

# Architecting Flex RIAs

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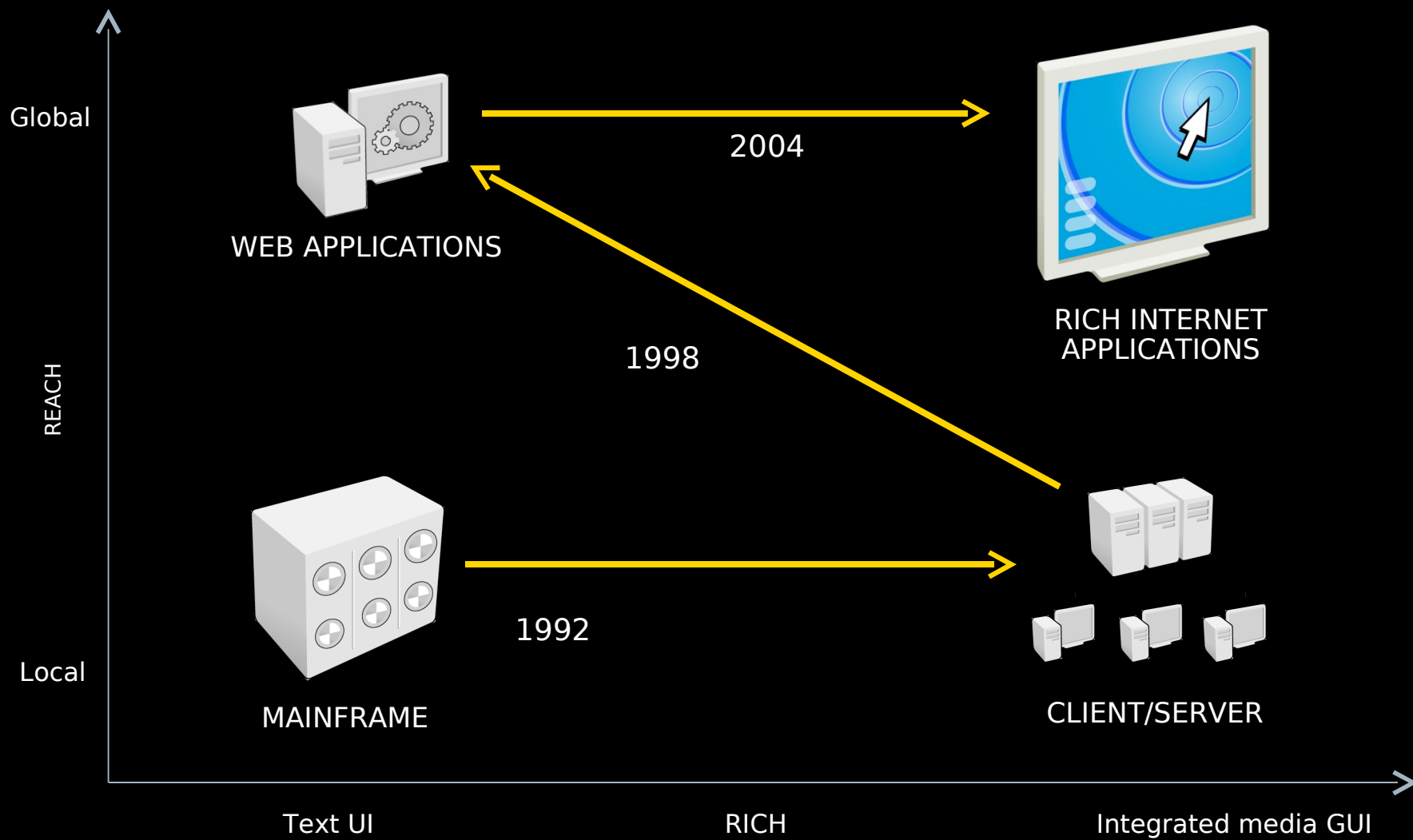
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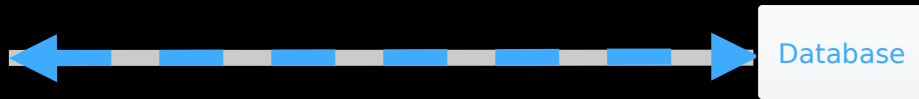
# Applications have evolved



