ABSTRACT

Java™ EE 6 Web Profile specification defines the Java™ EE Web Profile ("Web Profile"), a profile of the Java™ Platform, Enterprise Edition specifically targeted at web applications. Siwpas™, (Simple Web Profile Application Server) is an application server aimed for implementing the Java™ EE Web Profile specification. In this white paper, the components of Siwpas, its current state and the level of compatibility regarding to the Web Profile Specification will be discussed.

INTRODUCTION

Java™ Enterprise Edition (Java™ EE or formerly known as Java 2 Platform, Enterprise Edition or J2EE) is an enterprise platform for developing highly available, secure, reliable and scalable business applications. Java™ EE platform has undergone several changes from its first release version J2EE 1.2 (December 12, 1999)[1]. Latest version of the specification is Java™ Platform, Enterprise Edition (Java EE) Specification, v6[2]. In this white paper, Java™ EE and Java™ Platform, Enterprise Edition (Java EE) Specification, v6 will be used interchangebly.

Java™ EE Specification defines "Java™ EE Profiles". A Java™ EE profile (simply "a profile") represents a configuration of the platform suited to a particular class of applications[2]. " Java™ EE Web Profile" is a "Java™ EE Profile" that consists of several independent specifications related to web application development.

Siwpas is an open source (LGPL[3] license) application server based on Apache Software Foundation(ASF)[4] Java™ EE projects. Latest version of Siwpas is "CR-5" and first commerical quality version is planned to be released at the end of March.

This white paper has been organized as follows. *Java™ EE Web Profile* section gives some details about Web Profile. Next section talks about ASF and his Java™ EE based projects. *MechSoft Siwpas* section explains components of Siwpas and its compatibility regarding the Web Profile specification. This white paper ends with *Summary* and *References* sections.

Java EE 6 WEB PROFILE

Java™ EE Platform Specification consists of huge number of specifications (APIs). For platform provider companies, it is not easy to developfully compliant Java™ EE Platform that implements all of the required components of the Java™ EE Platform Specification. For application developers, it is not necessary to use all of the Java™ EE APIs for developing enterprise applications. Because of these observations, Java™ EE Expert Group (EG) has defined *Profiles* in Java™ EE v6 and first standard profile has been defined, "*Java™ Platform, Enterprise Edition 6 (Java EE 6) Web Profile Specification*".

The Web Profile is aimed for developers of modern web applications. Aiming "modern" web applications then implies offering a reasonably complete stack, composed of standard APIs, and capable out-of-the-box of addressing the needs of a large class of web applications. Furthermore, this stack should be easy to grow, so as to address any remaining developer needs[5]. Web Profile stack has consisted of the following technologies;

Web Profile Required Components

Specification Name	Version
Servlet	3.0
Java Server Pages	2.2
Expression Language	2.2
Debugging Support for Other Languages	1.0
Standard Tag Library for JSP	1.2
Java Server Faces	2.0
Common Annotations for the Java Platform	1.0
Enterprise Java Beans Lite	3.1
Java Transaction API	1.1
Java Persistence API	2.0
Bean Validation	1.0
Managed Beans	1.0
Interceptors	1.1
Context and Dependency Injection for Java EE	1.0
Dependency Injection for Java	1.0

Java™ web applications are generally written as 3-tiers. These tiers are “Web Tier”, “Business Tier ” and “Persistence Tier” . Each of the Web Profile component sits on these tiers as follows;

- Web Tier
  - Servlet, Java Server Pages, Debugging Support for Other Languages, Standard Tag Library for JSP, Java Server Faces
- Business Tier
  - Enterprise Java Beans Lite
- Persistence Tier
  - Java Persistence API

Some of the components are used for general functionality. These components and their functions are as follows,

- Common Annotations for the Java Platform
  - This JSR well develop annotations for common semantic concepts in the J2SE and J2EE platforms that apply across a variety of individual technologies[6]
- Java Transaction API
  - Transaction management and demarcation
- Bean Validation
  - Management of business constaints
- Managed Beans
  - Common lifecycle of managed beans
- Interceptors
  - Aspect Oriented Programming (AOP) operations
- Context and Dependency Injection for Java EE

    - Dependency injection for Java EE
- Dependency Injection for Java
    - Dependency injection for standard Java

As known, the Java™ EE Web Profile is a subset of the Java™ EE Platform specification. Lots of Java™ EE Platform specification required components are not contained in the Java™ EE Web Profile. For exampe, below components are not defined for Java™ EE Web Profile specification,

- JAX-WS, JAX-RPC, JAX-R, SAAJ, JAX-RS, JAX-B, JMS, JAAS, JASPIC, JACC, JCA, JavaMail, JSR77, JSR88.

