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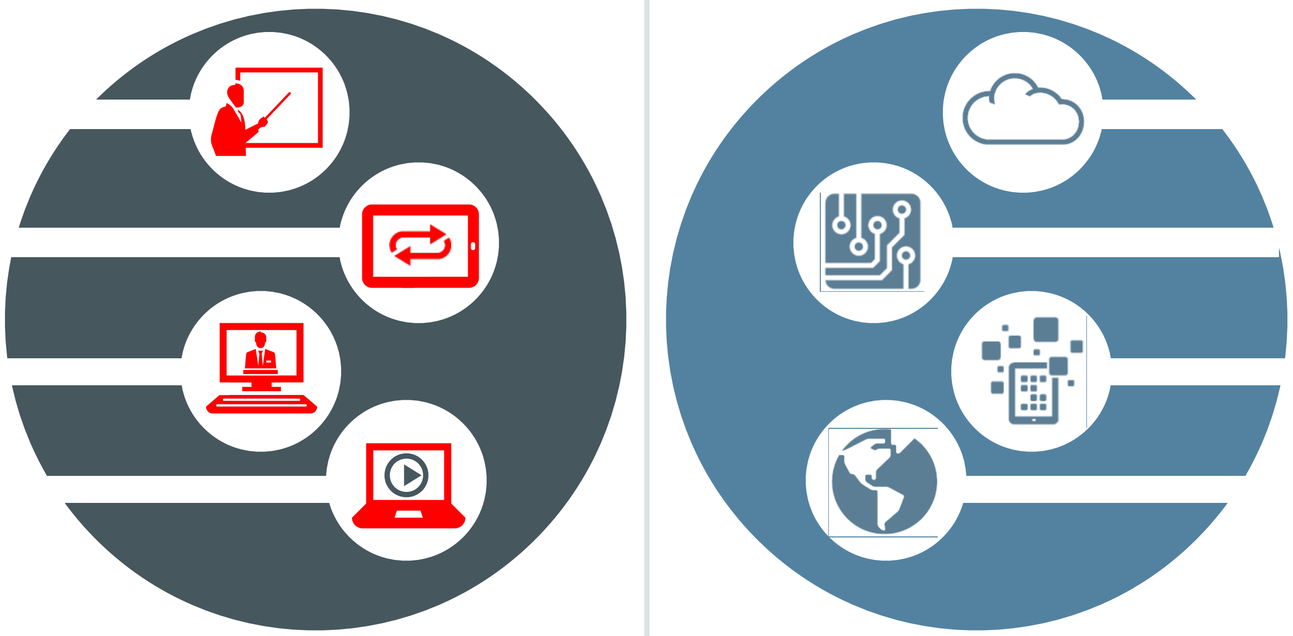

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New and Noteworthy in Jersey 2

Petr Janouch
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Oracle, Application Server Group
October 28, 2015

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Goals of The Presentation

- To show new additions to Jersey project
- To demonstrate some lesser-known features
- To show where the project is heading

Jersey 2 update

- Jersey 2 provides reference implementation of JAX-RS 2.0
- Included in GlassFish 4.x
- And in WebLogic 12.1.3 (Jersey 2 as a shared library)
- And in WebLogic 12.2.1
- Provides ouf-the-box support for other containers
- 2.22.1 is the current version

Notable additional features

- Integration with various HTTP containers and client transports
- Support for SSE
- MVC view templates
- Reactive/Async Client ★
- Security
- Test Framework
- Monitoring and Tracing ★
- Various data bindings

