What’s new in WildFly 8 ?

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zeroturnaround.com

The Great Java Application Server Debate with Tomcat, JBoss, GlassFish, Jetty and Liberty Profile

May 21, 2013 | Simon Maple | 27 comments

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Part V – ...And The Best Application Server Award Goes To...

In case you were wondering, we did finally decide that one application server among those tested proved to win over the others...JBoss wins the award!

JBoss AS 7 (aka WildFly) **WINS THE AWARD!**

> *If we had to pick a **winner**, it would be **JBoss**. The only application server in the group whose score **never dropped below a 4***
>
> — zeroturnaround.com

> *JBoss **consistently** performs **very well** in each category which is why it also **shines** in the developer profiles exercise*

— zeroturnaround.com

WildFly
The new and improved JBoss Application Server!

`Objective:`

Understand the new features of WildFly 8 and revise some of the features carry forward from AS 7.x.

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- Open source

WildFly 8 main features

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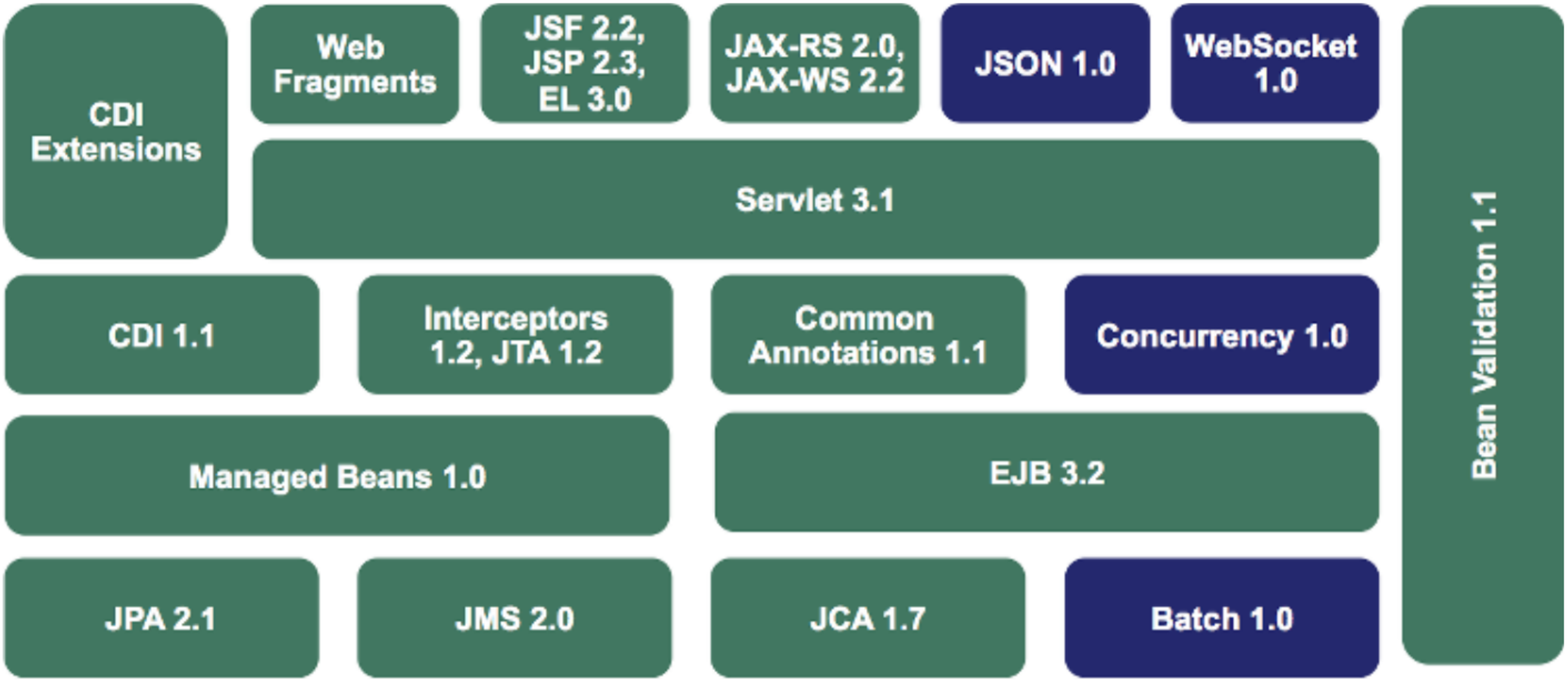
- Role based administration control & auditing
- Automated patching
- Minimalistic "core" distribution

