

# **Java Servlets 3.0**

Lesson 02: Working with  
WildFly 8.x

## Lesson Objectives

- About WildFly
- WildFly Features
- Installing WildFly
- Using WildFly in Eclipse Environment
- Accessing the WildFly Homepage



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### **Lesson Objectives:**

This lesson introduces Web application concepts. The lesson contents are:

Lesson 02: Working with WildFly 8.x

- 2.1: History
- 2.2: Product Support
- 2.3: Features
- 2.4: Installing WildFly
- 2.5: Working with WildFly using Eclipse
- 2.6: Accessing WildFly Homepage

## 2.1: History

## About WildFly

- WildFly formerly known as JBoss AS, is an application server authored by JBoss
- Developed by Red Hat, WildFly is free and open source software
- Red Hat acquired JBoss Inc. in 2006
- WildFly 8 is the direct continuation to the JBoss AS project. WildFly 8 was officially released on November 20, 2014
- WildFly is a flexible, lightweight, managed application runtime that helps us build JEE applications



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In 1999, JBoss project was started by March Fleury which launched JBoss Application Server. He started this project with intention of taking forward his research interest in middleware.


It was taken ahead by forming the JBoss group in 2001 which provided expert technical support services. Then in 2004, JBoss Group formed a corporation know as JBoss Inc. The JBoss Inc. was owned by employees and was backed by Matrix Partners, Accel Partners and Intel. JBoss Inc. provides Middleware technology that offers the lowest cost of ownership by the use of open source software licenses. It is also backed up by expert technical support services.

Further in April 2006, JBoss Inc. was acquired by Red Hat.

2.2: Product Support

WildFly Features

- WildFly supports a list of services which include
  - Application Container
  - Java Message Service
  - Java Naming and Directory Interfaces (JNDI)
  - ORM Integration for persistence programming
  - Servlet 3.0 and JSP 2.1
  - Latest JEE standards and technology
- JBoss Community Plug-in for Eclipse IDE

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WildFly has become popular and is a safe choice for deploying JEE applications because it provides a set of Java Enterprise products.

The following list of products are supported in WildFly

WildFly Application Server – A server for deploying Enterprise applications

Java Messaging Service – It is the asynchronous message queuing system

Java Naming and Directory Interfaces (JNDI) – is a Java API for a directory service that allows Java clients to discover and look up data and objects via a name

Hibernate-ORM (Hibernate in short) is an object relational mapping library for the Java language, providing a framework for mapping an object oriented domain model to a traditional relational database

WildFly Web Server – Uses Tomcat internally, this web server supports Servlets/JSP, ASP.NET, PHP & CGI also.


Also included are JBoss Community which consists of JBoss Plug-in for Eclipse IDE and JBoss developer studio.

We will be using WildFly as a Web Server. Deploying Web application is covered in further courses

2.3: Features

## WildFly 8 features

- WildFly application server
  - is an open source server
  - compliant to JEE standards
- WildFly uses forked version of Tomcat internally as a Web Container
- WildFly is fully Java compliant and works with Java SE 8
- WildFly can be installed on various operating systems



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WildFly application server is an open source server and it complies to JEE 7 standards. It is the industry's first officially certified application server.

WildFly has full support for Service Oriented Architecture and JEE Web Services. It also supports asynchronous messaging using Java Messaging Service(JMS). JMS is a standard API for sending & receiving messages.

In addition, WildFly 8.0 supports JSP2.x,Servlet 3.x and EJB 3.x. Java Connector Architecture (JCA) which is a standard architecture for connecting the JEE platform to heterogeneous enterprise information systems.


JBoss 4 uses forked version of Tomcat as a Web Container. It is fully Java compliant and works with JEE 7 as well as Java SE 8. WildFly can be installed on various operating systems like Windows, Linux etc.

Forked version of Tomcat implies that copy of tomcat was used (original source) and independent development was started on that to create a branch(fork) of tomcat.

2.3: Features

WildFly 8 features

- Integration with Hibernate
  - Tightly integration with Hibernate object persistence framework which maps Java objects to relational table and vice versa.
- Caching and clustering
  - Improved caching and clustering support

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Integration with Hibernate – It is an object persistence framework which maps Java objects to relational tables and vice versa. Hibernate was acquired by WildFly and now it maintains and provides support for Hibernate. Hibernate deployer is available by default to provide hibernate framework libraries support to all applications

Caching and clustering – WildFly 8.0 has improved caching and clustering support.