Finally, it is worth reminding that Web Profile products are allowed to ship with more technologies than the required ones. It is conceivable that products will offer choices during installation between different configurations, some richer in extensions, or even allow for complete customization beyond the required core ("à la carte" installation)[5].

APACHE EE PROJECTS

The Apache Software Foundation provides organizational, legal, and financial support for a broad range of open source software projects. The Foundation provides an established framework for intellectual property and financial contributions that simultaneously limits contributors potential legal exposure. Through a collaborative and meritocratic development process, Apache projects deliver enterprise-grade, freely available software products that attract large communities of users. The pragmatic Apache License makes it easy for all users, commercial and individual, to deploy Apache products[4].

In Siwpas, we use ASF Java™ EE projects for satisfying Java™ EE Web Profile required components. These projects and their correspondence to Web Profile components are shown below.

ASF Project Name	Web Profile Requirement
Apache Tomcat 7™	Servlet, JSP,EL and related components
Apache MyFaces 2™	Java Server Faces component
Apache OpenEJB™	EJB 3.1 Lite and related components
Apache OpenWebBeans™	Dependency Injection components
Apache Bean Validation™	Validation component
Apache OpenJPA™	Persistence API component

Except the Apache OpenEJB[10] project , each of the above ASF projects is standalone compatible with TCK (Technology Compatibility Kit). In other words, Tomcat 7[7], MyFaces[8] 2, OpenWebBeans[11], Bean Validation[12] and OpenJPA[9] are TCK compliant projects on their own.

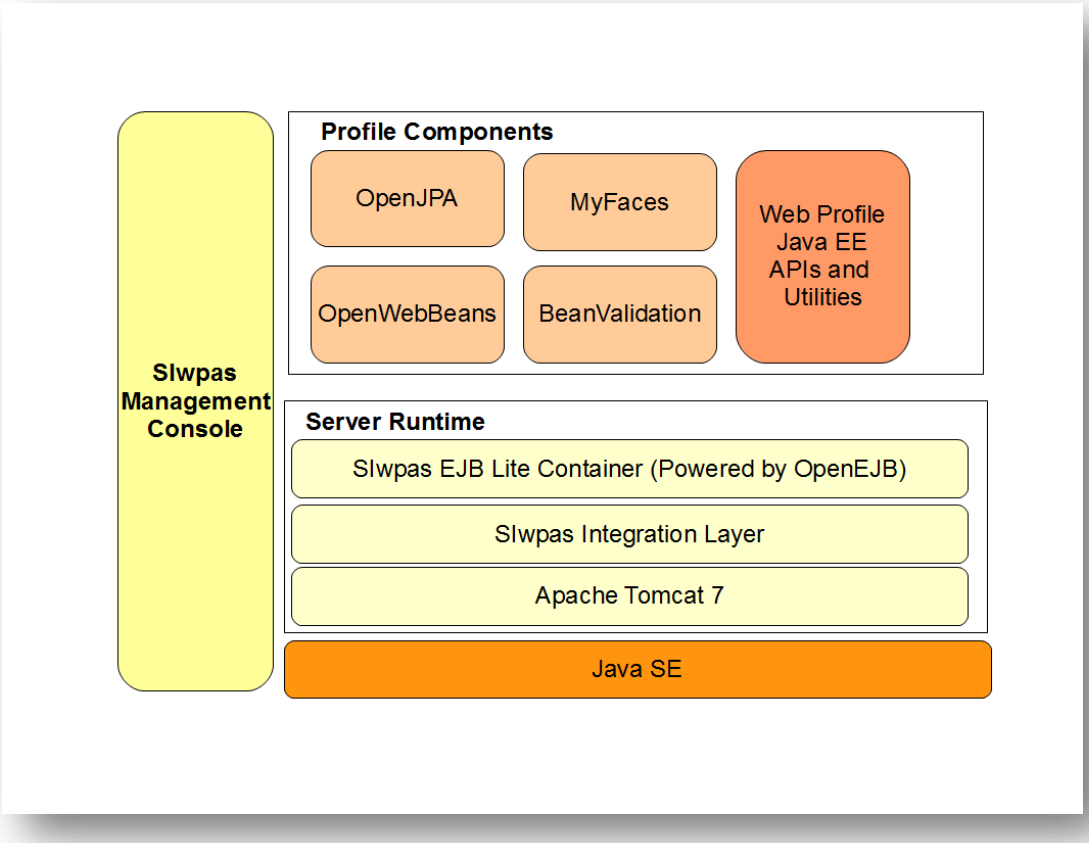
EJB Lite container in Siwpas is a subset of the Apache OpenEJB project and it is called as *Siwpas EJB Lite Container*. Currently Siwpas EJB Lite Container has not been tested with EJB 3 Lite TCK.

