

Mobile application transformation for z/VSE



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Ingo Franzki
IBM Germany



Evolution for future payments

What remains...



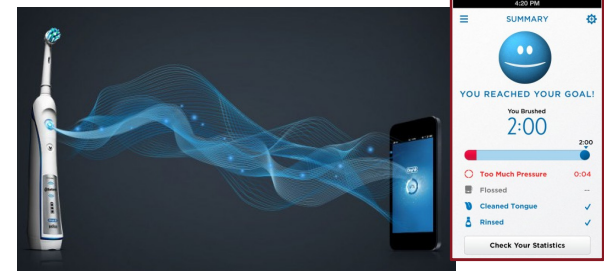
Cash and classical use of Credit- and Debit cards

Actual News...



Contact free payments with cards at terminals and Mobile, use of QR-Codes

What's coming?



Diverse other devices: Watches, Glasses, ...?

Next Generation Bill Pay

For Private Banks & Trusts



Purpose built bill pay solutions.

Balance gives you the ability to connect with any US based checking account to pay any US bill. With Balance, you can scan and upload bills and set different payment rules and requirements related to payments. Provide access to multiple parties to make payments, approve bills and view documents.

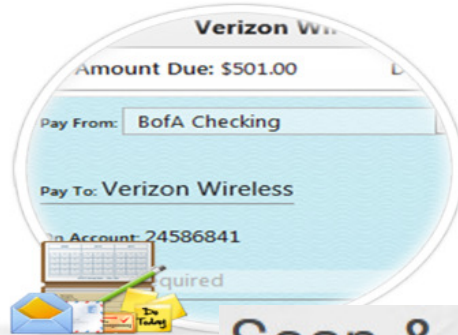


Photo Bill Pay & File

With the Balance iPhone app, clients can make payments and file documents. Trifork service professional such as a trust or estate account. Use the photo bill pay app to scan bills, upload them to the app, and help clients better

Scan & Pay

It can be a hazzle to pay bills online, when you need to type in various payment details on your smartphone. Why not just scan the bill with your built-in camera on your mobile phone and pay, when you want?



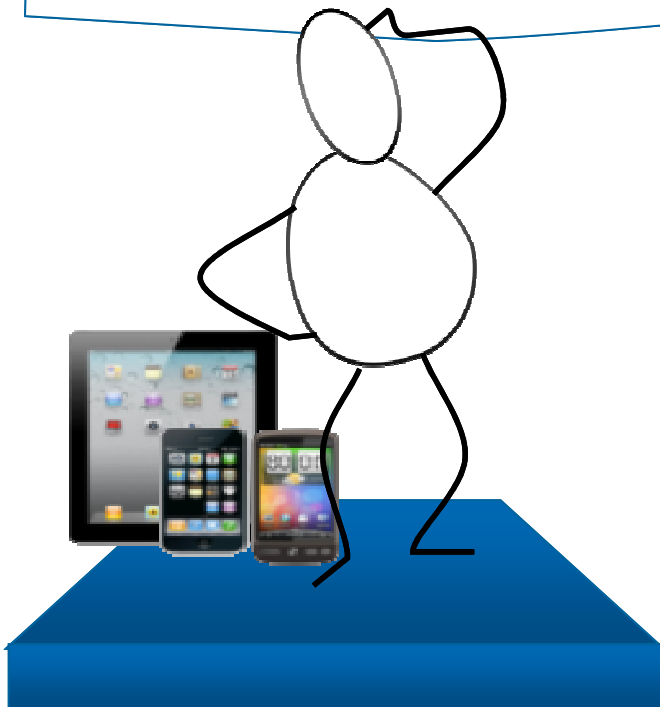
An easy and well-proven solution

Trifork Scan & Pay is an intuitive solution which easily fits into your current mobile banking application or can be implemented as a feature into a new mobile banking solution. It's a well-

What about the mainframe?

The mainframe...

- Home to business critical applications and data
- How do we bridge the gap?



IBM z Systems - Bridge Systems of Record and Systems of Engagement

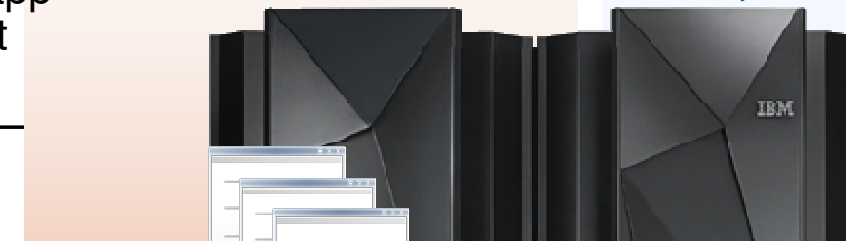
Systems of Engagement

Systems of Engagement are cloud-based, decentralized, support rapid app development