Agenda

1. Performance improvements
2. Weld SE support
3. Client on Android
4. Dynamic reloading example
5. Jersey 3.x

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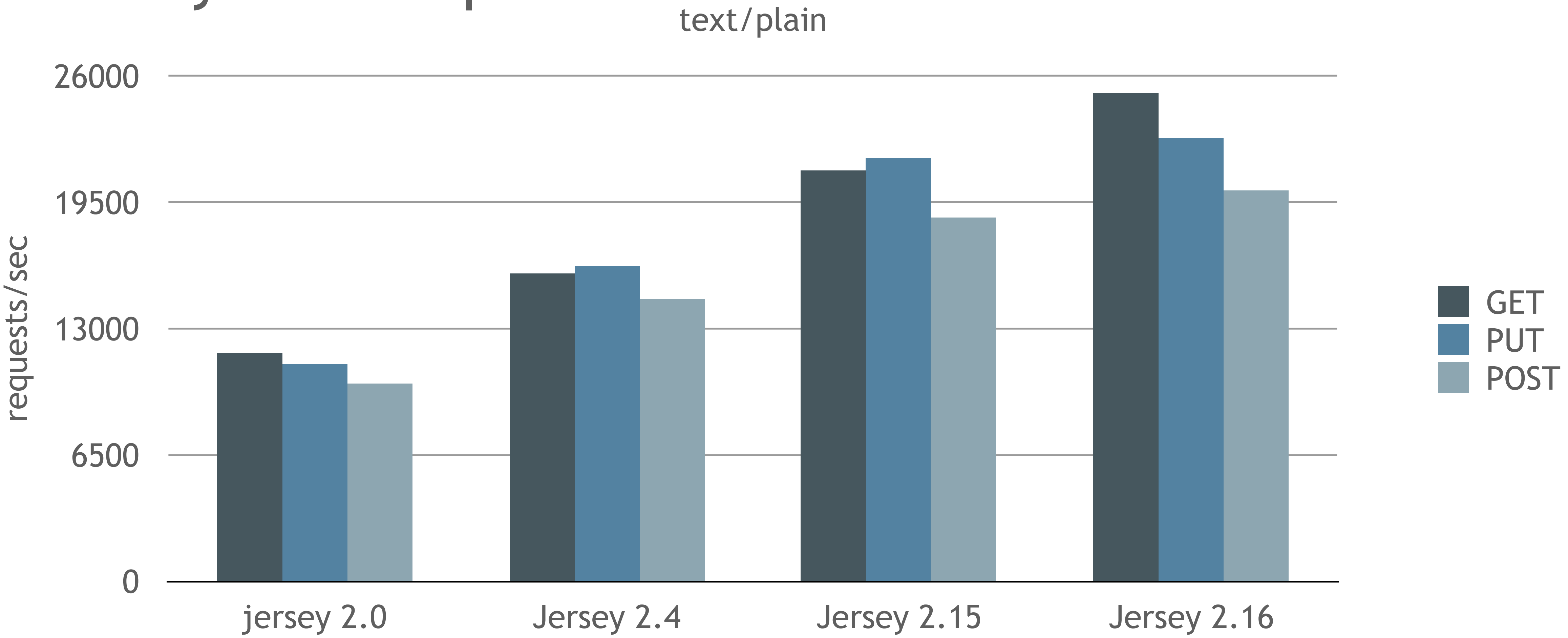
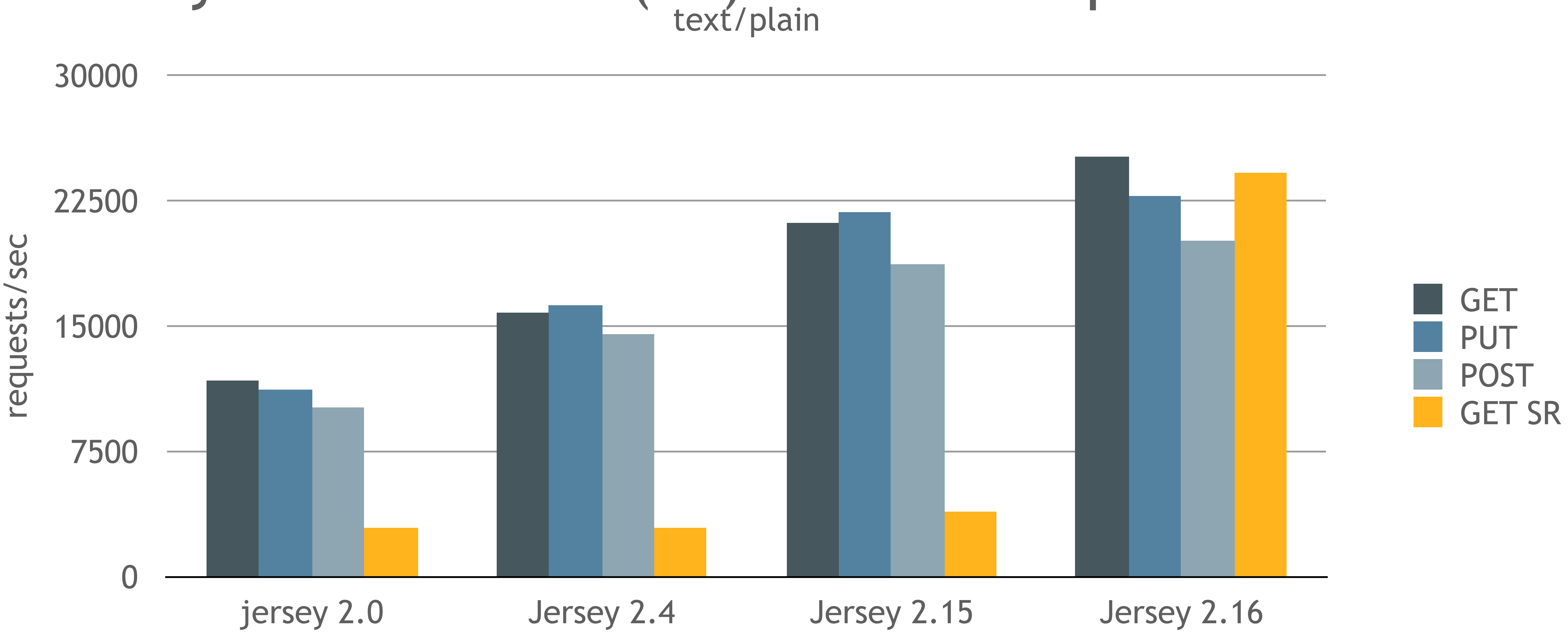
Jersey core improvements



