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The Java EE 7 Platform: Reaching for the Cloud

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Agenda

- Java EE 7 theme
- Main features
- Highlights of some new APIs
- Component JSRs
- Schedule

Java EE 7 Theme : The Cloud

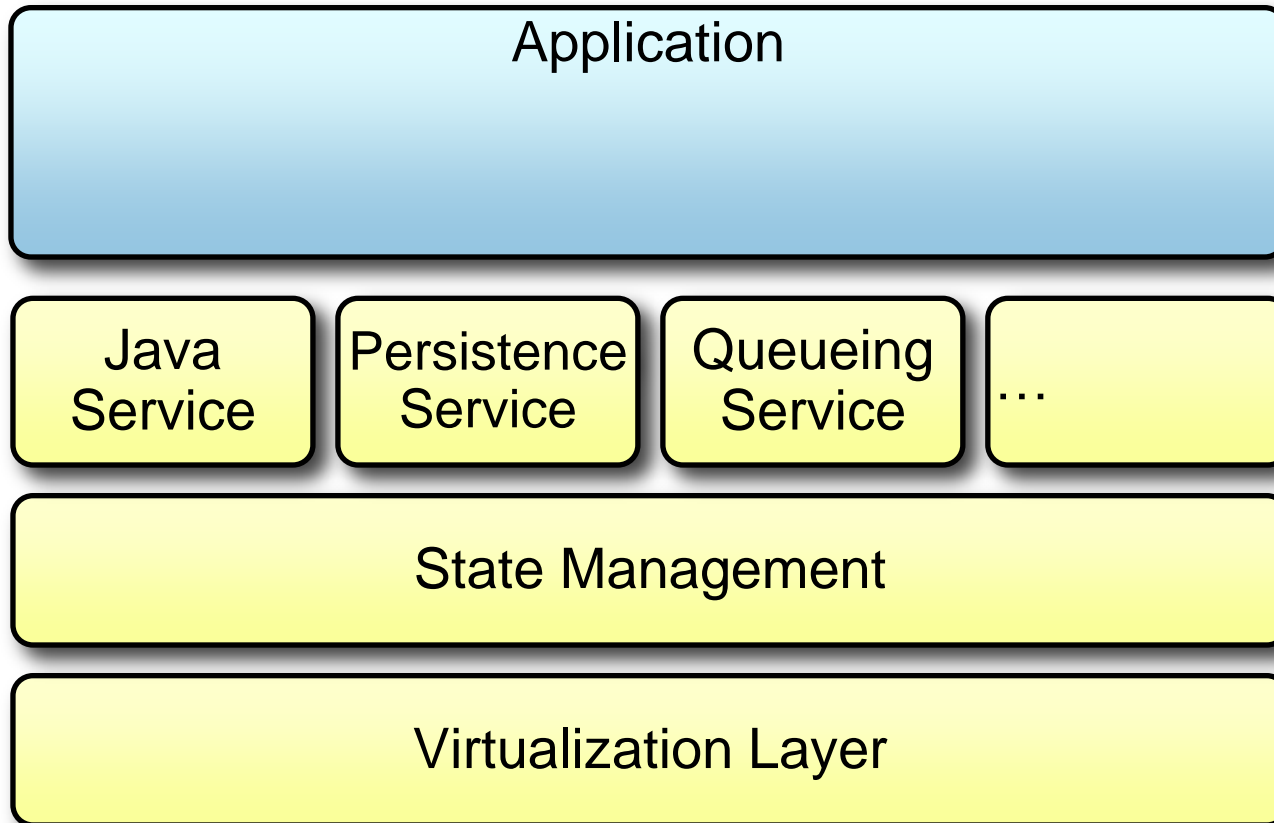
- “We’re making Java EE ready for the cloud”
- Support for Platform-as-a-Service (PaaS) model