WildFly cache can be replicated. The WildFly cache instances can be distributed across JVM's. To support the caching features WildFly takes support of different cache loaders. SleepyCat Berkeley DB, generic JDBC data source and file system cache loaders are available.

The sessions information and SSO security context is replicated across clustered servers. Therefore if one server fails, the users are automatically moved on to another servers without losing any of their information.

2.4: Installing WildFly

Steps for installing WildFly

- Steps for installing WildFly
  - Require JDK 7 or Higher
  - Set the JAVA\_HOME environment variable to the location of JDK 7 or higher or this could be done by setting the path variable.
- Identify the drive/location on the system for installing WildFly

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Before installing WildFly ensure that the system satisfies certain pre-requisites.

Check the availability of JDK 8. Check the version of JDK by using the command

```
java -version
```

Set the JAVA\_HOME variable to the location of JDK 8 or setting path variable

Identify the drive/location on the system for installing WildFly


(Note : It does not matter where WildFly is installed on the system.

However do not install WildFly in a directory that contains spaces, it can cause problems sometimes)

2.4: Installing WildFly

WildFly installable

- Download WildFly
  - Latest version can be downloaded from <http://wildfly.org/downloads>
  - The zip version can be downloaded from here
- Basic installation : Extracting the contents of the archive to an appropriate location identified
- Follow below steps for Wildfly Eclipse Plugin:
  - Select "Help->Eclipse Marketplace..." from the Eclipse menu bar. Choose "Eclipse Marketplace" if prompted for a marketplace catalog.
  - Search for "JBoss Tools" and install JBoss Tools (Luna), version 4.2.x.
  - Wait until "Calculating requirements..." has finished and make sure that all features are checked, then confirm.
  - Accept the license agreements and click "Finish".

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WildFly Server is freely downloadable. An evaluation copy could also be used

WildFly archive(Zip, tar) can be downloaded from  
<http://wildfly.org/downloads>

Once the required version is downloaded basic installation can be done. Extract the contents of the archive in the appropriate location identified on the system.



2.4: Installing WildFly

## WildFly Directory Structure

- WildFly server directory structure

Name	Date modified	Type	Size
.installation	5/30/2014 9:54 PM	File folder	
appclient	2/24/2015 4:26 PM	File folder	
bin	2/24/2015 4:26 PM	File folder	
docs	2/24/2015 4:26 PM	File folder	
domain	2/24/2015 4:26 PM	File folder	
modules	2/24/2015 4:26 PM	File folder	
standalone	2/24/2015 4:28 PM	File folder	
welcome-content	2/24/2015 4:26 PM	File folder	
copyright.txt	5/30/2014 9:54 PM	TXT File	3 KB
jboss-modules.jar	5/30/2014 9:54 PM	Executable Jar File	347 KB
LICENSE.txt	5/30/2014 9:54 PM	TXT File	26 KB
README.txt	5/30/2014 9:54 PM	TXT File	3 KB

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Once WildFly is available on the system, it will create the directory that contains server configurations, JARs and other directories which help in functioning of WildFly.

The figure on the slide shows the WildFly directory structure with below diagram

DIRECTORY	DESCRIPTION
appclient	Configuration files, deployment content
bin	Startup scripts, startup configuration files and various command line utilities like Vault, add-user
docs/schema	XML schema definition files
docs/examples/configs	Example configuration files representing specific use cases
domain	Configuration files, deployment content, and writable areas used by the domain mode processes run from this installation.
modules	WildFly 8 is based on modular class loading architecture. The various modules used in the server are stored here.
Standalone	Configuration files, deployment content, and writable areas used by the single standalone server run from this installation
welcome-content	Default Welcome Page content

## 2.4: Installing WildFly

## WildFly Directory Structure

- Standalone Directory Structure
- In "standalone" mode each WildFly 8 server instance is an independent process. The configuration files, deployment content and writable areas used by the single standalone server run from a WildFly installation.