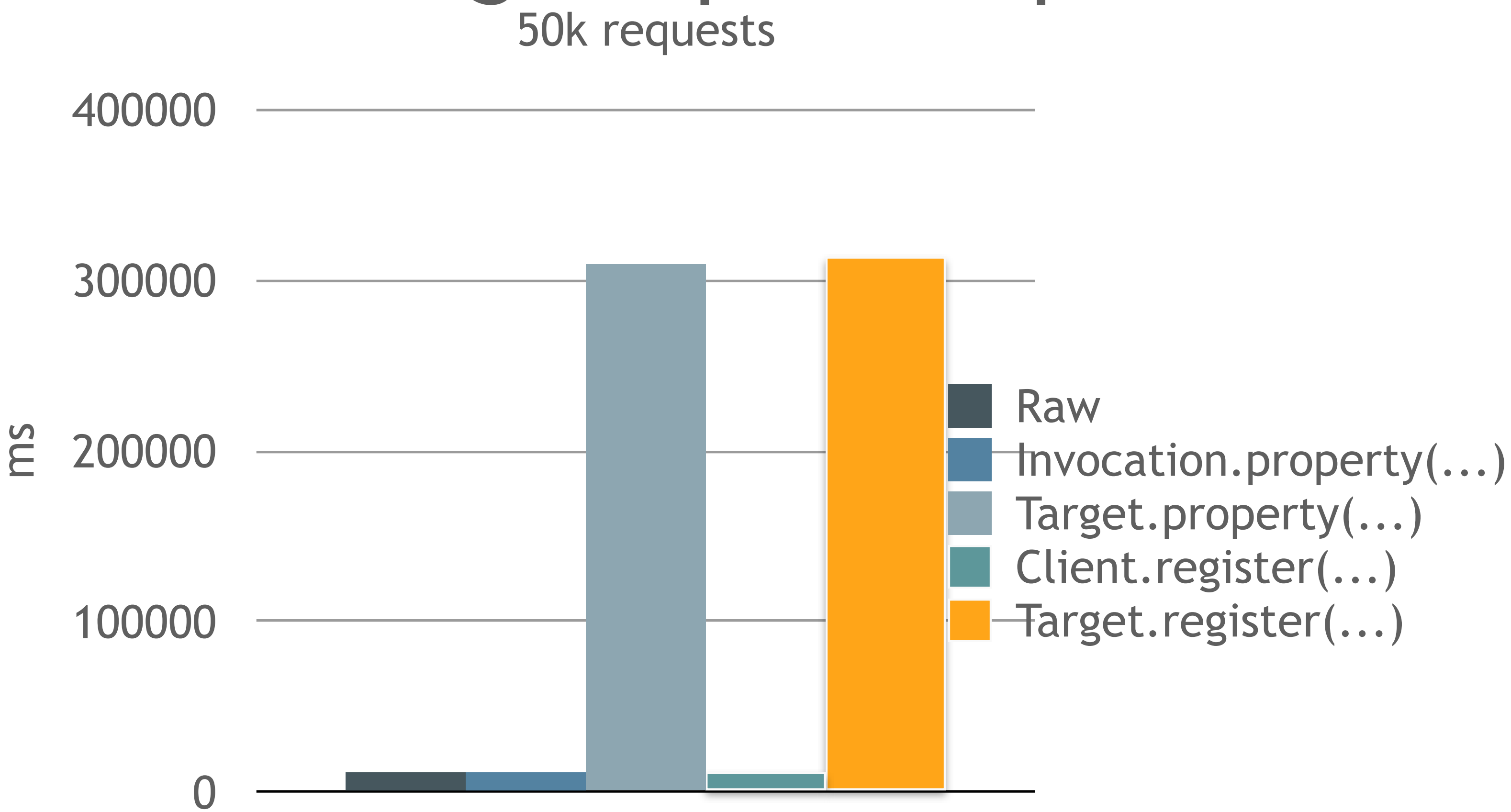
Subresource reminder

```
@Path(“resource”)
public class Resource {

    @GET
    @Path("hello")
    public String getHello() {
        return "Hello from Sub-Resource Method";
    }

    @Path("subresource")
    public SubResource getSubResource() {
        return new SubResource();
    }
}

public class SubResource {
    @GET
    public String getHello() {
        return "Hello, from Sub-Resource Locator";
    }
}
```

