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E-Neuauflage - Die Java Enterprise Edition 7 und GlassFish

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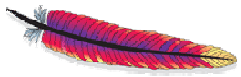
Java: Broadest Industry Adoption

9,000,000

JAVA DEVELOPERS

DEPLOYING TO 18 COMPLIANT APPLICATION SERVERS



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Make the Future Java

- Platform Completeness
- Modernization and Innovation
- Developer Productivity
- Open and Transparent Evolution
- Active Community Involvement
- Quality and Security

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Java EE 7 Themes

- More annotated POJOs
- Less boilerplate code
- Cohesive integrated platform

- WebSockets
- JSON
- Servlet 3.1 NIO
- REST

- Batch
- Concurrency
- Simplified JMS

Top Ten Features in Java EE 7

1. WebSocket client/server endpoints
2. Batch Applications
3. JSON Processing
4. Concurrency Utilities (asynchronous capabilities)
5. Simplified JMS API
6. @Transactional and @TransactionScoped (on any POJO)
7. JAX-RS Client API
8. Default Resources (JDBC DataSource, JMS ConnectionFactory)
9. More annotated POJO's (@JMSDestinationDefinition)
10. Faces Flow in JSF

Java API for WebSocket 1.0

- Server and Client WebSocket Endpoint
  - Annotated: @ServerEndpoint, @ClientEndpoint
  - Programmatic: Endpoint
- Lifecycle methods
- Packaging and Deployment

```
@ServerEndpoint("/chat")
 public class ChatServer {
   @OnMessage
   public void chat(String m) {
     . . .
   }
 }
```

Java API for WebSocket 1.0

Chat Server

```
@ServerEndpoint("/chat")
public class ChatBean {
    static Set<Session> peers = Collections.synchronizedSet(…);

    @OnOpen
    public void onOpen(Session peer) {
        peers.add(peer);
    }

    @OnClose
    public void onClose(Session peer) {
        peers.remove(peer);
    }

    . . .
```

Java API for WebSocket 1.0

Chat Server (contd.)

```
    . . .

    @OnMessage
    public void message(String message) {
        for (Session peer : peers) {
            peer.getRemote().sendObject(message);
        }
    }
}
```

JSON Processing 1.0

- API to parse and generate JSON
- Streaming API
  - Low-level, efficient way to parse/generate JSON
  - Similar to StAX API in XML world
- Object Model API
  - Simple, easy to use high-level API
  - Similar to DOM API in XML world

Java API for JSON Processing 1.0

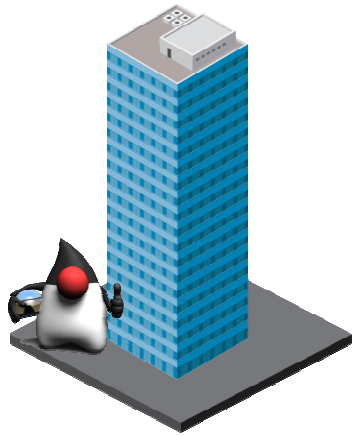
Streaming API

```
{
    "firstName": "John", "lastName": "Smith", "age": 25,
  "phoneNumber": [
    { "type": "home", "number": "212 555-1234" },
    { "type": "fax", "number": "646 555-4567" }
  ]
}
```

```
JsonParser p = Json.createParser(…);
JsonParser.Event event = p.next();          // START_OBJECT
event = p.next();                           // KEY_NAME
event = p.next();                           // VALUE_STRING
String name = p.getString();                // "John”
```

Batch Applications for Java Platform 1.0

- Suited for non-interactive, bulk-oriented, and long-running tasks
- Batch execution: sequential, parallel, decision-based
- Processing Styles
  - Item-oriented: Chunked (primary)
  - Task-oriented: Batchlet



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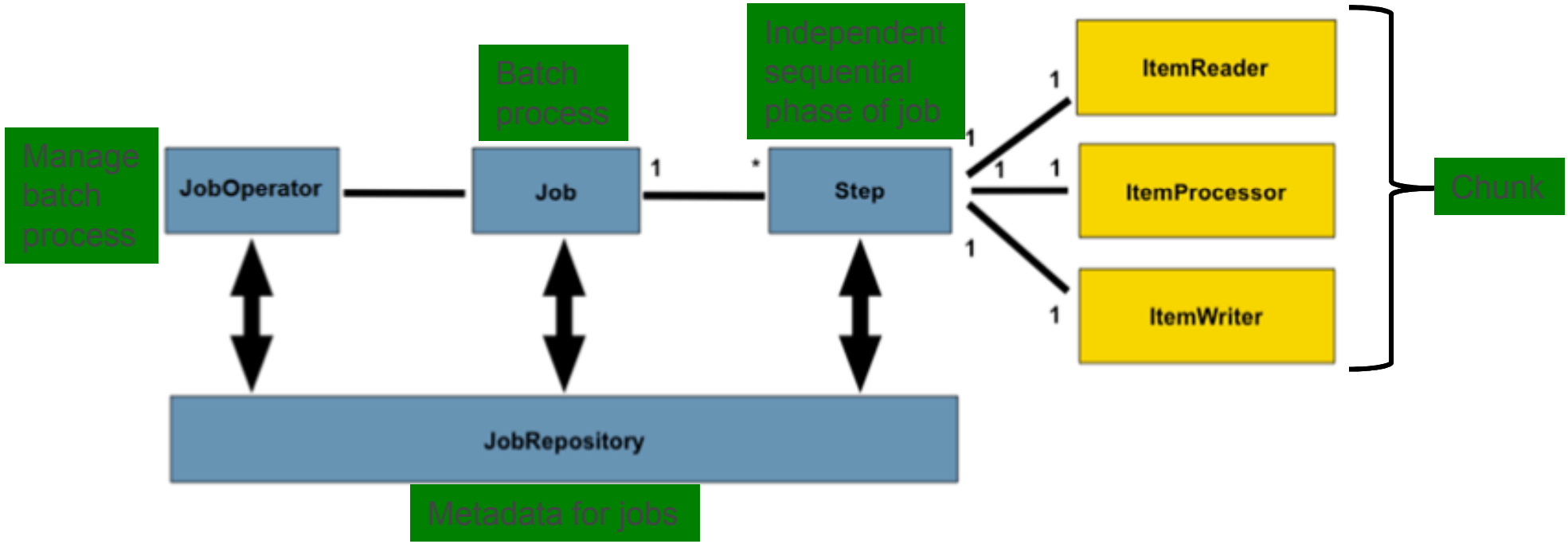
Batch Applications 1.0

Concepts



Batch Applications 1.0

Chunked Job Specification

```
<step id=”sendStatements”>
  <chunk item-count=“3”>
    <reader ref=”accountReader”/>
    <processor ref=”accountProcessor”/>
    <writer ref=”emailWriter”/>
</step>
```

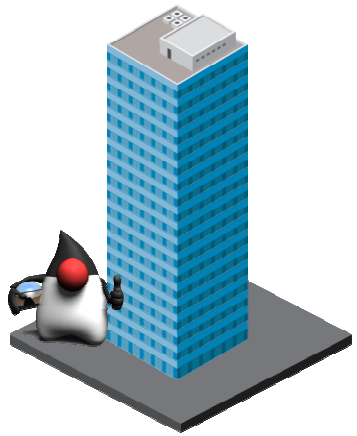
```
…implements ItemReader {
public Object readItem() {
    // read account using JPA
}
```

```
…implements ItemProcessor {
Public Object processItems(Object account) {
    // read Account, return Statement
}
```

```
…implements ItemWriter {
public void writeItems(List accounts) {
    // use JavaMail to send email
}
```


Concurrency Utilities for Java EE 1.0

- Extension of Java SE Concurrency Utilities API
- Provide asynchronous capabilities to Java EE application components
- Provides four types of managed objects
  - ManagedExecutorService
  - ManagedScheduledExecutorService
  - ManagedThreadFactory
  - ContextService
- Context Propagation



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Concurrency Utilities for Java EE 1.0

