

Flex and Flash Media **Interactive** Server

Toronto Flex Camp 2
May 15, 2008
Brian Lesser

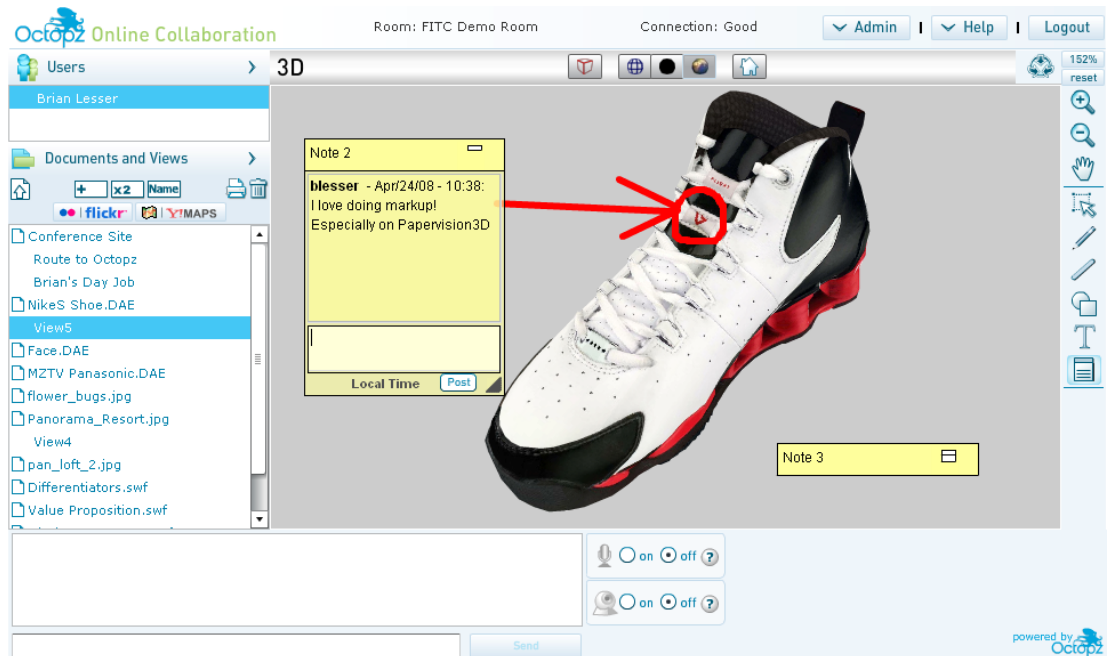
Flash Media **Interactive** Server

- Building Real-Time Collaborative Applications
- Not just streaming media (use the less expensive Flash Media Server for that.)

Quick Octopz Demo

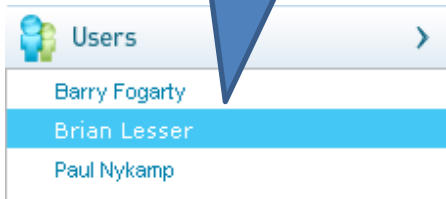
Things I want to demonstrate:

- Synchronized View and Markup of Papervision3D models
- Synchronized Yahoo maps and Markup
- VOIP and Video



Component-Based Application

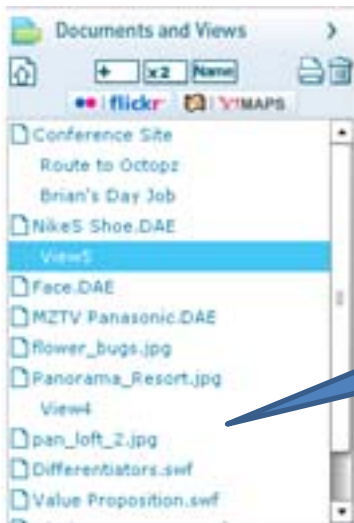
User List



Content/Markup Manager



Document View List



Text Chat



Video Conference



Flash Media **Interactive** Server 3.x

- Server-side JavaScript 1.5 (SpiderMonkey) based language
<http://www.mozilla.org/js/spidermonkey/>
- No components/framework for Flex 2, 3/Flash 9/AS3
(just Flash Communication Server components)
- Familiar **NetConnection**, **SharedObject**, **Stream** (like NetStream) classes.
- Not so familiar **Client** and **Application** classes.