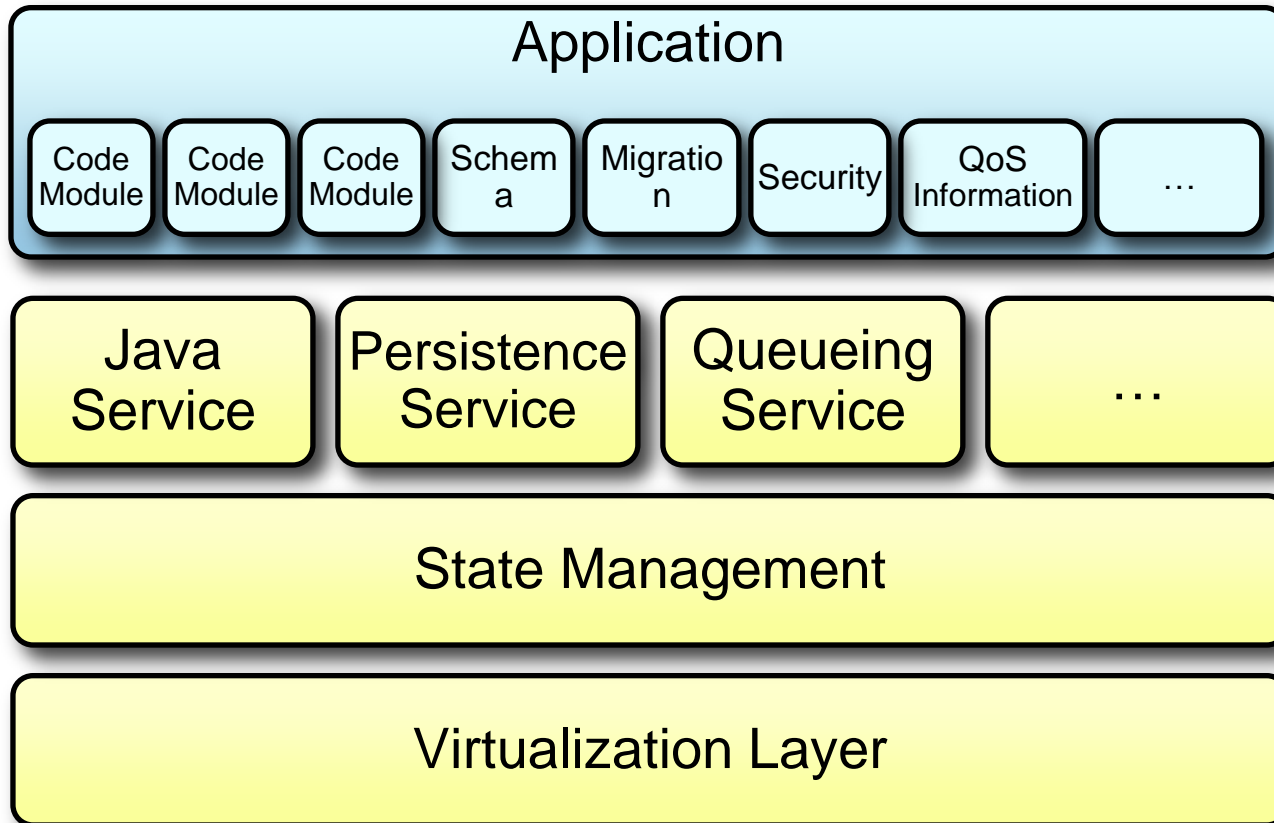
Java EE for the Cloud

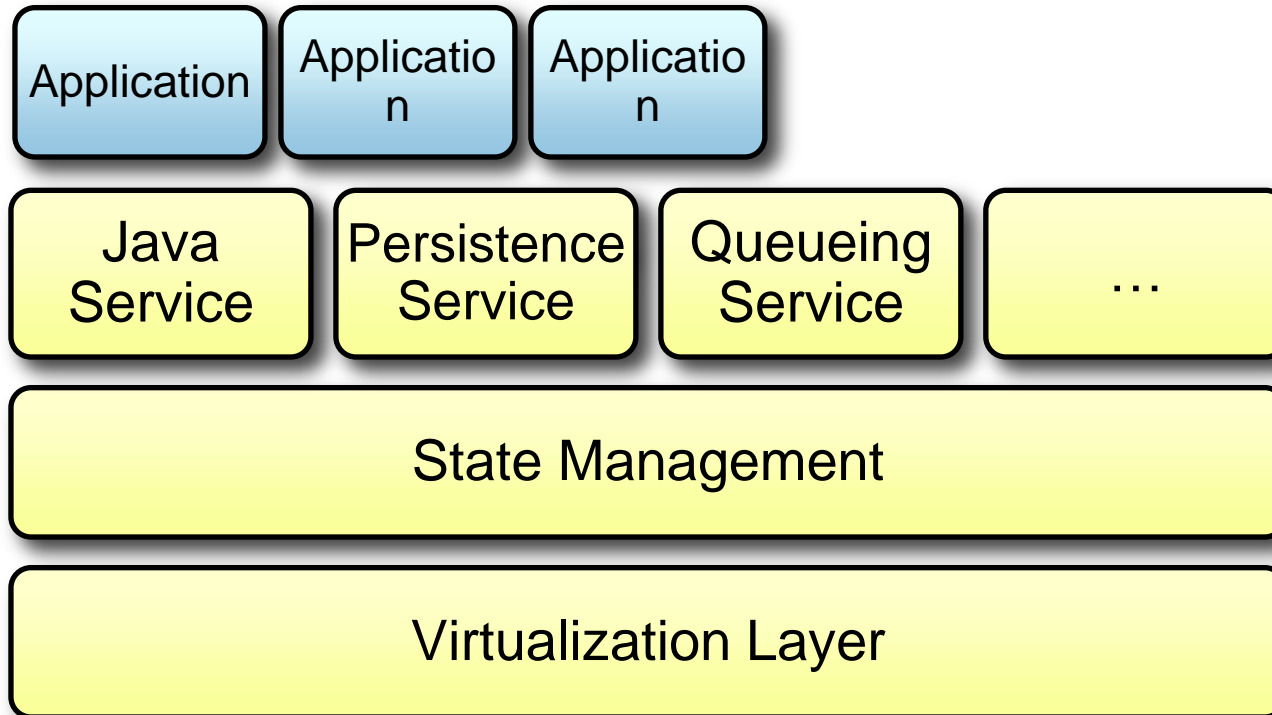
- Tighter requirements for resource and state management
- Better isolation between applications and their data, using tenants as an isolation unit
- Standard APIs for caching in EE 7, perhaps MapReduce, NORDBMS in the future
- Common management and monitoring interfaces
- Evolution, not revolution

