Java API for RESTful Web Services

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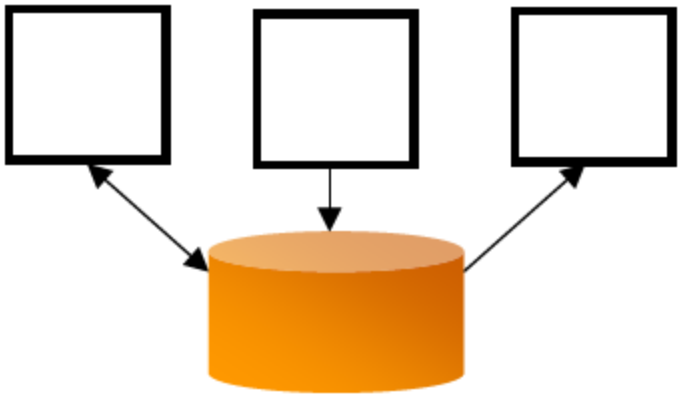
What is a Web Service?

- “Web page” supposed to be consumed by autonomous program instead web browser
- Designed for small scales and single trust domains
- Problem: communication among various services belonging to different trust domains

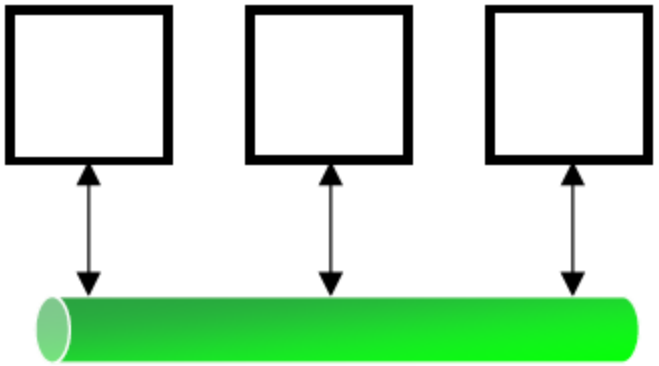
Software connectors

File Transfer



Shared Data

Procedure Call
Remote Procedure Call

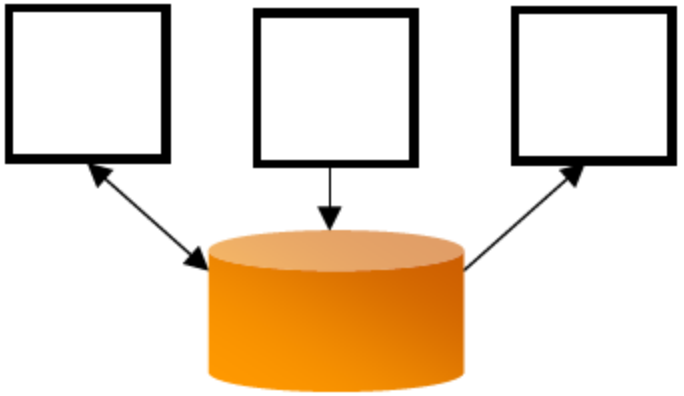


Message Bus
Events

Image taken from Cesare Pautasso, ECOWS'10

Software connectors

File Transfer



Shared Data

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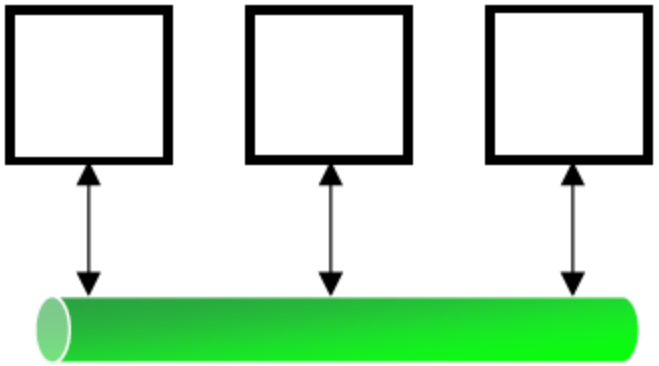
WS-* approaches