Linux on z

z/OS,
z/VSE, zTPF



Existing Web Apps

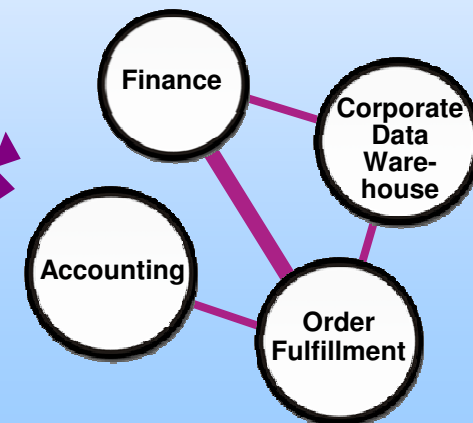
IBM
MobileFirst



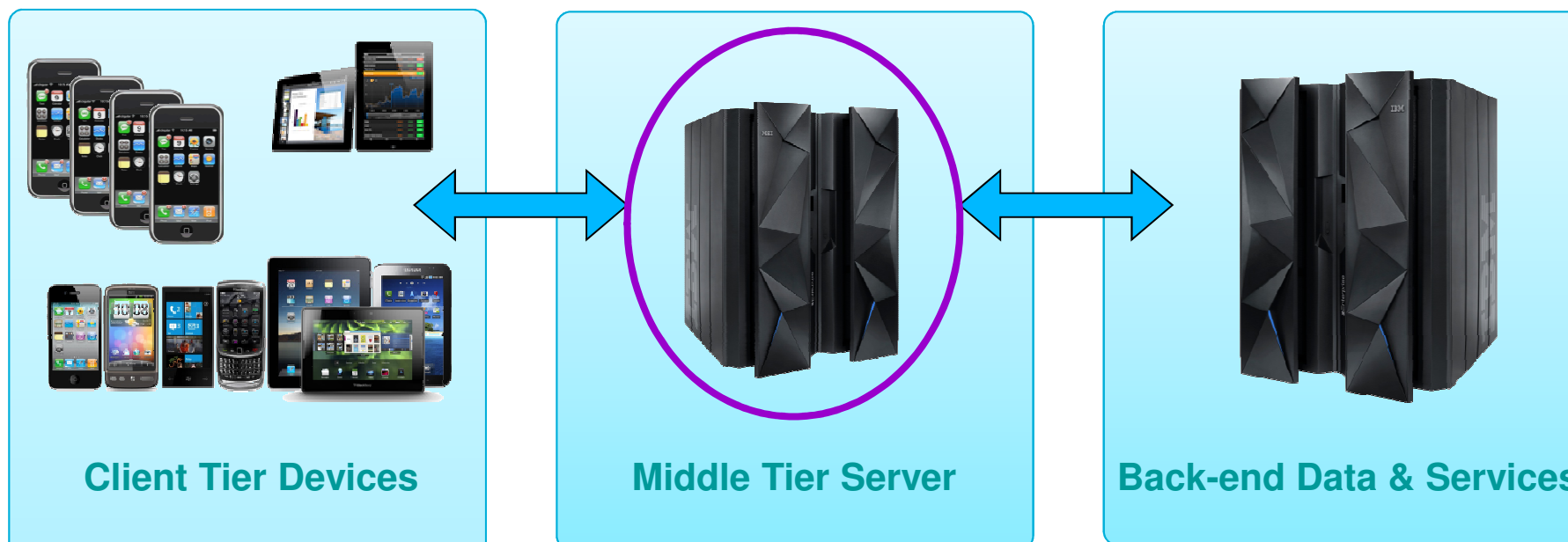
Mobile Apps

Systems of Record

Systems of Record are well integrated, trusted repositories



Multi-tier Mobile Apps - Specific Challenges



Mobile-specific challenges:

- ✓ Lots of device targets
- ✓ Provisioning rules and artifacts
- ✓ Curated App Stores
- ✓ Dependent upon backend service versions

The Mobile-specific challenges are mainly:

1. Dealing with the **specific issues in the Mobile Client tier**
2. And subsequently **coordinating separate pipelines** for each tier:

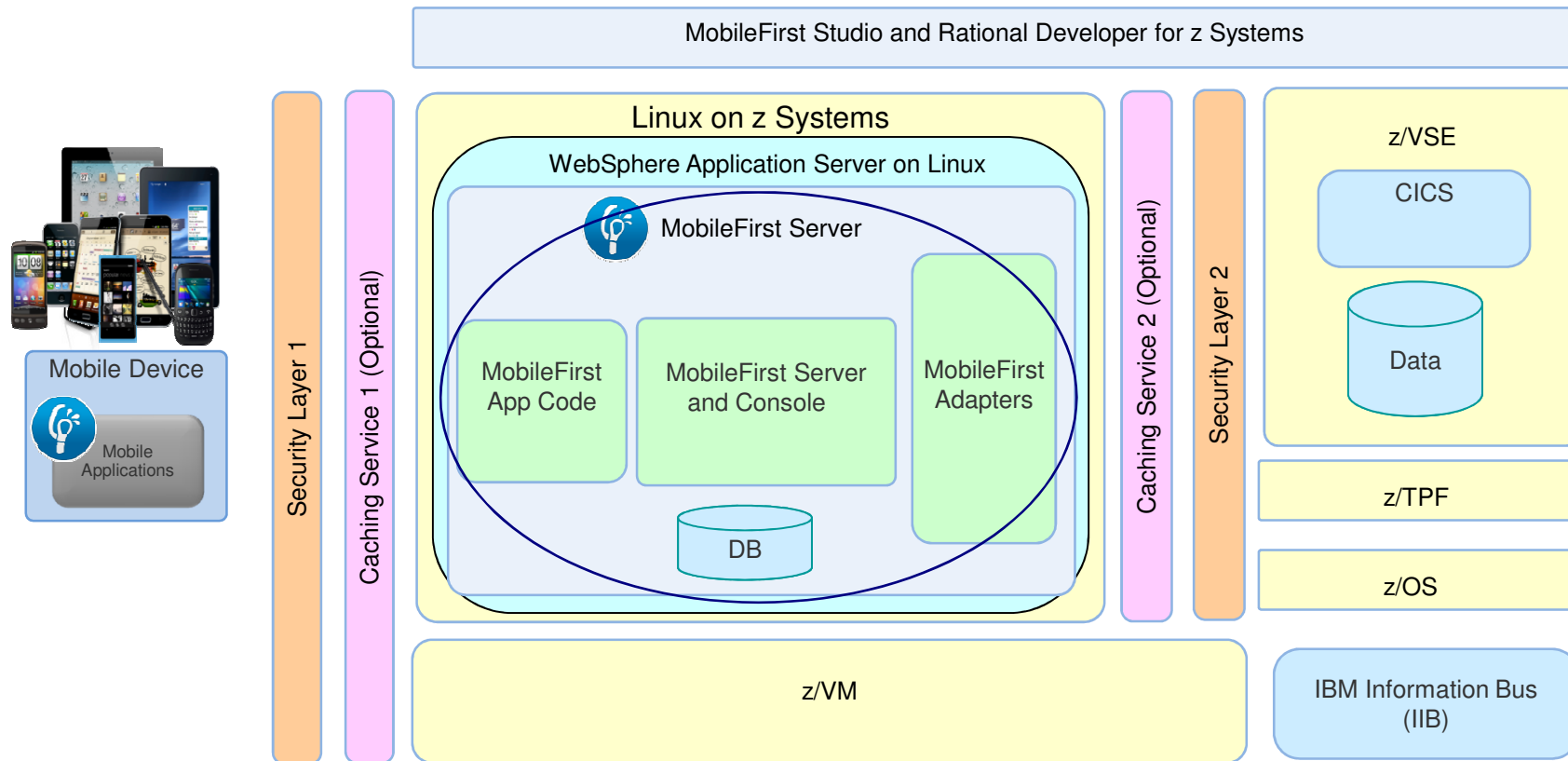
- **Mobile Client**
- **Middleware**
- **Back-end data and services**