WildFly: Java EE 7



WildFly: Java EE 7 WebSocket (JSR 356)

ChatServer.java

```
@ServerEndpoint("/chat") ❶
public class ChatEndpoint {
    @OnMessage ❷
    public void message(String message,
                        Session session) ❸
                  throws IOException, EncodeException {
        for (Session peer : session.getOpenSessions()) {
            peer.getBasicRemote().sendText(message);
        }
    }
}
```

❶ Creates a WebSocket endpoint, defines the listening URL

❷ Marks the method that receives incoming WebSocket message

❸ Payload of the WebSocket message

WildFly: Java EE 7 Batch (JSR 352)

job.xml

```
<job id="myJob" xmlns="http://xmlns.jcp.org/xml/ns/javaee" version="1.0">
    <step id="myStep" >
        <chunk item-count="3"> ❶
            <reader ref="myItemReader"/> ❷
            <processor ref="myItemProcessor"/> ❸
            <writer ref="myItemWriter"/> ❹
        </chunk>
    </step>
</job>
```

❶ Item-oriented processing, number of items in chunk

❷ Item reader for chunk processing

❸ Item processor for chunk processing

❹ Item writer for chunk processing

WildFly: Java EE 7 JSON (JSR 353)

CreateJson.java

```
JsonObject jsonObject = Json.createObjectBuilder() ❶
                .add("apple", "red") ❷
                .add("banana", "yellow")
                .build(); ❸
StringWriter w = new StringWriter();
JsonWriter writer = Json.createWriter(w); ❹
writer.write(jsonObject);
```

❶ Creates a JSON object builder

❷ Adds a name/value pair to the JSON object

❸ Returns the JSON object associated with this builder

❹ Writes the JSON object to the writer

WildFly: Java EE 7 Concurrency (JSR 236)

RunMyTask.java

```
public class MyTask implements Runnable { ❶

    @Override
    public void run() {
        . . .
    }
}

@Resource(name = "DefaultManagedExecutorService") ❷
ManagedExecutorService defaultExecutor;

executor.submit(new MyTask()); ❸
```

❶ `Runnable` or `Callable` tasks can be submitted

❷ `ManagedExecutor` is injected, default resource provided

❸ Submit the task

WildFly: Java EE 7 JAX-RS (JSr 339)

RunClient.java

```
Client client = ClientBuilder.newClient(); ❶
WebTarget target = client.target("..."); ❷
target.register(Person.class);
Person p = target
            .path("{id}") ❸
            .resolveTemplate("id", "1")
            .request(MediaType.APPLICATION_XML) ❹
            .get(Person.class); ❺
```

❶ `ClientBuilder` is the entry point

❷ Build a new web resource target, specifies the path

❸ Sub resource URI

❹ Define the accepted response media types

❺ Call HTTP GET, specify the type of resource

WildFly: Java EE 7 JMS (JSR 343)

SendMessage.java

```
@JMSDestinationDefinition(name="myQueue", interfaceName="javax.jms.Queue") ❶

@Resource(mappedName="myQueue")
Queue syncQueue;

@Inject
// @JMSConnectionFactory("java:comp/DefaultJMSConnectionFactory") ❷
private JMSContext context; ❸

context.createProducer().send(syncQueue, "..."); ❹
```

❶ Create destination resource during deployment

❷ Default JMS connection factory

❸ Main interface of the simplified API

❹ Fluent builder API, runtime exceptions

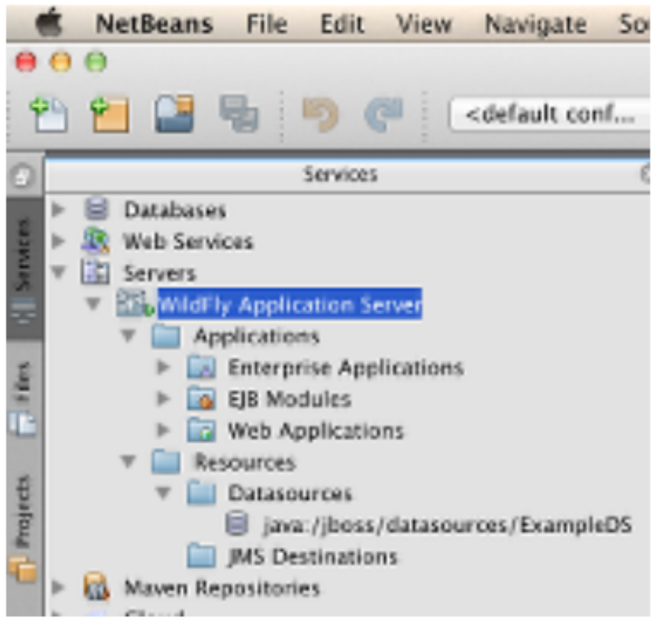
Java Transaction API 1.2 (JSR 907)