Submit Tasks to ManagedExecutorService using JNDI

```
public class TestServlet extends HttpPServlet {
  @Resource(name="java:comp/DefaultManagedExecutorService")
  ManagedExecutorService executor;

  Future future = executor.submit(new MyTask());

  class MyTask implements Runnable {
    public void run() {
      . . .  // task logic
    }
  }
}
```

Java Message Service 2.0

Get More from Less

- New JMSContext interface
- AutoCloseable JMSContext, Connection, Session, …
- Use of runtime exceptions
- Method chaining on JMSProducer
- Simplified message sending

Java Message Service 2.0

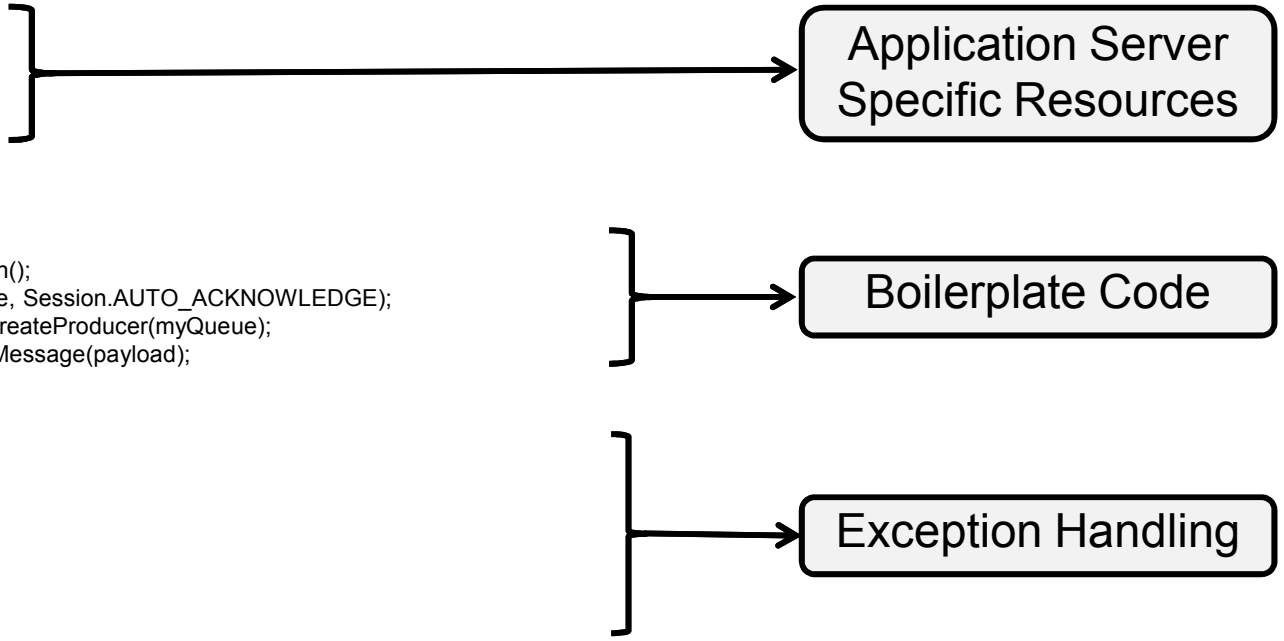
Sending a Message using JMS 1.1

```
@Resource(lookup = "myConnectionFactory")
ConnectionFactory connectionFactory;

@Resource(lookup = "myQueue")
Queue myQueue;

public void sendMessage (String payload) {
    Connection connection = null;
    try {
        connection = connectionFactory.createConnection();
        Session session = connection.createSession(false, Session.AUTO_ACKNOWLEDGE);
        MessageProducer messageProducer = session.createProducer(myQueue);
        TextMessage textMessage = session.createTextMessage(payload);
        messageProducer.send(textMessage);
    } catch (JMSException ex) {
        //. . .
    } finally {
        if (connection != null) {
            try {
                connection.close();
            } catch (JMSException ex) {

                //. . .
            }
        }
    }
}
```



Java Message Service 2.0

Sending a Message

```
@Inject
JMSContext context;


@Resource(lookup = "java:global/jms/demoQueue”)
Queue demoQueue;


public void sendMessage(String payload) {
    context.createProducer().send(demoQueue, payload);
}
```

Java API for RESTful Web Services 2.0

- Client API
- Message Filters and Entity Interceptors
- Asynchronous Processing – Server and Client
- Common Configuration

Java API for RESTful Web Services 2.0

Client API

```
// Get instance of Client
Client client = ClientBuilder.newClient();

// Get customer name for the shipped products
String name = client.target("../orders/{orderId}/customer")
                    .resolveTemplate("orderId", "10")
                    .queryParam("shipped", "true")
                    .request()
                    .get(String.class);
```

Contexts and Dependency Injection 1.1

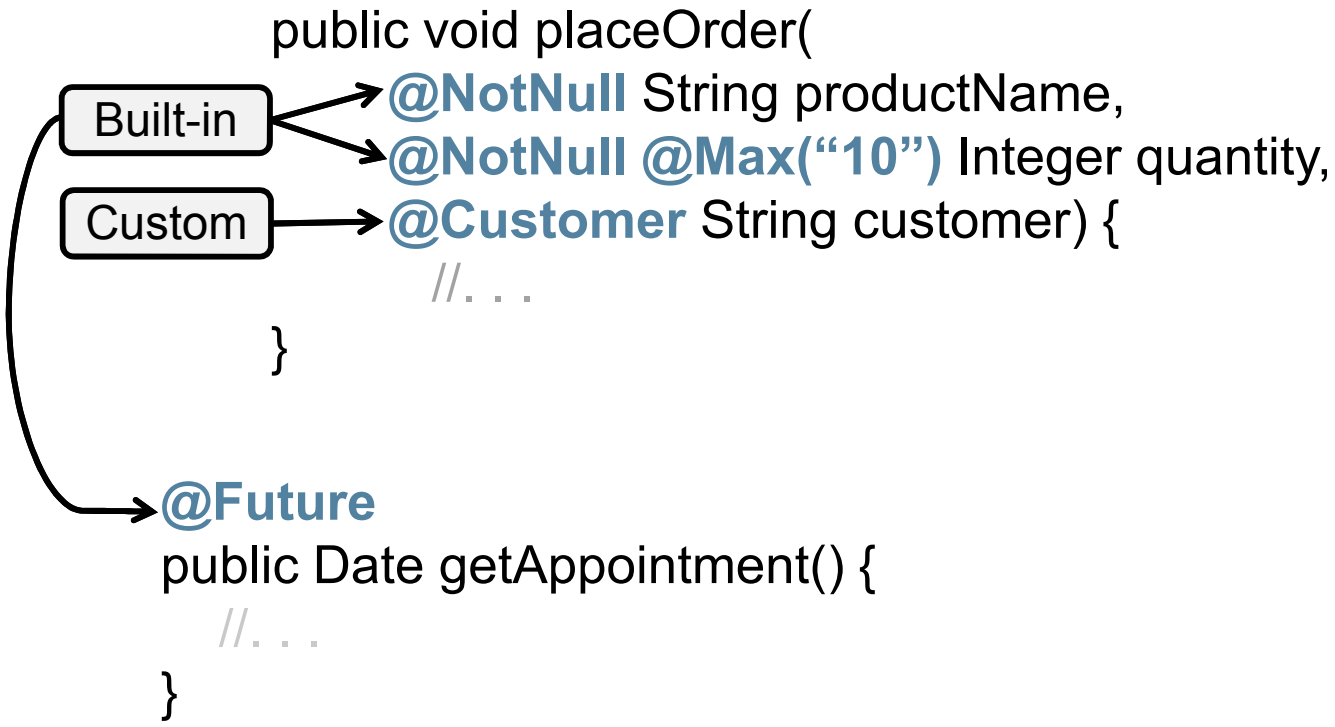
- Automatic enablement for beans with scope annotation and EJBs
  - “beans.xml” is optional
- Bean discovery mode
  - all: All types
  - annotated: Types with bean defining annotation
  - none: Disable CDI
- @Vetoed for programmatic disablement of classes
- Global ordering/priority of interceptors and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

Bean Validation 1.1

- Alignment with Dependency Injection
- Method-level validation
  - Constraints on parameters and return values
  - Check pre-/post-conditions
- Integration with JAX-RS