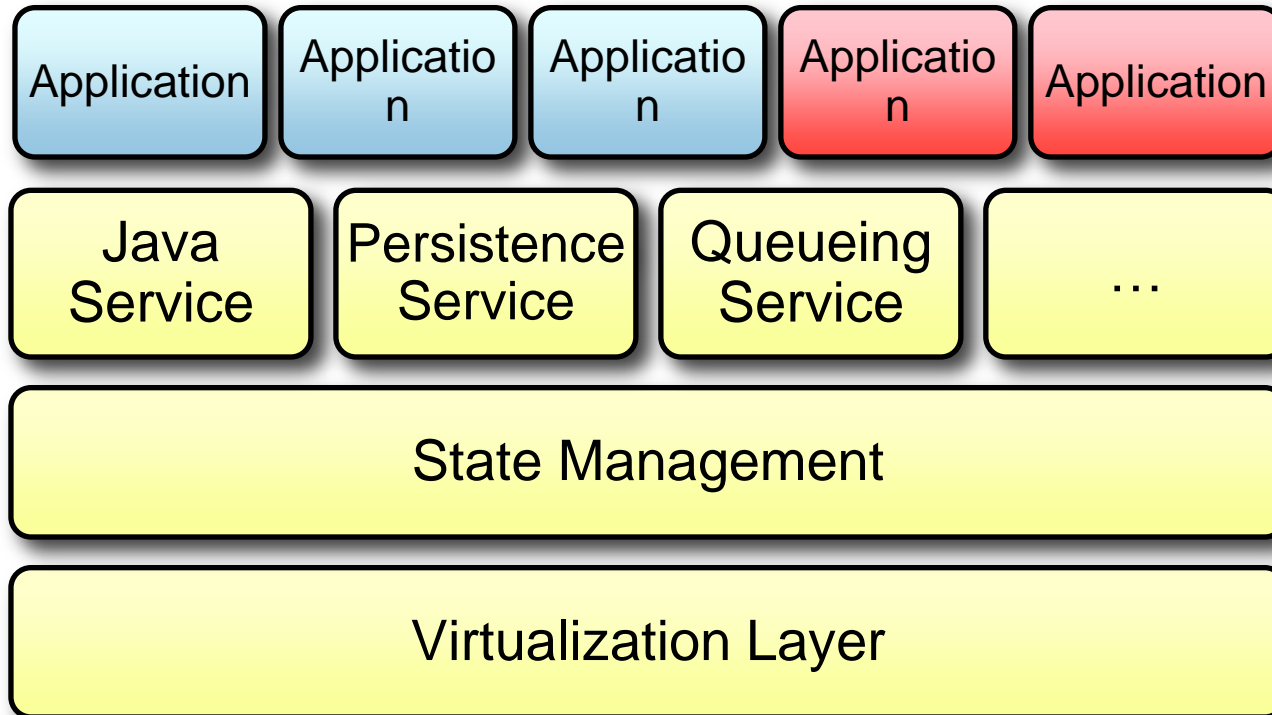
Better Packaging for the Cloud

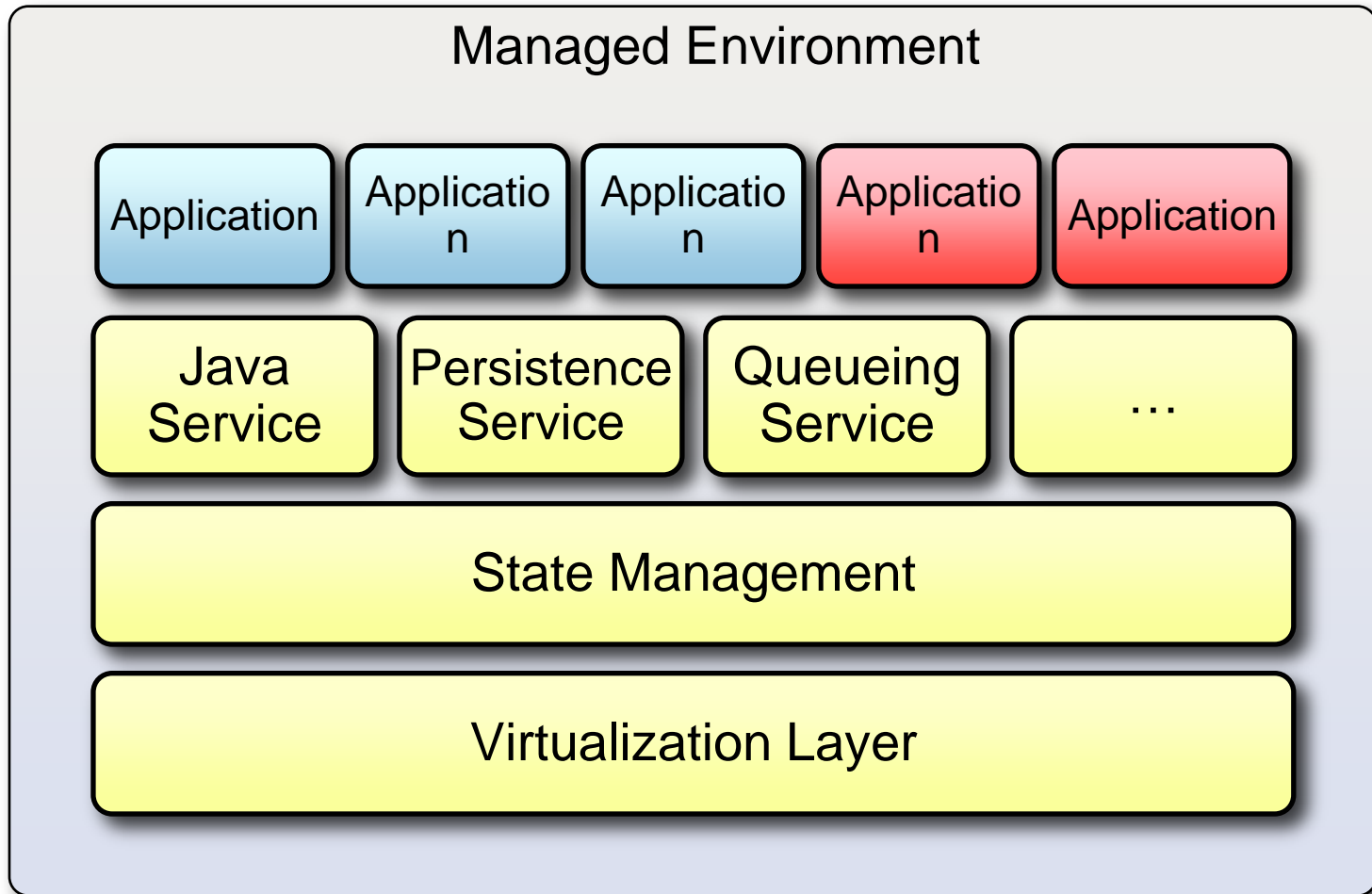
- Apps are versioned
- Multiple versions can coexist
- Must deal with data versioning, upgrades, etc.
- Need ability to specify QoS properties
- Apps both expose and connect to services