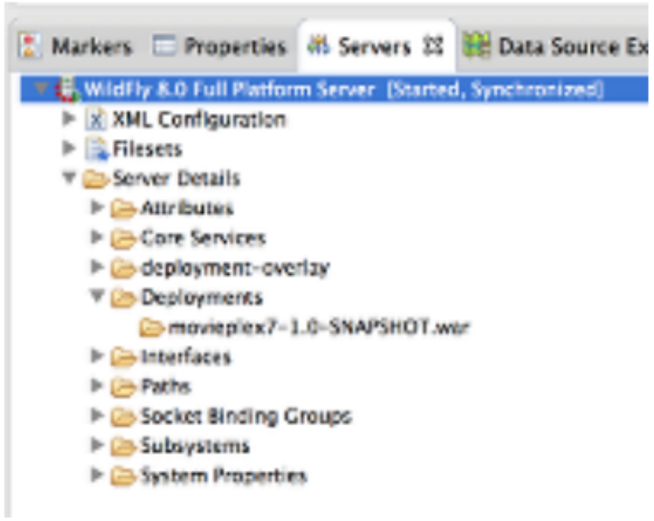
- `@Transactional` Transaction boundaries on CDI managed beans
- `@TransactionScoped` CDI scope for bean instances scoped to the active JTA transaction

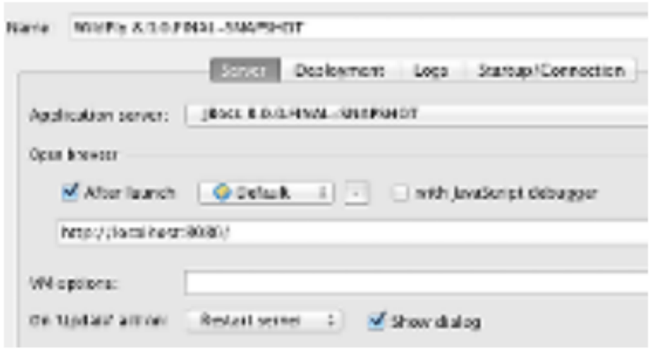
Contexts and Dependency Injection 1.1 (JSR 346)

- Automatic enablement for beans with scope annotation and EJBs
- “beans.xml” is optional
- Bean discovery mode
  - `all`: All types
  - `annotated`: Types with bean defining annotation
  - `none`: Disable CDI
- `@Vetoed` for programmatic disablement of classes
- Global ordering/priority of interceptors and decorators

WildFly: Java EE 7 IDEs







NetBeans IDE 8.0 BETA

JBoss Tools

IntelliJ IDEA 13 ULTIMATE

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- Composition/handler based architecture
- Lightweight & fully embeddable
- Supports Servlet 3.1 & HTTP upgrade
- `mod_cluster` supported

WildFly new web server: Undertow

NonBlockingHandler.java

```
Undertow.builder() ❶
  .addListener(8080, "localhost")
  .setHandler(new HttpHandler() { ❷
    @Override
    public void handleRequest(final HttpServerExchange exchange)
      throws Exception {
      exchange.getResponseHeaders()
              .put(Headers.CONTENT_TYPE, "text/plain");
      exchange.getResponseSender()
              .send("Hello World");
    }
  }).build().start(); ❸
```

❶ Same API used for WildFly integration, fluent builder API

❷ Can create multiple handlers

❸ Start the handler in JVM

Undertow benchmarks

```
techempower@lg01:~$ wrk -d 30 -c 256 -t 40 http://10.0.3.2:8080/byte
Running 30s test @ http://10.0.3.2:8080/byte
  40 threads and 256 connections
  Thread Stats   Avg      Stdev     Max   +/- Stdev
    Latency   247.05us    3.52ms 624.37ms   99.90%
    Req/Sec    27.89k     6.24k   50.22k    71.15%
  31173283 requests in 29.99s, 3.83GB read
  Socket errors: connect 0, read 0, write 0, timeout 9
Requests/sec: 1039305.27
Transfer/sec:    130.83MB
```

This is output from Wrk testing a single server running Undertow using conditions similar to Google's test (1-byte response body, no HTTP pipelining, no special request headers) **1.039 million requests per second**.