IBM positioning to solve the Mobilizing challenges

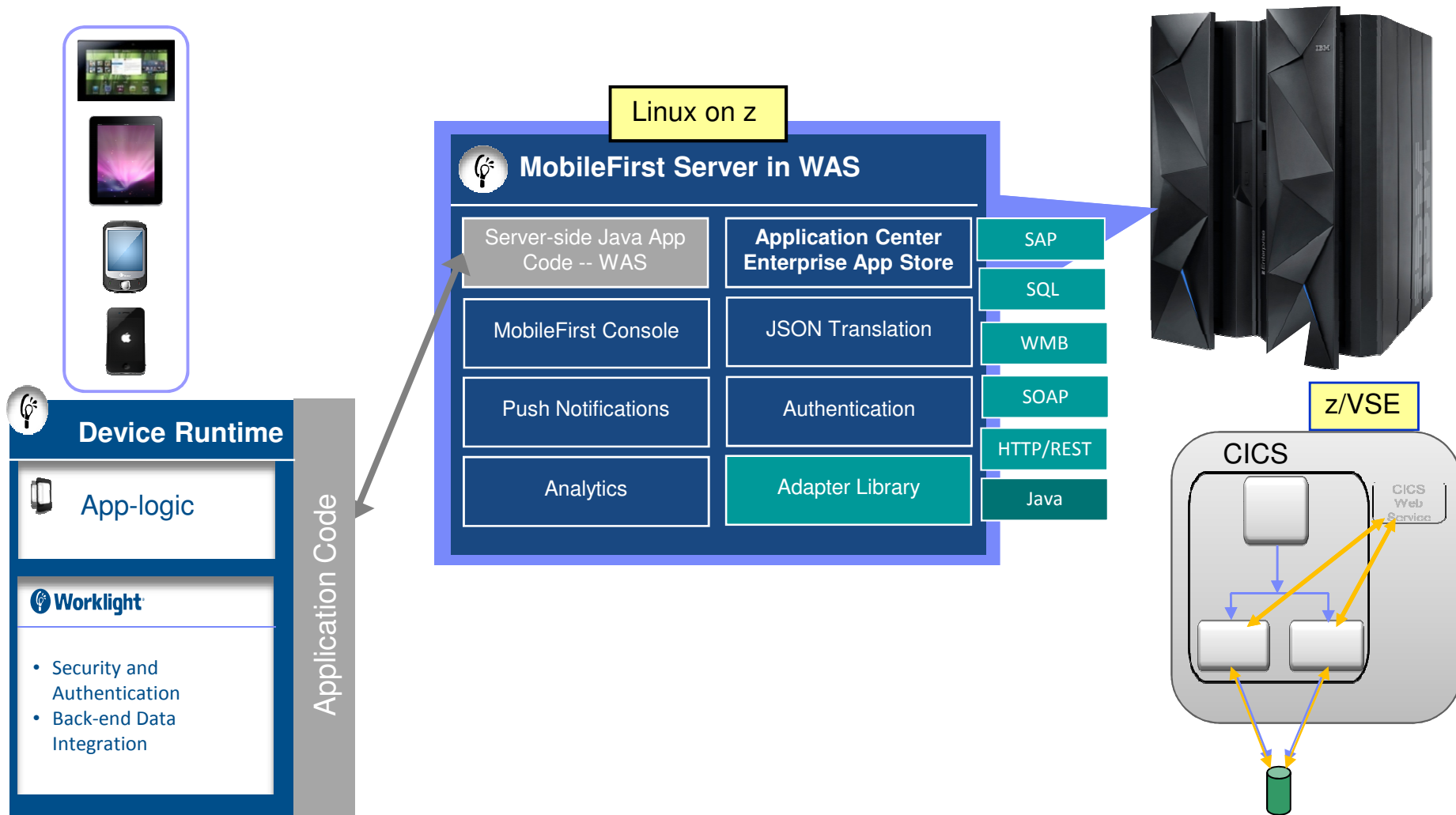
MobileFirst Platform – An Enterprise Blueprint



