

# **Enhydra JDDI Syntax Guide**

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# Chapter 1. Overview of Enhydra JDDI

Enhydra JDDI enhances the static presentation capabilities of HTML, as it is designed to support the systematic embedding of Java functionality within an HTML page. Enhydra JDDI files, like HTML files, are simple ASCII files; Enhydra JDDI files are distinguished from standard HTML files by their ".jHTML" extension.

Within an Enhydra JDDI file, Java code supplies dynamic content, while a non-programmer can easily edit existing static content with any best-of-breed web authoring tool. The Enhydra JDDI syntax allows for the integration of Java with HTML, or the modular separation of HTML templates and Java libraries into separate files.

There are two categories within the Enhydra JDDI syntax: <JDDI> tags and Enhydra JDDI Fields. The <JDDI> tags, with their various attributes, isolate Java sections and conditionally insert static HTML content. Enhydra JDDI Fields support the ability to decode URL arguments, or to embed values directly from a Java object.

Enhydra JDDI files are the building blocks of Presentation Objects, which are compiled using the Enhydra Jddic compiler. These Presentation Objects are then executed from any web server supported by Enhydra.

## Enhydra Jddic Compiler Options

The Enhydra Jddic compiler, with the following commands, compiles a JHTML file:

```
jddic [options] src.jHTML packageName
```

The .jHTML file extension is mandatory to the source file src. The resultant class belongs to the Java package name packageName.

**Table 1.1. Command line options supported by the compiler:**

option	description
-k	Keep the resultant .java files. This is useful for debugging. Normally the .java files are automatically removed after successfully compiling the .class file.
-d destdir	Specify the destination root for the Java class files. The default is javadir.
-j javadir	Directory in which to generate the .java files. The default is the current working directory.

When developing in the Enhydra Development Environment, the use of Enhydra Jddic is usually transparent, as the distributed makefiles contain the rules for running the Enhydra JDDI compiler.

## Executing a Presentation Object

A compiled Presentation Object consists of a class with the same name as the original JHTML file. A well-defined entry method, such as:

```
run(HTTPPresentationComms)
```

is automatically inserted into the Presentation Object by the Enhydra Jddic compiler. Presentation Objects can also be constructed by hand, without the use of the Enhydra Jddic compiler.

Upon receipt of a URL ending in .po (e.g., demoApp.po), Enhydra will turn the request into a run() method on the appropriate PO (e.g., demoApp.class).

The run() method will sequentially execute each part of an Enhydra JDDI Presentation Object (dynamic Java or static HTML) according to the conditional rules set forth by <JDDI> tags.

Execution continues until the Presentation Object ends naturally, an unhandled exception is thrown, or an HTTP redirect is invoked.

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# Chapter 2. Enhydra JDDI Fields

The values of `page.data` variables, when used within HTML sections, are called Enhydra JDDI Fields. Enhydra JDDI Fields and their values result from two possible scenarios. First, when entering a page environment, Enhydra JDDI Fields initially represent decoded CGI arguments from an HTTP GET or POST method.

For example, the argument:

```
.../foo.po?firstName=Pete&lastName=Smith  
creates the Enhydra JDDI Fields cgiArgs.firstName and cgiArgs.lastName.
```

The values contained in Enhydra JDDI Fields (in this example, "Pete" and "Smith") may be accessed from within static HTML content by pre-pending and post-pending "`@`" and "`@`", respectively, such as:

```
<BR>Your last name is (@cgiArgs.lastName@).
```

This construct would generate the following string, displayed by the client:

```
Your last name is Smith.
```

Additionally, Enhydra JDDI Fields can be the result of an Enhydra JDDI Java section, created using the `set` method of the `page.data` class. Both the `page.data` variable and Enhydra JDDI Field name must be a valid Java identifier.

In the example below, this statement from an Enhydra JDDI Java section creates an Enhydra JDDI Field called `minLength`, with a value of 8:

```
page.data.set("minLength", "8");  
which is then referenced within static HTML content:
```

```
<BR>The minimum required password length is (@minLength@).  
and displays:
```

```
The minimum required password length is 8.
```

Enhydra JDDI Fields represent the hierarchical structure of `page.data`. The `.` (period) character is significant, as it delimits the branches within the `page.data` hierarchy. As new Enhydra JDDI Fields are created, the `page.data` object accumulates their variables and values throughout the lifetime of the page. If a referenced Enhydra JDDI Field does not exist, or is illegally specified, an exception will be thrown when executing the Presentation Object.