PaaS Support

- New roles:
 - PaaS Provider, PaaS Customer (Tenant), Application Administrator, End-User
- Multitenancy
 - Application does not directly manage the association to a tenant
 - Containers may use e.g. virtual servers to map a request to a tenant
 - Containers and resource managers cooperate to propagate tenant identity across tiers
- Extensible descriptor for service metadata (e.g. QoS)
- Connectionless APIs for convenience

Modularity

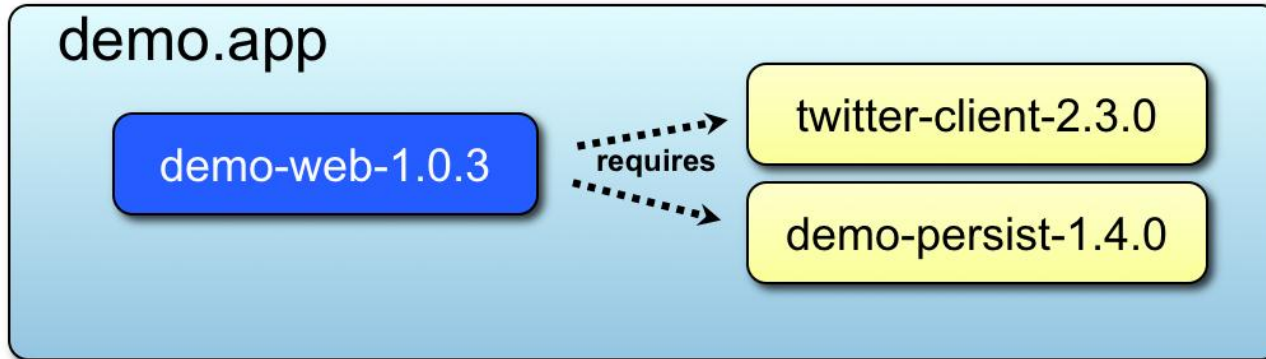
- Deliver modularity metadata ahead of Java SE 8
- Alignment with SE 8 is essential
- Use cases:
 1. Enable easy updating of an API to the latest version
 2. Support applications composed of versioned modules
- Full modularity support deferred to EE 8
 - Classloader changes