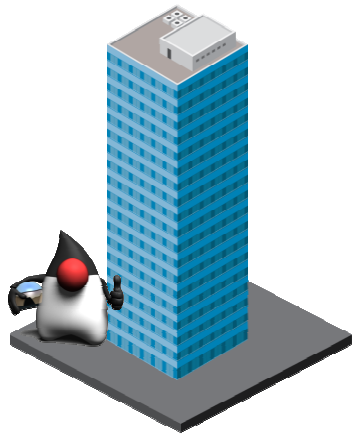
Bean Validation 1.1

Method Parameter and Result Validation



Java Persistence API 2.1

- Schema Generation
  - javax.persistence.schema-generation.* properties
- Unsynchronized Persistence Contexts
- Bulk update/delete using Criteria
- User-defined functions using FUNCTION
- Stored Procedure Query



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Servlet 3.1

- Non-blocking I/O
- Protocol Upgrade
- Security Enhancements
  - <deny-uncovered-http-methods>: Deny request to HTTP methods not explicitly covered

Servlet 3.1

Non-blocking I/O Traditional

```
public class TestServlet extends HttpServlet
  protected void doGet(HttpServletRequest request,
                       HttpServletResponse response)
                  throws IOException, ServletException {
    ServletInputStream input = request.getInputStream();
    byte[] b = new byte[1024];
    int len = -1;
    while ((len = input.read(b)) != -1) {
      . . .
    }
  }
}
```


Servlet 3.1

Non-blocking I/O: doGet

```
AsyncContext context = request.startAsync();
ServletInputStream input = request.getInputStream();
input.setReadListener(
    new MyReadListener(input, context));
```

Servlet 3.1

Non-blocking read

```
@Override
public void onDataAvailable() {
  try {
    StringBuilder sb = new StringBuilder();
    int len = -1;
    byte b[] = new byte[1024];
    while (input.isReady() && (len = input.read(b)) != -1) {
      String data = new String(b, 0, len);
      System.out.println("--> " + data);
    }
  } catch (IOException ex) {
    . . .
  }
}
```

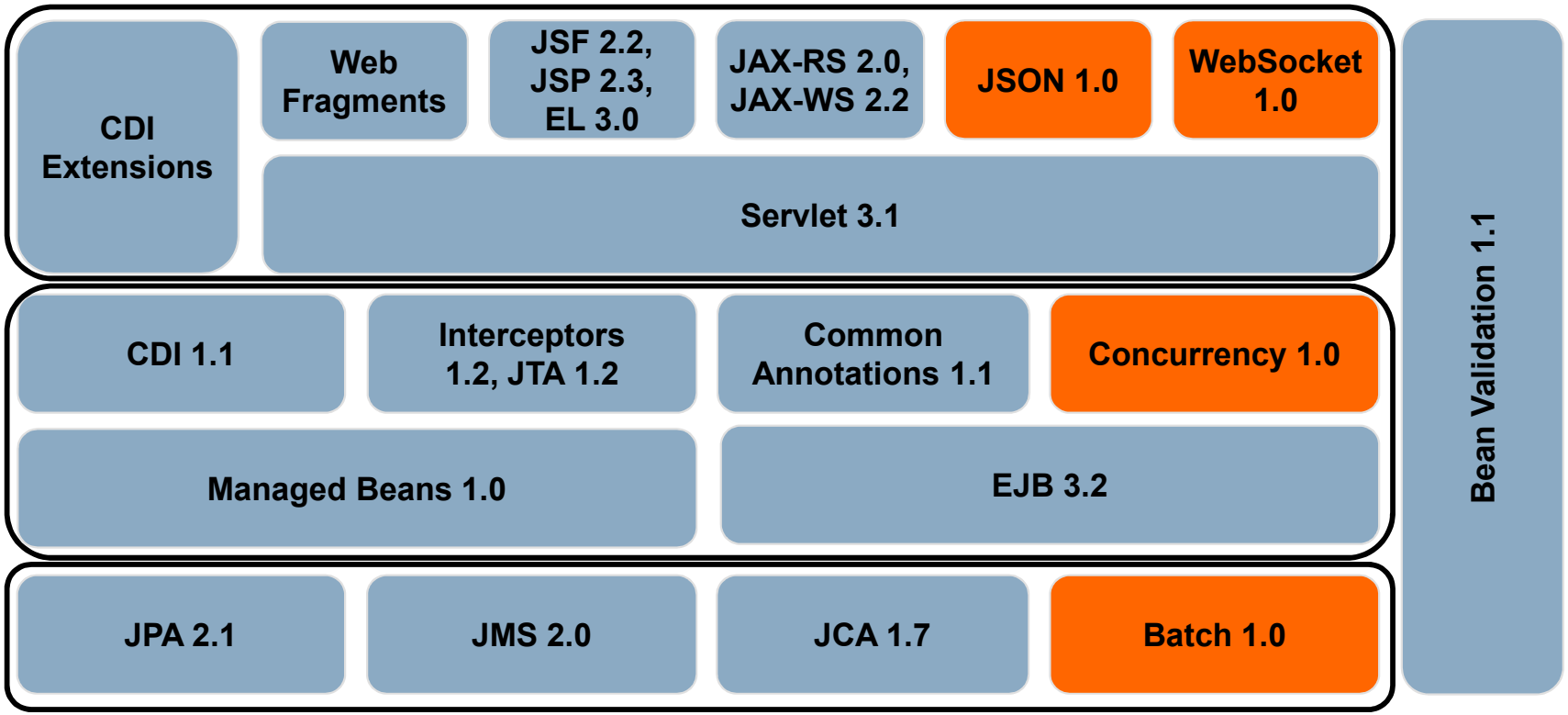
JavaServer Faces 2.2

- Faces Flow
- Resource Library Contracts
- HTML5 Friendly Markup Support
  - Pass through attributes and elements
- Cross Site Request Forgery Protection
- Loading Facelets via ResourceHandler
- h:inputFile: New File Upload Component

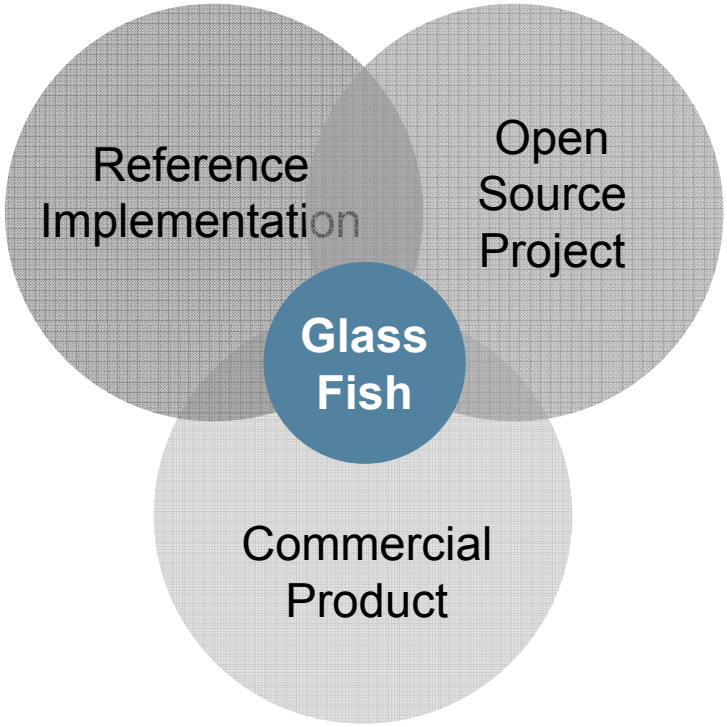
Java Transaction API 1.2

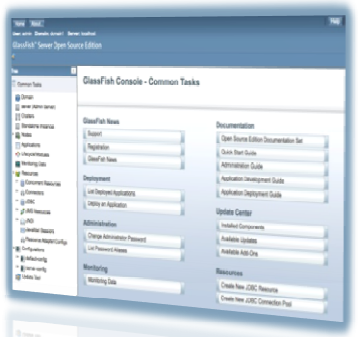
- @Transactional: Define transaction boundaries on CDI managed beans
- @TransactionScoped: CDI scope for bean instances scoped to the active JTA transaction