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The details of the standalone directory is present in below diagram

DIRECTORY	DESCRIPTION
configuration	Configuration files for the standalone server that runs off of this installation. All configuration information for the running server is located here and is the single place for configuration modifications for the standalone server.
data	Persistent information written by the server to survive a restart of the server
deployments	End user deployment content can be placed in this directory for automatic detection and deployment of that content into the server's runtime.
lib/ext	Location for installed library jars referenced by applications using the Extension-List mechanism
log	standalone server log files
tmp	location for temporary files written by the server
tmp/auth	Special location used to exchange authentication tokens with local clients so they can confirm that they are local to the running AS (Application Server) process

2.4: Installing WildFly

WildFly Configurations

- Standalone Server Configurations
  - standalone.xml (default)
    - Java Enterprise Edition 7 web profile certified configuration with the required technologies
  - standalone-ha.xml
    - Java Enterprise Edition 7 web profile certified configuration with high availability
  - standalone-full.xml
    - Java Enterprise Edition 7 full profile certified configuration including all the required EE 7 technologies
  - standalone-full-ha.xml
    - Java Enterprise Edition 7 full profile certified configuration with high availability



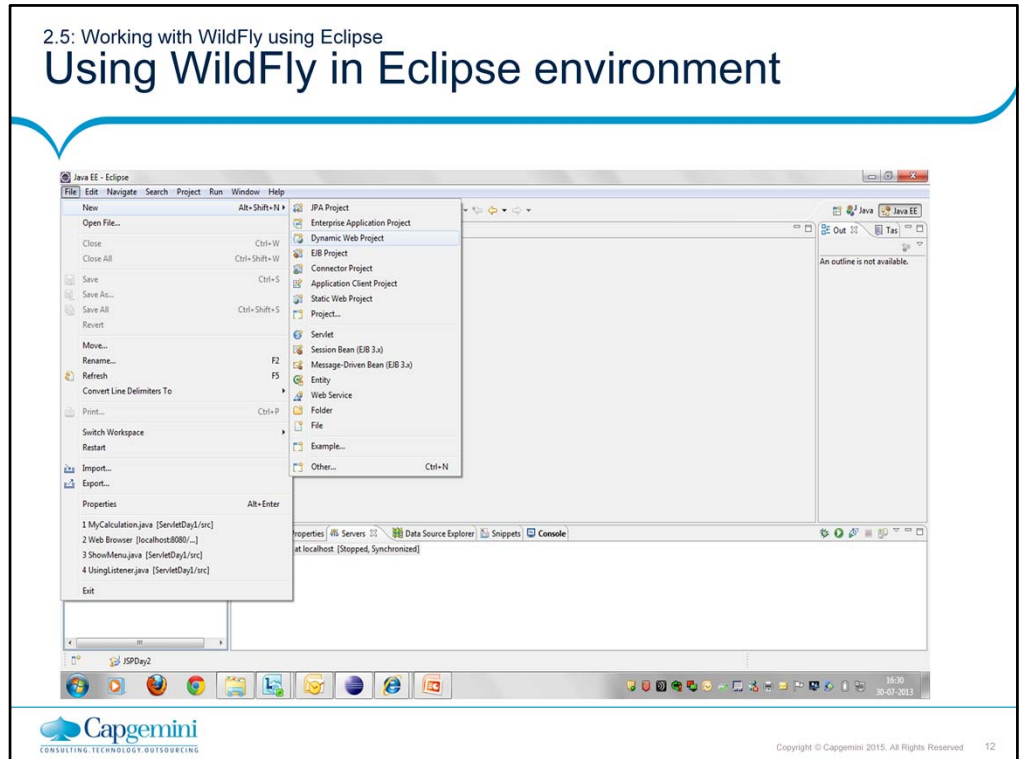
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We also have the Domain Server Configurations

domain.xml

Java Enterprise Edition 7 full and web profiles available with or without high availability

Important to note is that the domain and standalone modes determine how the servers are managed not what capabilities they provide.



Select Dynamic Web Project

2.5: Working with WildFly using Eclipse

## Using WildFly in Eclipse environment

**New Dynamic Web Project**

Dynamic Web Project  
Create a standalone Dynamic Web project or add it to a new or existing Enterprise Application.