Server application.onXXXX Events

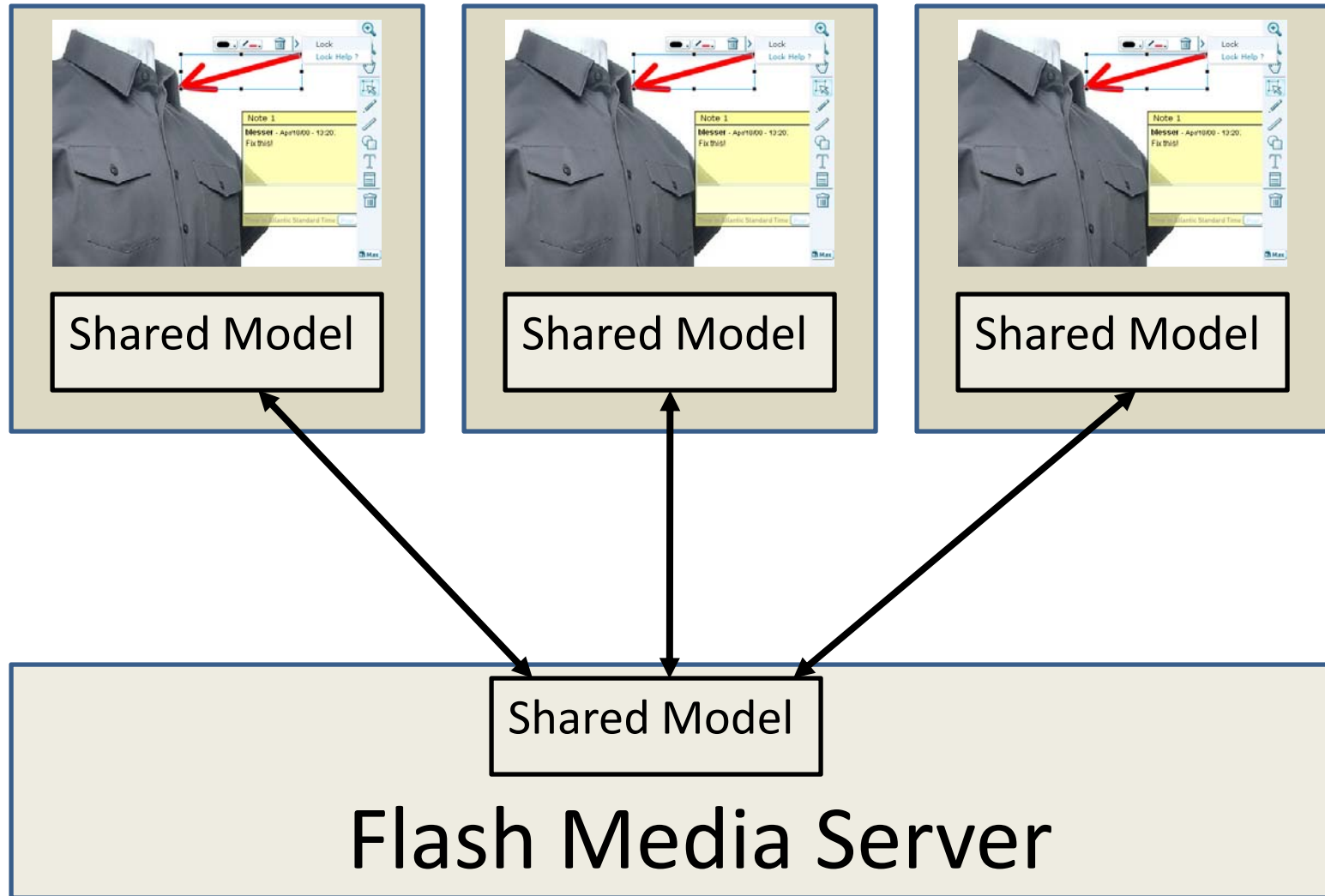
- onAppStart
- onConnect (client SWF tries to connect)
- onDisconnect (client SWF disconnects)
- onAppStop

Unlike Flex events:

- applicationComplete
- initialize, creationComplete, etc..