## Specifying Default Values

You can also specify default values for JDDI Fields. The format is:

```
(@ (encoding) name : default @)  
where encoding is either HTML or JavaScript (case insensitive).
```

`name` is the same as it was before except for the added feature that if it starts with `session`, then it gets the value of the `name` in `JoltPage.session.data` instead of the `name` in `JoltPage.data`

`default`, optionally enclosed in quotes, is the value to use if there is no value for the `name`

The purpose for the encoding is to quote unsafe characters in the value to prevent possible problems when these strings are used in HTML or JavaScript.

JavaScript encoding quotes are:

```
' " \
```

HTML encoding quotes are:

```
< > &
```

Here are some examples. Assume we had previously coded the following:

```
page.session.data.set("first", "Tubby");
page.session.data.set("last", "Smith");
and
page.data.set("company", "Tubby's Restaurant");
page.data.set("status", "open");
```

The following tags would be replaced by these values:

```
(@status@) returns "open"
page.data.get("status") returns "open"
(@session.first@) returns "Tubby"
page.session.data.get("first") returns "Tubby"
```

In the case of a JDDI Field that doesn't exist:

```
(@middle:N/A@) N/A
The following Java code,
page.data.get("middle")
fails. So the default of "N/A" is used
(@session.middle:"not specified@) returns "not specified"
page.session.data.get("middle") fails so the default of "not specified" is used
```

## JDDI Fields and Quoted Characters

```
(@(JavaScript)company@) Tubby\'s Restaurant
page.data.get("company")
returns "Tubby's Restaurant" which is then encoded for use in JavaScript giving "Tubby's Restaurant"
(@@(JavaScript)(HTML)session.company:"O'Neal & Jordan") O\'Neal & Jordan
page.session.data.get("company") fails so the default of "O'Neal & Jordan" is then encoded for use in JavaScript and
HTML giving
"O\'Neal & Jordan"
```

Here's an example of when you would need to use the JavaScript encoding.

```
<SCRIPT language="JavaScript">
var companyname = '@company@';
</SCRIPT>
```

Since company contains the ' character, it would cause a JavaScript error if we didn't quote it. We would get

```
var companyname = 'Tubby's Restaurant';
which is illegal.
```

For the HTML case, we have a similar problem with different characters if we did `page.data.set("formula", "A < B")` and then

```
<HTML>(@formula@)</HTML>
we would end up with
```

```
<HTML>A < B</HTML>
which is illegal HTML.
```

If a portion of HTML needs to include the (&#64; or @) characters literally, they must be quoted with the regular HTML quoting mechanism:

```
<BR>Quoting characters look like (@@)
```

This construct generates the string:

```
Quoting characters look like (@@)
```

If referencing a directory when utilizing Enhydra JDDI Fields, an HTML-formatted dump of all known Enhydra JDDI Field names and their values under the specified directory will be reported.

## Accessing Enhydra JDDI Fields from JavaScript

Enhydra JDDI Fields are evaluated before the HTML results of a Presentation Object are sent as a response to the client. Therefore, Enhydra JDDI Fields are ideal for adding simple dynamic content to pages containing JavaScript (or any other client-side language).

Previously in this reference, an example of an Enhydra JDDI Java section stored a minimum password length value in an Enhydra JDDI Field called `minLength`. The following JavaScript uses this Enhydra JDDI Field to alert the user before the form is submitted:

```
<SCRIPT LANGUAGE="JavaScript">
    if (form.password.value.length < (@minLength@))
        alert("@minLength@ characters are required")
</SCRIPT>
```

Using the example above, remember that the integer value "8" has been stored in the Enhydra JDDI Field `minLength`. The following events occur:

- JavaScript is called on the client-side.
- The "if..." statement asks if the password input by the users contains less than the required number of characters as specified in `minLength`.
- If the result is true (if the password does not contain the minimum number of characters), the browser displays an alert pop-up window. The value of `minLength` ("8") is referenced in the pop-up, which displays "8 characters are required".

