several Catalogs

If you view the messages from the current context catalog and then change the context by navigating to a new catalog, a second Message Viewer window opens displaying the new catalog. You can view messages for as many catalogs as you require (or can reasonably fit on your screen). Each catalog is displayed in a separate Message Viewer window. See "Browsing to an Existing Catalog" on page 6-4 for information about browsing to a new catalog.

Selecting a Message to Edit from the Message Viewer

You can select any message displayed in the Message Viewer and the selected message becomes the context catalog. The message is displayed in the Message Editor window.

Figure 6-11 Message Viewer and Message Editor for Message 909001

Editing an Existing Message

To edit an existing message:

1. Find the message you want to edit.

   You can use the Search dialog, described in Finding a Log Message and Finding a Simple Text Message, or select the message in the message viewer, described in Selecting a Message to Edit from the Message Viewer.

   The message appears in the Message Editor window.

2. Edit the fields you want to change.

3. Click **Update**.

   The message is updated and the entire catalog is immediately written to disk.

Retiring and Unretiring Messages

You can retire and unretire messages in the Message Editor window. Retiring a message does not mean that the message is deleted from the master catalog; it is simply hidden from user view. This feature is useful for removing obsolete messages. If you need to bring a retired message back into view, you can unretire it.

To retire or unretire a message, complete the following procedure:

1. Find the message you want to retire or unretire.
2. In the Message Editor window, toggle the **Retired message** option by selecting or clearing the check box.
3. Click **Update**.

CHAPTER 7

Using the WebLogic Server Internationalization Utilities

The following sections contain information about the WebLogic Server utilities used for internationalization and localization:

- "WebLogic Server Internationalization Utilities" on page 7-1
- "WebLogic Server Internationalization and Localization" on page 7-2
- "weblogic.i18ngen Utility" on page 7-3
- "weblogic.l10ngen Utility" on page 7-5
- "weblogic.GetMessage Utility" on page 7-7

WebLogic Server Internationalization Utilities

WebLogic Server provides three internationalization utilities:

- `weblogic.i18ngen Utility`—Message catalog parser. Use this utility to validate and generate classes used for localizing text in log messages. For more information, see "weblogic.i18ngen Utility" on page 7-3.
- `weblogic.l10ngen Utility`—Locale-specific message catalog parser. Use this utility to process locale-specific catalogs. For more information, see "weblogic.l10ngen Utility" on page 7-5.
- `weblogic.GetMessage Utility`—Utility that lists installed log messages. Use this utility to generate a list of installed log messages or display a message. For more information, see "weblogic.GetMessage Utility" on page 7-7.

Notes: Text in the catalog definitions may contain formatting characters for readability (for example, end of line characters), but these are not preserved by the parsers. Text data is normalized into a one-line string. All leading and trailing white space is removed. All embedded end of line characters are replaced by spaces as required to preserve word separation. Tabs are left intact.

Use escapes to embed newlines (for example `'\n'`). These are stored and result in newlines when printed.

WebLogic Server Internationalization and Localization

Use the `weblogic.i18ngen` utility to validate message catalogs and create the necessary runtime classes for producing localized messages. The `weblogic.l10ngen` utility validates locale-specific catalogs, creating additional properties files for the different locales defined by the catalogs.

You can internationalize simple text-based utilities that you are running on WebLogic Server by specifying that those utilities use `Localizers` to access text data. You configure the applications with `Logger` and `TextFormatter` classes generated from the `weblogic.i18ngen` utility.

For more information on `Logger` and `TextFormatter` classes, see Appendix C, "TextFormatter Class Reference for WebLogic Server," and Appendix D, "Logger Class Reference for WebLogic Server."

The generated `Logger` classes are used for logging purposes, as opposed to the traditional method of writing English text to a log. For example, `weblogic.i18ngen` generates a class `xyzLogger` in the appropriate package for the catalog `xyz.xml`. For the `MyUtilLog.xml` catalog, the class, `programs.utils.MyUtilLogger.class`, would be generated. For each log message defined in the catalog, this class contains static public methods as defined by the `method` attributes.

`TextFormatter` classes are generated for each simple message catalog. These classes include methods for accessing localized and formatted text from the catalog. They are convenience classes that handle the interface with the message body, placeholders, and `MessageFormat`. You specify the formatting methods through the method attribute in each message definition. For example, if the definition of a message in a catalog includes the attribute, `method=getErrorNumber(int err)`, the `TextFormatter` class shown in Listing 7-1 is generated.

Listing 7-1 Example of a TextFormatter Class

```
package my.text;
public class xyzTextFormatter
{
   . . .
   public String getErrorNumber(int err)
   {
   . . .
   }
}
```

Listing 7-2 shows an example of how the `getErrorNumber` method could be used in code.