Components and Shared Models

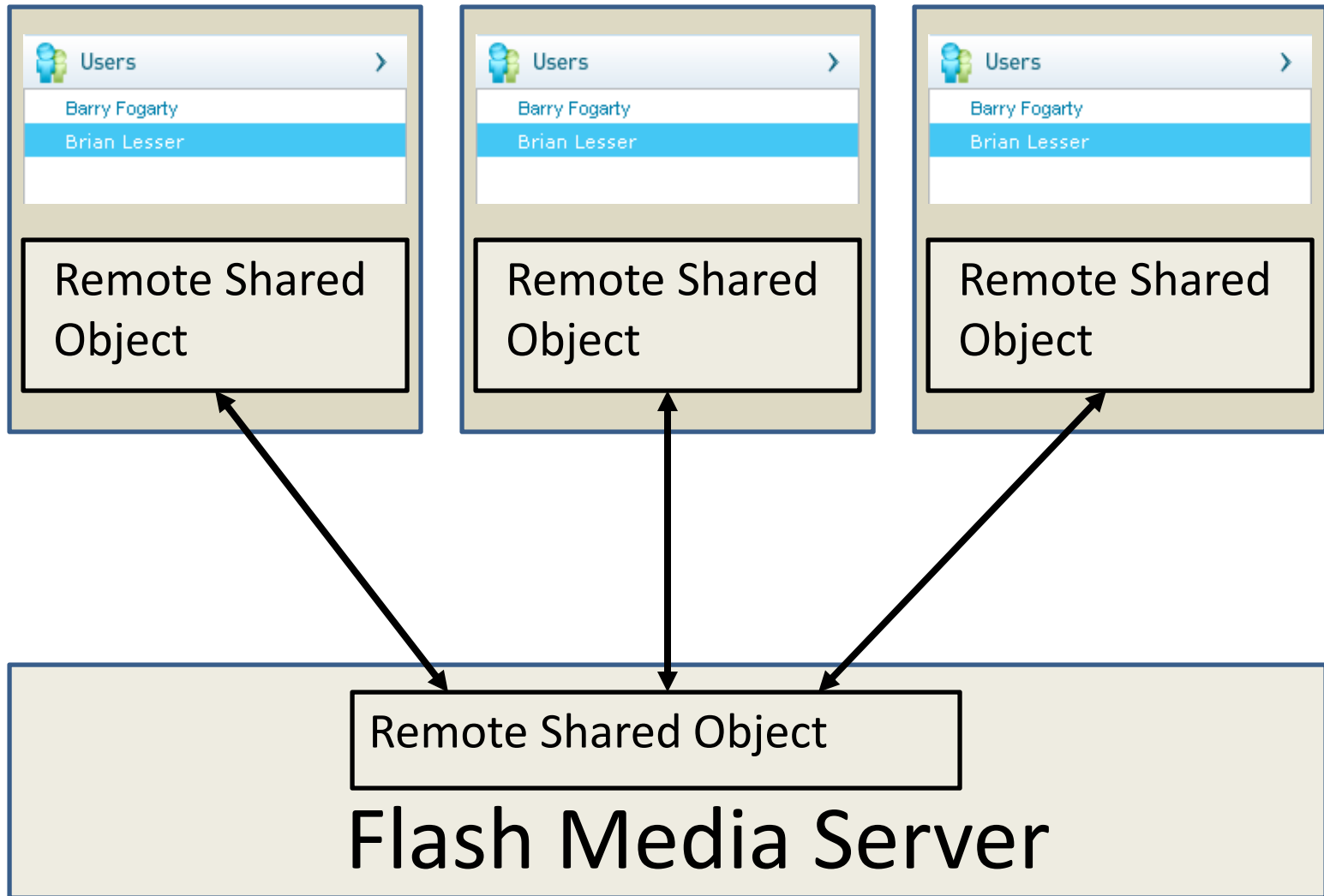


Remote Shared Objects

- Not the same as RemoteObject or Local SharedObject
- Higher-level data structure is relatively easy to work with – don't have to manage lower-level client-to-server-to-client messages.
- Set an RSO property value on a client or send a message to the server and set the property value there (the later is more secure and automatic serialization).
- The server updates all the other clients and calls an onSync message after each update.
- RSOs don't make good component data providers!