Modular Applications

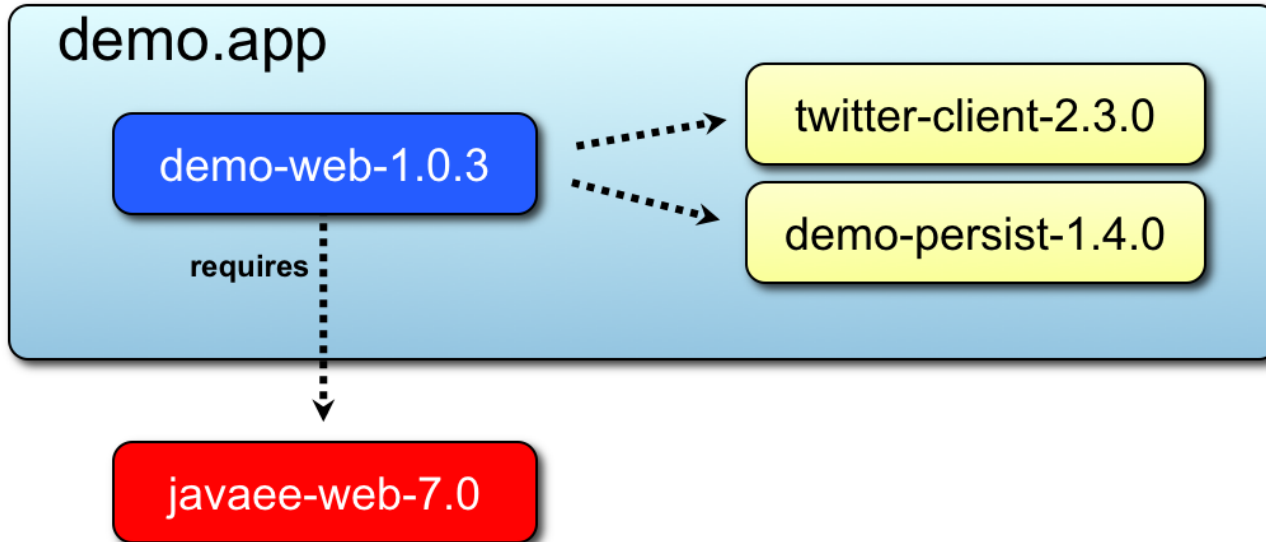
demo.app

demo-web-1.0.3

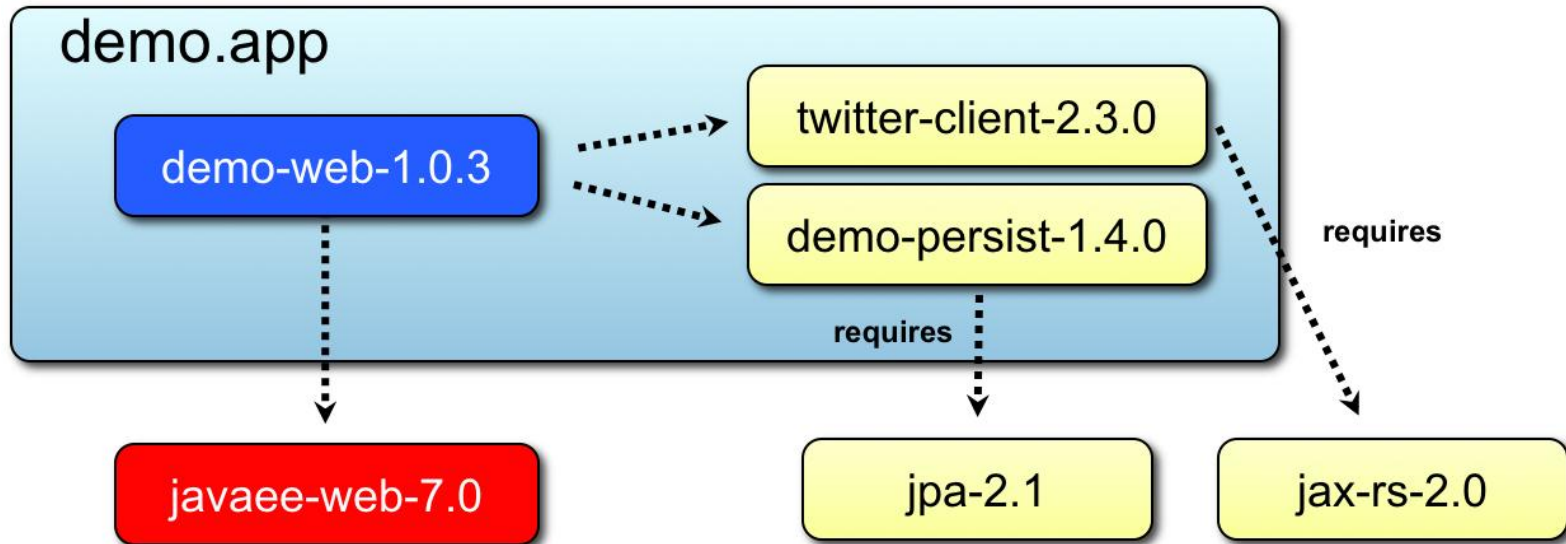
Modular Applications



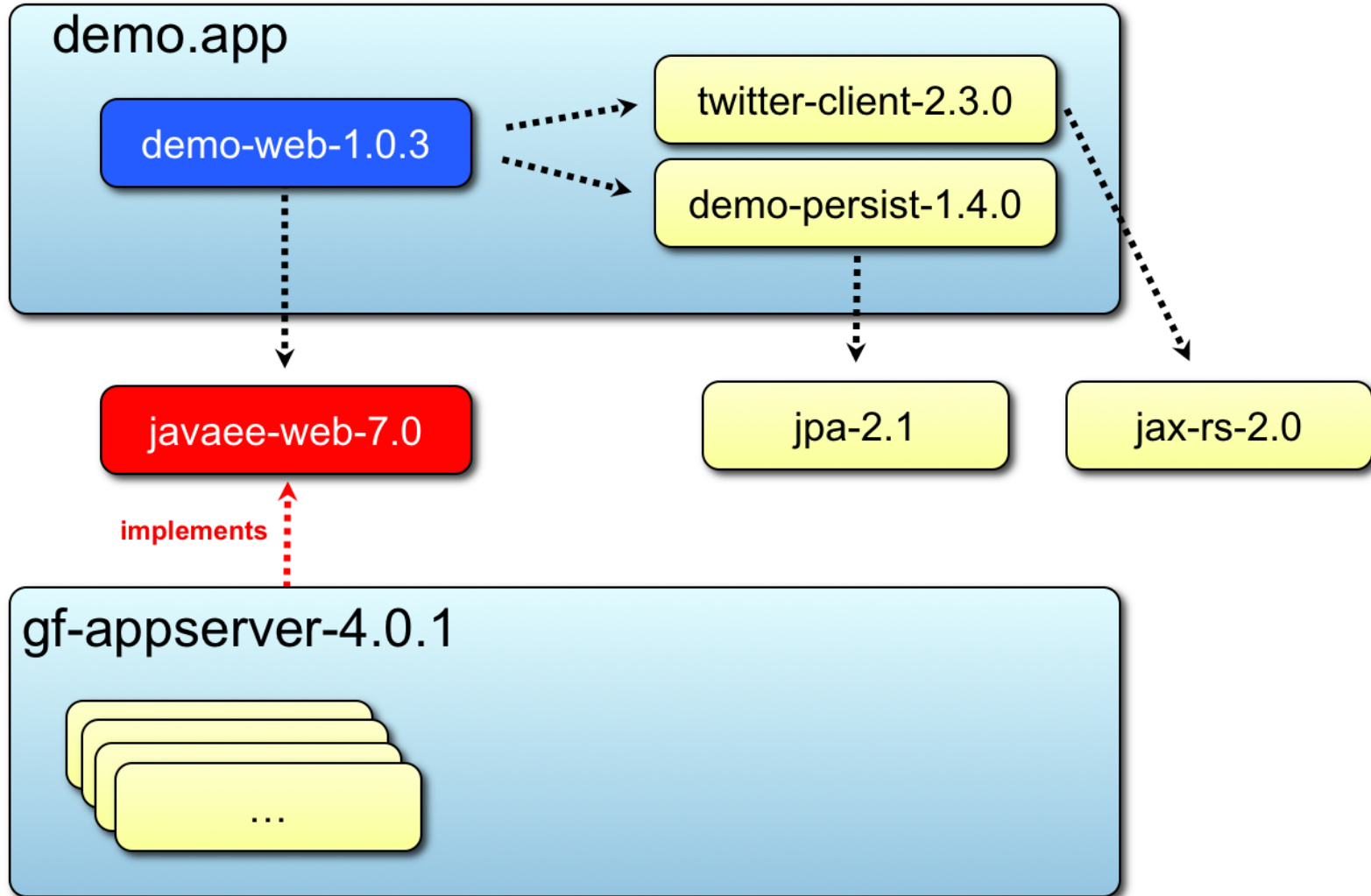
Modular Applications



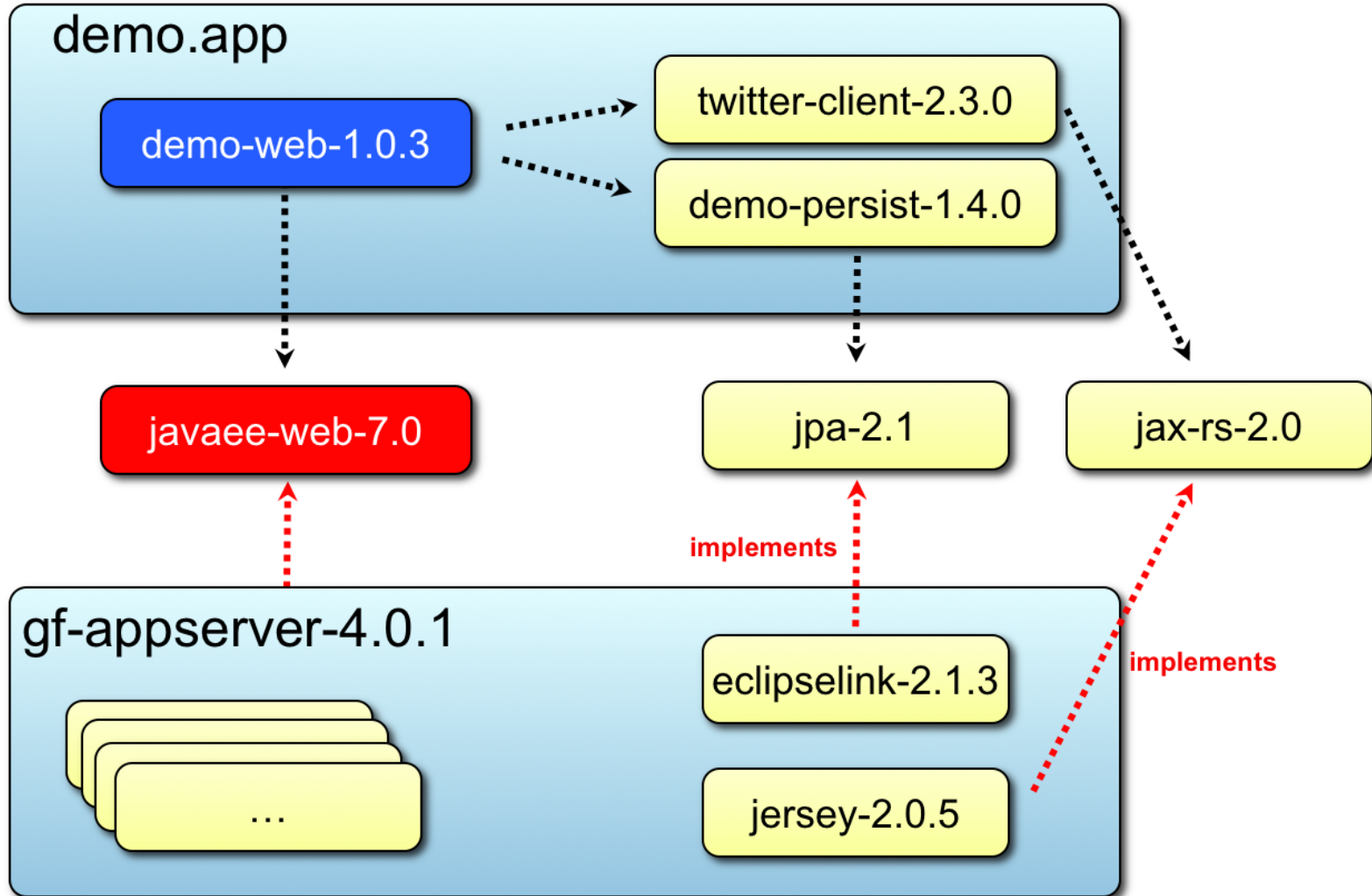
Modular Applications



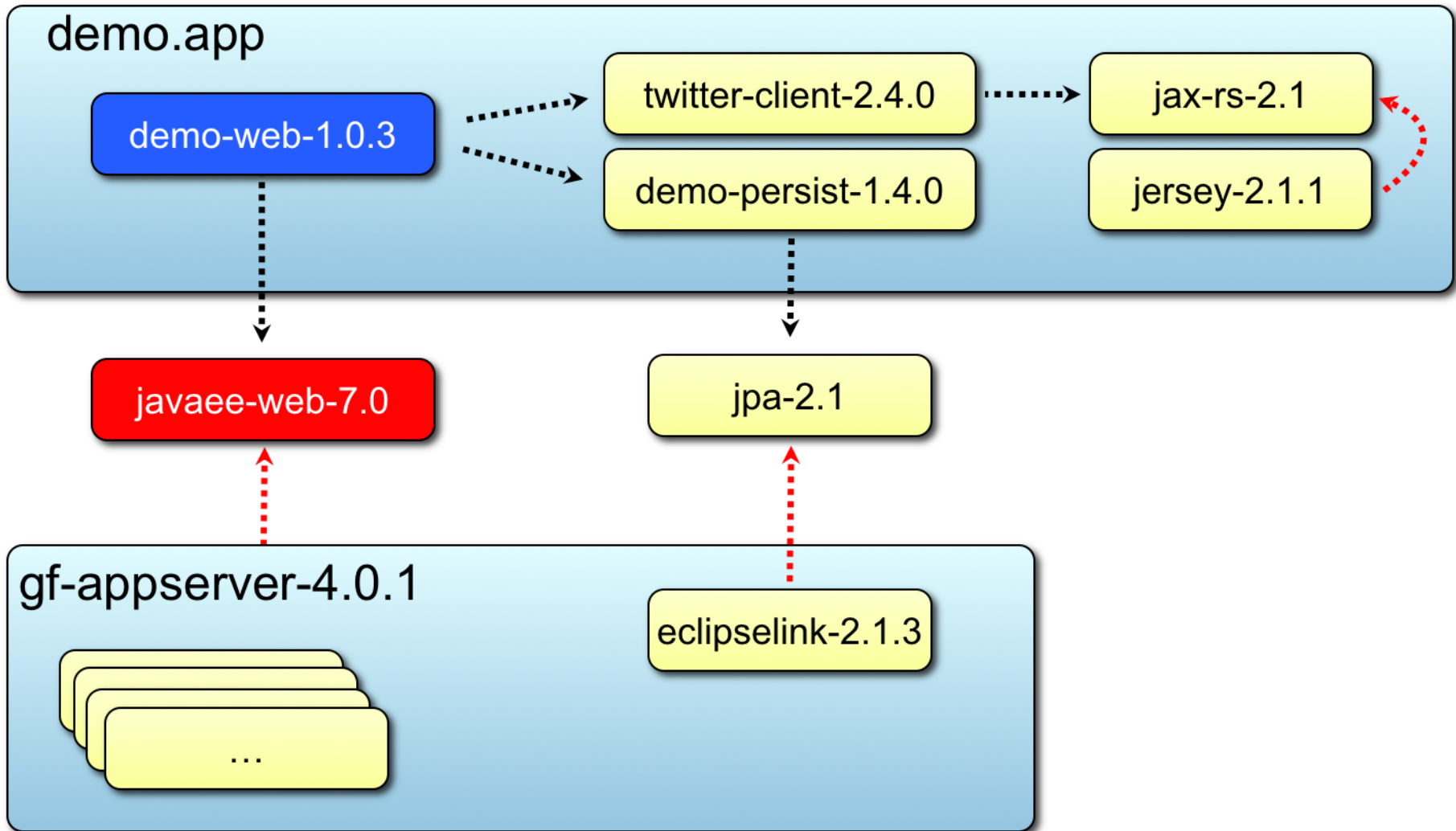
Modular Applications



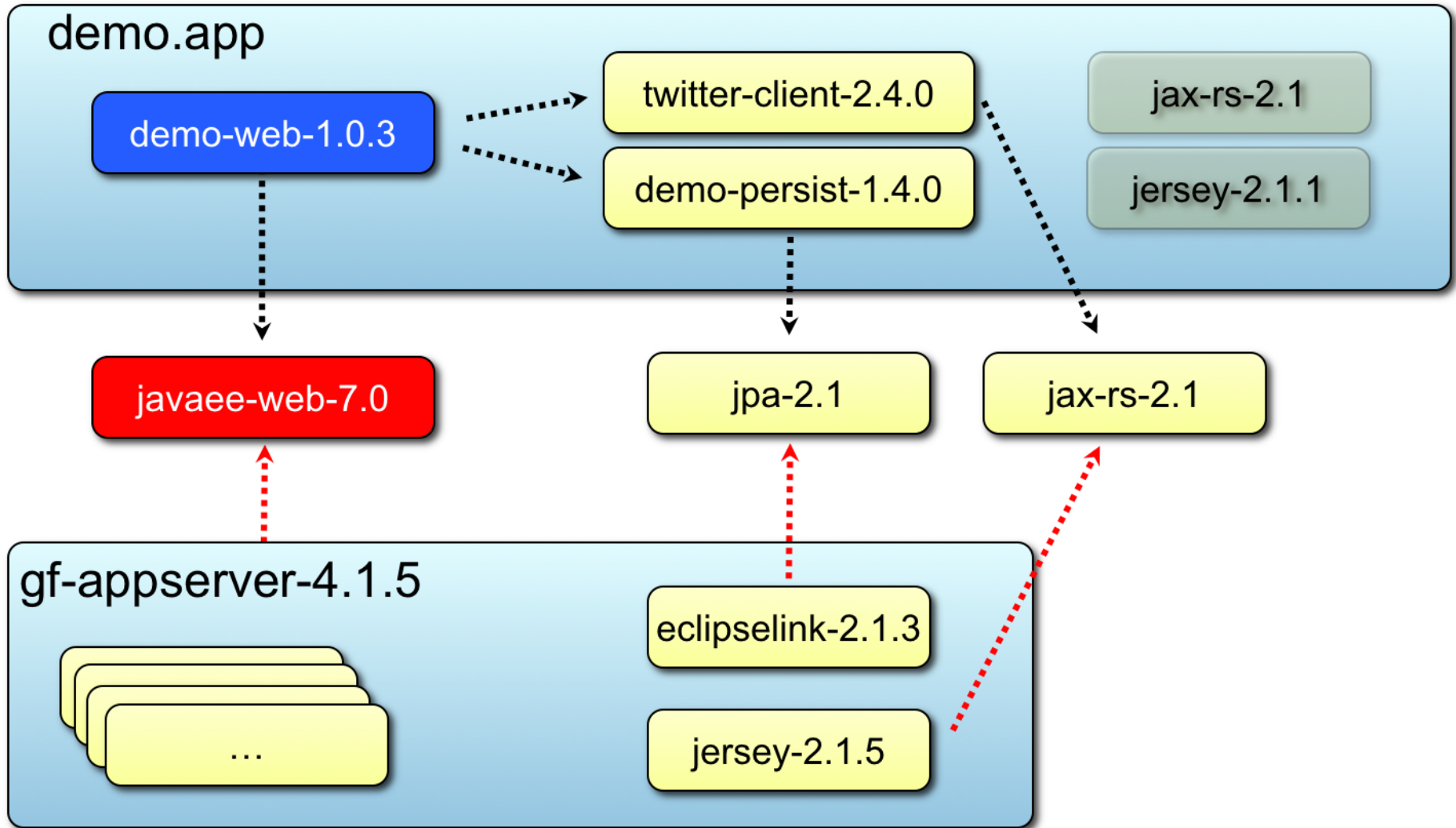
Modular Applications



Modular Applications



Modular Applications



Web Tier

- Web socket support in the servlet container
- Standard JSON API
- HTML5 support in JSF
- NIO.2-based web container
- Update the Web Profile definition
 - JAX-RS 2.0 will be a required component

New APIs

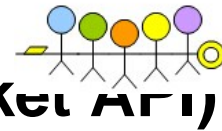
- Concurrency Utilities (JSR-236)
 - E.g. a transaction-, security-, naming-aware ExecutorService
- JCache (JSR-107)
 - Local cache API, a key-value map
 - Needs to be aligned with the JPA Cache API
- JMS 2.0
 - Brings annotation-based programming model to JMS
- JSON 1.0
- RESTful client API in JAX-RS 2.0

RESTful Client API (using Jersey)

```