Mobile Architecture Overview for IBM z Systems



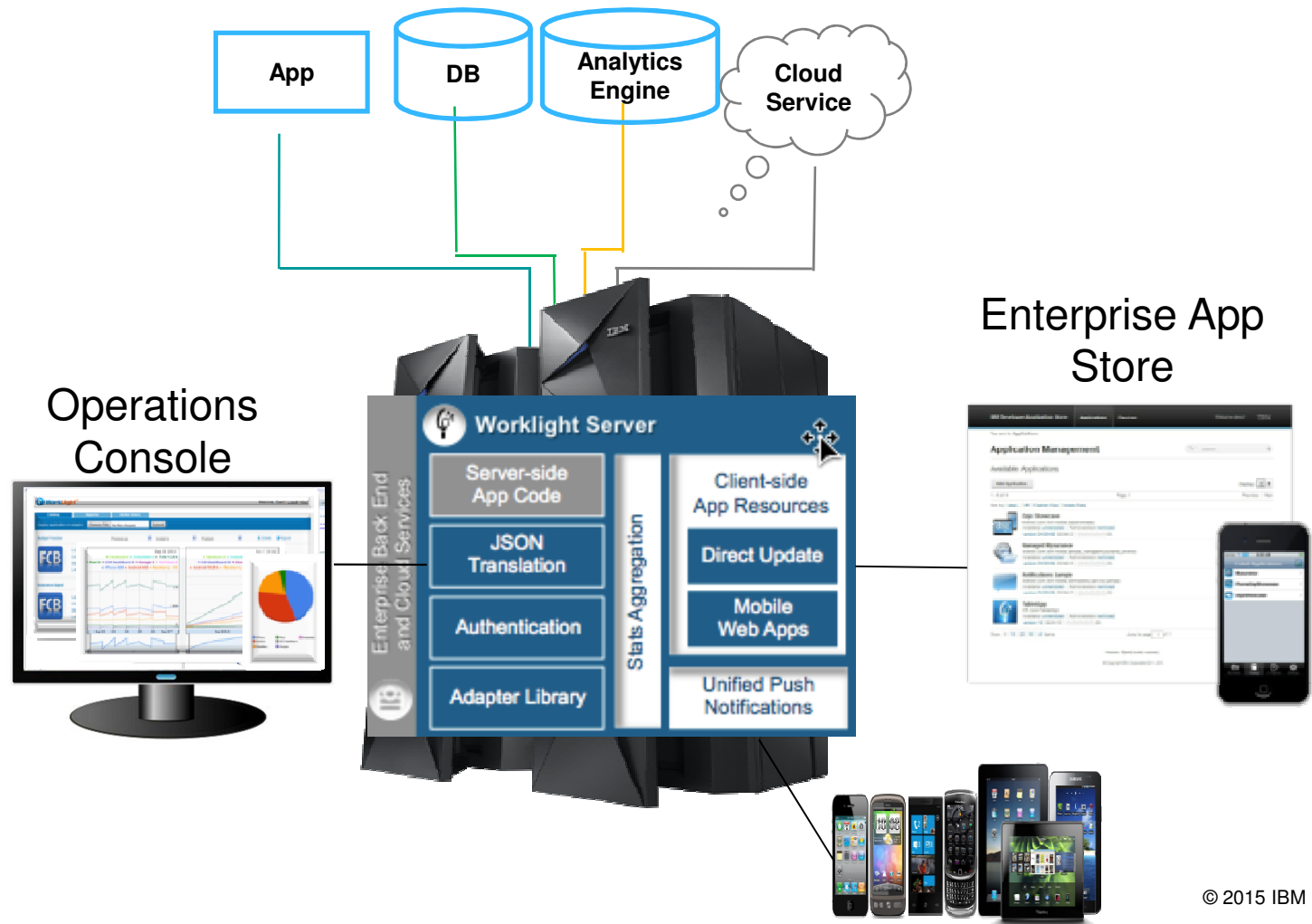
IBM MobileFirst Server



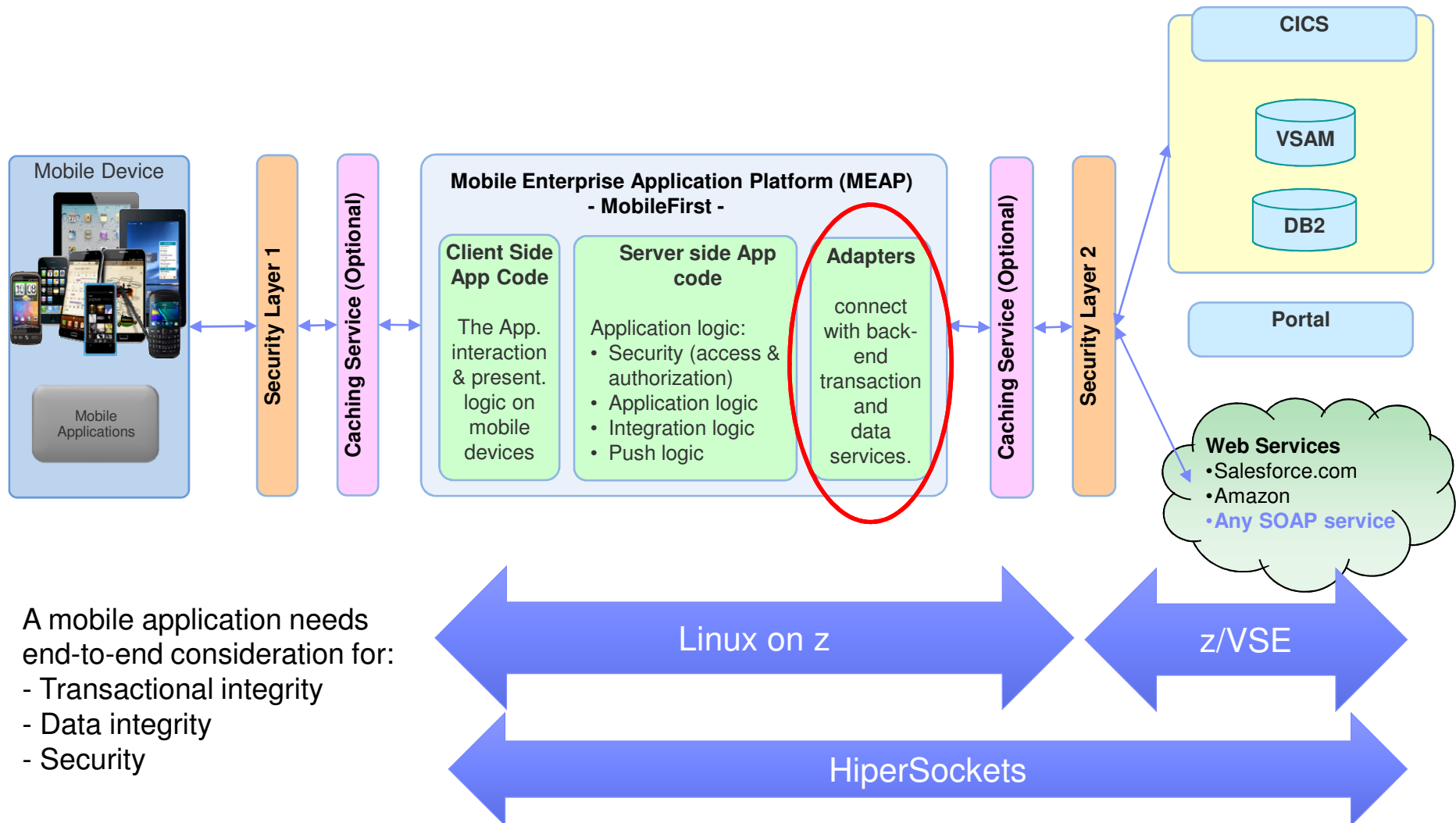
MobileFirst Video: http://www.youtube.com/watch?feature=player_embedded&v=zHnFw70XXXo