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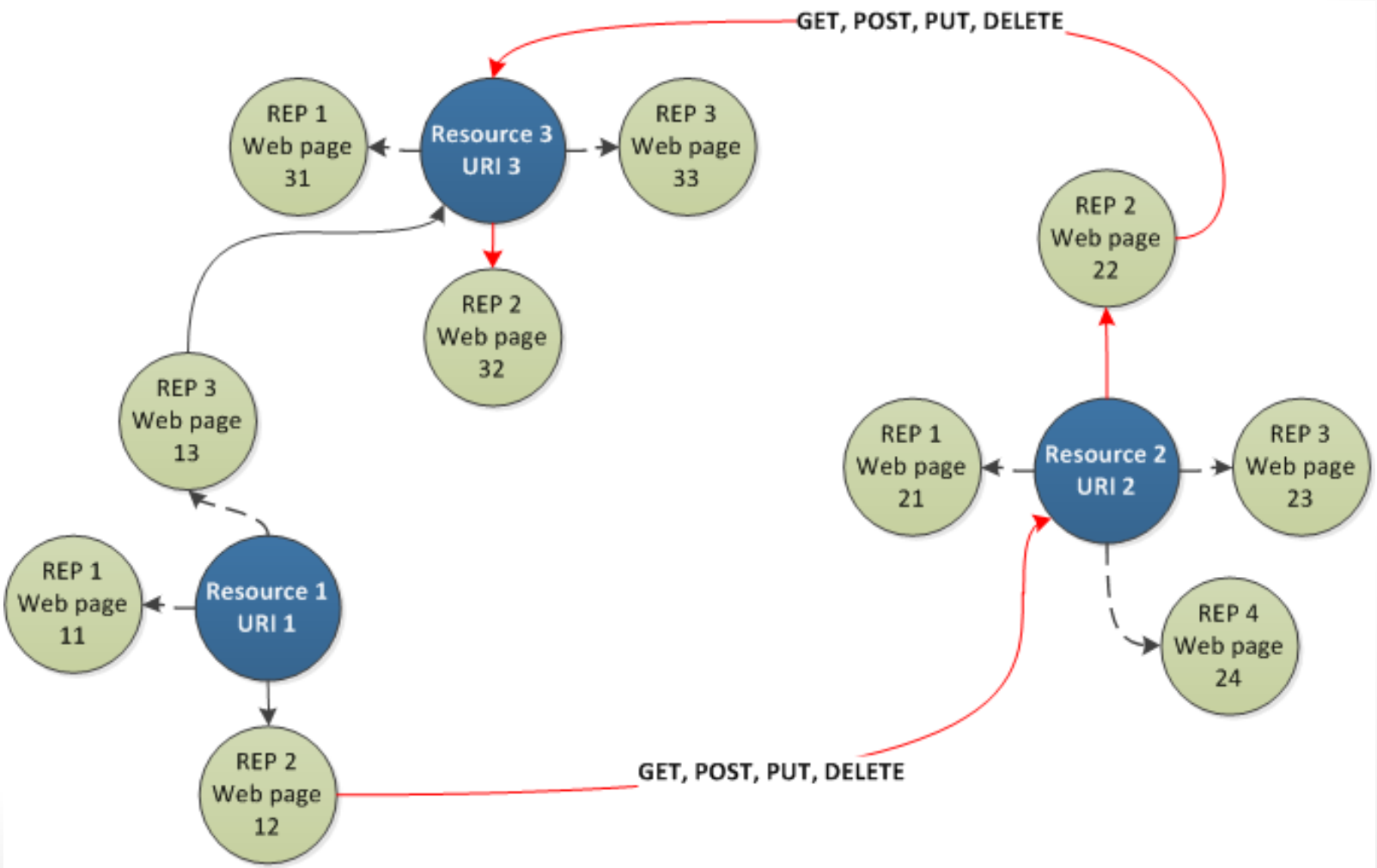
Internet URI language

- Online language, i.e. the collection of nouns and verbs
- Nouns are represented (equivalent) to URIs
- Verbs are general, they represent **actions among nouns:**
  - GET – get a resource
  - POST – create a resource - unsafe
  - PUT – create or update a resource
    DELETE – delete a resource

What is REST?

- **RE**presentational **S**tate **T**ransfer
- **Not** a platform or tool
- Just the way of representing already existing Web infrastructure
- Usually (not necessary) based on HTTP

REST “state machine”



WS* and REST comparison

Feature	REST	WS-*
Discovery	Referral	Centralized
Identification	Global	Context-based
Binding	Late	Late
Platform	Independent	Independent
Interaction	Asynchronous	Asynchronous
Model	Self-describing	Shared
State	Stateless	Stateless
Generated Code	None	Static
Conversation	Reflective	Explicit

JAX-RS API

- Java API designed to help in building REST applications
- Programmer just decorates Java methods with annotations:
  - 4 x CRUD operations (@GET, @POST, @PUT, @DELETE)
  - @Path
  - @HEAD
  - @PathParam
  - @QueryParam
  - @Consumes
  - @Produces

Example – client side

```
$.ajax({
        url: "/world/news/getNews/" + from + "/" + to
        type: "GET",
        dataType: "json",
        async: false,
        success: function (data) {
                self.data = data;
                //loading inbox…
        }
});
```