Java EE 7 Final Specification - JSR's



GlassFish Server





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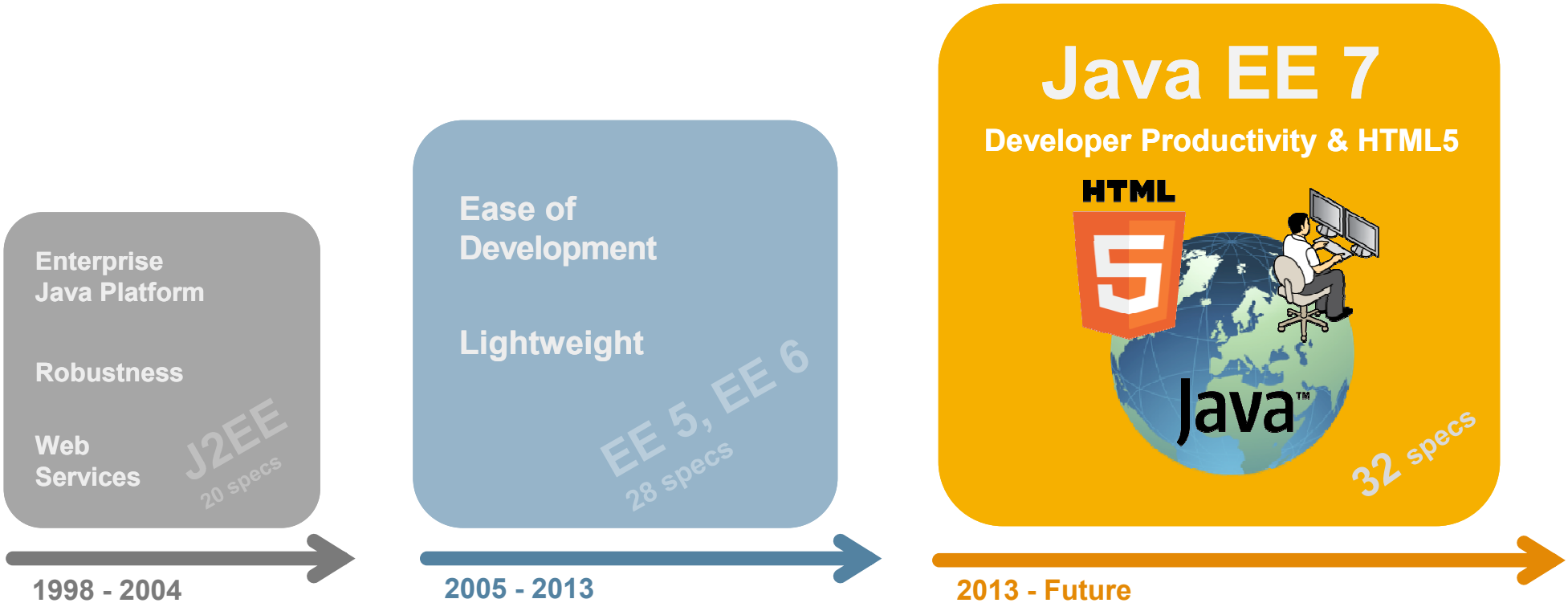
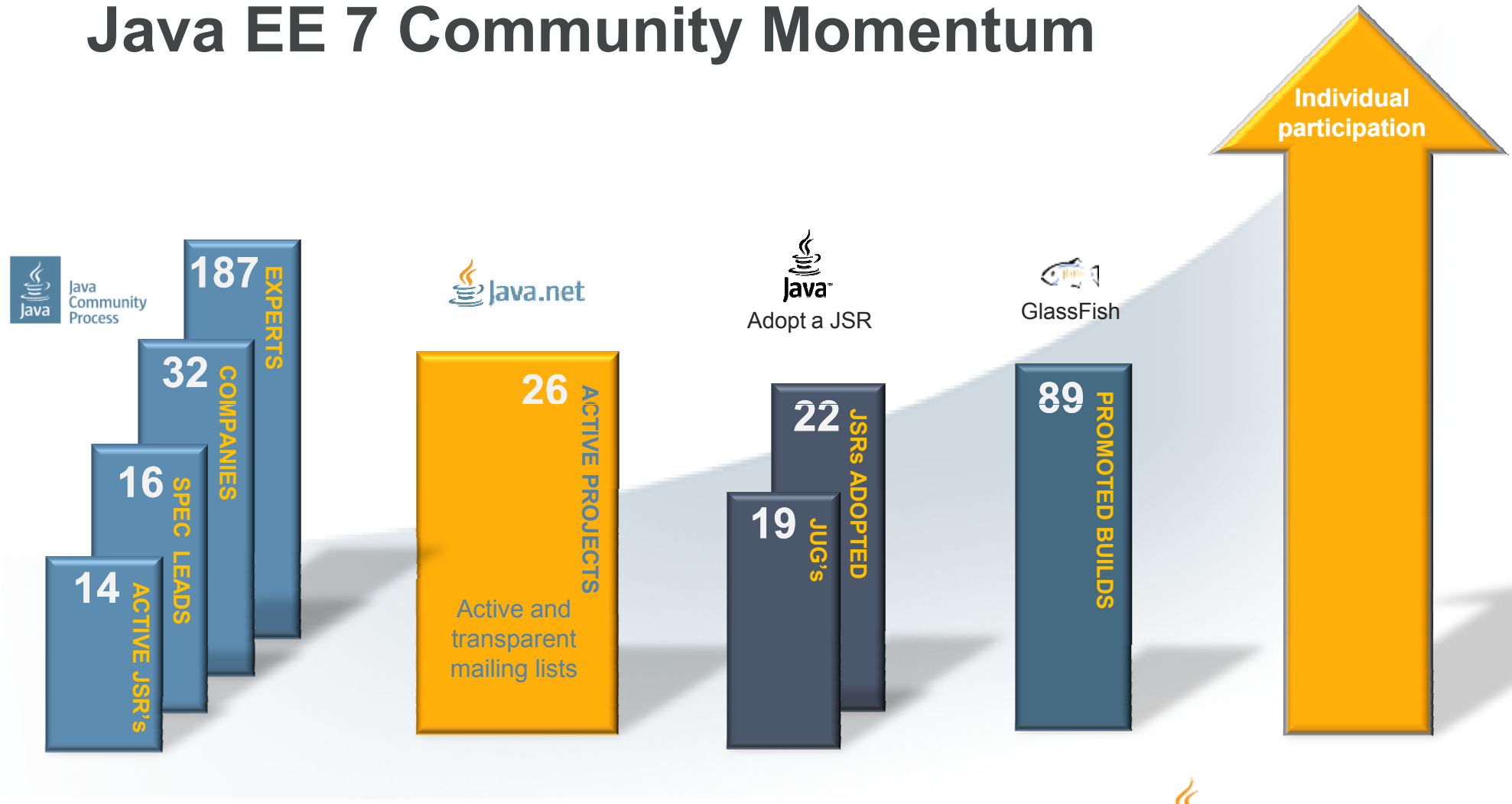
GlassFish Server -
Reference Implementation

Java EE – and GlassFish - Journey



Java EE 7 Community Momentum



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GlassFish Server –
Open Source Project

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GlassFish Server

Open Source Project

- Built in open source
- World's first Java EE 7 Application Server
- Lightweight / modular / easy to use
- Production ready