MobileFirst: A control point for mobile access to the enterprise

Caching, authentication, mobile application management and push notifications



Mobile application overview diagram

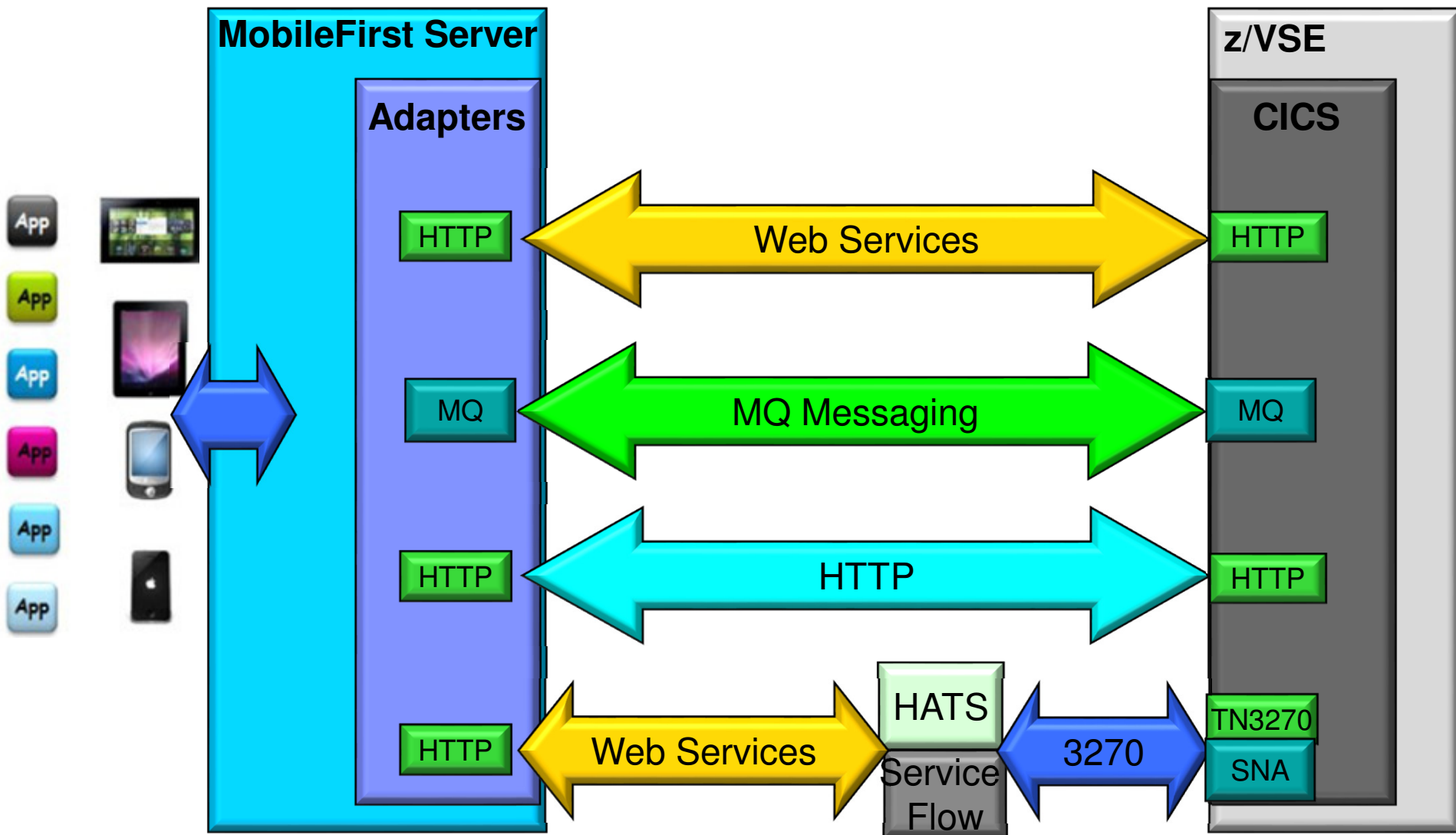


A mobile application needs end-to-end consideration for:

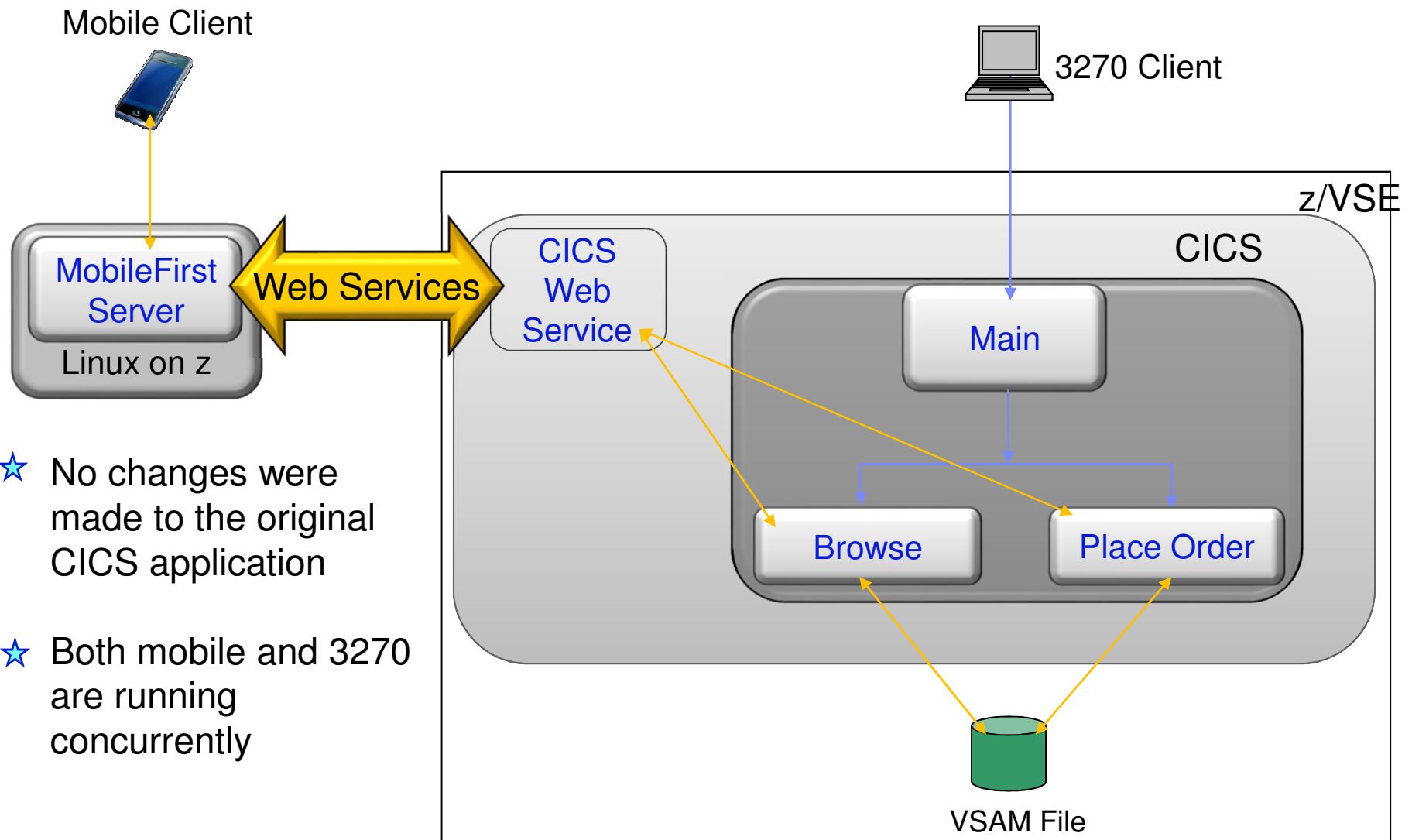
- Transactional integrity
- Data integrity
- Security