Components and Remote Shared Objects

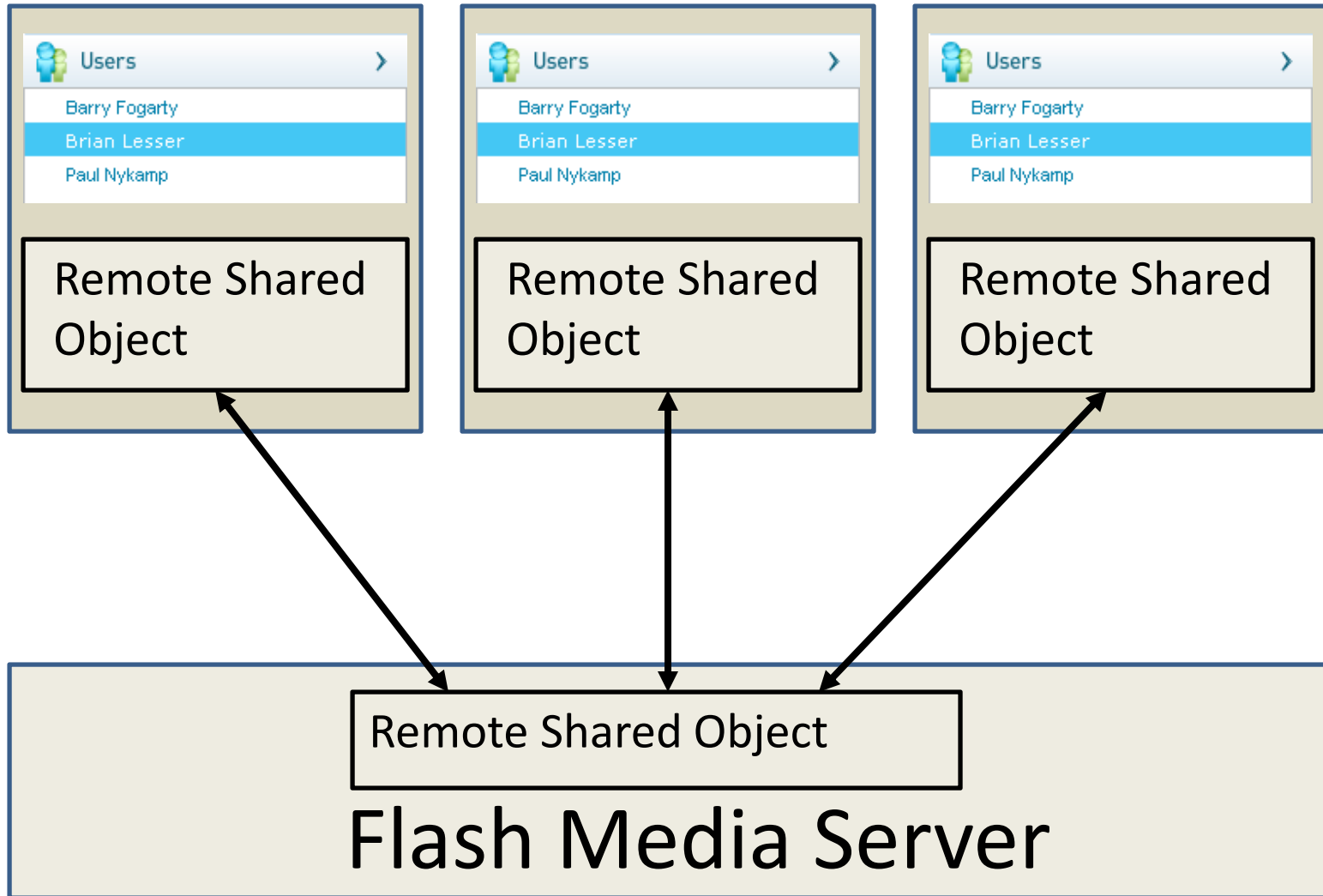


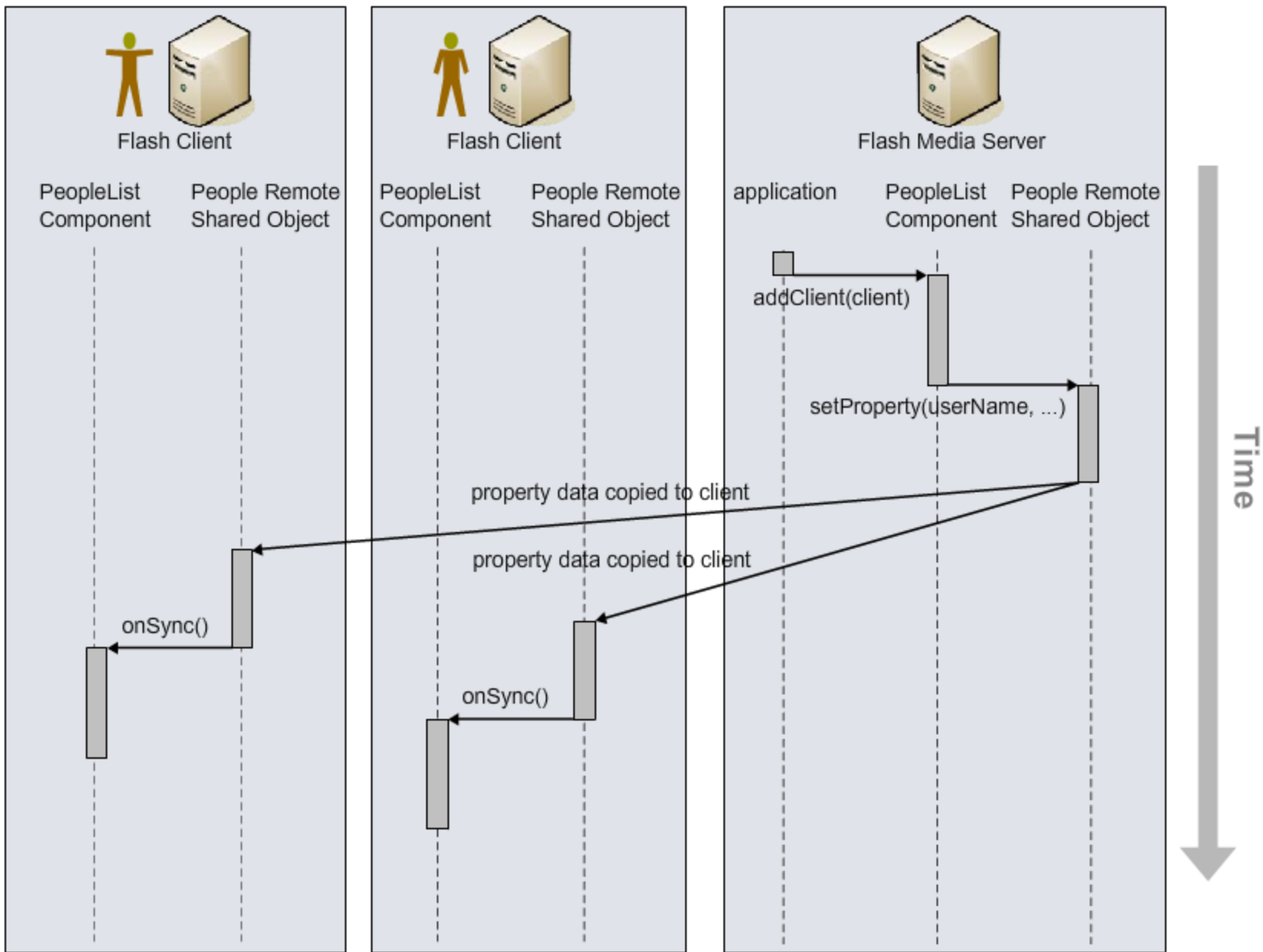
PeopleList Component RSO

- Like an object, an RSO has named properties with values.
- For the PeopleList example lets say each property name is the person's userName.
- Each property contains an object with information about a Person.

Property Name	Property Value	
blesser	roles	participant
	firstName	Paul
	lastName	Nykamp
barry	roles	presenter
	firstName	Barry
	lastName	Fogarty

Components and Remote Shared Objects





PeopleList Component RSO

- Like an object, an RSO has named properties with values.
- For the PeopleList each property name is the person's userName.
- Each property contains an object with information about a Person.