## Dumping Known Field Names w/ (@@)

Enhydra JDDI Fields with no inserted name (@@) automatically generate an HTML-formatted dump of all Enhydra JDDI Field names and their values known within the page context. This is particularly useful during application development and debugging.

---

# Chapter 3. Enhydra JDDI Tags

The <JDDI> tags within the Enhydra JDDI syntax serve numerous functions ranging from referencing files and Java methods to conditionally including HTML content.

Depending upon its attribute and/or conditions, a <JDDI> tag can include Java code or HTML content within an Enhydra JDDI file. Some <JDDI> tags are also provided to catch exceptions upon compiling or executing a Presentation Object, providing a programmer error-catching control that is superior to CGI-based applications.

Further in this chapter, as individual tags are described, the tags are referenced using their attribute as an identifier. For example, the <JDDI> tag with the JAVADEF attribute is referred to as the <JDDI JAVADEF> tag.

In the examples provided for each tag, quotation marks (") are used to surround arguments. These quotation marks are optional, unless the value contains a space.

## Tests for Conditions

Conditions can be applied to <JDDI> tags, to determine if HTML content (including JavaScript and nested <JDDI> tags, where applicable), will be included in the resultant HTML file. Within each tag, only a single conditional test can be performed. The range of test options are described the table below:

**Table 3.1.**

Conditional	Test Behavior
IFEQ	If the contents of FIELD equal VALUE, then true.
IFNEQ	If the contents of FIELD are not equal to VALUE, then true.
IFDEF	If the FIELD is defined, then true
IFNDEF	If the FIELD is not defined, then true
IFCALL	If a method returns true, then true. Must return a boolean value.
IFNCALL	If a method returns false, then true. Must return a boolean value.

In this example, the Java method addNewColor is invoked only if an Enhydra JDDI Field named color exists:

```
<JDDI JAVACALL=addNewColor IFDEF FIELD=color>
...HTML CONTENT...
</JDDI>
```

Applicable examples of tests for conditions are included later in this chapter.

## The <JDDI JAVADEF> Tag

The general syntax of the <JDDI JAVADEF> tag is as follows, and multiple <JDDI JAVADEF> tags may not be nested:

```
<JDDI JAVADEF>
...Java field, method or inner class declarations...
```

```
</JDDI>
```

The `JAVADEF` attribute allows for any regular Java declarations to be made, including field, method and inner class declarations. Once defined within a `<JDDI JAVADEF>` section, all fields and methods become part of the Presentation Object class.

The `<JDDI JAVACALL>` tag can then be used to call these pre-defined methods, as long as the methods take a single mandatory `JoltPage` argument.

### Example 3.1.

```
<JDDI JAVADEF>
    private static final String COMPANY="Enhydra";
    void setJddiFields (JoltPage page)
    throws Exception
    {
        // Create some JDDI Fields...
        page.data.set("mode.on", new Boolean(true));
        page.data.set("company", COMPANY);
        ... more Java code...
    }
</JDDI>
```

```
<JDDI JAVACALL="setJddiFields"></JDDI>
```

```
<BR>The company name is (@company@)
```

```
<BR>The mode is set to (@mode.on@)
```

The above `<JDDI JAVADEF>` declaration defines two fields ( `company` and `mode` ), as well as a method ( `setJddiFields` ) then called by the `<JDDI JAVACALL>` tag.

An HTML-defined method can be called directly from Java by using the `call(methodName)` method from the `JoltPage` class. This is an overloaded method allowing an optional `KeywordValueTable` to be layered on the `page.data` scope prior to calling the method.

### Example 3.2.

```
page.call(myMethod, myArguments);
```

Multiple `<JDDI JAVADEF>` tags are legal. Their contents are concatenated in the order they are defined.

## The `<JDDI HTMLDEF>` Tag

The general syntax of the `<JDDI HTMLDEF>` tag is as follows, and multiple `<JDDI HTMLDEF>` tags may be nested:

```
<JDDI HTMLDEF="methodName">
    ...HTML CONTENT...
</JDDI>
```

The HTMLDEF attribute allows for a block of HTML to be defined and subsequently referenced by name, creating an environment for the modular development of code. The <JDDI JAVACALL> tag can then be used to call methods.