Mobile application integration is realized with MobileFirst Adapters

CICS Connectivity Options with MobileFirst

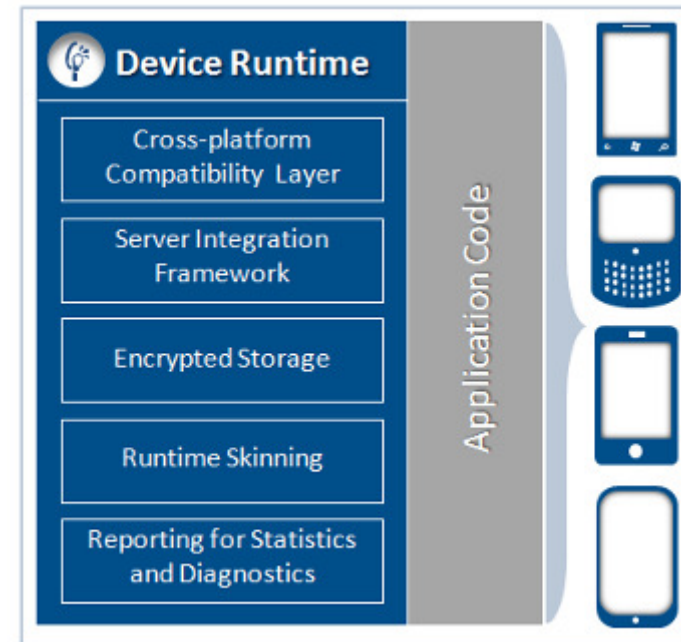
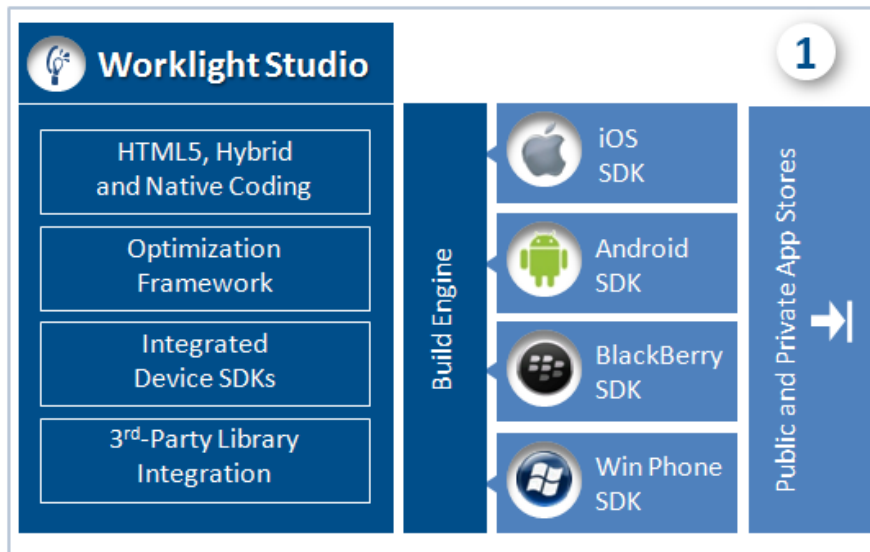


MobileFirst Modernizes the CICS Web Service Enabled App

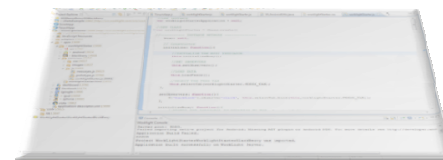
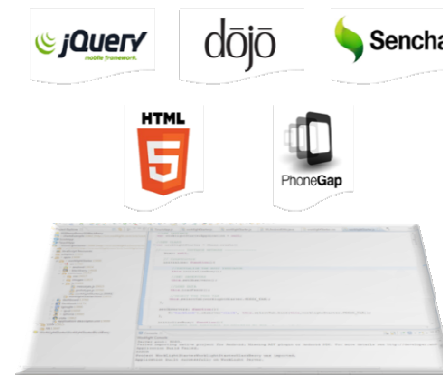


- ★ No changes were made to the original CICS application
- ★ Both mobile and 3270 are running concurrently

IBM MobileFirst Studio & Device Runtime



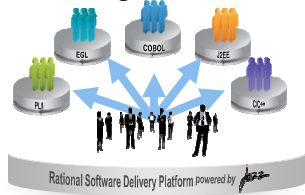
Eclipse based mobile **Integrated Development Environment (IDE)**



RDz with MobileFirst Studio

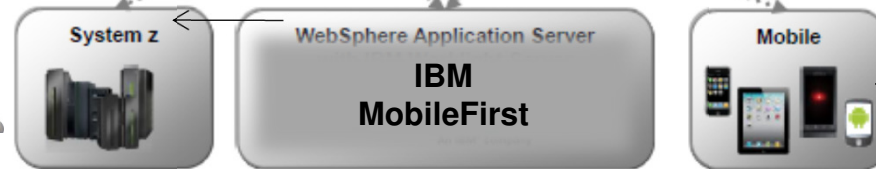
Full set of z Systems and Mobile Development capabilities (z/VSE Plug-In required)

Integration with Team Concert for Lifecycle and Source Management



- Built on Eclipse
- Common tool set for end to end development
- Build, preview, and deploy within the IDE
- Mobile simulator (for unit test)
- End-to-end debug
- Integrate with third-party SDKs (e.g. Android Development Tools)