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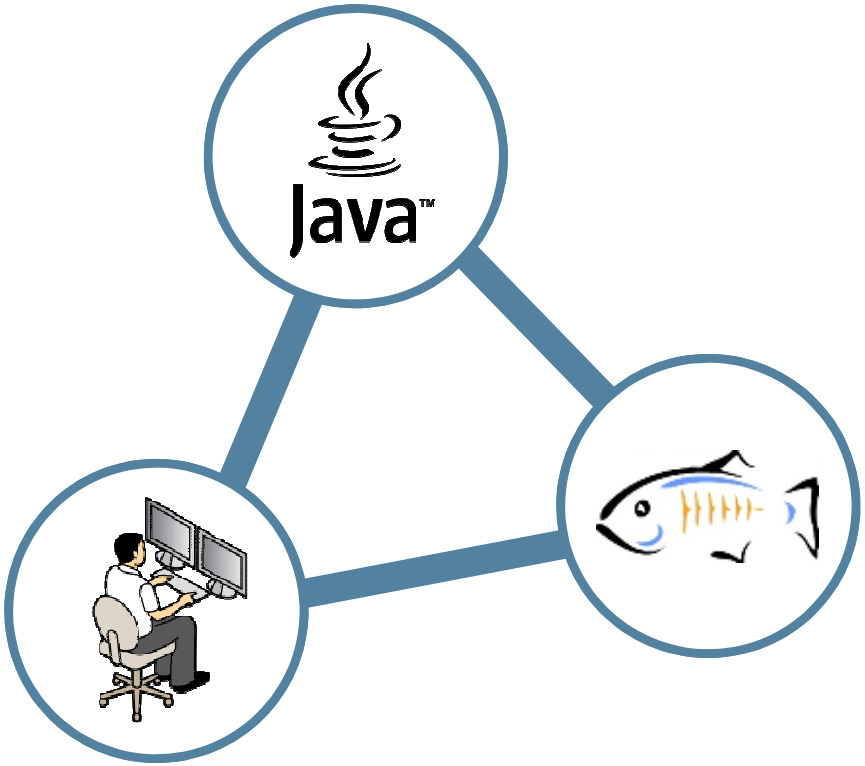
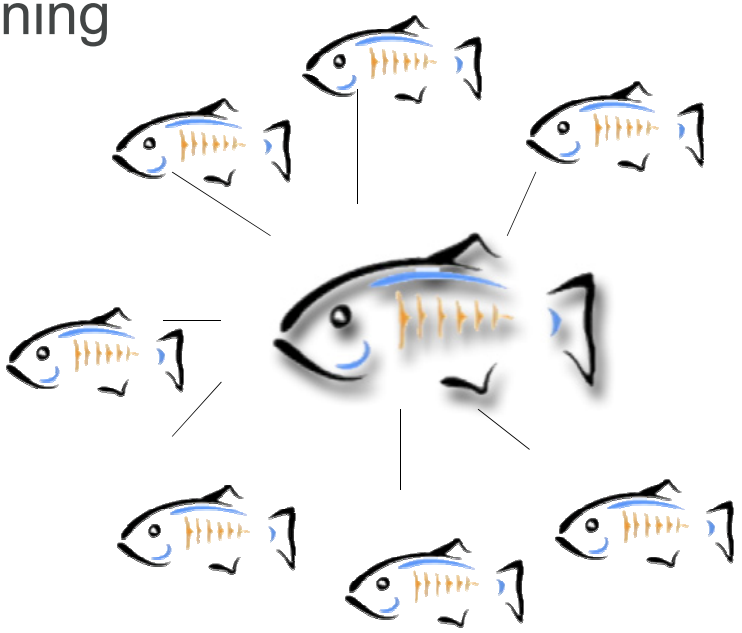
The GlassFish Community

- 10+ million annual downloads
- FishCAT - Early testing and fixes
  - Community Acceptance Testing program
- Active user forums
- Community contributions



Centralized Management

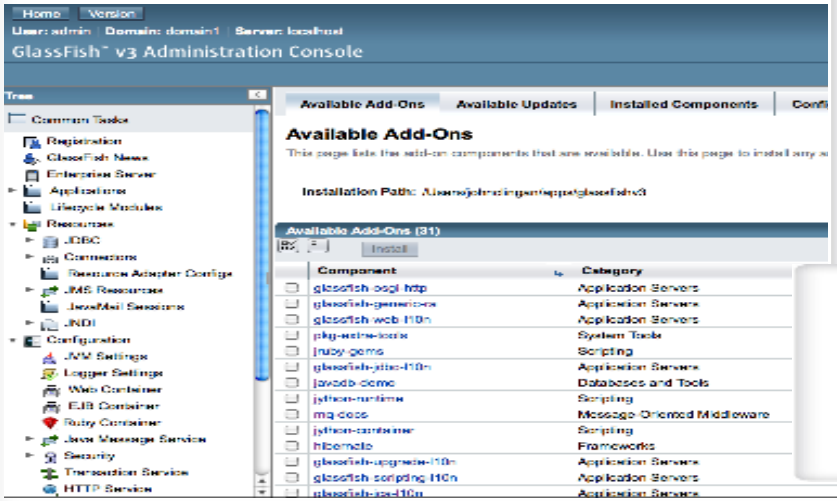
- Integrated GlassFish Server Provisioning
- Manage instance/cluster lifecycle
- Manage configurations
- Manage Java EE resources
- Manage application lifecycle



Flexible Administration



Web Browser



REST API

Command Line

```
$ asadmin deploy --target prod_cluster website.war
Application deployed with name website.
Command deploy executed successfully.
```

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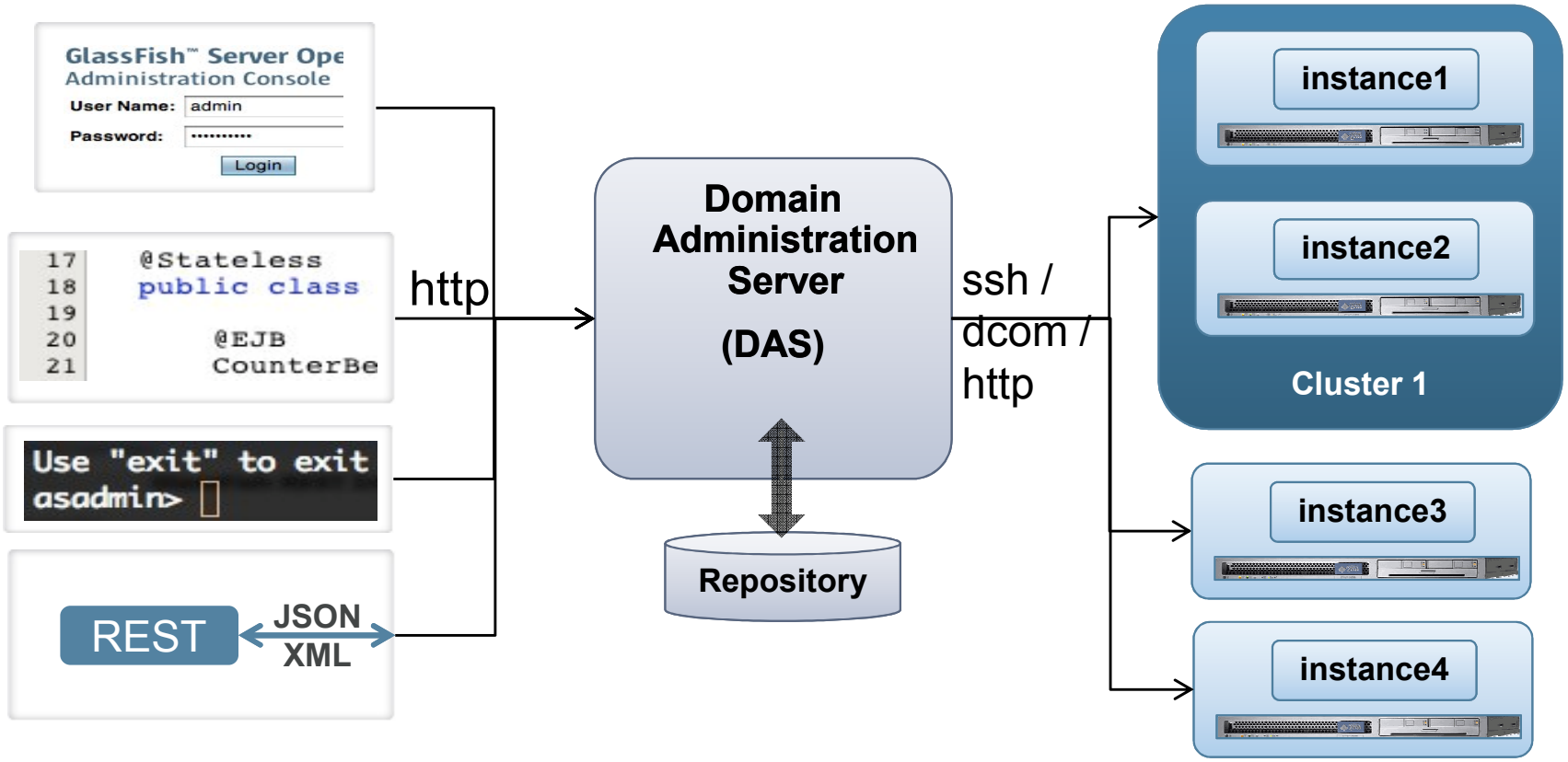
GlassFish Server Administration Architecture