Methods defined by the HTMLDEF attribute and Java methods defined by the JAVADEF attribute are accessed in exactly the same manner.

## The <JDDI JAVACALL> Tag

The general syntax of the <JDDI JAVACALL> tag is as follows, and multiple <JDDI JAVACALL> tags may be nested:

```
<JDDI JAVACALL="methodName" ARG.field1="value1" ARG.field2="value2">
    ...HTML CONTENT...
</JDDI>
```

The CALL and JAVACALL attributes are functionally equivalent. JAVACALL is included for backwards compatibility.

The CALL attribute instructs the Presentation Object to call the specified method, identified by methodName. Usually the method is declared within the JHTML file and either applies HTML to the output or sets Enhydra JDDI Fields.

However, any method may be called by importing the referred class or fully qualifying the method name. For example, Enhydra includes a utility class called JoltDebug that is automatically included by the Enhydra Jddic compiler.

In this example, the getRequest method dumps all the information about the request in a pre-formatted manner:

```
<JDDI JAVACALL="JoltDebug.getRequest">
    ...HTML CONTENT...
</JDDI>
```

An example of a fully qualified method would be:

```
<JDDI JAVACALL="com.lutris.jolt.Utils.exampleMethod">
    ...HTML CONTENT...
</JDDI>
```

## Passing Arguments Using <JDDI JAVACALL>

When passing arguments to a method, the ARG. prefix is removed and the fields are then accessible to Java-defined methods or Enhydra JDDI Fields in HTML-defined methods.

### Example 3.3.

```
<JDDI JAVACALL="exampleMethod" ARG.first="Pete" ARG.last="Smith"> </JDDI>
This examples makes exampleMethod.first (the value is "Pete") and exampleMethod.last (the value is "Smith") ac-
```

cessible.

Optionally, valid HTML content may be present and delimited by the closing `</JDDI>` tag. In this case, the text is made available to the method in a page variable named `tagContents`. This can be used to good effect for creating a library of HTML formatting routines.

### Example 3.4.

```
<JDDI JAVADEF>
    void addColor (JoltPage page)
    throws Exception
    {
        // -> page.append() is used to write HTML.
        page.append("<BR><FONT COLOR=\"blue\">");
        page.append(page.tagContents);
        page.append("</FONT>");
    }
</JDDI>
```

```
<JDDI JAVACALL="addColor">
```

```
    Color me blue!!!
```

```
</JDDI>
```

In this example, `addColor` is a Java method that returns the content text ("Color me blue!!!") as an HTML string with additional tags:

```
<FONT COLOR="blue">Color me blue!!!</FONT>
```

The variable `page.tagContents` is available within the scope of the method.

## Using Conditions Within `<JDDI JAVACALL>`

Following are ways that method invocation can be made conditional within a `<JDDI JAVACALL>` tag. For a quick look at the list of conditional tests, please see the table on Conditional Test.

In the example below, using the `IFEQ` conditional attribute, the method `methodName` is invoked if the value of the variable called `fieldName` is equal to value `value`. If `fieldName` does not exist then the condition is not true and `methodName` is not called, regardless of value:

```
<JDDI JAVACALL="methodName" IFEQ FIELD="fieldName" VALUE="value">
```

```
...HTML CONTENT...
```

```
</JDDI>
```

Similarly, using the `IFNEQ` conditional attribute, method `methodName` will be invoked if the value of the variable called `fieldName` is not equal to value `value`. If `fieldName` does not exist then the condition is true and `methodName` is called, regardless of value:

```
<JDDI JAVACALL="methodName" IFNEQ FIELD="fieldName" VALUE="value">
```

```
...HTML CONTENT...  
</JDDI>
```

Below, using the IFDEF conditional attribute, the method `methodName` is invoked simply if the variable called `fieldName` exists:

```
<JDDI JAVACALL="methodName" IFDEF FIELD="fieldName">  
...HTML CONTENT...  
</JDDI>
```