Access to typical IBM z Systems sub-system functionality in, CICS, IMS, DB2, WAS



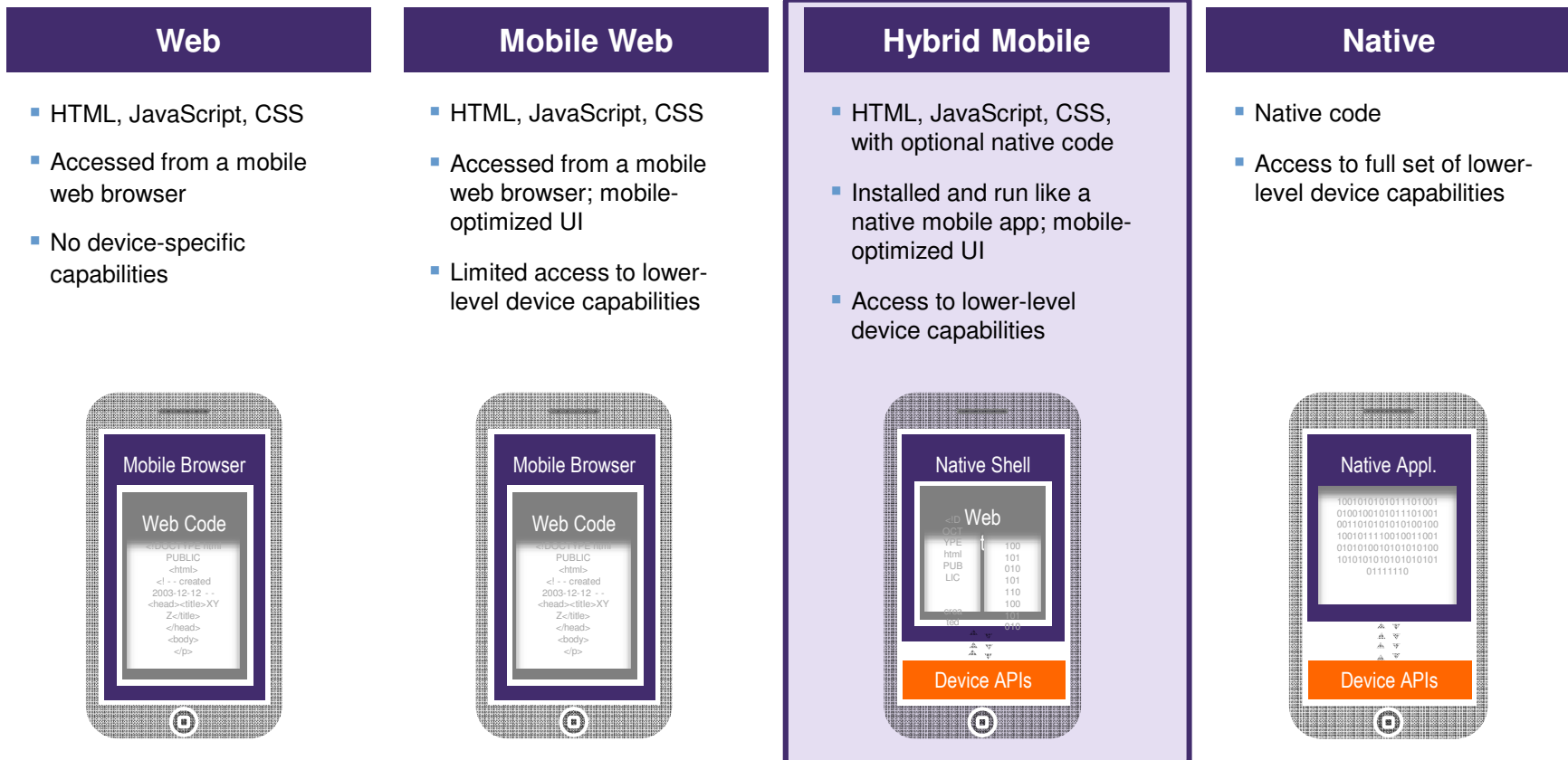
COBOL, ASM, JCL, C, Java, HTML5, GUI Development

Robust Mobile Development in conjunction with MobileFirst

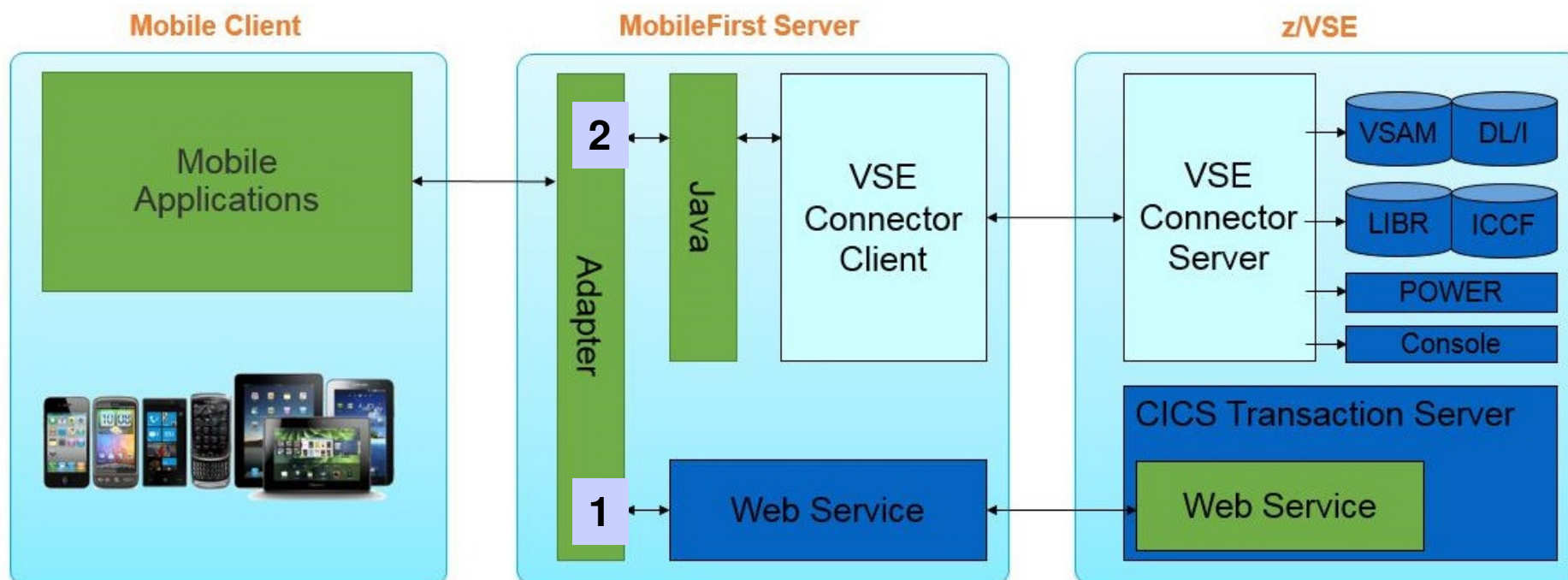


IBM MobileFirst – Support for Different Mobile Application Styles

•Simplifies the development of mobile applications across multiple mobile platforms - iOS, Android, BlackBerry, and Windows® Phone