Jersey sub-resource (SR) locators improvements



Client usage impact on performance (Noteworthy)



```
c = ClientBuilder.newClient()
t = c.target(“www.acme.com”)

// raw:
t.request().get();

// Invocation.property:
t.request.property(…)

// Target.property(…)
t.property(…)
```

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Weld (CDI) SE support

- CDI 1.2 linked to Java EE container
- Weld SE
  - DI with qualifiers and alternatives
  - @ApplicationScoped, @Dependent, @Singleton scopes
  - Interceptors and decorators
  - Stereotypes
- Jersey adds @RequestScoped

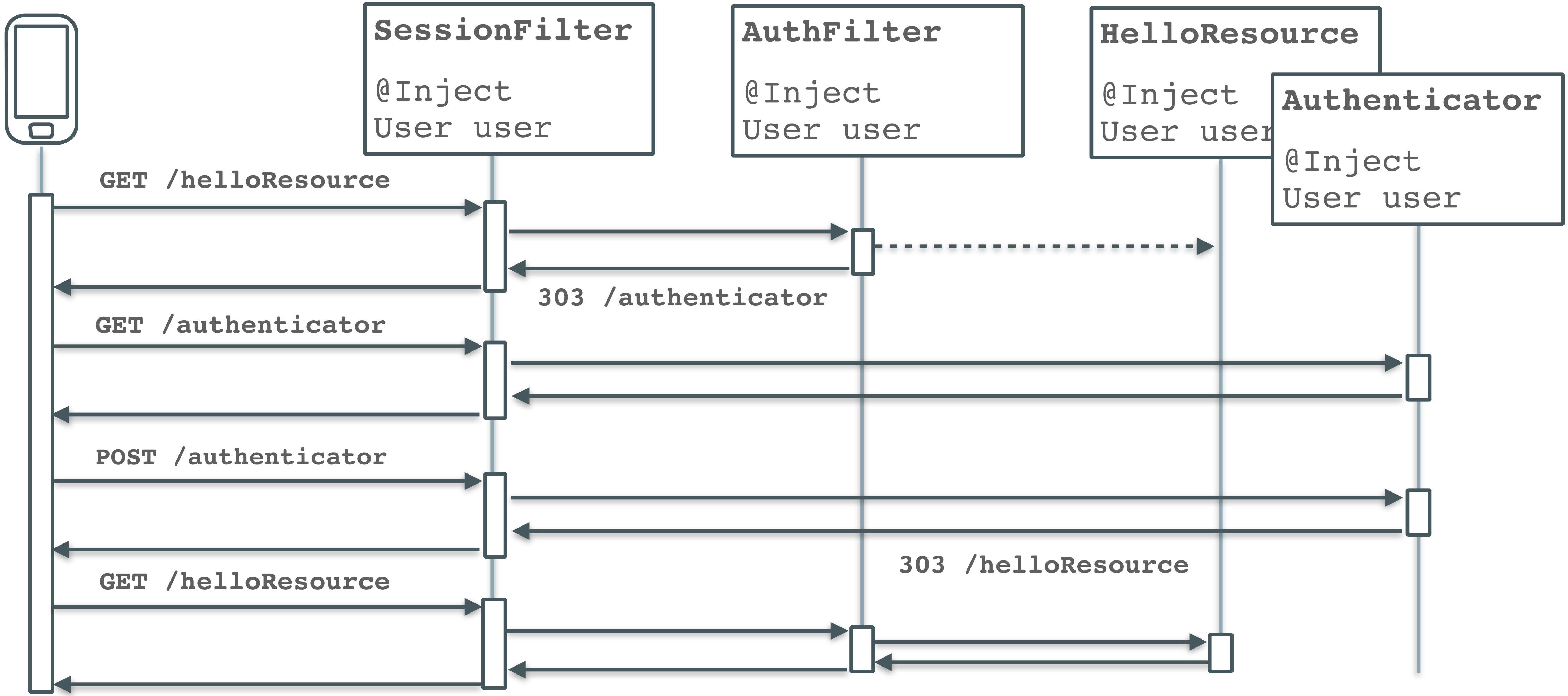
Weld SE integration

```
Weld weld = new Weld();
weld.initialize();

HttpServer httpServer = GrizzlyHttpServerFactory.createHttpServer(myUri, new
MyApp(), true);

public MyApp() extends ResourceConfig {super(HelloResource.class);}

Path(“hello”)
@RequestScoped
public class HelloReource {

    @GET
    public String sayHello() {
        return “Hello”;
    }
}
```

Weld SE demo

- Integration with various HTTP containers and client transports ★
- Support for SSE
- MVC view templates ★
- Reactive/Async Client
- Security ★
- Test Framework
- Monitoring and Tracing
- Various data bindings

Weld SE demo


SessionFilter
@Inject
User user
AuthFilter
@Inject
User user
HelloResource
@Inject
User user
Authenticator
@Inject
User user
GET /helloResource
303 /authenticator
GET /authenticator
POST /authenticator
303 /helloResource
GET /helloResource

Weld SE demo

```
@RequestScoped
public class User {
    private String name;
    private boolean authenticated = false;

    . . .
}

@RequestScoped
public class OriginalDestination {
    private URI uri;

    . . .
}

@NameBinding
@Retention(RetentionPolicy.RUNTIME)
public @interface FormAuthenticated {}
```