Property Name	Property Value	
paul	roles	admin
	firstName	Paul
	lastName	Nykamp
blesser	roles	participant
	firstName	Paul
	lastName	Nykamp
barry	roles	presenter
	firstName	Barry
	lastName	Fogarty

Flex2FMS Explorer Demonstration

The screenshot shows the Flex 2 FMS Explorer application. The title bar displays "Flex 2 FMS Explorer" on the left, "Welcome: Paul" in the center, and a "Logout" button on the right. A vertical sidebar on the left contains several menu items: "People List", "Simple Live Stream", "Controlled Live Stream", "Simple Video Conference", "Simple Shared Object Editor", "Shared Ball", "Scratch Pad", "Plain Text Chat", "Shared Text" (which is highlighted with a blue border), and "Minimal Sample".

The main content area is divided into two sections. The top section, titled "Shared Text", contains a text area with the following log output:

```
currentUser has changed from undefined to  
length has changed from undefined to 2  
onEditResult> result: OK  
currentUser has changed from  to Paul  
onCancelResult> result: OK  
currentUser has changed from Paul to  
currentUser has changed from  to Brian  
onEditResult> result: Brian is editing the text area. Please try again later.
```

The bottom section, titled "Shared Text Editor", contains a text area with the following instructions:

Take control of this simple editor by pressing the Edit button.

Then **enter** and/or **format** some text:

- Use bullets
- etc..

Then press the **Save** or **Cancel** button.

At the bottom of the editor section, there is a "Version:" label, a small input field containing the number "2", a spin button, and the text "Brian is editing.". To the right of this is an "Edit Text" button.

Code Walk Through Contents

- Server-Side code in applications/flex2FMSExplorer
- Client-Side code in Flex

Client-Side PeopleList.mxml

```
<mx:List id="peopleList" labelField="userName"  
        change="showUserDetails"/>
```

```
public function set netConnection(netConnection:NetConnection): void{  
    _peopleSharedObject = SharedObject.getRemote(className + "/people",  
                                                netConnection.uri);  
    _peopleSharedObject.addEventListener(SyncEvent.SYNC, onSync);  
    _peopleSharedObject.connect(_netConnection);  
    peopleList.dataProvider = new ArrayCollection();  
}
```


Client-Side PeopleList.mxml

```
public function onSync(event:SyncEvent):void{
    var selectedItem:Object = null;
    var user:Object;
    var item:Object;

    // Rewrite the list with every sync event.
    var dp:ArrayCollection = peopleList.dataProvider as ArrayCollection;
    dp.removeAll();

    for( var userID:String in _peopleSharedObject.data ){
        user = _peopleSharedObject.data[userID];
        item = {userName: user.userName, data: user };
        dp.addItem(item);
        if (userID == _lastSelectedUserID) selectedItem = item;
    }
    peopleList.dataProvider = dp;
    peopleList.selectedItem = selectedItem;
}
```

Server-Side PeopleList.asc

```
function PeopleList(){
  // Create the temporary shared object:
  this.people_so = SharedObject.get(this.className + "/people");
}

PeopleList.prototype.className = "PeopleList";

PeopleList.prototype.onAcceptClient = function(client){
  this.people_so.setProperty(client.user.id, client.user);
}

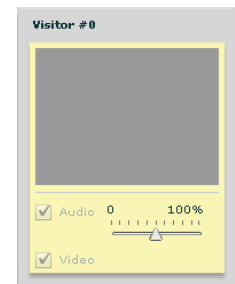
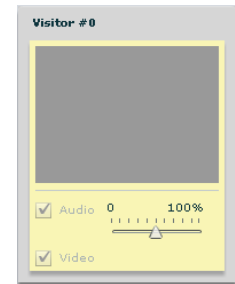
PeopleList.prototype.onClientDisconnect = function(client){
  if (client.user){
    this.people_so.setProperty(client.user.id, null);
  }
}
```

Simple Video Conference Remote Shared Objects

- Master Shared Object – one property for each user.
- Server-side code adds property for each user.
- Client-side onSync() handler creates playback panel

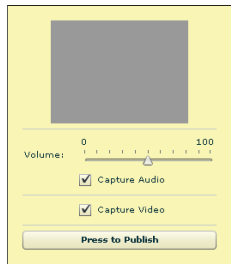
SimpleVideoConference/conferenceUsers

Property Name	Property Value
0	userName: blesser Id: 0 fullName: Brian Lesser
1	userName: paul Id: 1 fullName: Paul Nykamp



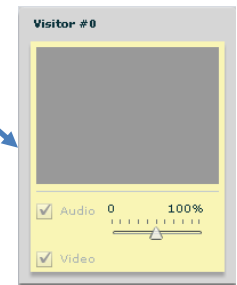
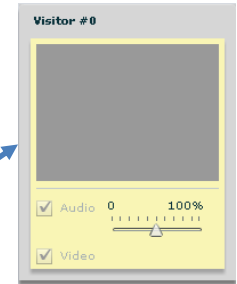
Simple Video Conference Remote Shared Objects

- One Shared Object per user with stream status.