Listing 7-2 Example of getErrorNumber Method

```
import my.text.xyzTextFormatter
. . .

xyzTextFormatter xyzL10n = new xyzTextFormatter();
System.out.println(xyzL10n.getErrorNumber(someVal));
```

The output prints the message text in the current locale, with the `someVal` argument inserted appropriately.

weblogic.i18ngen Utility

Use the `weblogic.i18ngen` utility to parse message catalogs (XML files) to produce `Logger` and `TextFormatter` classes used for localizing the text in log messages. The utility creates or updates the following properties file, which is used to load the message ID lookup class hashtable `weblogic.i18n.L10nLookup`:

`targetdirectory``\i18n_user.properties`

Any errors, warnings, or informational messages are sent to `stderr`.

In order for user catalogs to be recognized, the `i18n_user.properties` file must reside in a directory identified in the WebLogic classpath.

For example: *targetdirectory*\i18n_user.properties

BEA Systems recommends that the i18n_user.properties file reside in the server classpath. If the i18n_user.properties file is in *targetdirectory*, then *targetdirectory* should be in the server classpath.

Syntax

```
java weblogic.i18ngen [options] [filelist]
```

Note: Utilities can be run from any directory, but if files are listed on the command line, then their path is relative to the current directory.

Options

Option	Definition
-build	Generates all necessary files and compiles them. The -build option combines the -i18n, -l10n, -keepgenerated, and -compile options.
-d *targetdirectory*	Specifies the root directory to which generated Java source files are targeted. User catalog properties are placed in i18n_user.properties, relative to the designated target directory. Files are placed in appropriate directories based on the i18n_package and l10n_package values in the corresponding message catalog. The default target directory is the current directory. This directory is created as necessary. If this argument is omitted, all classes are generated in the current directory, without regard to any class hierarchy described in the message catalog.
-n	Parse and validate, but do not generate classes.
-keepgenerated	Keep generated Java source (located in the same directory as the class files).
-ignore	Ignore errors.
-i18n	Generates internationalizers (for example, Loggers and TextFormatters). i18ngen -i18n creates the internationalizer source (for example, *Logger.java) that supports the logging of internationalized messages.

`-l10n`	Generates localizers (for example, `LogLocalizers` and `TextLocalizers`). `i18ngen -l10n` creates the localizer source (resource bundles) that provide access to each message defined in the message catalog. These classes are used by localization utilities to localize messages.
`-compile`	Compiles generated Java files using the current CLASSPATH. The resulting classes are placed in the directory identified by the `-d` option. The resulting classes are placed in the same directory as the source. Errors detected during compilation generally result in no class files or properties file being created. `i18ngen` exits with a bad exit status.
`-nobuild`	Parse and validate only.
`-debug`	Debugging mode.
`-dates`	Causes `weblogic.i18ngen` to update message timestamps in the catalog. If the catalog is writeable and timestamps have been updated, the catalog is rewritten.
`filelist`	Process the files and directories in this list of files. If directories are listed, the command processes all XML files in the listed directories. The names of all files must include an XML suffix. All files must conform to the `msgcat.dtd` syntax. `weblogic.i18ngen` prints the fully-qualified list of names (Java source) to the `stdout` log for those files actually generated.

weblogic.l10ngen Utility

The `weblogic.l10ngen` utility generates property resources for localizations of message catalogs named in the file list. The file list identifies the top-level catalogs, not translated catalogs.

Similarly the target directory (`-d` option) identifies the same target directory where the default localizations reside. For example, if the default catalogs are located in `$SRC\weblogic\msgcat` and the generated resources are to be placed in `$CLASSESDIR`, the appropriate `l10ngen` invocation would be:

```
java weblogic.l10ngen -d $CLASSESDIR $SRC\weblogic\msgcat
```

This command generates localized resources for all locales defined in the `weblogic\msgcat` subdirectories.

Syntax

```
java weblogic.l10ngen [options] [filelist]
```

Note: Utilities can be run from any directory, but if files are listed on the command line, then their path is relative to the current directory.

Options

Option	Definition
`-d` *`target`*	Directory in which to place properties. Default is the current directory.
`-language` *`code`*	Language code. Default is `all`.
`-country` *`code`*	Country code. Default is `all`.
`-variant` *`code`*	Variant code. Default is `all`.
`filelist`	Specifies the message catalogs for which you want to generate properties files. You must specify top-level catalogs that the Message Editor creates; you do not specify locale-specific catalogs that the Message Localizer creates. Usually, this is the same set of source files or source directories that you specified in the `i18ngen` command.

Message Catalog Localization

Catalog subdirectories are named after lowercase, two-letter ISO 639 language codes (for example, `ja` for Japanese and `fr` for French). You can find supported language codes in the `java.util.Locale` javadoc.

Variations to language codes are achievable through the use of uppercase, two-letter ISO 3166 country codes and variants, each of which are subordinate to the language code. The generic syntax is `lang\country\variant`.

For example, `zh` is the language code for Chinese. `CN` is a country code for simplified Chinese, whereas `TW` is the country code for traditional Chinese. Therefore `zh\CN` and `zh\TW` are two distinct locales for Chinese.