- http://www.techempower.com/blog/2014/03/04/one-million-http-rps-without-load-balancing-is-easy/

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  - 8080 for applications
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- Only overhead is the initial HTTP Upgrade request/response

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- Users or Groups are defined in Roles

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- Logging of management operations
- Log message as JSON records
- **Audit logging handlers**
  - **Local file**
  - **Syslog (UDP / TCP / TLS)**

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- Rollbacks are possible

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- Built-in lightweight web server

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- New public clustering API
- Pruned: CMP, JAX-RPC, JSR 88

WildFly: In the cloud

Carry forward from AS 7.x

- Standalone and Managed Domain
- Centralized Administration
  - Command Line Interface (jboss-cli)
  - Admin Console
  - Configuration files

Standalone and Managed Domain

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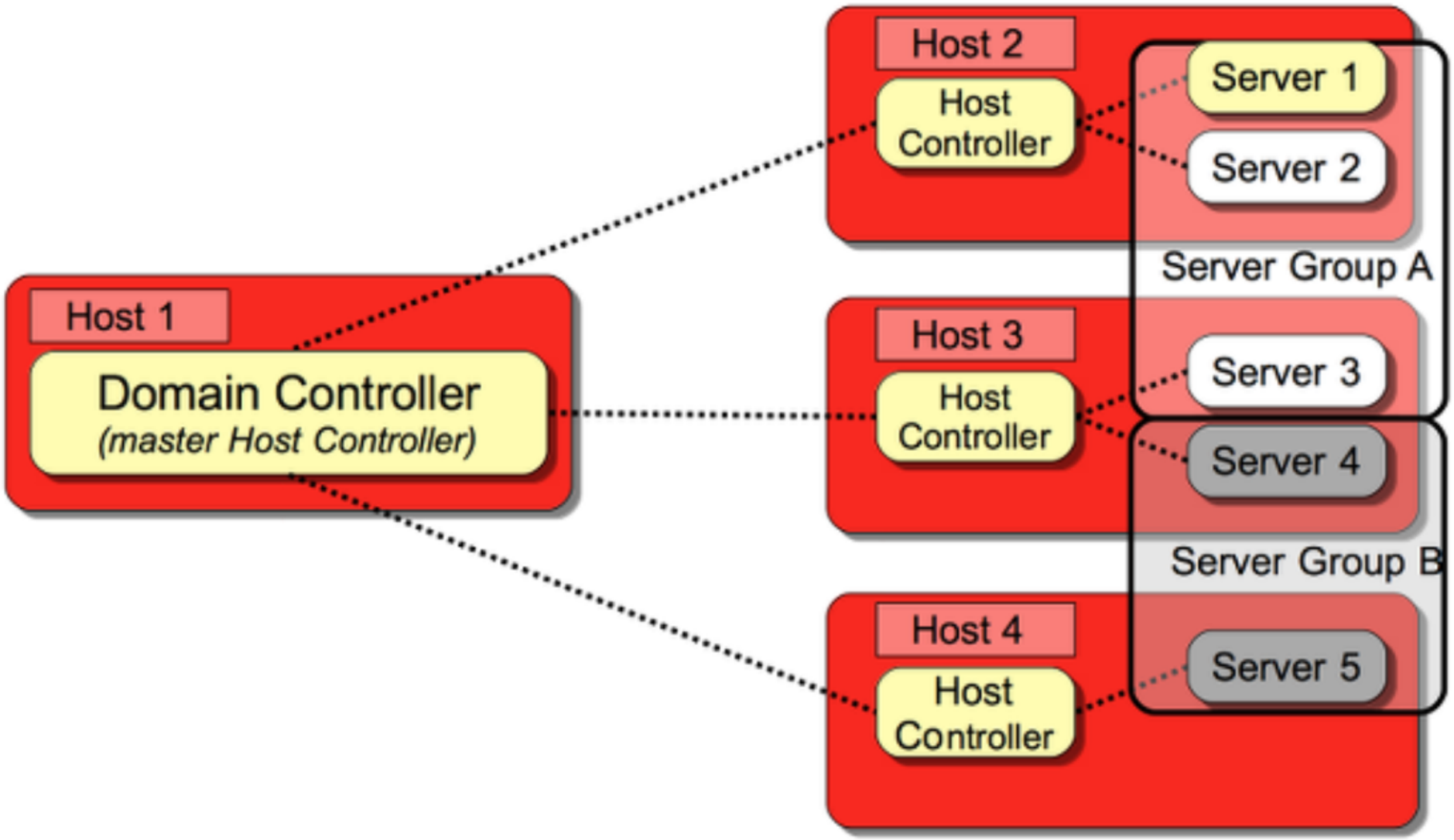
- **Standalone**: single independent instance