Using IFNDEF, the method `methodName` is invoked if the variable called `fieldName` does not exist:

```
<JDDI JAVACALL="methodName" IFNDEF FIELD="fieldName">  
...HTML CONTENT...  
</JDDI>
```

Here, using IFCALL, method `methodName` is invoked if `testMethod` returns a boolean true.

```
<JDDI JAVACALL="methodName" IFCALL="testMethod">  
...HTML CONTENT...  
</JDDI>
```

Similarly, using IFNCALL, the method `methodName` is invoked if `testMethod` returns a boolean false.

```
<JDDI JAVACALL="methodName" IFNCALL="testMethod">  
...HTML CONTENT...  
</JDDI>
```

Complex conditionals can also be achieved by nesting a `<JDDI JAVACALL>` tag within conditional `<JDDI HTML>` tags.

## The `<JDDI CALL>` Tag

This tag is identical to the `<JDDI JAVACALL>` tag.

## The `<JDDI HTMLCALL>` Tag

This tag is identical to the `<JDDI JAVACALL>` tag, with the exception that additional arguments are not allowed.

## The `<JDDI HTML>` Tag

The general syntax of the `<JDDI HTML>` tag is as follows, and multiple `<JDDI HTML>` tags may be nested:

```
<JDDI HTML CONDITION_SYNTAX>  
...HTML...  
</JDDI>
```

Similar to calling methods using the `<JDDI JAVACALL>` tag, when using the `<JDDI HTML>` tag, content will be included if the `FIELD` variable content is equal to the value associated with `VALUE`.

In the following example of using the conditional `IFEQ` with the `<JDDI HTML>` tag, if `mode.on` contains the value "true", then the HTML content will be included in the Presentation Object by the Enhydra Jddic compiler.

```
<JDDI HTML IFEQ FIELD="mode.on" VALUE="true">
<BR>You are seeing this because
<BR>you are in verbose mode.
</JDDI>
```

Using `IFNEQ` in the example below, if the field `fieldName` does not exist then the condition is not true and the HTML is not included, regardless of value .

```
<JDDI HTML IFNEQ FIELD="fieldName" VALUE="value">
...HTML CONTENT...
</JDDI>
```

However, also using `IFNEQ` in this example, if the `fieldName` does not exist, the condition becomes true and the HTML content is included regardless of `VALUE` :

```
<JDDI HTML IFNEQ FIELD="mode.on" VALUE="true">
<BR>You have chosen non-verbose mode.
</JDDI>
```

In the example below, using `IFDEF`, HTML content will be included simply if the variable called `fieldName` exists:

```
<JDDI HTML IFDEF FIELD="fieldName">
...HTML CONTENT...
</JDDI>
```

Similarly, using `IFNDEF`, HTML content will be included using the example below, simply if the variable called `fieldName` does not exist:

```
<JDDI HTML IFNDEF FIELD="fieldName">
...HTML CONTENT...
</JDDI>
```

In this example, using `IFCALL`, HTML content will be included if the Java method named `testMethod` returns true.

```
<JDDI HTML IFCALL="testMethod">
...HTML CONTENT...
</JDDI>
```

Similarly, using `IFNCALL`, HTML content will be included if the Java method named `testMethod` returns false.

```
<JDDI HTML IFNCALL="testMethod">
...HTML CONTENT...
</JDDI>
```

Complex conditionals can also be achieved by nesting `<JDDI HTML>` tags.

## The `<JDDI JAVAIMPORT>` Tag

The general syntax of the `<JDDI JAVAIMPORT>` tag is as follows, and multiple `<JDDI JAVAIMPORT>` tags may not be nested:

```
<JDDI JAVAIMPORT>
...Java import statements...
</JDDI>
```

The `JAVAIMPORT` attribute is used to delimit one or more Java import statements. Since the Java language mandates that imports are included at the head of a Java file, using this tag ensures this condition. Multiple Enhydra JDDI import tags can be declared anywhere in the JHTML file.

Imports can be included in simple `JJAVADEF` tags, as long as this section is the first in the file. However, the use of this feature is not recommended.