Project name: Test

Project location  
☒ Use default location  
Location: [D:\Yukti Data\Yukti\Java\gate\Advanced Java-Module 3\Servlets - 3.0-Upg] Browse...

Target runtime  
WildFly 8.x Runtime  
WildFly 8.x Runtime  
<None>

Configuration  
<custom> Modify...

Help: Get started quickly by selecting one of the pre-defined project configurations.

EAR membership  
☐ Add project to an EAR  
EAR project name: TestEAR New Project...

Working sets  
☐ Add project to working sets  
Working sets:

If <None> in Target Runtime then select New Runtime

If Target Runtime is already configured, then select same and proceed.

**New Server Runtime Environment**

Define a new server runtime environment

Select the type of runtime environment:  
type filter text

JBoss Community  
JBoss 3.2 Runtime  
JBoss 4.0 Runtime  
JBoss 4.2 Runtime  
JBoss 5.0 Runtime  
JBoss 5.1 Runtime  
JBoss 6.x Runtime  
JBoss 7.0 Runtime  
JBoss 7.1 Runtime  
WildFly 8.x Runtime

WildFly Application Server 8.x

< Back Next > Finish Cancel

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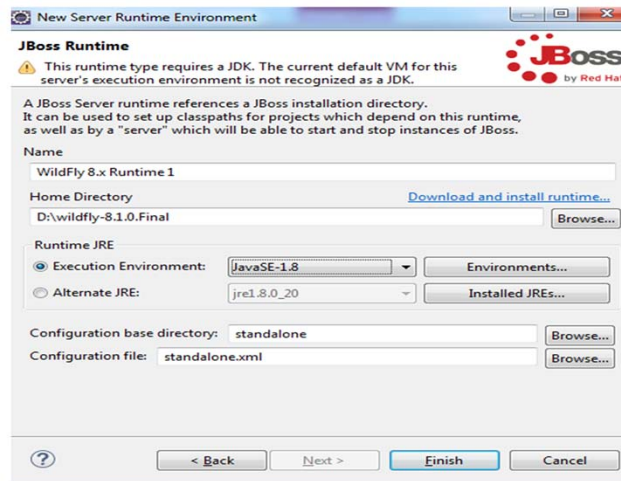
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Click New Runtime to add server