Variants are of use when, for instance, there is a functional difference in platform vendor handling of specific locales. Examples of vendor variants are WIN, MAC, and POSIX. There may be two variants used to further qualify the locale. In this case, the variants are separated with an underscore (for example, `Traditional_Mac` as opposed to `Modern_MAC`).

Note: Language, country, and variants are all case sensitive.

A fully-qualified locale would look like `zh\TW\WIN`, identifying traditional Chinese on a Win32 platform.

Message catalogs to support the above locale would involve the following files:

- `\*.xml`—default catalogs
- `\zh\*.xml`—Chinese localizations
- `\zh\TW\*.xml`—Traditional Chinese localizations
- `\zh\TW\WIN\*.xml`—Traditional Chinese localizations for Win32 code sets

Specific localizations do not need to cover all messages defined in parent localizations.

Examples

1. To generate localization properties for all locales:

   ```
   java weblogic.l10ngen -d $CLASSESEDIR catalogdirectory
   ```

2. To generate localization properties for all traditional Chinese locales:

   ```
   java weblogic.l10ngen -d $CLASSESEDIR -language zh -country TW
   catalogdirectory
   ```

3. To generate localization properties for all Chinese locales:

   ```
   java weblogic.l10ngen -d $CLASSESEDIR -language zh catalogdirectory
   ```

4. To generate localization properties for the JMS catalog in all locales:

   ```
   java weblogic.l10ngen -d $CLASSESEDIR catalogdirectory
   ```

Note: Example 2 is a subset of example 3. All Chinese (`zh`) would include any country designations (for example, `TW`) and variants.

`weblogic.l10ngen` does not validate the locale designators (language, country, variant).

weblogic.GetMessage Utility

The `weblogic.GetMessage` utility replaces the `CatInfo` utility provided with earlier releases of WebLogic Server. This utility displays message content but can also be used to list all or some subset of installed messages. By default (no options), `weblogic.GetMessage` prints a usage statement.

Syntax

```
java weblogic.GetMessage [options]
```

Options

Note: All options may be abbreviated to a single character except `-verbose`.

Option	Definition
`-id` *nnnnnn*	where *nnnnnn* represents the message ID. The `-id` option is used to specify a particular message.
`-subsystem` *identifier*	The subsystem identifier. The `-subsystem` option prints only those messages that match the specified subsystem.
`-nodetail`	Requests a non-detailed listing, and only outputs the message body of a message. By default, a detailed listing is output, which includes severity, subsystem, message detail, cause, and action information.
`-verbose`	Requests more detail on the listing. The `-verbose` option also prints packaging, stacktrace option, severity, subsystem, message detail, cause, and action information.
`-lang` *code*	The language to use. For example, `en` for English.
`-country` *code*	The country code to use. For example, `US` for United States.
`-variant` *code*	The variant designator for locale.
`-help`	Provides usage information.
`-retired`	Lists all retired messages. Retired messages are not displayed unless this option is used. Only the subsystem and ID's of such messages are listed.

If no arguments are provided, `weblogic.GetMessage` outputs a usage message, equivalent to `-help`.

APPENDIX A

Localizer Class Reference for WebLogic Server

The following sections provide reference information for `Localizer` classes:

- "About Localizer Classes" on page A-1
- "Localizer Methods" on page A-2
- "Localizer Lookup Class" on page A-3

Note: This information on `Localizer` class methods is provided as reference for advanced users. Normally, you do not need to use these interfaces directly. Instead, you would typically use the generated methods in the catalogs.

About Localizer Classes

`Localizers` are classes that are used by applications and server code to localize text for output. The `weblogic.i18ngen` utility creates `Localizer` classes based on the content of the message catalog.

One `Localizer` class is generated for each catalog file. The name of the class is the catalog name (without the `.xml` extension, which is stripped by the utility), followed by `LogLocalizer` for log message catalogs and `TextLocalizer` for simple text catalogs. A `Localizer` class for the catalog `ejb.xml` is `ejbLogLocalizer`.

Localizer Methods

Localizers are `PropertyResourceBundle` objects. Four additional methods are provided to simplify the access of the localization data in the `Localizer`. These methods are described in Table A-1.

These methods are not part of the `Localizer`. Rather, they are part of the `Localizer` class. The `Localizer` class is used by the `Logger` and `TextFormatter` classes to extract data out of the `Localizer`. Each `Localizer` has an associated `Localizer` class that is obtained through `L10nLookup`, the `Localizer` lookup object.

Table A-1 Methods for Localization Data Access

Method	Description
`public Object getObject(String key, String id)`	Returns localization text for the `key` element for message `id`.
`public Object getObject(String key, int id)`	Returns localization text for the `key` element for message `id`.
`public String getString(String key, String id)`	Returns localization text for the `key` element for message `id`.
`public String getString(String key, int id)`	Returns localization text for the `key` element for message `id`.