MECHSOFT Siwpas Application Server

What is Siwpas

Siwpas[13] (pronounced as **Si**mple **W**eb **P**rofile **A**pplication **S**erver) is a lightweight Java™ application server platform for developing enterprise quality Java EE web applications. Siwpas integrates above ASF Java™ EE based projects for providing Java™ EE Web Profile compatible runtime platform.

Siwpas Runtime View



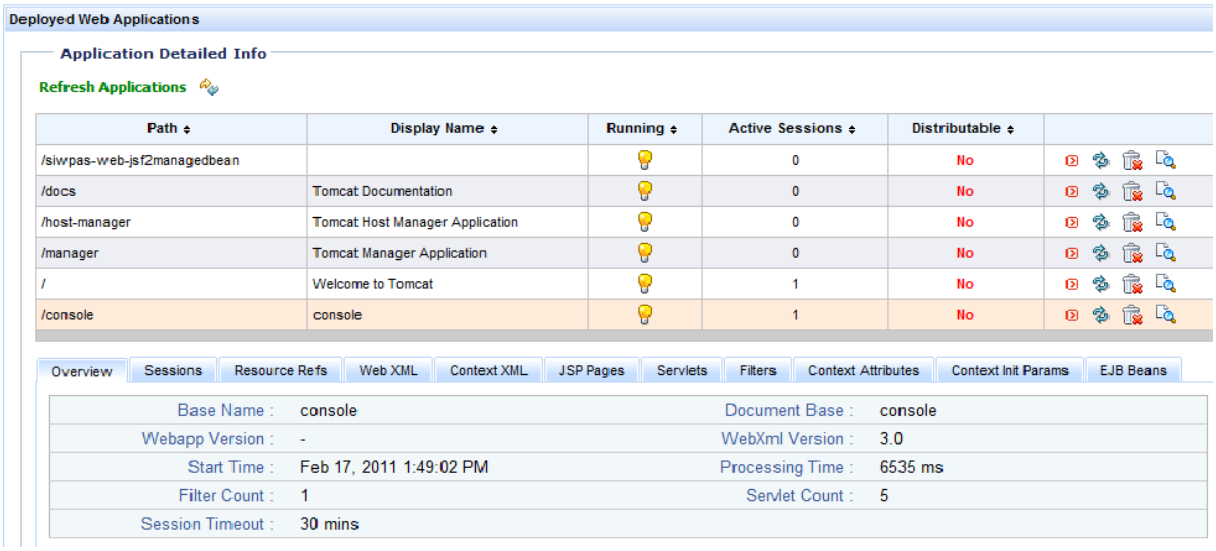
Integrating different set of projects on the same runtime is not an easy task . MechSoft[14] has been writing integration layer component to integrate Apache Tomcat 7 runtime with Siwpas EJB 3.1 Lite container runtime. Moreover, cool web based management console to manage all aspects of the Siwpas has been written. Siwpas management console will be released with 1.0.0 GA release of Siwpas.

Siwpas management console provides the following management operations.

- Overall realtime view of the current running system
  - CPU, Memory, OS, JVM Heap size
- Server configuration
- Applications view and deployment operations
- JMX, JNDI and ClassLoader views
- Dashboards
- Web and EJB Container runtime status

- And more...

Below is a sample snapshot view from Siwpas console “Applications View” page,



Why Siwpas

Why another server?

Before Siwpas were developed, Apache OpenWebBeans (implementation of Context and Dependency Injection for Java™ EE Specification) and Apache OpenEJB were used in some commercial projects, but it was wanted to use lightweight application server in a cloud infrastructure. At that time there was no such an open source application server for using the OpenWebBeans and the OpenEJB in a lightweight server runtime. Therefore it was decided to implement a lightweight server based on Apache Tomcat 7.