Weld SE demo

```
@Priority(100)
public class SessionFilter implements ContainerRequestFilter, ContainerResponseFilter {

    @Inject private User user;
    @Inject private OriginalDestination originalDestination;
    @Inject private Session session;

    public void filter(ContainerRequestContext requestContext) {
        User.fillFromSession(user, session);
        OriginalDestination.fillFromSession(originalDestination, session);
    }

    public void filter(ContainerRequestContext requestContext, ContainerResponseContext responseContext){
        if (user.isAuthenticated()) {
            user.storeInSession(session);
        } else {
            if (originalDestination.getUri() != null) {
                originalDestination.storeInSession(session);
            }
        }
    }
}
```

Weld SE demo

```
@Priority(200)
@FormAuthenticated
public class AuthenticationFilter implements ContainerRequestFilter {

    @Inject private User user;
    @Inject private OriginalDestination originalDestination;

    public void filter(final ContainerRequestContext requestContext) {
        if (!user.isAuthenticated()) {
            originalDestination.setUri(
                requestContext.getUriInfo().getRequestUri());
            requestContext.abortWith(Response.seeOther(
                UriBuilder.fromResource(Authenticator.class).build())
                .build());
        }
    }
}
```

Weld SE demo

```
@RequestScoped
@Path("/hello")
public class HelloResource {

    @Inject private User user;

    @FormAuthenticated
    @GET
    @Produces(MediaType.TEXT_HTML)
    public Viewable sayHello() {
        Map<String, String> binding = new HashMap<>();
        binding.put("user", user.getName());
        return new Viewable("/freemarker/hello", binding);
    }
}
```

Weld SE demo

```
@ApplicationScoped
@Path("authentication")
public class Authenticator {

    @Inject private OriginalDestination originalDestination;
    @Inject private User currentUser;

    @GET
    @Produces(MediaType.TEXT_HTML)
    public Viewable getLoginPage() {
        return new Viewable("/freemarker/authentication");
    }

    @POST
    @Produces(MediaType.TEXT_HTML)
    public Object handleLogin(@FormParam("username") String userName, @FormParam("password") String password) {
        if (authenticate(userName, password)) {
            return Response.seeOther(originalDestination.getUri()).build();
        }

        Map<String, Object> binding = new HashMap<>();
        binding.put("errorMessage", "Invalid username and password combination");
        return new Viewable("/freemarker/authentication", binding);
    }
}
```

Weld SE demo

```
public class MyApp extends ResourceConfig {

    public MyApp() {
        super(Authenticator.class, HelloResource.class,
            AuthenticationFilter.class, SessionFilter.class);
        register(FreemarkerMvcFeature.class);
    }

    public static void main(String[] args) throws Exception {
        Weld weld = new Weld();
        weld.initialize();

        HttpServer httpServer = GrizzlyHttpServerFactory
            .createHttpServer("http://localhost:8080", new MyApp(), false);
       httpServer.start();
        System.in.read();
    }
}
```

Weld SE demo summary

- https://github.com/PetrJanouch/JavaOne2015-Weld-SE-demo

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1 Performance improvements

2 Weld se support

3 Client on Android

4 Dynamic reloading example

5 Jersey 3.x

Jersey client primer

```
Client client = ClientBuilder.newClient(new ClientConfig()
            .register(MyClientResponseFilter.class)
            .register(new AnotherClientFilter()));

String entity = client.target("http://example.com/rest")
            .register(FilterForExampleCom.class)
            .path("resource/helloworld")
            .queryParam("greeting", "Hi World!")
            .request(MediaType.TEXT_PLAIN_TYPE)
            .header("some-header", "true")
            .get(String.class);
```

Jersey client - features

- Fluent API
- Many connectors (Grizzly, Jetty, Apache, …)
- Secure (SSL, Digest, Basic, OAuth, …)
- Various data bindings
- Filters
- Reactive extensions

Jersey client on Android

- JAX-B refactored from core into a separate module (in 2.16)
- But some references to JDK dark corners still remain:

```
$jdeps -P jersey-client-app-with-dependencies
    . . .
      -> javax.activation                                   Full JRE
    . . .
      -> javax.imageio                                      Full JRE
      -> javax.imageio.spi                                  Full JRE
      -> javax.imageio.stream                               Full JRE
    . . .
```