Standalone and Managed Domain

- Standalone: single independent instance
- Managed domain: manage multiple WildFly instances from a single control point
  - HA from fail-over: removes single point of failure
  - HA from load-balancing: timely response to client, even with high-volume requests

Managed Domain



Clustering Strategies

- Uses UDP for communication, can be configured for unicast TCP
- `mod_cluster`, `mod_jk`, `mod_proxy`, ISAPI or NSAPI connectors are available
- Advantages of `mod_cluster`
  - App server performs LB factor calculations
  - Server-side LB factors are communicated to httpd
  - Dynamic configuration of HTTPD proxies
  - Dynamically route requests to a node based upon context availability

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- Persistent changes

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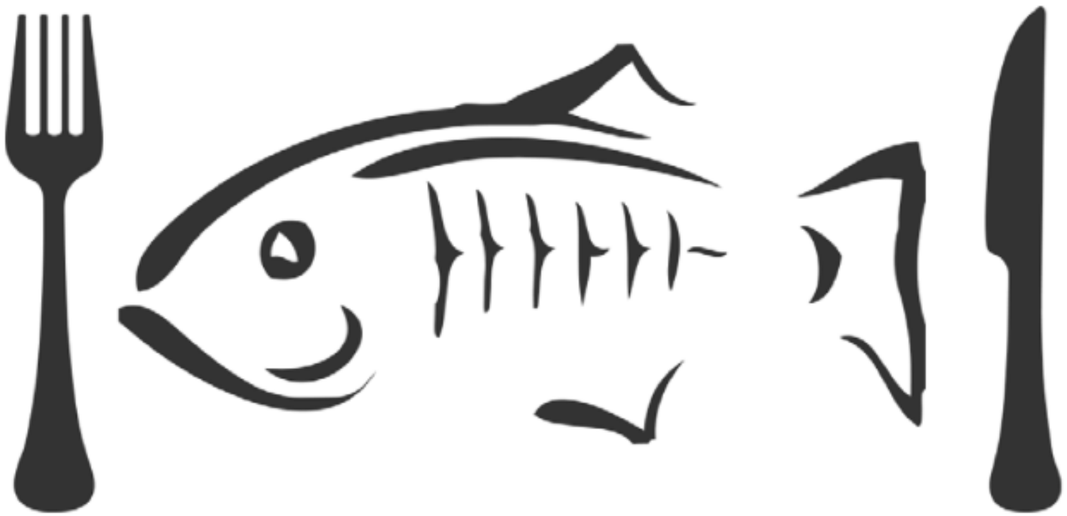
Admin Console

- Simple
- Fast
- Lightweight
- Avoids XML configuration
- Single instance and domains
- Mostly configuration, basic monitoring
  - Not a Red Hat JBoss Operations Network replacement

Migrate to WildFly



- http://wildfly.org/news/2014/02/06/GlassFish-to-WildFly-migration/
- http://zeroturnaround.com/rebellabs/abandon-fish-migrating-from-glassfish-to-jboss-or-tomee/

> *the most logical decision when migrating from GlassFish is opting for an* ***equivalent open source alternative***
>
> — zeroturnaround.com

JBoss/WildFly or TomEE chosen because …

- Vibrant developer community
- Amount of documentation on the web
- Sponsorship and support by market leaders

- Java EE 7 compliant
- lightweight
- managable
- highly scalable
- open source
- application server

Now available!

Open source polyglot conference

References

- WildFly - http://wildfly.org, http://github.com/wildfly, @WildFlyAS
- JBoss EAP 6.2 - http://www.jboss.org/products/eap
- Java EE 7 samples - https://github.com/javaee-samples/javaee7-samples
- Slides generated with Asciidoctor and DZSlides backend
- Original slide template - Dan Allen & Sarah White

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