Each of the methods for accessing localization data has a `key` argument. The following list shows the recognized values for the `key` argument:

- `Localizer.SEVERITY`
- `Localizer.MESSAGE_ID`
- `Localizer.MESSAGE_BODY`
- `Localizer.MESSAGE_DETAIL`
- `Localizer.CAUSE`
- `Localizer.ACTION`

With the exception of the `Localizer.SEVERITY` key, the localization data returned by `Localizers` are String objects that return an integer object.

The following list shows the severity values that are returned:

- `weblogic.logging.severities.EMERGENCY`
- `weblogic.logging.severities.ALERT`
- `weblogic.logging.severities.CRITICAL`
- `weblogic.logging.severities.NOTICE`
- `weblogic.logging.severities.ERROR`
- `weblogic.logging.severities.WARNING`
- `weblogic.logging.severities.INFO`
- `weblogic.logging.severities.DEBUG`

The specific strings returned are defined in the message catalogs.

The `key` argument to the `get*()` methods identify which element of a definition to return. Acceptable values are defined in the `Localizer` class definition. The returned text can be further expanded through `java.text.MessageFormat.format()`. The `message body`, `detail`, `cause`, and `action` elements are all localizable. The other elements, `message ID`, `severity`, and `subsystem` are not localizable and do not require further processing by `MessageFormat`.

Localizer Lookup Class

To obtain the correct `Localizer` for a message, use the `L10nLookup` class, which is a property class extension that is loaded at system startup from the property file:

`i18n_user.properties`

This property file is created by `weblogic.i18ngen` and is included in the WebLogic Server installation. When you start up a user application, any `i18n_user.properties` files in its classpath are also loaded into `L10nLookup`.

Properties in the lookup (`i18n_user.properties`) file have the following format:

`nnnnnn=subsystem:Localizer class`

The arguments on this line are defined as follows:

- *`nnnnnn`* is the message ID
- *`subsystem`* is the related subsystem
- *`Localizer class`* is the name of the generated `Localizer` class

For example, message `001234` is identified as an EJB subsystem message ID from the `weblogic.i18n.ejbLogLocalizer` class by the following property in the lookup file:

```
001234=EJB:weblogic.i18n.ejbLogLocalizer
```

APPENDIX B

Loggable Object Reference for WebLogic Server

The following sections provide reference information for loggable objects:

- "About Loggable Objects" on page B-1
- "How To Use Loggable Objects" on page B-1

About Loggable Objects

By default, all log message catalogs create `Logger` classes with methods that are used to log the messages to the WebLogic server log. The `Logger` classes can optionally include methods that return a loggable object instead of logging the message. Loggable objects are useful when you want to generate the log message but actually log it at a later time. They are also useful if you want to use the message text for other purposes, such as throwing an exception.

How To Use Loggable Objects

To create a `Logger` class that provides methods to return loggable objects, you must set the `loggables` attribute in the message catalog.

For example, consider the `test.xml` catalog shown in Listing B-1.

Listing B-1 test.xml Message Catalog

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
```

```
"http://www.bea.com/servers/wls90/dtd/msgcat.dtd">
<message_catalog
   subsystem="Examples"
   version="1.0"
   baseid="500000"
   endid="500001"
   loggables="true"
   >
   <logmessage
      messageid="500000"
      severity="error"
      method="logIOError(Throwable t)"
      >
      <messagebody>
         IO failure detected.
      </messagebody>
      <messagedetail>
      </messagedetail>
      <cause>
      </cause>
      <action>
      </action>
   </logmessage>
</message_catalog>
```

When you run this catalog through the `weblogic.i18ngen` utility, a `Logger` class is created for this catalog with the following two methods:

- `logIOError (throwable)`—logs the message
- `logIOErrorLoggable (throwable)`—returns a loggable object

The loggable object can be used as shown in Listing B-2.

Listing B-2 Example of Use of Loggable Object

```
package test;
import weblogic.logging.Loggable;
import weblogic.i18n.testLogger;
...
try {
  // some IO
} catch (IOException ioe) {
  Loggable l = testLogger.logIOErrorLoggable(ioe);
```