## The `JINCLUDE` Tag

The general syntax of the `JINCLUDE` tag is as follows, and multiple `JINCLUDE` tags may be nested:

```
>JDDI INCLUDE="RelativeFilePath"> >/JDDI>
```

The `JINCLUDE` attribute provides a convenient method of including content from one file within another. The named file is compiled into the page as if it were in-line code. Either Enhydra JDDI files or standard HTML files can be included, using the `JINCLUDE` tag.

An HTML file, for instance, might be included as a copyright footer or common header. The included file may include additional `JDDI` tags and access Enhydra JDDI Fields contained within the current page context. The `JDDI` end-tag is especially important when using the `JINCLUDE` tag, as the included file cannot cross the boundary of the current page.

By convention, included files use the `.jinc` extension. The example below includes the file `CommonFooter.jinc`, located in the directory above the current directory of the JHTML file.

```
<JDDI INCLUDE=" ../CommonFooter.jinc" > </JDDI>
```

The `JINCLUDE` and `JJAVADEF` tags can be used effectively to split otherwise large JHTML files into a number of manageable pieces. This approach can also be used to separate Java method calls from the HTML component, for support or maintenance reasons.

## The `JJAVACATCH` Tag

The general syntax of the `JJAVACATCH` tag is as follows, and multiple `JJAVACATCH` tags may not be nested:

```
<JDDI JJAVACATCH="ExceptionName">
...Java Code...
</JDDI>
```

To catch exceptions created at the Presentation Object level, a single `JJAVACATCH` clause can be created. It does not matter where in the file the clause appears, but the order is maintained. However, this clause is rarely necessary, as exceptions are usually caught within the Java code within the Presentation Object, or by an external exception mechanism.

The content of the `JJAVACATCH` clause is the body of a regular Java catch handler. For example:

```
<JDDI JJAVACATCH="MyException">
// The catch handler code for MyException...
</JDDI>
```

```
<JDDI JAVACATCH="Exception">
// Catch all exceptions...
</JDDI>
```

The `<JDDI JAVACATCH>` tag offers the facility to catch exceptions thrown anywhere within a page. A more general mechanism is offered by Enhydra, enabling exception handlers to be declared to handle exceptions from a group of Presentation Objects.

## The `<JDDI JAVAFINALLY>` Tag

The general syntax of the `<JDDI JAVAFINALLY>` tag is as follows, and multiple `<JDDI JAVAFINALLY>` tags may not be nested:

```
<JDDI JAVAFINALLY>
...Java Code...
</JDDI>
```

Similarly to `<JDDI JAVACATCH>` clauses, a single `<JDDI JAVAFINALLY>` clause can be declared anywhere in a file. It does not matter where in the file the clause appears, but there can be only one. Also similar to `<JDDI JAVACATCH>` clauses, this clause is rarely necessary. The contents of the `<JDDI JAVAFINALLY>` clause is the body of a regular Java finally handler.

```
<JDDI JAVAFINALLY>
// Any Java code here will always be executed...
</JDDI>
```

---

# Chapter 4. APPENDIX A Glossary of Terms

**Table 4.1. The following terms are frequently used in the Enhydra JDDI Syntax Reference Guide:**

Attribute	One or more strings that appears after an element name within the start-tag. For example:  <code>&lt;JDDI JAVACATCH&gt;</code> where JAVACATCH is an attribute.
Content	The HTML text that appears between a start-tag and end-tag. For example:  <code>&lt;B&gt; Text in bold &lt;/B&gt;</code> where "Text in bold" is the content.
Element	A string that defines the structure of an HTML document. Elements are enclosed in angle brackets, referred to as "tags." For example, B is an HTML element. JDDI is also an HTML element.
End-tag Element	An HTML tag that terminates an HTML statement. For example:  <code>&lt;/JDDI&gt;</code>
Start-tag	An HTML tag that begins an HTML statement. For example:  <code>&lt;JDDI&gt;</code>
Value	Values may be optionally assigned to attributes in the form of an attribute-value pair. For example:  <code>&lt;JDDI JAVACALL="class.myMethod"</code>  <code>ARG.a="foo" ARG.b="bar"&gt;</code>  <code>&lt;/JDDI&gt;</code> contains three attributes ( CALL, ARG.a, ARG.b ) and three values, respectively ( class.myMethod, foo, bar ).