Seam

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Road Map

- Background
- Seam
- Future

Advantages of JSF/JPA over Struts/EJB 2

- Fewer, finer grained artifacts
  - No DTOs required
  - Clean MVC
- Less noise
  - No Struts/EJB 2.x boilerplate code
  - No direct calls to HttpSession or HttpRequest
- Simple ORM
  - Even simpler than the Hibernate API!

Advantages of JSF/JPA over Struts/EJB 2

- JSF is flexible and extensible
  - Custom UI widget suites (open source)
  - Good AJAX support
- JPA
  - Powerful object/relational mapping, far beyond EJB 2.x CMP entity beans
- All components are POJO so easily testable with TestNG or JUnit

But, still some problems

- JSF
  - Backing bean couples layers and is just noise
  - Hard to refactor all the XML and String outcomes
  - No support for the business layer
  - Validation breaks DRY
  - XML is too verbose
- How do we write our business layer
  - EJB3? - can’t be used directly by JSF
  - EJB3? - no concept of scopes

And some more challenges

- Workflow
  - Ad-hoc back buttoning not suppored
  - No stateful navigation
  - Long running business processes?
- Multi-tab/window support is not built in
  - All operations happen in the session - leakage
  - No support for a conversation context
  - Memory leak - objects don’t get cleaned up quickly

Adding Seam

- Reference the entities directly!

```
 <h:form>
  Item:          <h:outputText value="#{itemEditor.id} />
  Name:          <h:inputText value="#{itemEditor.item.name}">
                   <f:validateLength maximum="255" />
                 </h:inputText>
  Price (EUR): <h:inputText value="#{itemEditor.item.price}"/>
                   <f:convertNumber type="currency" pattern="$###.##" />
                 </h:inputText>
  <h:messages />
  <h:commandButton value="Save" action="#{itemEditor.save}" />
</h:form>
```

Adding Seam

```
@Name("itemEditor") @Scope(CONVERSATION)
public class EditItemBean implements EditItem {

   @In EntityManager entityManager;

   Long id;
   Item item;
   // getter and setter pairs

   @Begin public String find(Long id) {
     item  = entityManager.find(Item.class, id);
     return item == null ? "notFound" : "success";
   }

   @End public String save(Item item) {
     item = entityManager.merge(item);
     return "success";
   }
 }
```

A **conversation** scoped Seam component

Begin and **End** a conversation - state is maintained over multiple requests between these methods

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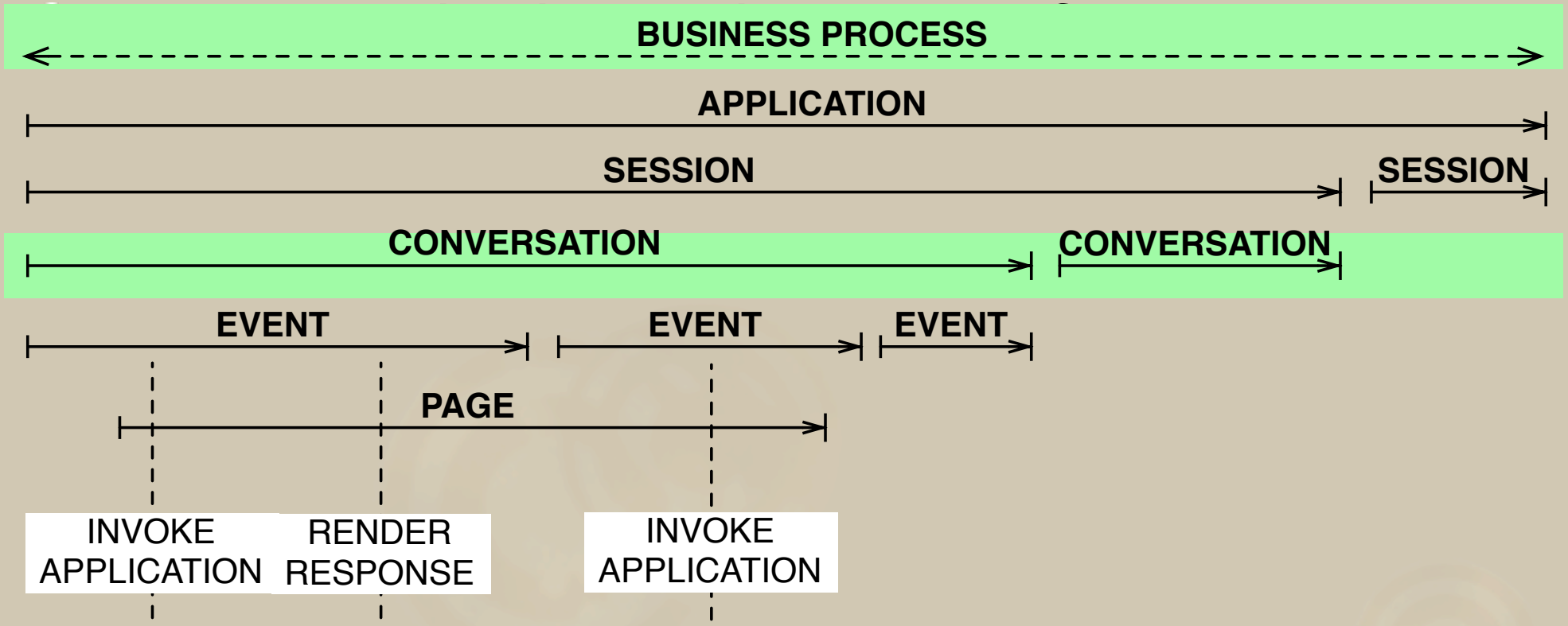
Contextual variables