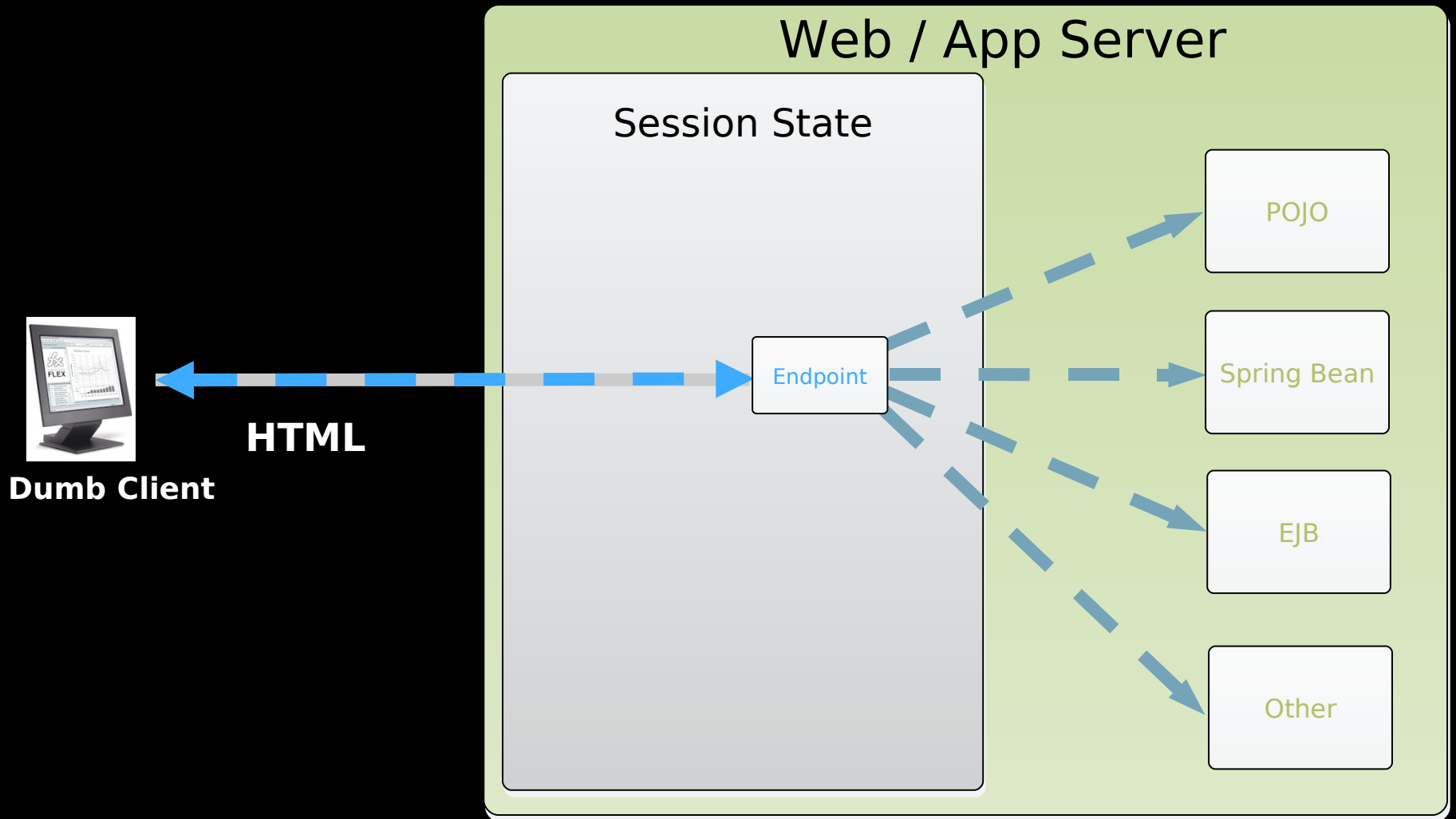
# Client - Server



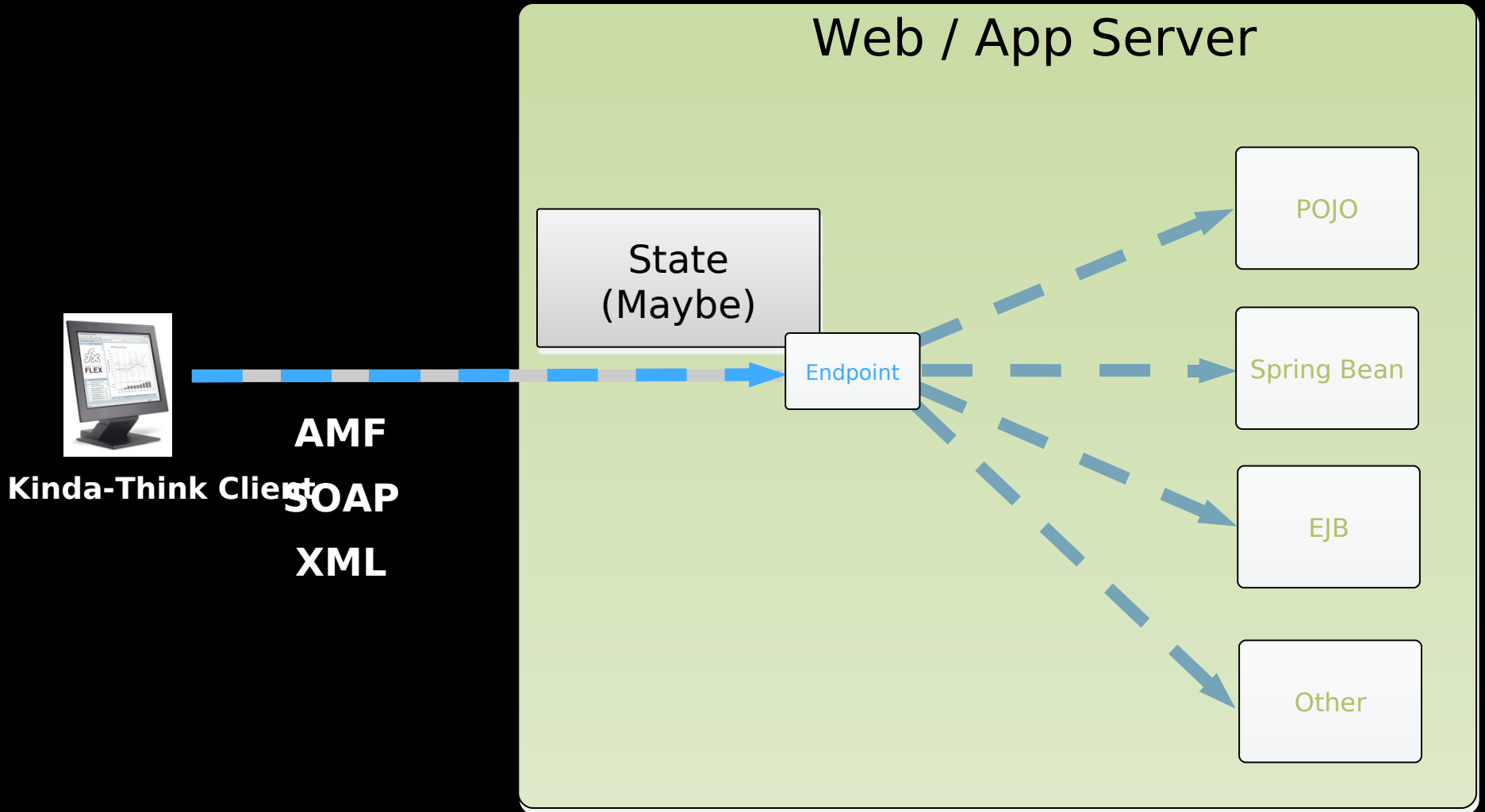
**Thick Client**



# Web



# RIA



# Adobe's Software Development Platform

Applications



Adobe  
Media  
Player

Open Bug Database:  
<http://bugs.adobe.com>

Designer/Developer Tools

60 Day **Free** Trial

**Free** for students  
and educators



Flex Builder

Client  
Runtimes



Adobe  
AIR



Flash  
Player



PDF

High Performance  
JIT'ing VM:  
Mozilla Tamarin



Adobe  
Flex 3