SimpleVideoConference/userStreams/0

Property Name	Property Value
sendingAudio	false
sendingVideo	false



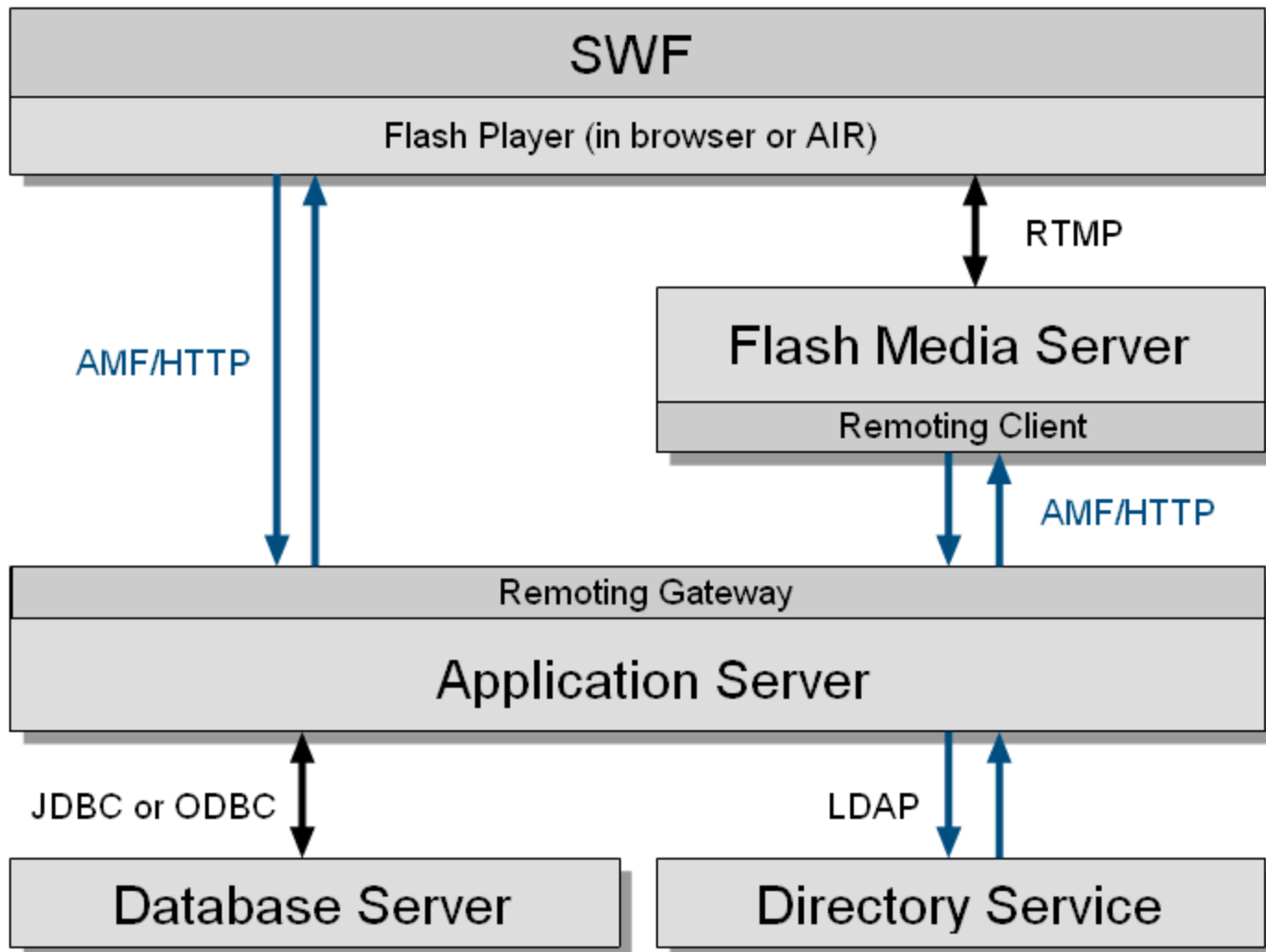
VideoPublisherForm.mxml

```
sharedObject.setProperty("sendingAudio", false);  
sharedObject.setProperty("sendingVideo", false);
```