- Contexts available in Seam
  - Event
  - Page
  - Conversation
  - Session
  - Business Process
  - Application

JSF lifecycle - quick review

- RESTORE VIEW: Restore the tree of UI components
- APPLY REQUEST VALUES: Synchronize request parameters with UI components
- PROCESS VALIDATIONS: Validate state of UI components
- UPDATE MODEL: Synchronize UI components with bound backing bean properties
- INVOKE APPLICATION: Notify action listeners, call action methods
- RENDER RESPONSE: Render a new tree of UI components

Application lifecycle



How is state stored?

- Seam provides hierarchical, stateful contexts
- Depends on the context:
  - Conversation context
    - Segmented HttpSession - times out if not used
  - Page context
    - Stored in the component tree of the JSF view (page)
    - Can be stored in HttpSession or serialized to client
  - Business Process context
    - Persisted to database, handled by jBPM

Bijection

- Seam provides hierarchical, stateful contexts
- (Dependency) Injection fine for stateless applications BUT stateful applications need bidirectional wiring. Think about aliasing a stateful object into a context

```
@Name("passwordChanger") public class PasswordChanger {

  @In EntityManager entityManager;

  @In @Out User currentUser;

  public void changePassword() {
    entityManager.merge(currentUser);
  }
}
```

Bijection: before the method call, inject the current user; after the method call, save it back into the context.

JPA Persistence Context

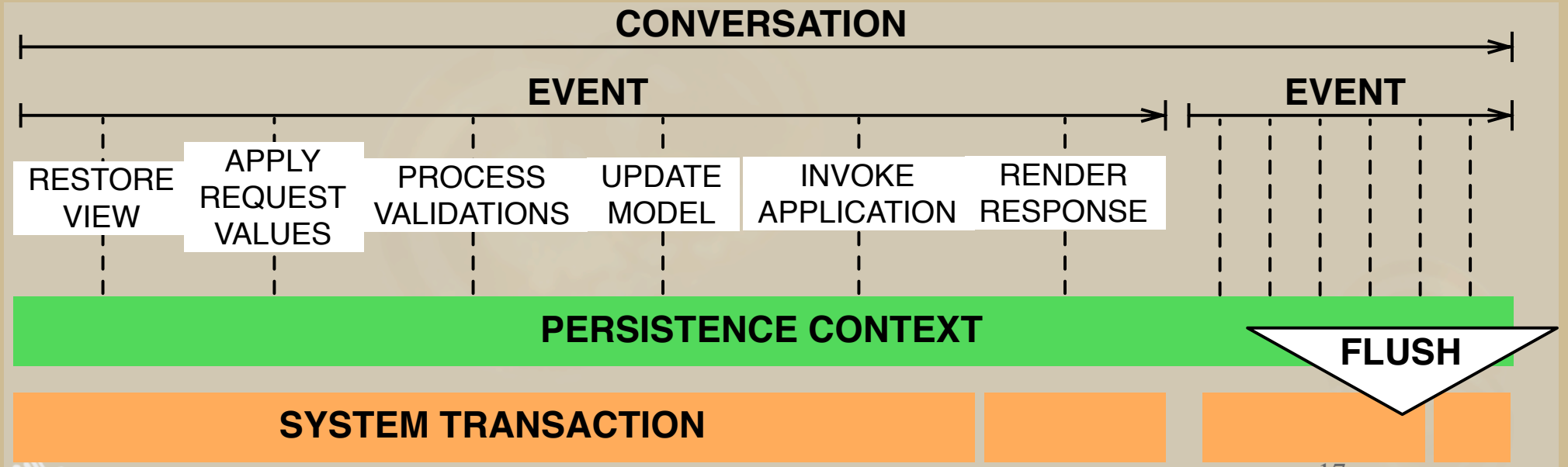
- What is the Persistence Context?
  - "a HashMap of all the objects I've loaded and stored"
  - holds (at most) one in-memory object for each database row while the PC is active
  - a natural first-level cache
  - can do dirty checking of objects and write SQL as late as possible (automatic or manual flushing)
- The Persistence Context has a flexible scope
  - default: same scope as the system transaction (JTA)
  - extended: the PC is bound to a stateful session bean