Servers/Services



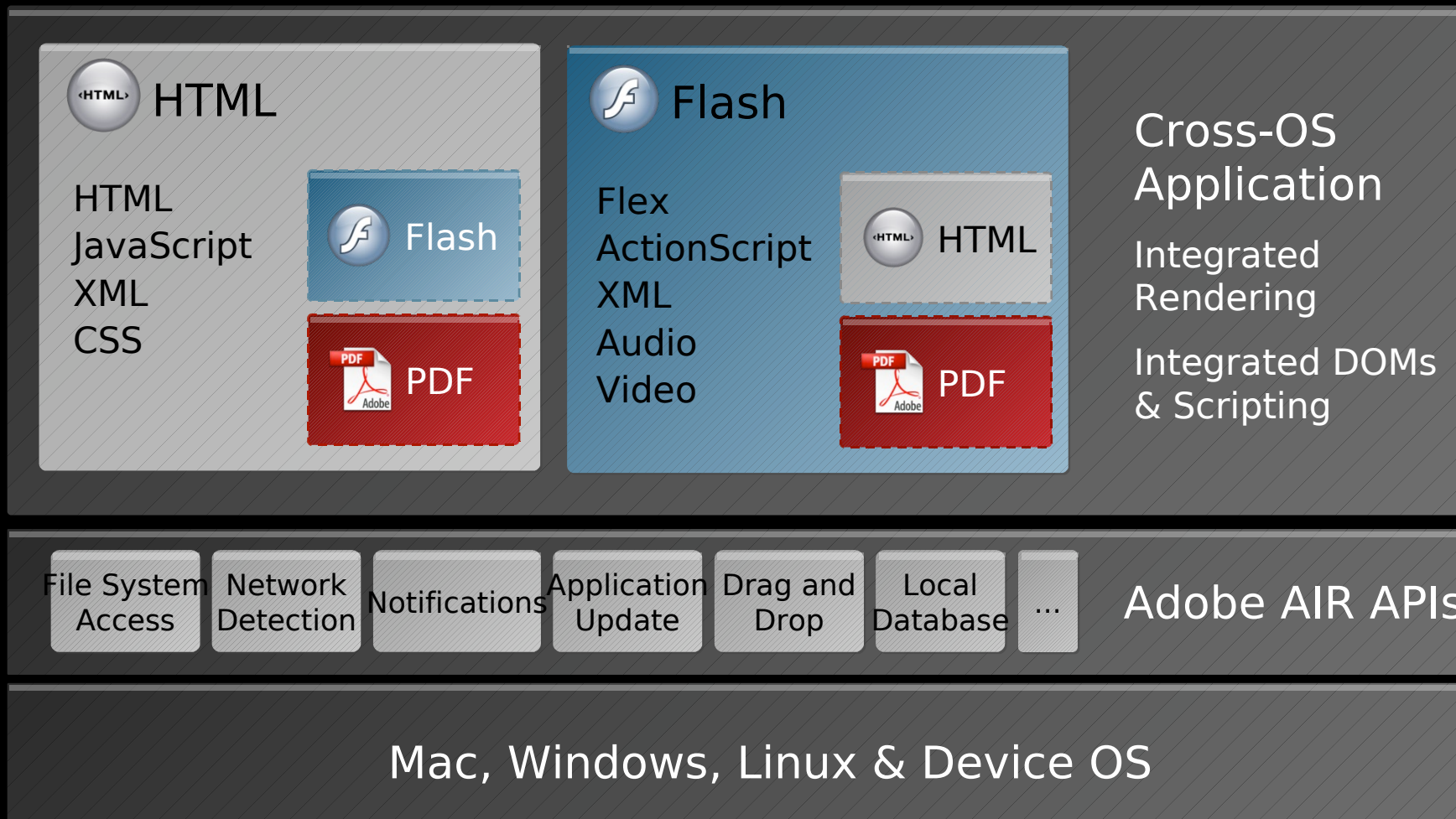
LiveCycle



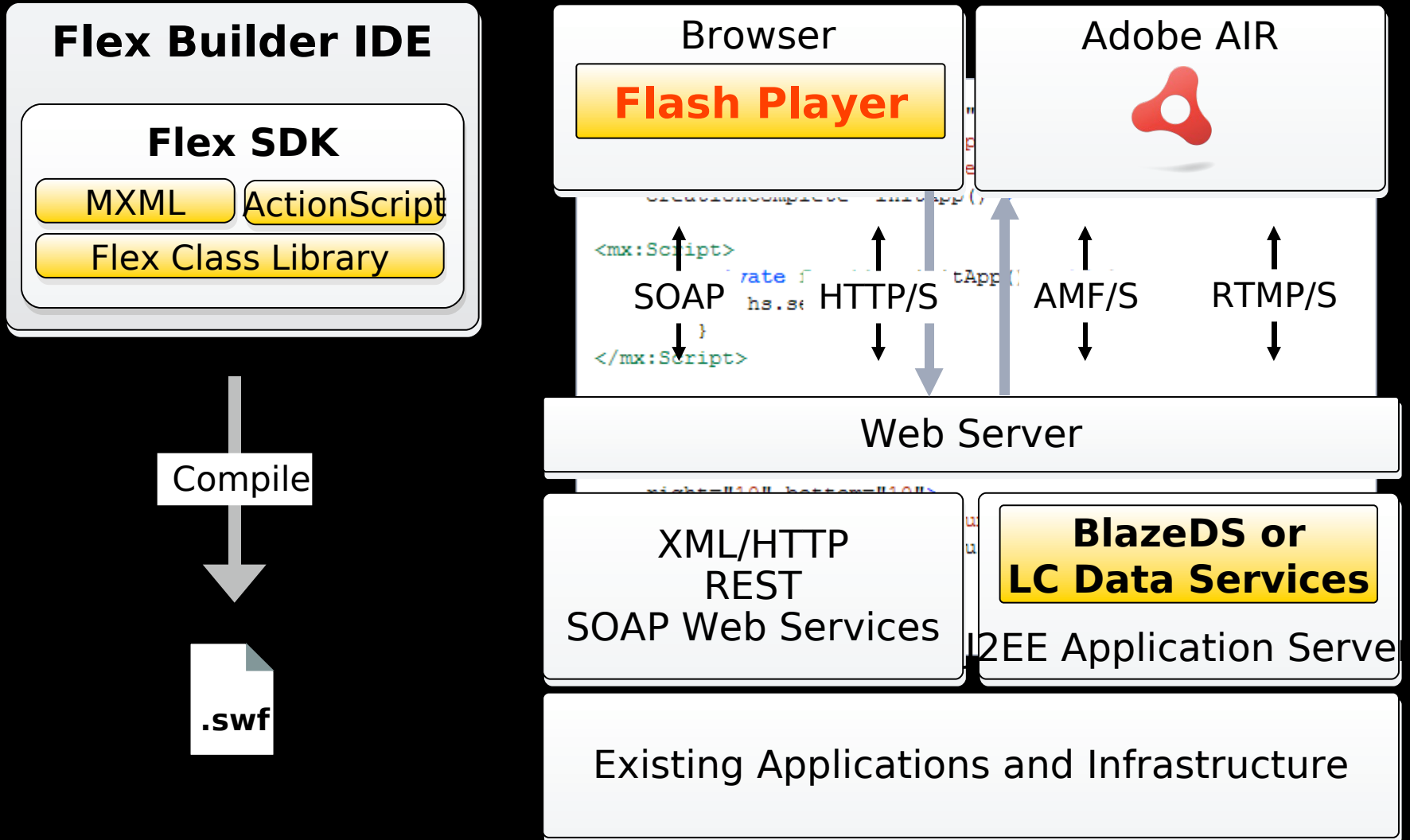
ColdFusion

Open Source: MPL  
Use any text editor / IDE

# Adobe AIR Application Stack



# How Flex Works





# Tour de Flex - flex.org/tour

The screenshot displays the Adobe Flex Tour website interface. At the top left is the Adobe logo and the 'Tour of FLEX' title. A search bar with the text 'Search = Filter' is located in the top right. The main content area is divided into three sections:

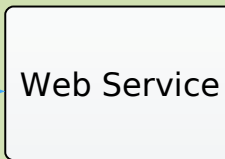
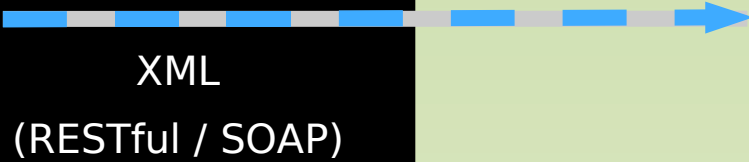
- Left Panel (Navigation):** A tree view of 'Flex Core Components' including UI Controls, Data Entry Controls, Buttons, Containers, Effects, Formatters, Validators, Charting, and Coding Techniques. The 'Buttons' category is expanded, showing sub-items like Button, PopupButton, ToggleButtonBar, ButtonBar, LinkBar, LinkButton, and TabBar.
- Center Panel (Preview):** Titled 'Button', it shows a 'Sample 1' window with a 'Button Control Example' containing four buttons: 'Default Button', 'Button With Icon', 'Skinned Button', and a blue 'GO TO SOURCE' button.
- Right Panel (Code):** A code editor showing the MXML and ActionScript code for the button example. The code includes a script to show an alert and MXML tags for a panel and three buttons.

At the bottom of the page, there is a footer with the following information: ©2008 Adobe Inc, All Rights Reserved; Version: 1.0 RC1; List Version: 2008-11-10-2; Samples: 216.