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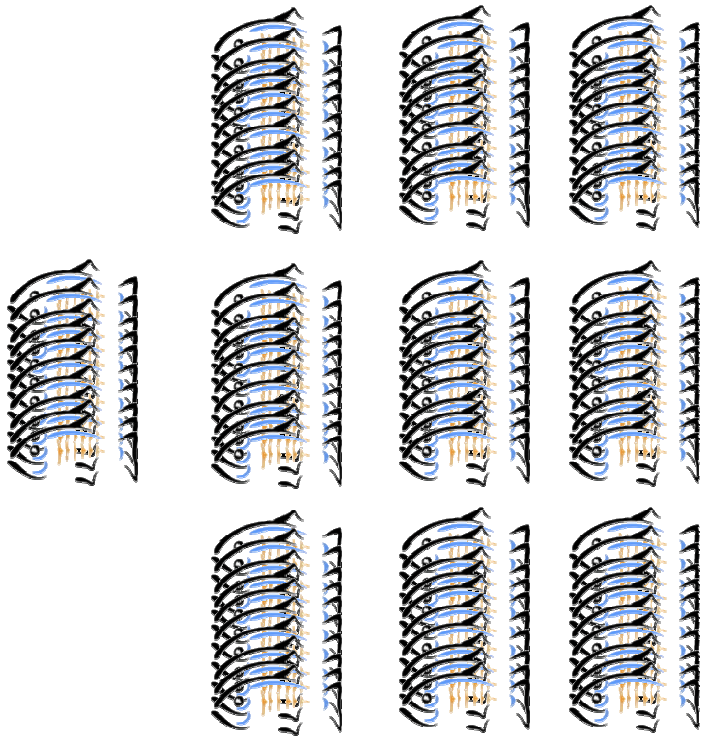
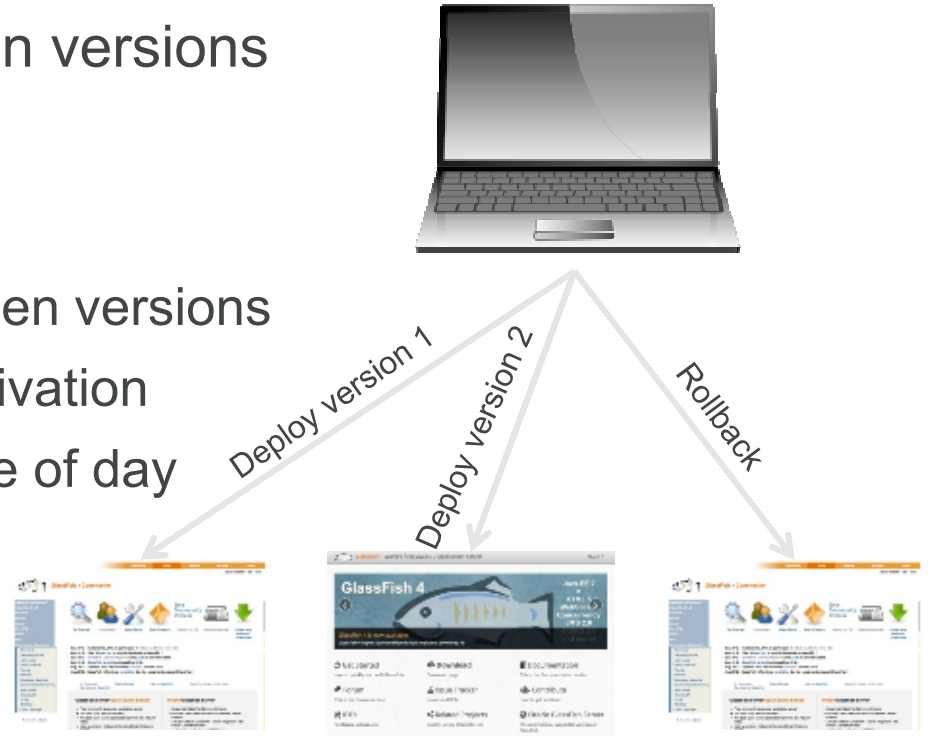
GlassFish Server Clustering

- Manage 100 instances per domain
  - Standalone
  - Clusters (max 10 per cluster)
- Dynamically resize cluster
- JMS Broker Clustering
- Load Balancing
  - Commercial plugin
  - AJP (mod_jk, mod_proxy)



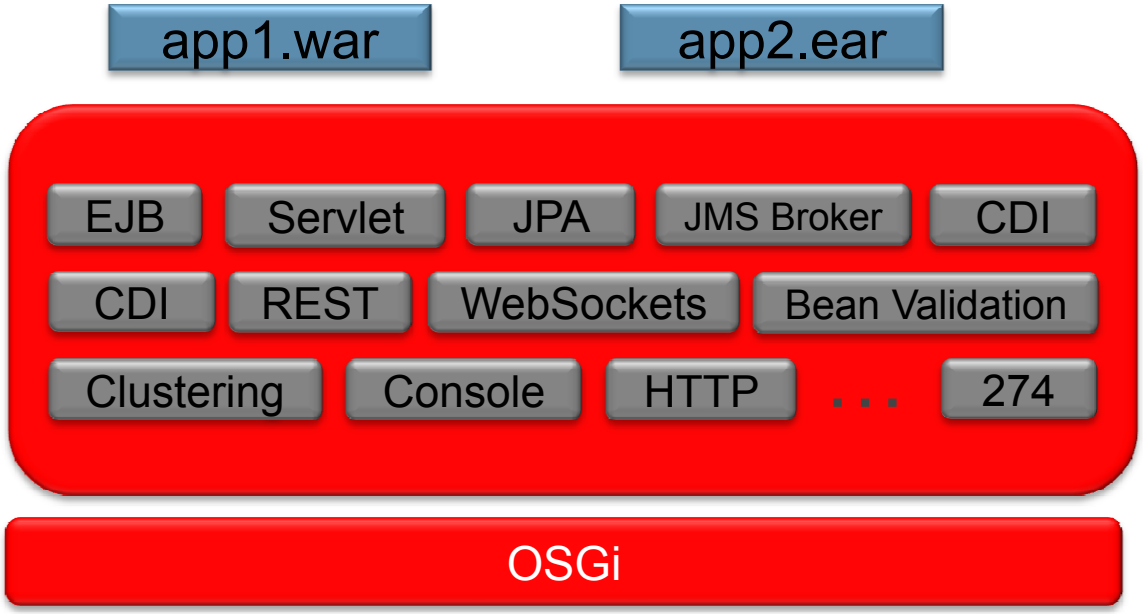
Application Versioning

- Deploy multiple versions application versions
- Activate any version
- For example:
  - Roll forward and backwards between versions
  - Pre-deploy application for later activation
  - Enable new version at specific time of day



GlassFish Modularity

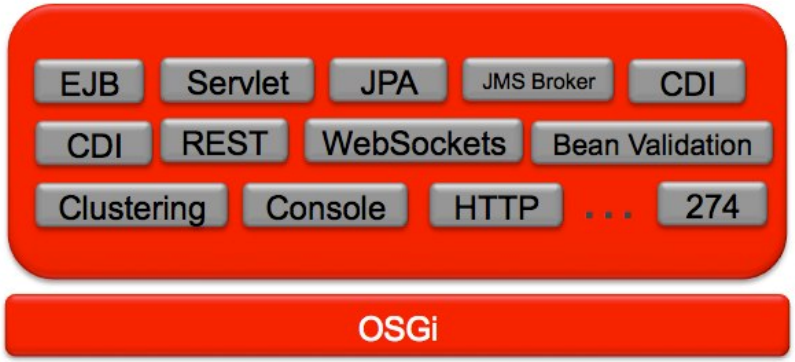
In a nutshell



- Starts in seconds
- Only loads required modules
- Including "infrastructure" features