Nowadays, huge number of application developers and enterprise companies want to use lightweight application servers for deploying and running their web applications. They do not want to use heavyweight Java™ EE Servers that are fully compliant with *Java™ EE Specifications*. They do want to manage lightweight, cloud environment friendly servers. Nonetheless, they also need more techonlogy stack for implementing their web based applications, such as using “JPA, JSF, JTA , EJB etc.” Moreover, most of them deploy their critical enterprise web applications into the Apache Tomcat in their production systems.

Siwpas is aimed to provide lightweight application server runtime based on Apache Tomcat 7 . It also fills web applications technology requirements via ASF Java EE projects. In summary, Siwpas translates the Apache Tomcat 7 into more powerful enterprise web server.

The benefits of using Siwpas can be listed as follows;

- It has lightweight but powerful runtime environment,
- It is based on very-well known JSP & Servlet Container, Apache Tomcat 7,
- It consists of Web Profile Specification technology stack,
- It consists of powerful, commerical quality ASF Java EE Projects,
- It is an open source project,

- It is supported by MechSoft (7x24 enterprise support),
- It is light and will be always light,
- It has very cool JSF based administration console.

Web Profile Compliance

Currently Siwpas is not claimed to be compatible (compliance) with *Java™ EE Web Profile Specification* becauase it has not been tested with *Java™ EE Web Profile TCK*. This does not mean that Siwpas will never be certified as a Web Profile Compliance application server. In order to test Siwpas with Java™ EE Web Profile TCK, MechSoft has to be licensee of Oracle and the issue is being discussed with Oracle to find a reasanable way to obtain TCK. As mentioned on the above paragraphs, except Apache OpenEJB, ASF Java™ EE projects are TCK compliant with their respective specificiations on themselves.

About JSR-299 and JSR-303 TCKs

Siwpas has passed "JSR-299 Web Profile TCK" and "JSR-303 TCK" succesfully. Therefore Siwpas provides JSR-299 and JSR-303 compatible CDI and Bean Validation runtime environment.

JSR-299 and JSR-303 TCKs are licensed by the Redhat as ASL v2. To get more information, visit

- JSR-303 TCK Home : http://community.jboss.org/wiki/BeanValidationTCK
- JSR-299 TCK Home : http://seamframework.org/Weld/CDITCKReleases

Siwpas Editions

There are two different editions of Siwpas

1. *Community Edition*
2. *Enterprise Edition*

Below table shows differences between each edition.

	Basic Support	Standard Support	Enterprise Support
Support Features			
Siwpas Enterprise Edition	√	√	√
Siwpas Admin Console	√	√	√
Product Updates	√	√	√
Security Patches	√	√	√
Emergency Hot Fixes	-	√	√
Service Hours	-	5x8 (Business Hours)	7x24
Number of Incidents	-	Unlimited	Unlimited
Number of Contracts	-	1	3
Web Based Support	√	√	√
Bug Fix Priority	-	-	√
Bug Tracking	√	√	√
Phone Support	-	√	√
Max Web Response Time	2 Business Day	1 Business Day	Less than 1 Business Day
Code Samples	-	√	√
Siwpas Developer Contact	-	√	√
Max Phone Response Time	-	4-8 hours	2-4 hours
End of Life Support	-	-	√
Extra Features			

Development Consultancy	-	Per Hours	Per Hours
Custom Product Feature	-	-	Per Feature

SUMMARY

The Java™ EE Web Profile Specification is the first standard profile specification in the Java™ EE Profiles that is explained in the Java™ EE Platform Specification. Instead of using a full profile compatible Java™ EE servers, now developers are able to use more lightweight server runtimes for developing their Java™ based web applications. This does not mean that full profile application servers such as Apache Geronimo will be useless. Some enterprise applications still need to use other cool features of Java™ EE full profile, such as *Remote EJB Invocation*, *Asynchronous Message Processing via JMS*, *CORBA Integration* etc. In an incoming version of the Java™ EE platform, a more number of specific profiles can be seen.

Siwpas is a lightweight web application server based on the ASF Java EE projects. It provides Java™ EE Web Profile components with a powerful web based administration console. It is one of the lightweight application servers to implement Java™ EE Web Profile Specification.

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