Example - server side

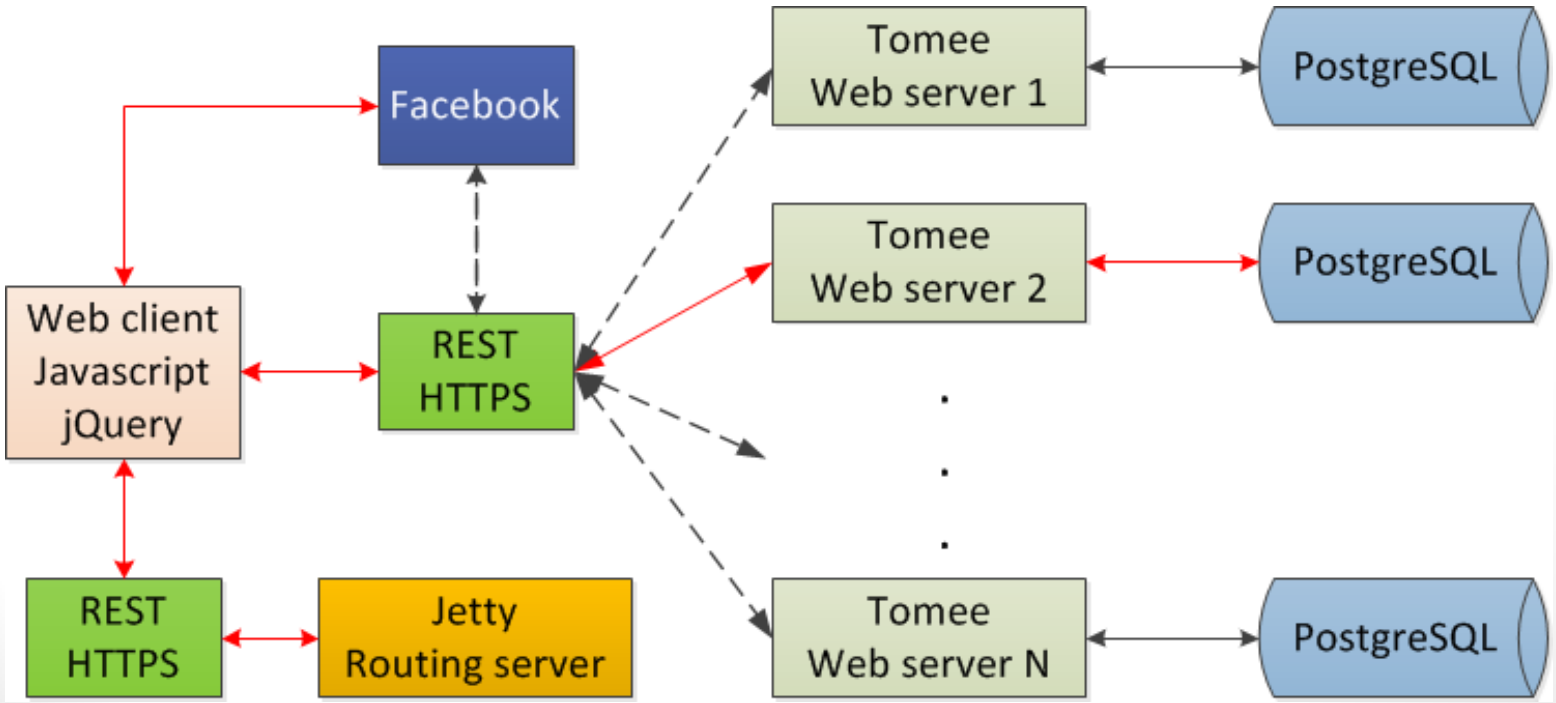
```
@Path("/news")
public class NewsREST {

        @EJB
        NewsService newsService;

        @GET
        @Path("/getNews/{from}/{to}")
        @Consumes("application/json")
        public Response getNews(@Context HttpServletRequest req,
                        @PathParam("from") Integer from,
                        @PathParam("to") Integer to) {
                        return newsService.getNews(from,to);
        }
…
}
```

Ongoing project that uses REST

- Online social game (will be released in October 2014)
- Real-time
- Several hundreds of REST procedures
- Scalable
- REST+JSON reduced overall bandwidth



Conclusions

- Easy to implement
- Scalable components interactions
- Independent deployment of connectors
- Reduced interaction latency
- Increased security – HTTPS
- Supports caches and proxies by default
- Enables transfers of unlimited size and type
  - Real-time applications
- General interfaces (GET, POST, PUT, DELETE)
- …

THANK YOU FOR ATTENTION.

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