```
  l.log();  // log the error
  throw new Exception(l.getMessage());//throw new exception with
       same text as logged
}
```

APPENDIX C

TextFormatter Class Reference for WebLogic Server

The following sections provide reference information for `TextFormatter` classes:

- "About TextFormatter Classes" on page C-1
- "Example of an Application Using a TextFormatter Class" on page C-1

About TextFormatter Classes

`TextFormatter` classes are generated by `weblogic.i18ngen` from simple message catalogs. These classes provide methods for generating localized versions of message text at runtime.

Example of an Application Using a TextFormatter Class

The following is an example of a `Hello_World` application, its simple message catalog, and the `TextFormatter` class generated for the catalog.

Listing C-1 Example of a Simple Message Catalog

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
"http://www.bea.com/servers/wls90/dtd/msgcat.dtd">
<message_catalog
   l10n_package="examples.i18n.simple"
   subsystem="I18N"
   version="1.0"
   >
```

```
<message
   messageid="HELLO_WORLD"
   datelastchanged="967575717875"
   method="helloWorld()"
   >
   <messagebody>
      Hello World!
   </messagebody>
</message>
<!--  -->
<message
   messageid="HELLO_AGAIN"
   datelastchanged="967575717804"
   method="helloAgain()"
   >
   <messagebody>
      Hello again
   </messagebody>
</message>
<!--  -->
<message
   messageid="NTH_HELLO"
   datelastchanged="967575770971"
   method="nthHello(int count)"
   >
   <messagebody>
      This is hello number {0,number}.
   </messagebody>
</message>
<!--  -->
<message
   messageid="VERSION"
   datelastchanged="967578656214"
   method="version(String version)"
   >
   <messagebody>
      Catalog version: {0}
   </messagebody>
</message>
<!--  -->
<message
   messageid="I18N_PACKAGE"
   datelastchanged="967578691394"
   method="i18nPackage(String pkg)"
   >
   <messagebody>
      I18n Package: {0}
   </messagebody>
</message>
```

```
   <!--  -->
   <message
      messageid="L10N_PACKAGE"
      datelastchanged="967578720156"
      method="l10nPackage(String pkg)"
      >
      <messagebody>
         L10n Package: {0}
      </messagebody>
   </message>
   <!--  -->
   <message
      messageid="SUBSYSTEM"
      datelastchanged="967578755587"
      method="subSystem(String sub)"
      >
      <messagebody>
         Catalog subsystem: {0}
      </messagebody>
   </message>
</message_catalog>
```

The following is an example of an application using the HelloWorld catalog. The example shows various ways of internationalizing an application using simple message catalogs.

Listing C-2 Example of an Application Using the HelloWorld Catalog

```
package examples.i18n.simple;
import java.util.Locale;
import java.text.MessageFormat;
import weblogic.i18n.Localizer;
import weblogic.i18ntools.L10nLookup;

/**
 * @author Copyright (c) 2000 by BEA Systems, Inc. All Rights Reserved.
 */

/**
 * This example shows various ways of internationalizing an application
 * using simple message catalogs.
 * <p>
 * Usage: java examples.i18n.simple.HelloWorld [lang [country]]
 * <p>
 * lang is a 2 character ISO language code. e.g. "en"
```

```
 * country is a 2 character ISO country code. e.g. "US"
 * <p>
 * Usage of any of the languages supported by this example presumes
 * the existence of the appropriate OS localization software and character
 * encodings.
 * <p>
 * The example comes with catalogs for English (the default) and  French.
 * The catalog source is in the following files, and were built
 * using the catalog editing utility, weblogic.i18ntools.gui.MessageEditor.
 * <p>
 * <pre>
 * English(base language)       ../msgcat/Helloworld.xml
 * French                       ../msgcat/fr/FR/HelloWorld.xml
 * </pre>
 * <p>
 * To build this example run the bld.sh(UNIX) or bld.cmd (NT) scripts from
 * the examples/i18n/simple directory. CLIENT_CLASSES must be set up and
 * needs to be in the classpath when running the example.
 */

public final class HelloWorld {

  public static void main(String[] argv) {
    /*
     * The easiest method for displaying localized text is to
     * instantiate the generated formatter class for the HelloWorld catalog.
     * This class contains convenience methods that return localized text for
     * each message defined in the catalog.  The class name is
     * the catalog name followed by "TextFormatter".
     *
     * Typically, you would use the default constructor to obtain
     * formatting in the current locale. This example uses a locale
     * based on arguments to construct the TextFormatter.
     */
    Locale lcl;
    if (argv.length == 0) { // default is default locale for JVM
      lcl = Locale.getDefault();
    }
    else {
      String lang = null;
      String country = null;
      //get  the language code
      lang = argv[0];
      if (argv.length >= 2) { // get the country code
        country = argv[1];
      }
      lcl = new Locale(lang,country);
    }
    /*
```

```
     * Get formatter in appropriate locale.
     */
    HelloWorldTextFormatter fmt = new HelloWorldTextFormatter(lcl);
    fmt.setExtendedFormat(true);
    /*
     * Print the text in the current locale.
     */
    System.out.println(fmt.helloWorld());

    /*
     * Alternatively,  text can be accessed and formatted manually. In this
     * case you must obtain the Localizer class for the catalog. The
     * Localizer class is formed from the l10n_package attribute in the
     * catalog, the catalog name, and the string "TextLocalizer".
     */
    Localizer l10n = L10nLookup.getLocalizer
      (lcl,"examples.i18n.simple.HelloWorldTextLocalizer");
    System.out.println(l10n.get("HELLO_AGAIN"));
    /*
     * If the message accepts arguments, they can be passed to the
     * method defined for the message.
     */
    System.out.println(fmt.nthHello(3));
    /*
     * If using the manual method, you must manually apply the argument to
     * the text using the MessageFormat class.
     */
    String text = l10n.get("NTH_HELLO");
    Object[] args = {new Integer(4)};
    System.out.println(MessageFormat.format(text,args));
    /*
     * The Localizer class also provides methods for accessing catalog
     * information.
     */
    System.out.println(fmt.version(l10n.getVersion()));
    System.out.println(fmt.l10nPackage(l10n.getL10nPackage()));
    System.out.println(fmt.i18nPackage(l10n.getI18nPackage()));
    System.out.println(fmt.subSystem(l10n.getSubSystem()));
  }
}
```