Jersey client on Android - workaround

```
public static class AndroidFriendlyFeature implements Feature{

  @Override
  public boolean configure(FeatureContext context) {
      context.register(new AbstractBinder() {
          @Override
          protected void configure() {
              addUnbindFilter(new Filter() {
                  @Override
                  public boolean matches(Descriptor d) {
                      String implClass = d.getImplementation();
                      return implClass.startsWith(
                        "org.glassfish.jersey.message.internal.DataSource")
                       || implClass.startsWith(
                        "org.glassfish.jersey.message.internal.RenderedImage");
                  }
              });
          }
      });
      return true;
  }
}

client = ClientBuilder.newClient().register(AndroidFriendlyFeature.class);
```

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Dynamic reloading example

- Jersey application can be forced to reload itself
- Used mainly for updating configuration
- Can be used to speed up development? Yes

Dynamic reloading example

```
ResourceConfig resourceConfig = createResourceConfig(new File(configFileName));
resourceConfig.registerInstances(new ContainerLifecycleListener() {

    public void onStartup(final Container container) {
        this.container = container;
        Timer t = new Timer(true);
        t.schedule(new FileCheckTask(), 0);
    }
}

private void reloadApp(final File configFile) {
    ResourceConfig rc = createResourceConfig(configFile);
    this.container.reload(rc);
}
```

Dynamic reloading example

```
public class AppClassLoader extends ClassLoader {

    private final Map<String, ClassFile> classFiles = new HashMap<>();

    @Override
    public Class<?> loadClass(String name) throws ClassNotFoundException {
        /* we are cheating here, the parent already has the class,
           but we prefer our bytecode to be used. */
        ClassFile cc = classFiles.get(name);
        if (cc == null) {
            return super.loadClass(name);
        }
        byte[] byteCode = cc.getByteCode();
        return defineClass(name, byteCode, 0, byteCode.length);
    }
}
```

Dynamic reloading example

```
Class<?> compile(String className, SimpleJavaFileObject sourceCode){
    ClassFile classFile = new ClassFile(className);
    List<SimpleJavaFileObject> compilationUnits = Arrays.asList(sourceCode);
    AppClassLoader cl = new AppClassLoader(
    Thread.currentThread().getContextClassLoader());
    FileManager fileManager = new FileManager(
        javac.getStandardFileManager(. . .), Arrays.asList(classFile), cl);
    CompilationTask task = javac.getTask(null, fileManager, null,
        getClOptions(), null, compilationUnits);
    task.call();
    return cl.loadClass(className);
}
```

Dynamic reloading example summary

- https://github.com/jersey/jersey/tree/master/examples/reload

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Jersey 3.0

- Jersey 2.x branched off and 3.x on the master
- Based on JAX-RS 2.1
  - Non-blocking IO
  - SSE support
  - Support for reactive programming
- Java 8 friendly
- Backwards compatible with 2.x

Asynchronous Jersey - reminder

- JAX-RS can be partially asynchronous:

```
@GET
public void asyncGet(@Suspended AsyncResponse ar) {
    client.target("someOtherService").request().async()
        .get(new InvocationCallback<String>() {
            public void completed(String result) {
                ar.resume(result);
            }
    . . .
}
```

- So what is left? I/O
  - based on InputStream, OutputStream

Servlet 3.1 non-blocking reminder

```
ServletInputStream inputStream = request.getInputStream();
inputStream.setReadListener(new ReadListener() {
    @Override
    public void onDataAvailable() throws IOException {
        while (inputStream.isReady()) {
            inputStream.read();
        }
    }

    @Override
    public void onAllDataRead() throws IOException {...}

    @Override
    public void onError(Throwable t) {...}
});
```

Non-blocking I/O

- Extra performance boost
- Inspired by but not based on Servlet 3.1
- Beneficial for large and streamed entities
- A brand new client connector
  - Getting rid of HttpUrlConnection
  - First version already in incubator
  - Much better performance than HttpUrlConnection even in blocking mode

Q/A