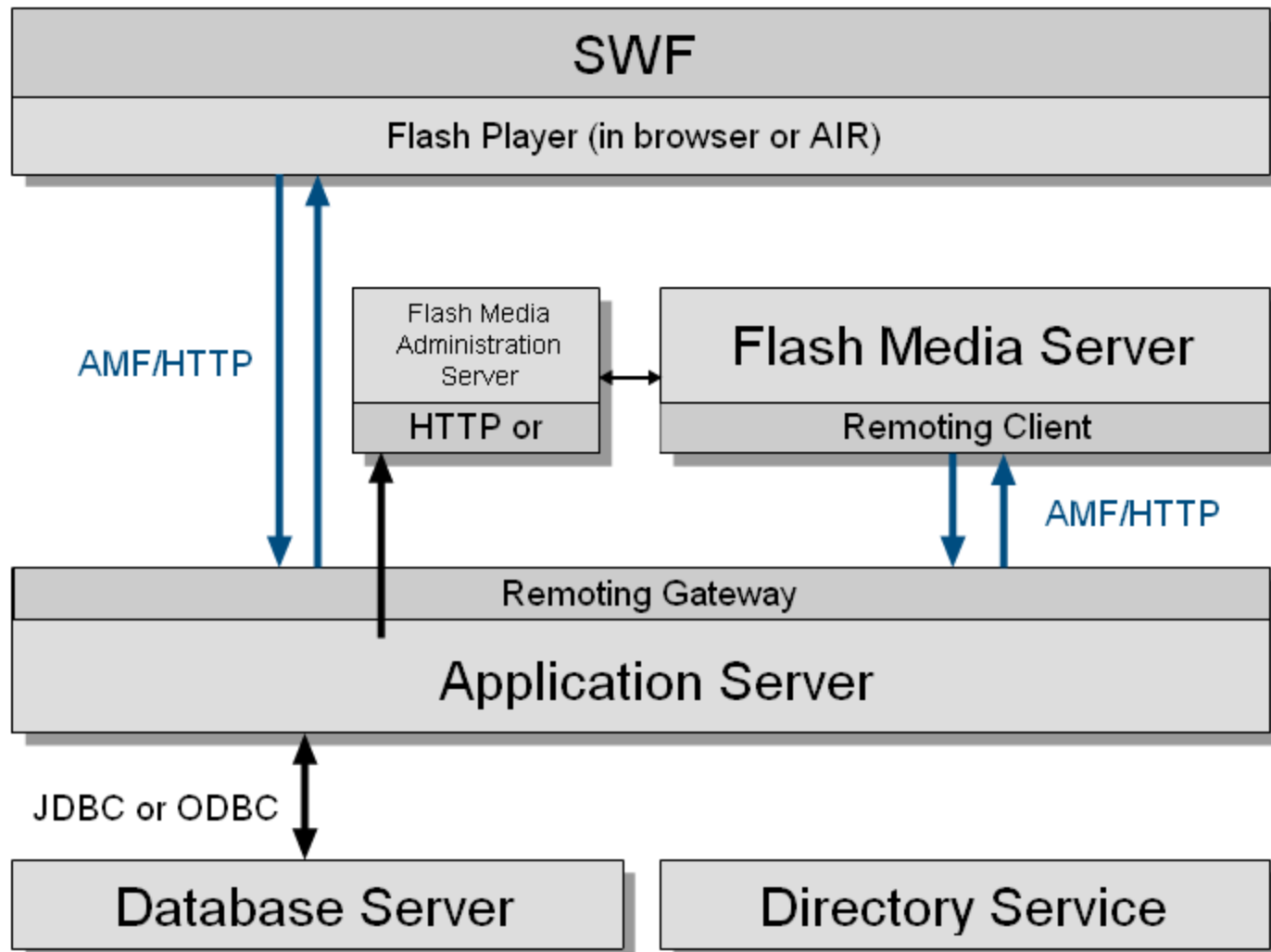
VideoPlaybackPanel.mxml

```
onSynch()
```

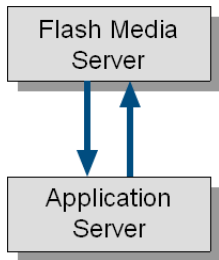
FMS Application Architecture – Authentication and Room Setup



FMS Application Architecture - Instance/Room Setup #2

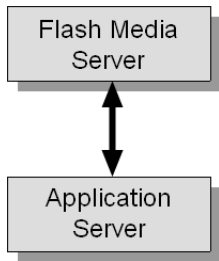


FMS / Application Server Connections



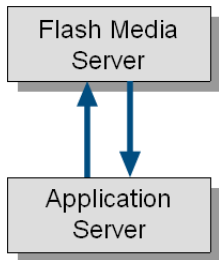
FMS > Application, Request/Response:

- Remoting
- Web Services
- HTTP (LoadVars)



FMS <> Application, Persistent Connections:

- XMLSocket
- Coldfusion FMS gateway (limited)

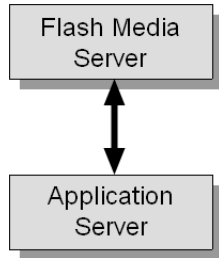


FMS < Application Server Request/Response:

- HTTP via FMS Administration Server

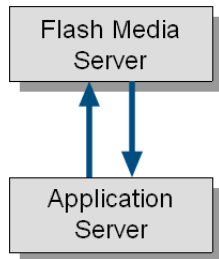
FMS / Application Server Connections

What's Missing?



FMS <> Application Persistent Connections:

- Fully capable Java/Coldfusion Clients
- C++ client for developing high quality streaming (like On2 SDK) but less \$\$??



FMS < Application Server

Request/Response:

- FMS Remoting Gateway to create, delete, and update instances.
- Web Service or HTTP as above.

Merging Database and Real-Time Data

	Room Name	Time Created	Created by	Last Access	Active
	00 1 test	17 Apr 2008 - 10:57	Nestor	18 Apr 2008 - 13:55	recently used
	00 Nestor	10 Dec 2007 - 14:08	Nestor	18 Apr 2008 - 13:27	2 users
	000000test	17 Dec 2007 - 22:29	pnykamp	17 Apr 2008 - 11:16	4 users
	001_plugin_test	1 Jun 2007 - 11:29	pnykamp	17 Apr 2008 - 18:41	1 user
	01_pauls test	23 Feb 2007 - 11:01	pnykamp	17 Apr 2008 - 10:31	3 users
	1 on 1 Room	24 Aug 2007 - 15:49	robholowka	1 Apr 2008 - 17:54	
	2.21 test	24 Jul 2007 - 19:50	Nestor	17 Apr 2008 - 11:21	
	3D Demo's	7 Sep 2007 - 11:51	Nestor	18 Apr 2008 - 13:32	
	A Demo Room	27 Sep 2007 - 18:31	AnnChristie	17 Apr 2008 - 13:46	2 users
	AA video test	13 Dec 2007 - 13:29	BarryF	17 Apr 2008 - 11:21	
	Ad Agency	20 Feb 2008 - 12:20	AnnChristie	8 Apr 2008 - 17:21	
	AdobeMAX Demo Room B	27 Sep 2007 - 18:52	AnnChristie	18 Apr 2008 - 13:42	
	AdobeMAX Demo Room C	27 Sep 2007 - 19:05	AnnChristie	17 Apr 2008 - 11:26	
	Ahmed's Room	19 Jun 2007 - 11:43	Ahmed	10 Apr 2008 - 15:09	

