San Diego
Java Users Group

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JavaFX Now and Beyond
Desktop to Mobile

Paul Anderson
Gail Anderson
Anderson Software Group, Inc.
asgteach.com

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Agenda

- Why JavaFX on Mobile?
- Gluon Framework
- Afterburner Framework
- Gluon Connect and Gluon CloudLink
- Oracle Cloud Database
- Oracle REST Data Services
- Wrap Up, Q & A
Afterburner Framework

- What is Afterburner?
  - Lightweight framework
  - Provides dependency injection

- Why Use Afterburner?
  - Injects FXML for views and Java objects
  - Generates Java boilerplate code

- Advantages
  - Reduces Java code
  - Safe and easy object sharing among views

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Gluon Cloud Demo

BP Cloud

- BP: Gail Anderson
- Sep 2017: 104/80 mmHg, 65 bpm on Sep 15, 2017, 5:44 PM
- May 2017: 134/80 mmHg, 61 bpm on May 3, 2017, 12:20 PM
- Apr 2017: 131/76 mmHg, 55 bpm on Apr 28, 2017, 10:59 AM
- Apr 2017: 120/80 mmHg, 60 bpm on Apr 28, 2017, 7:24 AM
- Apr 2017: 124/85 mmHg, 61 bpm on Apr 28, 2017, 3:28 PM
- Oct 2015: 121/77 mmHg, 58 bpm on Oct 5, 2015, 11:26 PM
- Oct 2015: 115/75 mmHg, 57 bpm on Oct 4, 2015, 7:18 AM
- Oct 2015: 127/78 mmHg, 58 bpm
Remote List Binding

UI Control

ObservableList

Local Data

UI Control

GluonObservableList

Remote Data

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Data Synchronization

- **Write Through**
  - Update remote copy when local data changes
  - `LIST_WRITE_THROUGH`
  - `OBJECT_WRITE_THROUGH`

- **Read Through**
  - Update local copy when remote data changes
  - `LIST_READ_THROUGH`
  - `OBJECT_READ_THROUGH`
Authentication Mode

- Credentials
  - Register application on CloudLink
  - Application keys supplied by Gluon

- Gluon Client

```java
GluonClient gluonClient =
    GluonClientBuilder.create().credentials(
        new GluonCredentials(APPKEY, APPSECRET))
    .authenticationMode(
        AuthenticationMode.USER)
    .build();
```
Service Class

```java
void getData() {
    GluonObservableList<BPData> gluonBPData =
    DataProvider.retrieveList(
        gluonClient.createListDataReader(
            user.get().getNick() +
            user.get().getNetworkId(), BPData.class,
            SyncFlag.LIST_READ_THROUGH,
            SyncFlag.LIST_WRITE_THROUGH,
            SyncFlag.OBJECT_READ_THROUGH,
            SyncFlag.OBJECT_WRITE_THROUGH));
    
    ...}
```
Oracle Database

Gluon CloudLink

REST Request

Oracle Database with ORDS

Remote Function Call

Mobile Application
Oracle REST Data Services

HTTP(S) client → Oracle REST Data Services

URI → Map & Bind → SQL

JSON → Transform to JSON → SQL Result Set

Oracle Database
# People Demo

<table>
<thead>
<tr>
<th>Dept</th>
<th>Name</th>
<th>Title</th>
<th>Hired</th>
<th>Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>CLARK</td>
<td>Manager</td>
<td>1981-06-09</td>
<td>5000</td>
</tr>
<tr>
<td></td>
<td>Harry</td>
<td>Wizard</td>
<td>2018-10-17</td>
<td>4200</td>
</tr>
<tr>
<td></td>
<td>Hermione</td>
<td>Wizard</td>
<td>2018-10-12</td>
<td>4500</td>
</tr>
<tr>
<td></td>
<td>KING</td>
<td>President</td>
<td>1981-11-17</td>
<td>5000</td>
</tr>
<tr>
<td></td>
<td>MILLER</td>
<td>Clerk</td>
<td>1982-01-23</td>
<td>1300</td>
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<tr>
<td>20</td>
<td>FORD</td>
<td>Analyst</td>
<td>1981-12-03</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>JONES</td>
<td>Manager</td>
<td>1981-04-02</td>
<td>2975</td>
</tr>
<tr>
<td></td>
<td>SCOTT</td>
<td>Analyst</td>
<td>1987-04-19</td>
<td>3000</td>
</tr>
</tbody>
</table>
## Remote Functions with REST

<table>
<thead>
<tr>
<th>REST Method</th>
<th>Remote Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>READ</td>
<td>getEmployees()</td>
</tr>
<tr>
<td>READ</td>
<td>getEmployee()</td>
</tr>
<tr>
<td>POST</td>
<td>createEmployee()</td>
</tr>
<tr>
<td>PUT</td>
<td>updateEmployee()</td>
</tr>
<tr>
<td>DELETE</td>
<td>deleteEmployee()</td>
</tr>
</tbody>
</table>
API Dashboard

API Management

Remote Functions

Function Information
Type: HTTP Request
Name: getEmployee
Internal only: false
Method: GET
End Point: http://54.217.216.239/ords/pdb1/myuser1/testmodule9/emp/$empno
Request Body: none

Function Parameters

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Value</th>
<th>Test Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>empno</td>
<td>7521</td>
<td>7369</td>
</tr>
</tbody>
</table>
GET Method Definition

```java
public class RemoteService {
    public <T> GluonObservableObject<T> getEmployees(Class<T> clazz) {
        RemoteFunctionObject function = RemoteFunctionBuilder.create("getEmployees").object();
        return function.call(clazz);
    }

    // other remote functions. . .
}
```
Dependency Injection

```java
@Inject
private RemoteService remoteService;

@FXML
private
CharmListView<Employee, Integer> charmListView;

private
GluonObservableObject<WorkForce> workforce;

private ChangeListener<? super Boolean>
    listener = null;
```
Remote Functions

GET Method Invocation

```java
workforce = remoteService.getEmployees(WorkForce.class);
...
workforce.initializedProperty().addListener(
    listener = (ObservableValue<? extends Boolean> obsrv, Boolean ov, Boolean nv) -> {
        if (nv) {
            charmListView.setItems(FXCollections.observableArrayList(
                workforce.get().getItems()));
        }
    }));
```
DELETE Method Definition

```java
public class RemoteService {
    public <T> GluonObservableObject<T> deleteEmployee(Class<T> clazz, String value) {
        RemoteFunctionObject function = RemoteFunctionBuilder.create("deleteEmployee")
            .param("empno", value)
            .object();
        return function.call(clazz);
    }
}
```
JavaFX Advantages
- Platform independent source code
- Observables, binding & background tasks to sync UI
- Flexible skinning to fit mobile form

Useful Frameworks
- Gluon/Gradle framework for mobile deployment
- Based on OpenJDK
- Afterburner framework for dependency injection
- Oracle Cloud Database and ORDS
Wrap Up

Thanks for Coming!
- paul@asgteach.com
- gail@asgteach.com

Source Code
- asgteach.com
  - SDJUG 2019 Meetup Examples
    - Click to Download
- Q & A