The following listing shows an example of the generated `TextFormatter` for the HelloWorld catalog.

Listing C-3 Example of Generated TextFormatter Class for the HelloWorld Catalog

```
package examples.i18n.simple;import java.text.MessageFormat;
import java.text.DateFormat;
import java.util.Date;
import java.util.Locale;
import weblogic.i18n.Localizer;
import weblogic.i18ntools.L10nLookup;

/**
 * Copyright (c) 2002 by BEA Inc. All Rights Reserved.
 * @exclude
 */

public class HelloWorldTextFormatter {
   private Localizer l10n;
   private boolean format=false;
   // constructors
   public HelloWorldTextFormatter() {
   l10n = L10nLookup.getLocalizer(Locale.getDefault(),
   "examples.i18n.simple.HelloWorldTextLocalizer");
   }
   public HelloWorldTextFormatter(Locale l) {
   l10n =
   L10nLookup.getLocalizer(l,"examples.i18n.simple.HelloWorldTextLocalizer");
   }
   public static HelloWorldTextFormatter getInstance() {
      return new HelloWorldTextFormatter();
   }
   public static HelloWorldTextFormatter getInstance(Locale l) {
      return new HelloWorldTextFormatter(l);
   }
   public void setExtendedFormat(boolean fmt) {
      format = fmt;
   }
   public boolean getExtendedFormat() { return format;

  /**
   * Hello World!
   */

   public String helloWorld()  {
      String fmt  = "";
      String id = "HELLO_WORLD" ;
      String subsystem = "I18N" ;
      Object [] args = {  };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
      DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM, D
```

```
ateFormat.LONG);
      fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+"> ";
      }
      return fmt+output;
      }

  /**
   * Hello again
   */

   public String helloAgain()  {
      String fmt  = "";
      String id = "HELLO_AGAIN" ;
      String subsystem = "I18N" ;
      Object [] args = {  };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
         fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }

 /**
  * This is hello number {0,number}.
  */

   public String nthHello(int arg0)  {
      String fmt  = "";
      String id = "NTH_HELLO" ;
      String subsystem = "I18N" ;
      Object [] args = { new Integer(arg0) };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
         fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }

 /**
  * Catalog version: {0}
  */

   public String version(String arg0)  {
      String fmt  = "";
      String id = "VERSION" ;
      String subsystem = "I18N" ;
```

```
      Object [] args = { arg0 };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
         fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }

 /**
  * I18n Package: {0}
  */

   public String i18nPackage(String arg0)  {
      String fmt  = "";
      String id = "I18N_PACKAGE" ;
      String subsystem = "I18N" ;
      Object [] args = { arg0 };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
         fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }

 /**
  * L10n Package: {0}
  */

   public String l10nPackage(String arg0)  {
      String fmt  = "";
      String id = "L10N_PACKAGE" ;
      String subsystem = "I18N" ;
      Object [] args = { arg0 };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
         fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }

 /**
  * Catalog subsystem: {0}
  */
```

```
   public String subSystem(String arg0)  {
      String fmt  = "";
      String id = "SUBSYSTEM" ;
      String subsystem = "I18N" ;
      Object [] args = { arg0 };
      String output =  MessageFormat.format(l10n.get(id) , args);
      if (getExtendedFormat()) {
         DateFormat dformat = DateFormat.getDateTimeInstance(DateFormat.MEDIUM
, DateFormat.LONG);
          fmt = "<"+dformat.format(new Date())+"><"+subsystem+"><"+id+">";
      }
      return fmt+output;
      }
}
```

TextFormatter Class Reference for WebLogic Server

APPENDIX D

Logger Class Reference for WebLogic Server

The following sections provide reference information for `Logger` classes:

- "About Logger Classes" on page D-1
- "Example of a Generated Logger Class" on page D-1

About Logger Classes

The classes generated by `i18ngen` are known as `Logger` classes. `Logger` classes provide the interface to WebLogic Server logging. For catalog `Xyz.xml`, a `Logger` class `XyzLogger` is generated.

The `Logger` class provides methods to log all messages defined in a catalog to the WebLogic server log. The methods included are the same as those defined in the associated catalog. If the catalog specifies the `loggables` attribute as true, then `Loggable` methods are also generated for each message.