# Flex with Java via XML (RESTful / SOAP)



**Client**

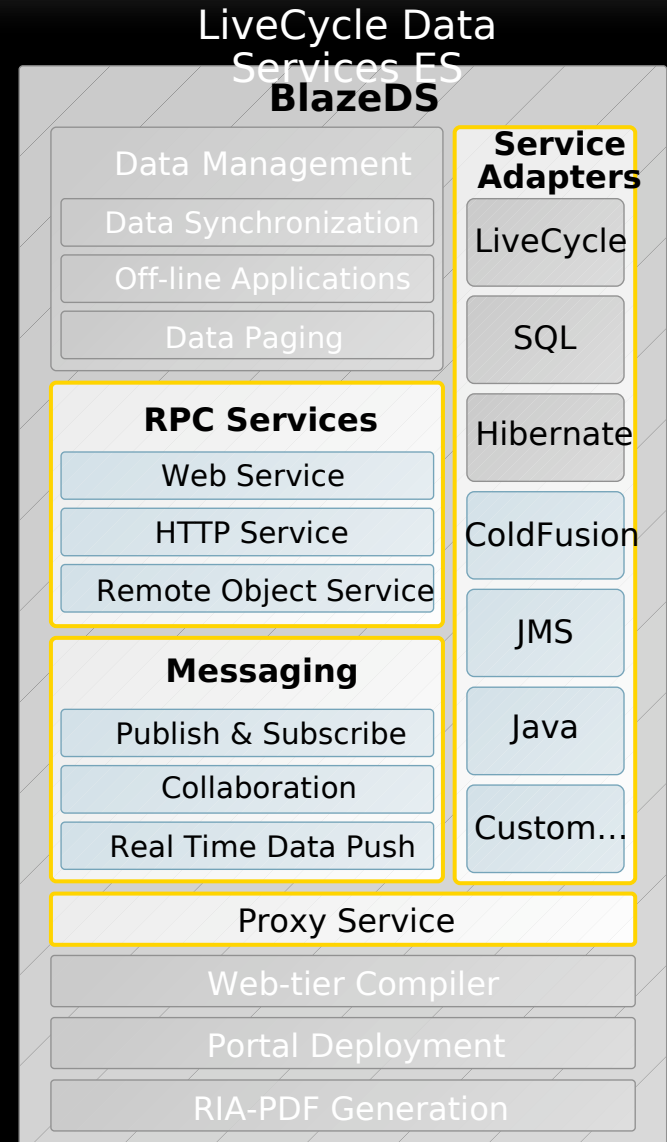


App Server

# Open Source BlazeDS

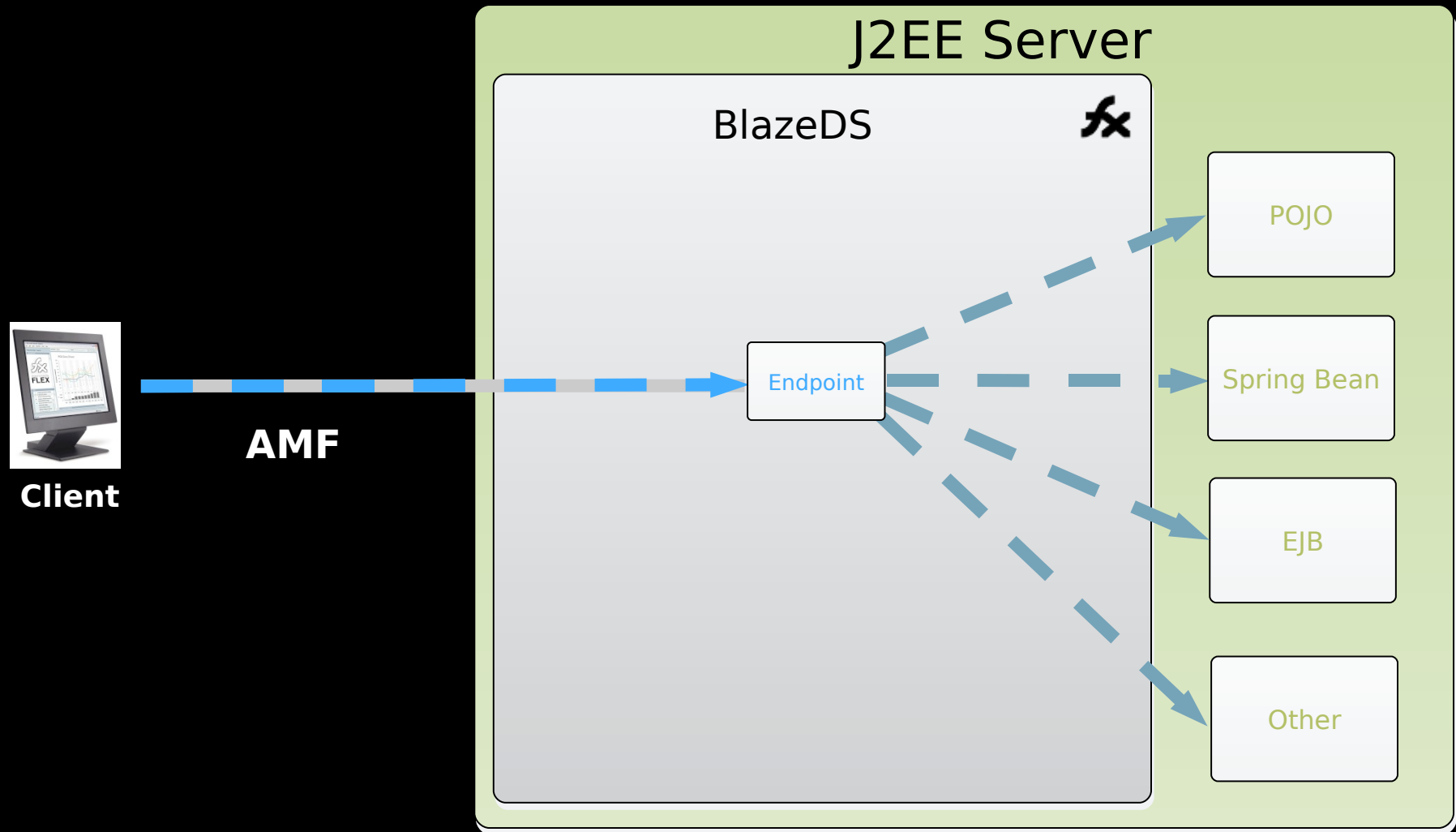
**BlazeDS is the remoting and HTTP-based messaging technology which Adobe is contributing to the community under LGPL v3**