WebResource r = Client.create().resource("http://example.com");
WebResource content = r.path("containers").path("quotes");
content.path("1")
    .type(MediaType.TEXT_PLAIN)
    .put("Something is rotten in the state of Denmark");

ClientResponse response = content.path("1")
    .header("If-Modified-Since", lastModified)
    .header("If-None-Match", etag)
    .get(ClientResponse.class);

assertEquals(Response.Status.NOT_MODIFIED,
    response.getResponseStatus());
```

Web Socket Sample (using Grizzly WebSocket API)

```
public class ChatApplication
    extends WebSocketApplication<ChatWebSocket> {
    protected ChatWebSocket createWebSocket(Connection c,
                                           ServerWebSocketMeta m) {
        return new ChatWebSocket(c, m, this);
    }
    public void onMessage(ChatWebSocket s, DataFrame frame) {
        String msg = frame.getAsText();
        s.sendJson(s.getUser(), msg);
    }
    public void onClose(ChatWebSocket s) {
        s.sendJson("system", s.getUser() + " left the chat");
    }
}
```

Async Web API Sample (with Atmosphere)

```
@Path("/{topic}")
@Produces("text/plain;charset=ISO-8859-1")
public class PubSub {
    private @PathParam("topic") Broadcaster topic;

    @GET @Suspend
    public Broadcastable subscribe() {
        return new Broadcastable("", topic); }

    @POST @Broadcast
    @Consumes(MediaType.APPLICATION_FORM_URLENCODED)
    public Broadcastable publish(
        @FormParam("message") String message) {
        return new Broadcastable(message, topic);
    }
}
```

JPA 2.1 Candidate Features

- Converters / custom types
- “Fetch” plans / profiles
- Additional mapping metadata
- User-defined naming strategies
- More flexibility in use of generated values
- Immutable attributes; readonly entities
- More flexible XML descriptors
- Additional event listeners and callbacks
- Improved control of persistence context synchronization
- Support for dynamic definition of persistence unit
- Extension of Metamodel API to ORM
- Methods for dirty detection
- Additional unwrap methods
- Support for stored procedures
- Additional built-in functions
- Database and vendor function invocation support
- Downcasting
- Outer joins with ON conditions
- Update and delete criteria queries
- Mapping between JPQL and criteria queries
- Improved result type mapping for native queries

Java EE 7 JSRs

Approved

- JPA 2.1
- JAX-RS 2.0
- Servlet 3.1
- EL 3.0
- Platform 7 / Web Profile 7
- JMS 2.0
- JSF 2.2

Ongoing

- Concurrency Utilities 1.0
- JCache 1.0

Yet to be filed

- EJB 3.2
- CDI 1.1
- JSR-330 1.1
- Bean Validation 1.1
- JSON 1.0

Transparency

- High level of transparency for all EE JSRs
- One java.net project per specification
 - E.g. jax-rs-spec, jpa-spec
- Publicly viewable, archived EG mailing list
- Jcp.org mailing list for administrative/confidential info
- Users list gets a copy of all emails to the EG
- JIRA for issue tracking
- Download area

Schedule

- First seven JSRs already approved
- Remaining ones to be filed in the coming weeks
- Final release by Q3 2012
- Date-driven release: anything not ready will be deferred to Java EE 8

Questions?

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