For more information, see Appendix B, "Loggable Object Reference for WebLogic Server."

Example of a Generated Logger Class

Listing D-1 contains an example of a generated logger class.

Listing D-1 Example of Generated Logger Class

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE message_catalog PUBLIC "weblogic-message-catalog-dtd"
"http://www.bea.com/servers/wls90/dtd/msgcat.dtd">
<message_catalog
   i18n_package="examples.i18n.logging"
   l10n_package="examples.i18n.logging"
   subsystem="I18N"
   version="1.0"
   baseid="600000"
   endid="610000"
   loggables="true"
   >
   <logmessage
     messageid="600000"
     method="logEntry()"
     severity="info"
     >
     <messagebody>Starting I18nLog example...</messagebody>
     <messagedetail></messagedetail>
     <cause></cause>
     <action></action>
   </logmessage>
   <logmessage
     messageid="600001"
     method="testArgs(String name,int cnt)"
     severity="debug"
     >
     <messagebody>Class {0} started with {1,number} arguments.</messagebody>
     <messagedetail></messagedetail>
     <cause></cause>
     <action></action>
   </logmessage>
   <logmessage
     messageid="600002"
     method="logTrace(Throwable t)"
     severity="error"
     stacktrace="true"
     >
     <messagebody>This message is followed by a trace</messagebody>
     <messagedetail></messagedetail>
     <cause></cause>
     <action></action>
   </logmessage>
   <logmessage
     messageid="600003"
     method="logNoTrace(Throwable t)"
```

```
     severity="warning"
     stacktrace="false"
     >
    <messagebody>This message is not followed by a trace, but we can insert its
text : {0}</messagebody>
     <messagedetail></messagedetail>
     <cause></cause>
     <action></action>
   </logmessage>
   <logmessage
     messageid="600004"
     method="getId()"
     severity="info"
     >
     <messagebody>This message's id will be in the next message</messagebody>
     <messagedetail>A message can contain additional detailed
information.</messagedetail>
     <cause>This message is displayed on purpose</cause>
     <action>Nothing to do, the example is working</action>
   </logmessage>
   <logmessage
     messageid="600005"
     method="showId(String id)"
     severity="info"
     >
     <messagebody>The previous message logged had message id {0}</messagebody>
     <messagedetail></messagedetail>
     <cause></cause>
     <action></action>
   </logmessage>
</message_catalog>
```

Listing D-2 shows the corresponding Java source code generated by `weblogic.i18ngen`.

Listing D-2 Example of Generated Logger Class

```
package examples.i18n.logging;

import weblogic.logging.MessageLogger;
import weblogic.logging.Loggable;
import java.util.MissingResourceException;

/**
 * Copyright (c) 2001 by BEA Systems, Inc. All Rights Reserved.
```

```
 * @exclude
 */
public class I18nLogLogger
{
  /**
   * Starting I18nLog example...
   * @exclude
   *
   * messageid:  600000
   * severity:   info
   */
  public static String logEntry()  {
    Object [] args = {  };
    MessageLogger.log(
       "600000",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600000";
  }
  public static Loggable logEntryLoggable() throws MissingResourceException {
    Object[] args = {  };
    return new Loggable("600000", args);
  }
  /**
   * Class {0} started with {1,number} arguments.
   * @exclude
   *
   * messageid:  600001
   * severity:   debug
   */
  public static String testArgs(String arg0, int arg1)  {
    Object [] args = { arg0, new Integer(arg1) };
    MessageLogger.log(
       "600001",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600001";
  }
  public static Loggable testArgsLoggable(String arg0, int arg1) throws
MissingResourceException {
    Object[] args = { arg0, new Integer(arg1) };
    return new Loggable("600001", args);
  }
  /**
   * This message is followed by a trace
   * @exclude
   *
   * messageid:  600002
   * severity:   error
```

```
   */
  public static String logTrace(Throwable arg0)  {
    Object [] args = { arg0 };
    MessageLogger.log(
       "600002",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600002";
  }
  public static Loggable logTraceLoggable(Throwable arg0) throws
MissingResourceException {
    Object[] args = { arg0 };
    return new Loggable("600002", args);
  }
  /**
   * This message is not followed by a trace, but we can insert its text : {0}
   * @exclude
   *
   * messageid:  600003
   * severity:   warning
   */
  public static String logNoTrace(Throwable arg0)  {
    Object [] args = { arg0 };
    MessageLogger.log(
       "600003",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600003";
  }
  public static Loggable logNoTraceLoggable(Throwable arg0) throws
MissingResourceException {
    Object[] args = { arg0 };
    return new Loggable("600003", args);
  }
  /**
   * This message's id will be in the next message
   * @exclude
   *
   * messageid:  600004
   * severity:   info
   */
  public static String getId()  {
    Object [] args = {  };
    MessageLogger.log(
       "600004",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600004";
  }
```