- Capabilities
  - Easily connects Flex & AIR applications to existing server logic
  - High performance data transfer for more responsive applications
  - Real-time data push over standard HTTP
  - Full pub/sub messaging that extends existing messaging infrastructure
- Publication of the Action Message Format (AMF3) binary data protocol specification
- Certified builds, warranty protection and enterprise support subscriptions available





# Flex with Java via Remoting



# fluint - Flex Unit and Integration Testing Framework

- Multiple simultaneous asynchronous operations
- Asynchronous setup and teardown
- Asynchronous returns before method body completion
- Support for UIComponent testing
- Support for test sequences
- Support for testing Cairngorm commands and controllers
- XML output of testing results
- Support for externalizing tests in modules
- Build automation integration with Apache Ant

# Flex Monkey

- Records and plays back Flex UI interactions
- UI Interactions can be edited and replayed
- Generates FlexUnit TestCases, and can also be used with non-FlexUnit-based testing frameworks
- Tests can be run from build systems such as Ant
- Handles all Flex UI events
- Uses Flex Automation API to provide native control over your flex app. Requires no javascript or browser plug-ins to use.
- Unit tests are written entirely in ActionScript. No other programming or special purpose scripting languages are needed to develop comprehensive UI test suites.
- Non-invasive. Requires no modifications to your application source.

# Project Structure

## Library Projects

- Reuse code across projects

## Modules

- Load blocks of code post-startup

## RSLs

- Load & cache stagnant / cross-application code at startup
- Framework Cache



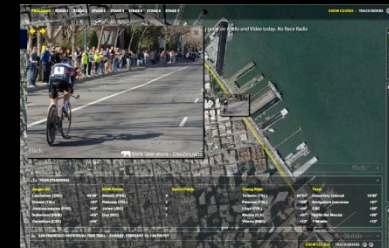
# Framework RSLs

## Persistent framework caching significantly reduces size of Flex applications

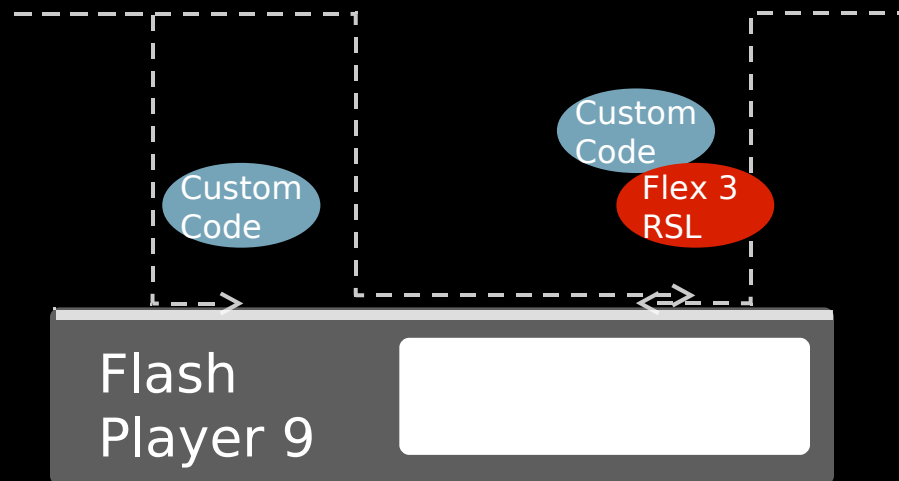
- Users only need to download the Adobe-signed Flex 3 platform component once
- Flash Player cache stores it for use by any Flex-enabled site
- Entire Flex applications can now be as small as 50KB



Site A



Site B



# Performance

## Item Renderers

- KEEP THEM SIMPLE!

## Objects

- Typed objects are optimized in the JIT
- AMF!!!

## Modules / Deferred Instantiation

- Do things later...