## 2.5: Working with WildFly using Eclipse

## Using WildFly in Eclipse environment

### ■ Select WildFly folder

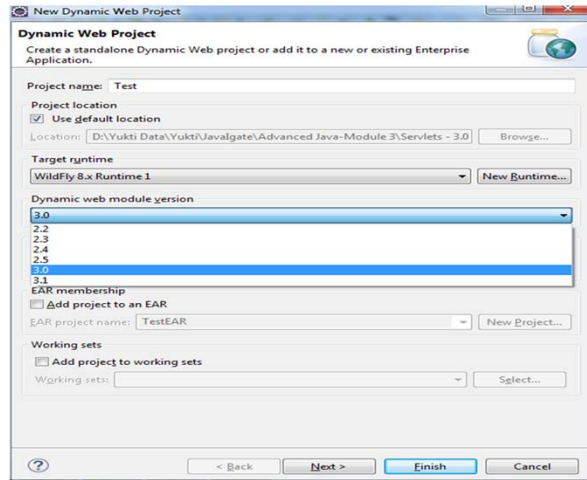


Select WildFly folder

## 2.5: Working with WildFly using Eclipse

## Using WildFly in Eclipse environment

- Click Next > Next > on this screen

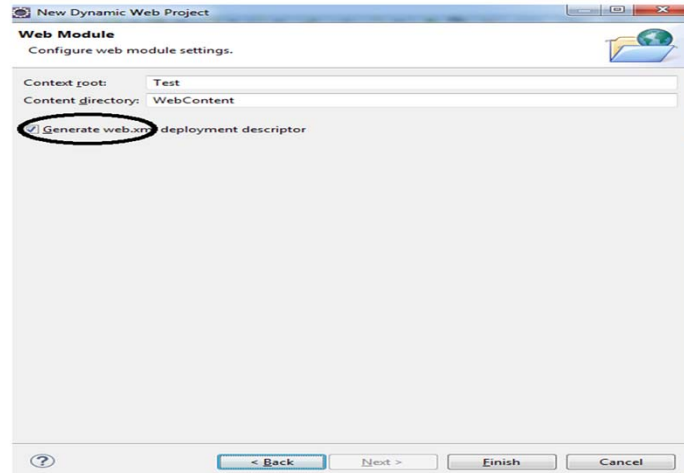


Select Dynamic web module version 3.0

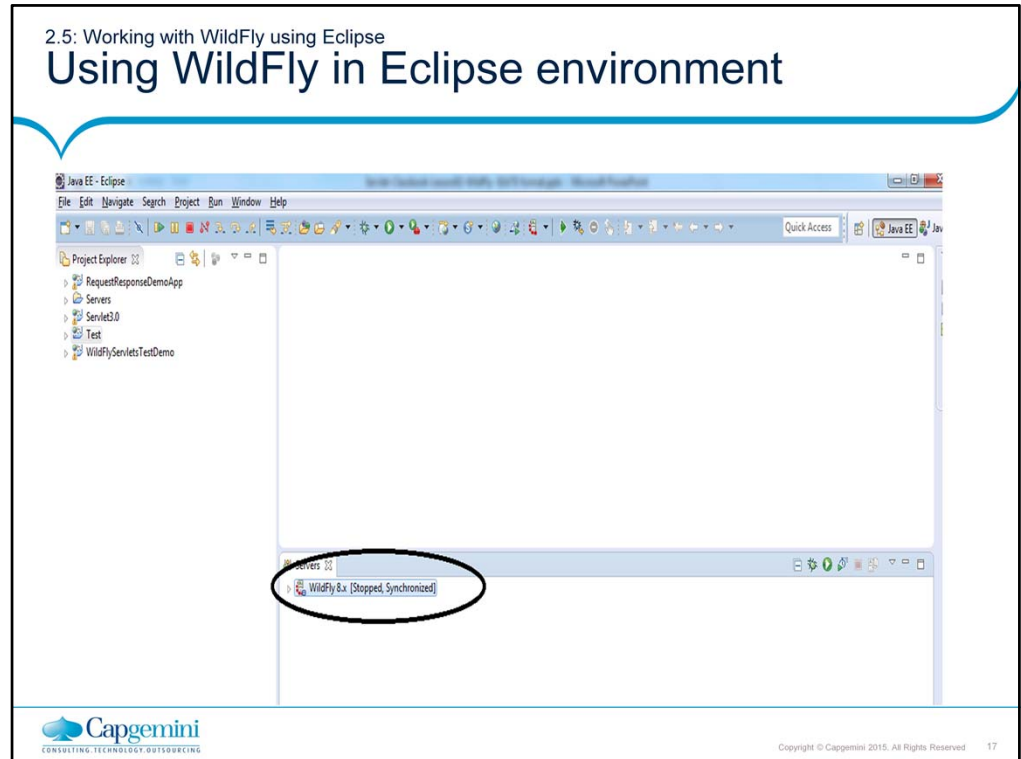
2.5: Working with WildFly using Eclipse

## Using WildFly in Eclipse environment

- Click on check box for web.xml and then on Finish







Double click highlighted link to start server

## 2.6: Accessing WildFly Homepage

## WildFly - Home Page

- Start the WildFly server
- The home page of WildFly can be accessed by specifying the URL `http://localhost:9090`.
- The home page can be seen



### Welcome to WildFly 8

Your WildFly 8 is running.

[Documentation](#) | [Quickstarts](#) | [Administration Console](#)


[WildFly Project](#) | [User Forum](#) | [Report an issue](#)

 | [JBoss Community](#)




## Summary

- Installing WildFly
- Accessing the WildFly Homepage

A square icon with a grey background and a blue border. It contains three white checkmarks on the left and three white horizontal lines on the right. Below the icon is a blue rectangular button with the word "Summary" in white text.

Summary

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Add the notes here.

## Review Questions

- Question 1: If an independent instance of WildFly required then which mode should be selected
  - Option 1: Basic
  - Option 2: Domain
  - Option 3: Standalone
  - Option 4: None of the above
- Question 2: All configuration information for running the server is located here and it is single place for configuration modifications for the standalone server
  - Option 1: data
  - Option 2: configuration
  - Option 3: log
  - Option 4: conf



Add the notes here.