Which PC scope to use?

- Transaction scoped & detached objects
  - LazyInitializationException
  - NonUniqueObjectException
  - Less opportunity for caching
- An extended persistence context of a SFSB is
  - not available during view rendering (LIE again)
  - very complicated propagation rules
- No concept of a conversation

Seam managed persistence and transactions

- Seam managed PC is conversation scoped
  - Remains active through conversation,
  - Inject using @In
  - Allows use of manual flush mode



Navigation

- Stateful
  - Pageflow powered by jBPM engine (graphical editor)
  - Back button normally disabled
- Stateless
  - Through JSF or `pages.xml`
  - `pages.xml` is very powerful compared to JSF navigation rules (outcomes, application state, raise events on navigation)

Work Flow

- What is it?
  - Very long running (multiple days)
  - Lots of users (tasks can be assigned)
- Can contain many tasks
  - A task is completed by one user
  - Often a conversation

Validation

- Validate in the user interface?
  - Yes, need to report validation errors back to the user on the correct field
  - BUT normally need to enforce same constraints at the persistence layer and the database

```
public @Entity class Item {

  @Id @GeneratedValue Long id;
  String name;

  @Length(min=3,
          max=1000,
          message="Must be between 3 and 1000 characters")
  String description;

}
```

Hibernate Validator

- Many built-in validators: Max, Min, Length, Range, Size, Email, Future, Past, Pattern, Email, CreditCard, ...
- Easy (very) to write custom validators
- Validation and message/error display with Seam UI components for JSF
- Works with every JPA provider, if used with Hibernate it generates SQL DDL constraints you can use in your database schema
- Standardization effort under way - JSR 303

Seam provides...

- Security
- Email
- PDF
- Remoting
- Asynchronicity (Java SE, EJB3 or Quartz)
- “Google your app” using Hibernate Search
- Integration and Unit Testing
- JSF components (deep integration into JPA)
- Components in groovy
- Webservices
- > 25 examples
- Portal support

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Flex as a view layer

- A community effort
- Uses Granite Data Services or Blaze Data Services
- Check out a couple of demos at

http://www.rationaldeveloper.com

JSF 2

- Easy Component Creation & Templating
  - Standardizes Facelets
  - No XML needed to create a component
- Built in Ajax support
- Many improvements to JSF
  - lifecycle (performance!)
  - error handling
  - navigation

Wicket as a view layer

- Why?
  - Component orientated like JSF
  - Built in AJAX
  - Decouple design from components
  - Very easy to build custom components
  - Type safe
- But?
  - Incredibly verbose
  - Not for everyone - you'll either love it or hate it!

What else?

- Seam 2.1 BETA released on Tuesday
  - so I can sleep again
  - Friendly URLs
  - Identity Management
- First class support for other other containers (e.g. Websphere, WebLogic)
- SSO for security
- Deeper integration with JBoss Portal (inter-portlet communication)

Q&A

http://in.relation.to/Bloggers/Pete

http://www.seamframework.org