Note: The following code sample has been simplified!

```
// AS 2 Version - when RSO Synchs merge into data provider
private function onSync(){
    var dp = _roomGrid.dataProvider;
    var len = dp.length;
    var i;
    var id;
    var peopleCount;
    var item;
    for(i = 0; i < len; i++){
        item = dp.getItemAt(i);
        id = item.id;
        peopleCount = _room_so.data[id];
        if (typeof peopleCount == "undefined" || peopleCount == 0){
            item.active = "";
        }
        else {
            item.active = peopleCount;
        }
    }
    dp.dispatchEvent({target:dp, type:"modelChanged",
        eventName: "updateAll"});
}
```

```
// AS 2 Version - when RSO Synchs merge into data provider
private function onSync(){
    var dp = _roomGrid.dataProvider;
    var len = dp.length;
    var i;
    var id;
    var peopleCount;
    var item;
    for(i = 0; i < len; i++){
        item = dp.getItemAt(i);
        id = item.id;
        peopleCount = _room_so.data[id];
        if (typeof peopleCount == "undefined" || peopleCount == 0){
            item.active = "";
        }
        else {
            item.active = peopleCount;
        }
    }
    dp.dispatchEvent({target:dp, type:"modelChanged",
        eventName: "updateAll"});
}
```

```
// AS 2 Version - when RSO Synchs merge into data provider
private function onSync(){
    var dp = _roomGrid.dataProvider;
    var len = dp.length;
    var i;
    var id;
    var peopleCount;
    var item;
    for(i = 0; i < len; i++){
        item = dp.getItemAt(i);
        id = item.id;
        peopleCount = _room_so.data[id];
        if (typeof peopleCount == "undefined" || peopleCount == 0){
            item.active = "";
        }
        else {
            item.active = peopleCount;
        }
    }
    dp.dispatchEvent({target:dp, type:"modelChanged",
        eventName: "updateAll"});
}
```

```
// AS 2 Version - when RSO Synchs merge into data provider
private function onSync(){
    var dp = _roomGrid.dataProvider;
    var len = dp.length;
    var i;
    var id;
    var peopleCount;
    var item;
    for(i = 0; i < len; i++){
        item = dp.getItemAt(i);
        id = item.id;
        peopleCount = _room_so.data[id];
        if (typeof peopleCount == "undefined" || peopleCount == 0){
            item.active = "";
        }
        else {
            item.active = peopleCount;
        }
    }
    dp.dispatchEvent({target:dp, type:"modelChanged",
        eventName: "updateAll"});
}
```

Merging Database and Real-Time Data

Room Name	Time Created	Created by	Last Access	Active
00 1 test	17 Apr 2008 - 10:57	Nestor	18 Apr 2008 - 13:55	recently used
00 Nestor	10 Dec 2007 - 14:08	Nestor	18 Apr 2008 - 13:27	2 users
000000test	17 Dec 2007 - 22:29	pnkamp	17 Apr 2008 - 11:16	4 users
001_plugin_test	1 Jun 2007 - 11:29	pnkamp	17 Apr 2008 - 18:41	1 user
01_pauls test	23 Feb 2007 - 11:01	pnkamp	17 Apr 2008 - 10:31	3 users
1 on 1 Room	24 Aug 2007 - 15:49	robholowka	1 Apr 2008 - 17:54	
2.21 test	24 Jul 2007 - 19:50	Nestor	17 Apr 2008 - 11:21	
3D Demo's	7 Sep 2007 - 11:51	Nestor	18 Apr 2008 - 13:32	
A Demo Room	27 Sep 2007 - 18:31	AnnChristie	17 Apr 2008 - 13:46	2 users
AA video test	13 Dec 2007 - 13:29	BarryF	17 Apr 2008 - 11:21	
Ad Agency	20 Feb 2008 - 12:20	AnnChristie	8 Apr 2008 - 17:21	
AdobeMAX Demo Room B	27 Sep 2007 - 18:52	AnnChristie	18 Apr 2008 - 13:42	
AdobeMAX Demo Room C	27 Sep 2007 - 19:05	AnnChristie	17 Apr 2008 - 11:26	
Ahmed's Room	19 Jun 2007 - 11:43	Ahmed	10 Apr 2008 - 15:09	

Q: What if a new room is added by someone else but the current user doesn't refresh their room list?

A: One, over simplified answer: check if there are room_so slots that don't match the data in the dataprovider and update the dataprovider by searching the database.

References

- Download FMIS starting here:
<http://www.adobe.com/products/flashmediainteractive/>
- After installation check:
C:\Program Files\Adobe\Flash Media Server 3\documentation
(ie installDirectory/documentation)
- My “old” book site:
Programming Flash Communication
Sever
<http://flash-communications.net/>
- Flex2FMSExplorer:
<http://flash-communications.net/technotes/flex2FMSExplorer/>



Questions?

<http://flash-communications.net/technotes>