```
  public static Loggable getIdLoggable() throws MissingResourceException {
    Object[] args = {  };
    return new Loggable("600004", args);
  }
  /**
   * The previous message logged had message id {0}
   * @exclude
   *
   * messageid:  600005
   * severity:   info
   */
  public static String showId(String arg0)  {
    Object [] args = { arg0 };
    MessageLogger.log(
       "600005",
       args,
       "examples.i18n.logging.I18nLogLogLocalizer");
    return "600005";
  }
  public static Loggable showIdLoggable(String arg0) throws
MissingResourceException {
    Object[] args = { arg0 };
    return new Loggable("600005", args);
  }

}
```

Listing D-3 shows an example application that uses the `weblogic.i18nLog` (internationalized (I18n) logging interfaces). The example logs an informational message.

Listing D-3 Example of Application Using i18nLog

```
package examples.i18n.logging;

import java.util.Locale;

import weblogic.i18n.Localizer;
import weblogic.i18ntools.L10nLookup;
import weblogic.logging.Loggable;

/**
 * @author Copyright (c) 2000 by BEA Systems, Inc. All Rights Reserved.
 */
```

```
/**
 * This example shows how to use the internationalized (I18n) logging interfaces.
 * <p>
 * usage: java examples.i18n.logging.I18nLog
 * <p>
 * Build procedure: run bld.sh (UNIX) or bld.cmd (NT). These scripts
 * process the I18nLog.xml catalog, producing the logging class,
 * <tt>examples.i18n.logging.I18nLogLogger</tt>. This class contains static
 * methods for logging messages to the WLS server log. The methods
 * and arguments are defined in the I18nLog.xml catalog. This example also
 * uses a simple message catalog, I18nSimple.xml.
 */


public  class I18nLog {

    public I18nLog() {}

    public static void main(String[] argv) {
      /**
       * This call just logs an info message. There are no arguments defined
       * for this method.
       *
       * This also shows how to use the Loggable form of the method.
       */

      Loggable ll = I18nLogLogger.logEntryLoggable();
      ll.log();
      System.out.println(ll.getMessage());

      /**
       * Here's an example of a message including a variety
       * of arguments.
       */
      I18nLogLogger.testArgs(I18nLog.class.getName(),argv.length);
      /**
       * If a Throwable is passed then it will result in a stack trace
       * being logged along with the method by default.
       */
      Throwable t = new Throwable("Test with stack trace");
      I18nLogLogger.logTrace(t);
      /**
       * Messages can optionally be defined to not log a stack trace.
       */
      I18nLogLogger.logNoTrace(t);
      /**
       * The logger methods return the message id for applications
       * that want to do more than just log these messages.
       */
```

```
      String messageId = I18nLogLogger.getId();
      I18nLogLogger.showId(messageId);
      /**
       * The message id can be used to obtain the different attributes
       * of a message. The L10nLookup object provides access to the catalogs
       * via Localizer classes. Localizers provide the access to individual
       * messages. Each log message catalog has two Localizers: one for
       * general message information and one for the detailed attributes.
       *
       * The basic Localizer provides access to catalog information:
       *     Version
       *     L10n Package - package for catalog data
       *     I18n Package - package for Logger methods
       *     Subsystem - catalog subsystem
       * For each message it also provides:
       *     Severity: debug, info, warning, error
       *     Message Body - the message text
       *     Stack option - whether to log a stack trace
       *
       * First get to the L10nLookup properties, then use them to get the
       * Localizers for the message.
       */
      L10nLookup l10n = L10nLookup.getL10n();
      /**
       * This returns the basic Localizer (arg 3 = false)
       */
      Localizer lcl = l10n.getLocalizer(messageId,Locale.getDefault(),false);
      /**
       * This returns the detailed Localizer (arg 3 = true)
       */
      Localizer lclDetail =
l10n.getLocalizer(messageId,Locale.getDefault(),true);
      /**
       * Use this appplication's simple message catalog to display the
       * log message catalog information
       */
      I18nSimpleTextFormatter fmt = new I18nSimpleTextFormatter();
      System.out.println(fmt.version(messageId,lcl.getVersion()));
      System.out.println(fmt.l10nPackage(messageId,lcl.getL10nPackage()));
      System.out.println(fmt.i18nPackage(messageId,lcl.getI18nPackage()));
      System.out.println(fmt.subsystem(messageId,lcl.getSubSystem()));
      System.out.println(fmt.severity(messageId,lcl.getSeverity(messageId)));
      System.out.println(fmt.body(messageId,lcl.getBody(messageId)));
      System.out.println(fmt.stack(messageId,lcl.getStackTrace(messageId)));
      /**
       * Now for the detailed information.
       */
      System.out.println(fmt.detail(messageId,lclDetail.getDetail(messageId)));
      System.out.println(fmt.cause(messageId,lclDetail.getCause(messageId)));
```

```
      System.out.println(fmt.action(messageId,lclDetail.getAction(messageId)));
    }
}
```