OSGi Support

- OSGi Runtime (Apache Felix)
  - Also runs on others
  - Ships with ~275 modules
  - Can run without OSGi
  - Integrates OSGi management tools
- Hybrid Java EE / OSGi Applications
  - Expose EJBs as OSGi Services
  - Inject OSGi services into Java EE applications
- Run any OSGi bundle
- Supports OSGi Enterprise



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Extending GlassFish Server

- Define a new container
  - System-level logic
  - Implement administration commands
- Expose administration capabilities
  - Administration Console
  - Command Line
  - RESTful Interface
- Embeddable API
- Re-brand user interface

Built-in Developer Features

- Ultra-fast deployment
  - Hot deployment
  - Directory deployment
- Run as a single JAR

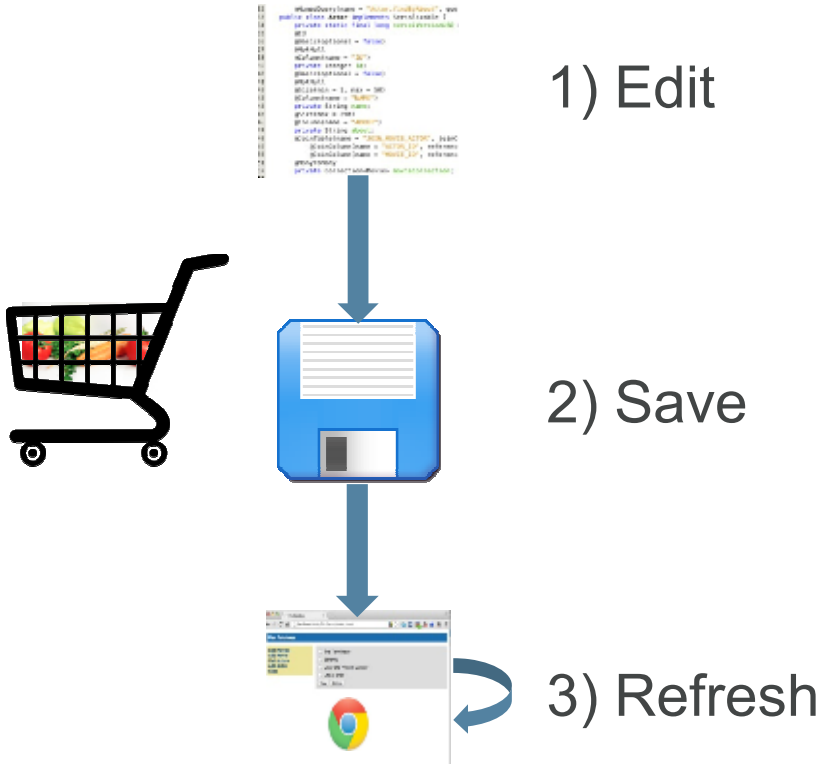
```
java –jar glassfish.jar app1.war
```

- Maven Plugin

```
mvn gf:run, gf:start, gf:deploy
```

Active Redeploy

- Maintains state across redeploys
- Rapid Iterative development
  - Edit
  - Save
  - Refresh



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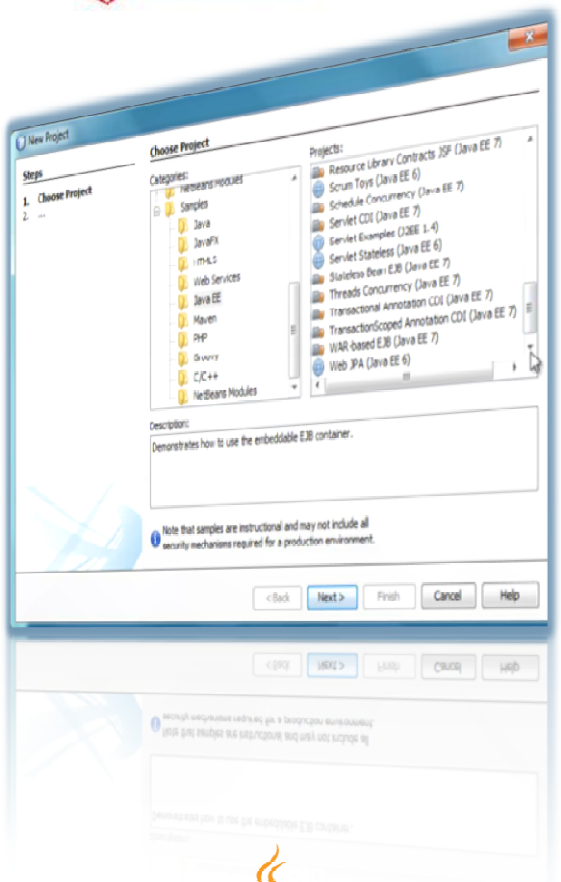
NetBeans 7.3.1 + GlassFish 4.0

- NetBeans bundles GlassFish
- Incremental compilation; auto-deploy
- Complete Java EE 7 support
  - All Java EE 7 project types
  - Maven Support
  - Wizards
  - Advanced Wizards
    - Entity to REST generation
    - Database to JSF 2.2



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Oracle GlassFish Server - Commercial Product

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Oracle GlassFish Server

Java EE 6 Compliant

- **Commercial Distribution of GlassFish Server Open Source Edition**
- GlassFish Server Control
- Java SE support
- 24 x 7 x 365 premium support
- Regular patch releases
- Indemnification

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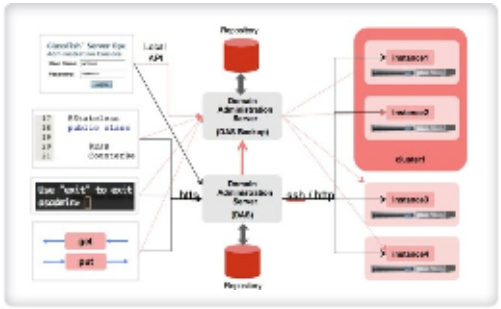
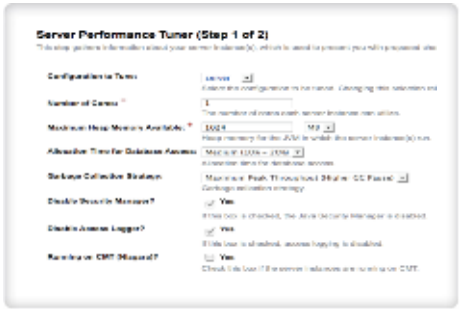
GlassFish Server Control