# Project Structure

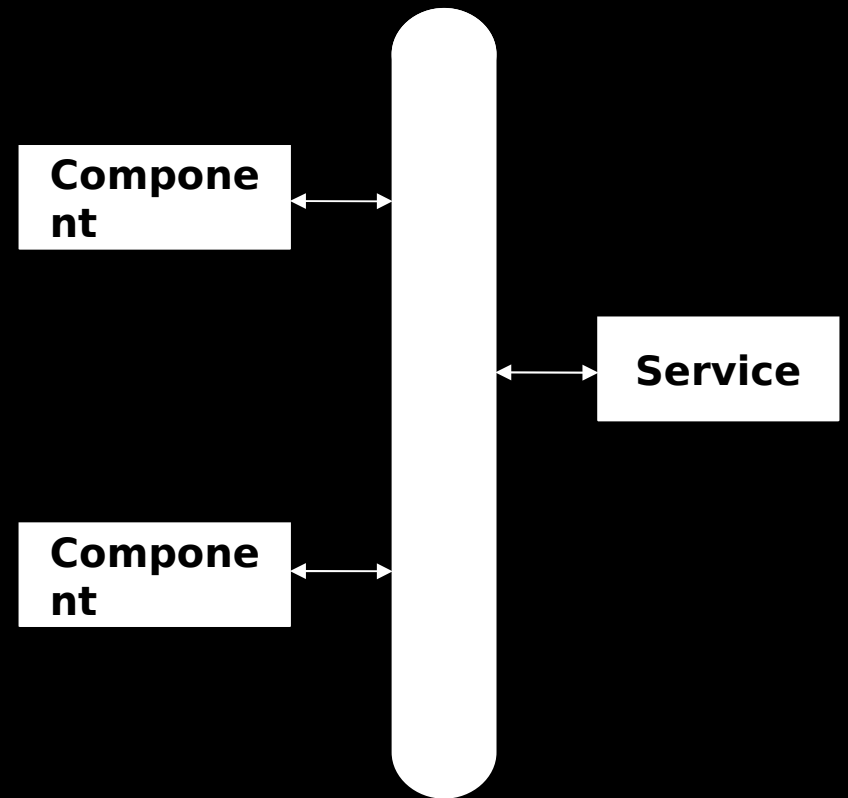
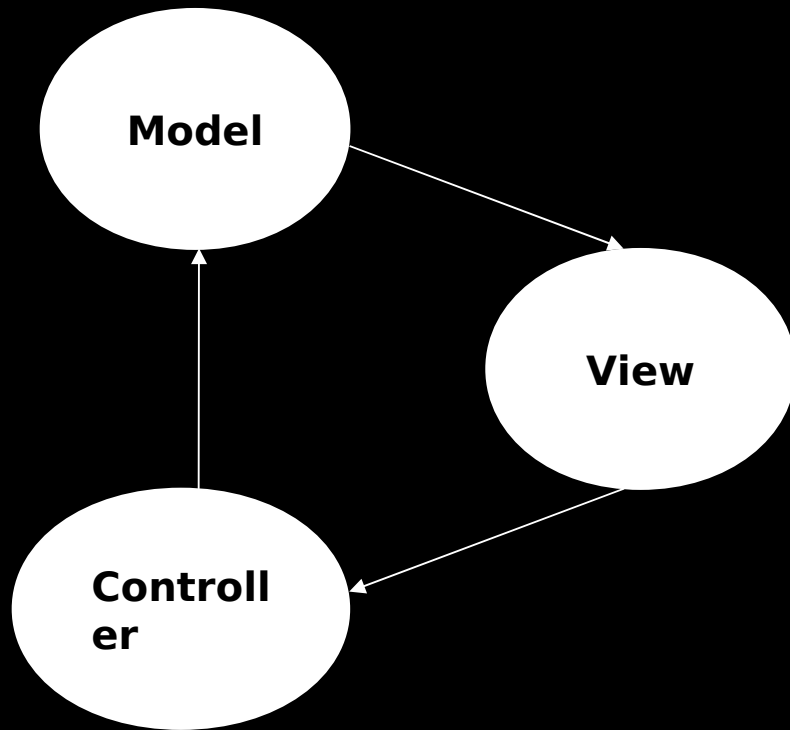
## Model - View - Controller

- Hand rolled
- Formal frameworks (Cairngorm, PureMVC, etc)
- Singletons
- Singletons and Modules don't mix

## Consider where Business Logic lives

- AIR / Offline requires client-side business logic
- Mostly stateless back-ends

# MVC / Service Bus



# Scalability

## CDNs

- Edge Cache SWFs

## NIO Based Messaging

- Thread per client does not scale
- Working with JCP & Comet style push options like Tomcat 6

## AMF!!!

# Security

## Flash Player uses the browser networking stack

- JAAS
- ACEGI

## crossdomain.xml - BE VERY AFRAID!

```
<cross-domain-policy>  
  <allow-access-from domain="*" />  
</cross-domain-policy>
```

- Never, ever, ever put a global policy file on an intranet site
- Never, ever, ever put a global policy file on a site using cookie authentication