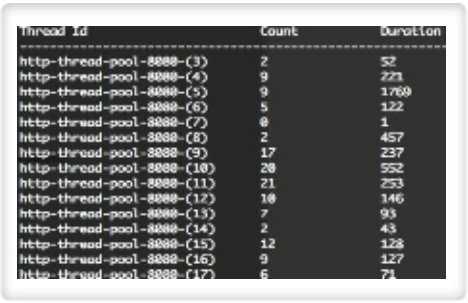
DAS Backup & Recovery



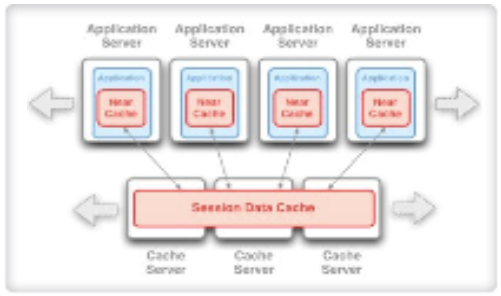
Performance Tuner



Monitoring Scripting Client

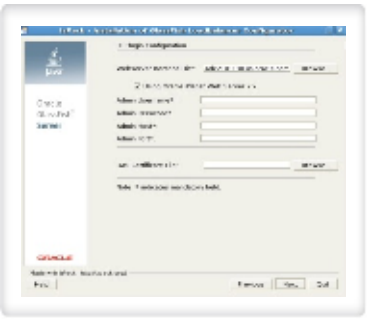


ActiveCache for GlassFish



Oracle Access Manager Integration

Load Balancer Plugin & Installer



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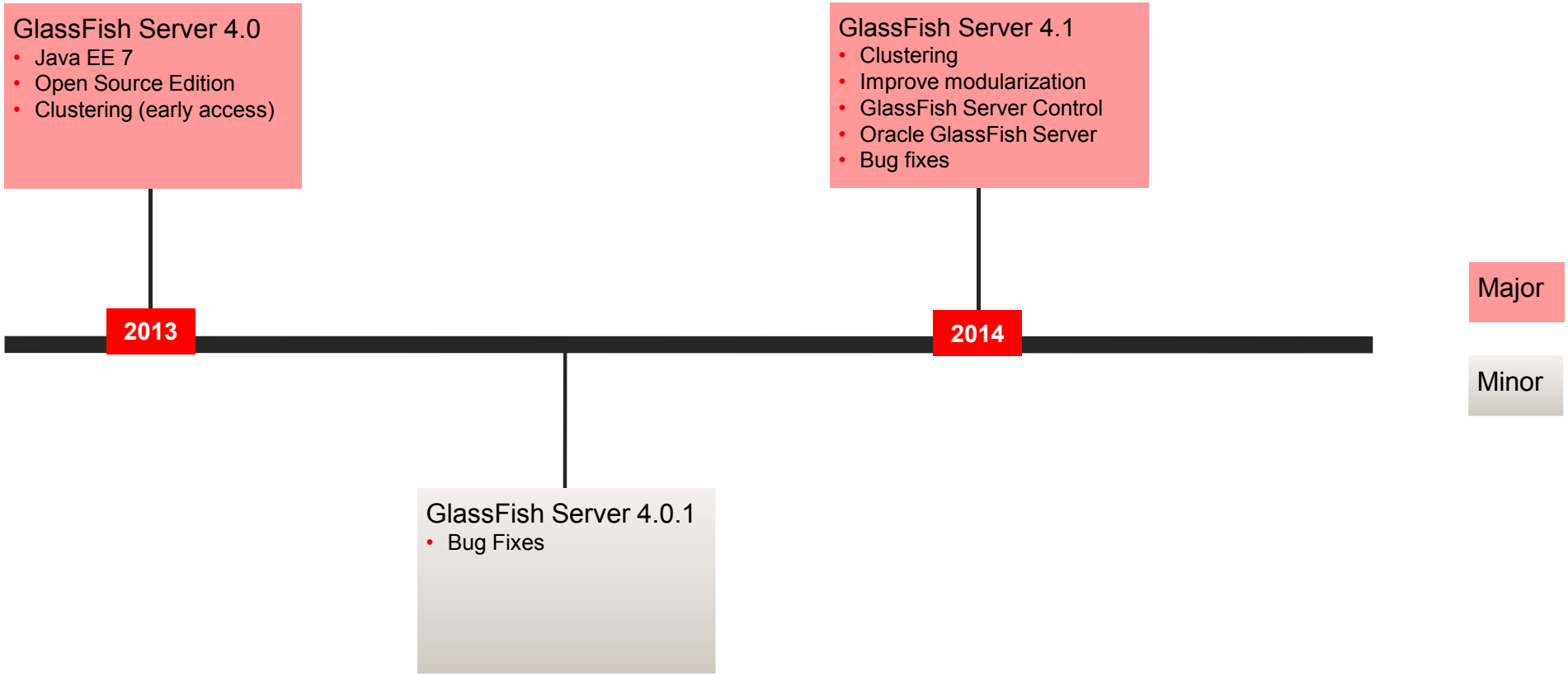
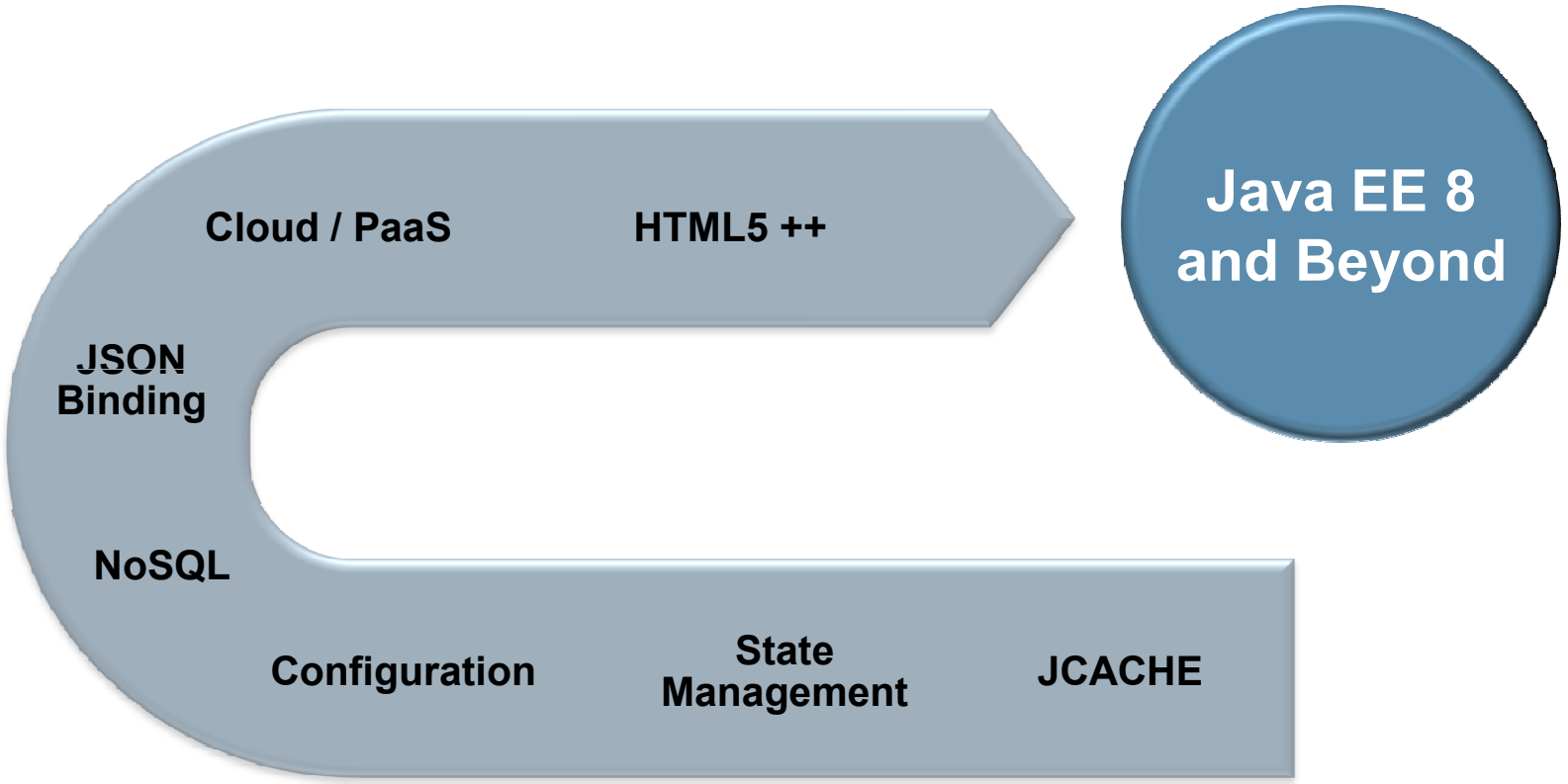
Roadmap

GlassFish Server 4.x



Future of Java EE



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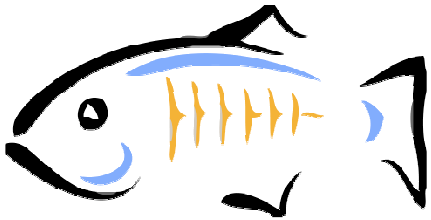
Zusammenfassung

- **Java EE 7**
  - Neue API's
- **Java als Plattform nutzt Innovationen im Ökosystem und paßt sich dem Änderungprozess der IT an**



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Java EE 7 SDK

oracle.com/javaee

GlassFish 4.0

Full Platform or Web Profile

glassfish.org

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Vielen Dank für Ihre Aufmerksamkeit!

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