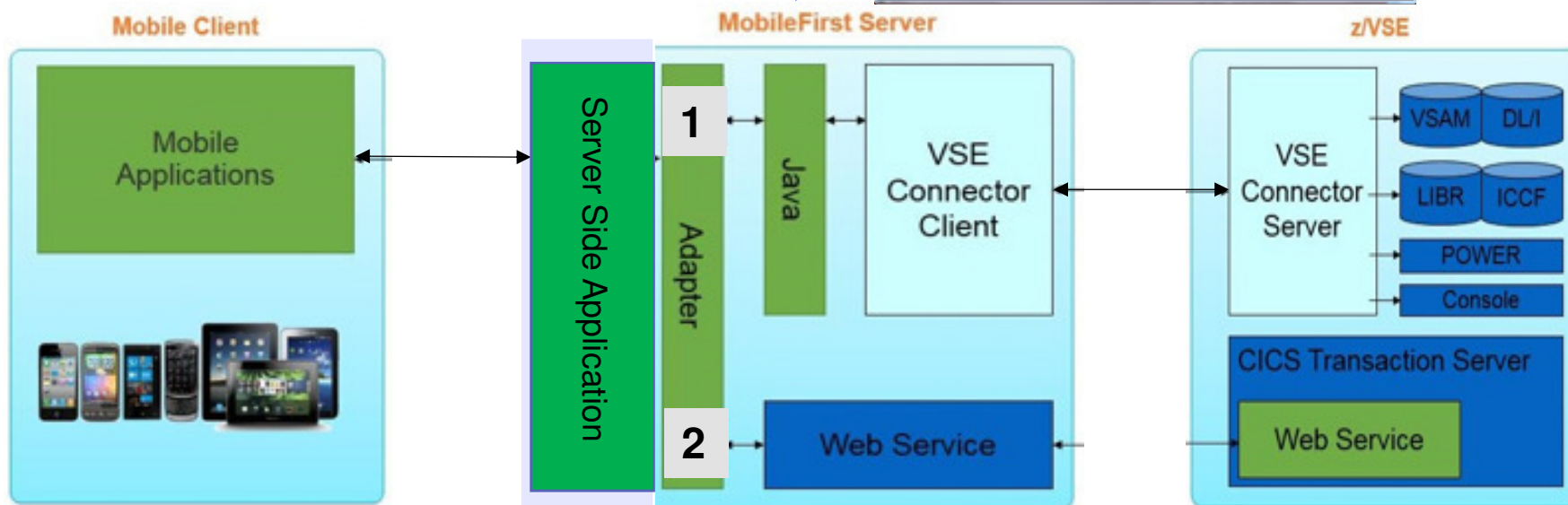
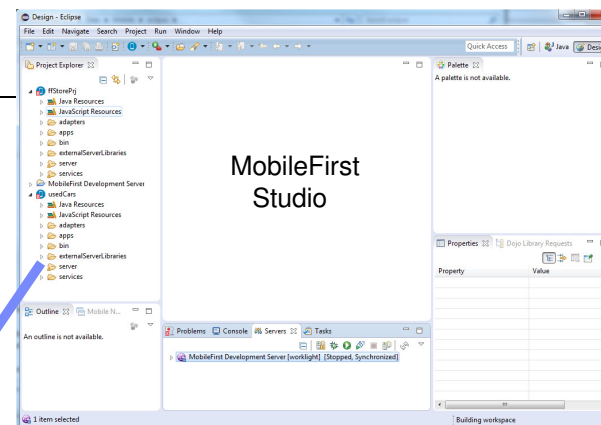
z/VSE and MobileFirst



To start mobile development with z/VSE, you need to have the following applications:

- The **IBM MobileFirst Platform Developer Edition**
- The **z/VSE Connector Client**
- The **z/VSE Connector Server** (part of VSE/ESA 2.5 and later releases)

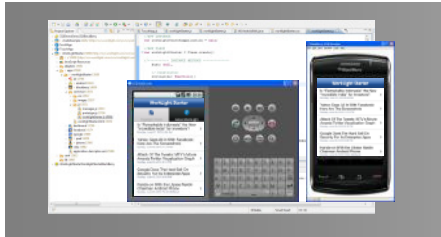
z/VSE and IBM MobileFirst



To start mobile development with z/VSE, you need to have the following applications:

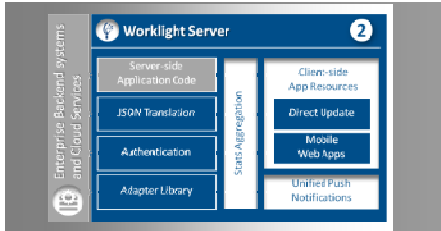
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IBM MobileFirst Platform Foundation overview



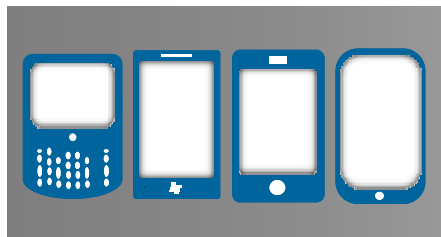
IBM MobileFirst Studio

The most complete, extensible environment with maximum code reuse and per-device optimization



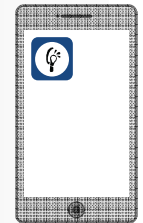
IBM MobileFirst Server

Unified notifications, runtime skins, version management, security, integration and delivery



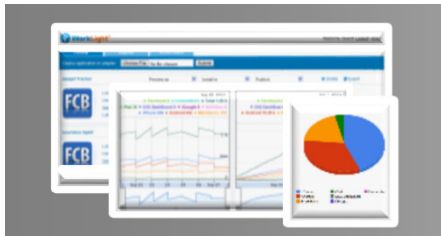
IBM MobileFirst Device Runtime Components

Extensive libraries and client APIs that expose and interface with native device functionality



IBM MobileFirst Application Center

The MobileFirst Application Center can function as an enterprise application storage to deploy mobile applications across mobile platforms.

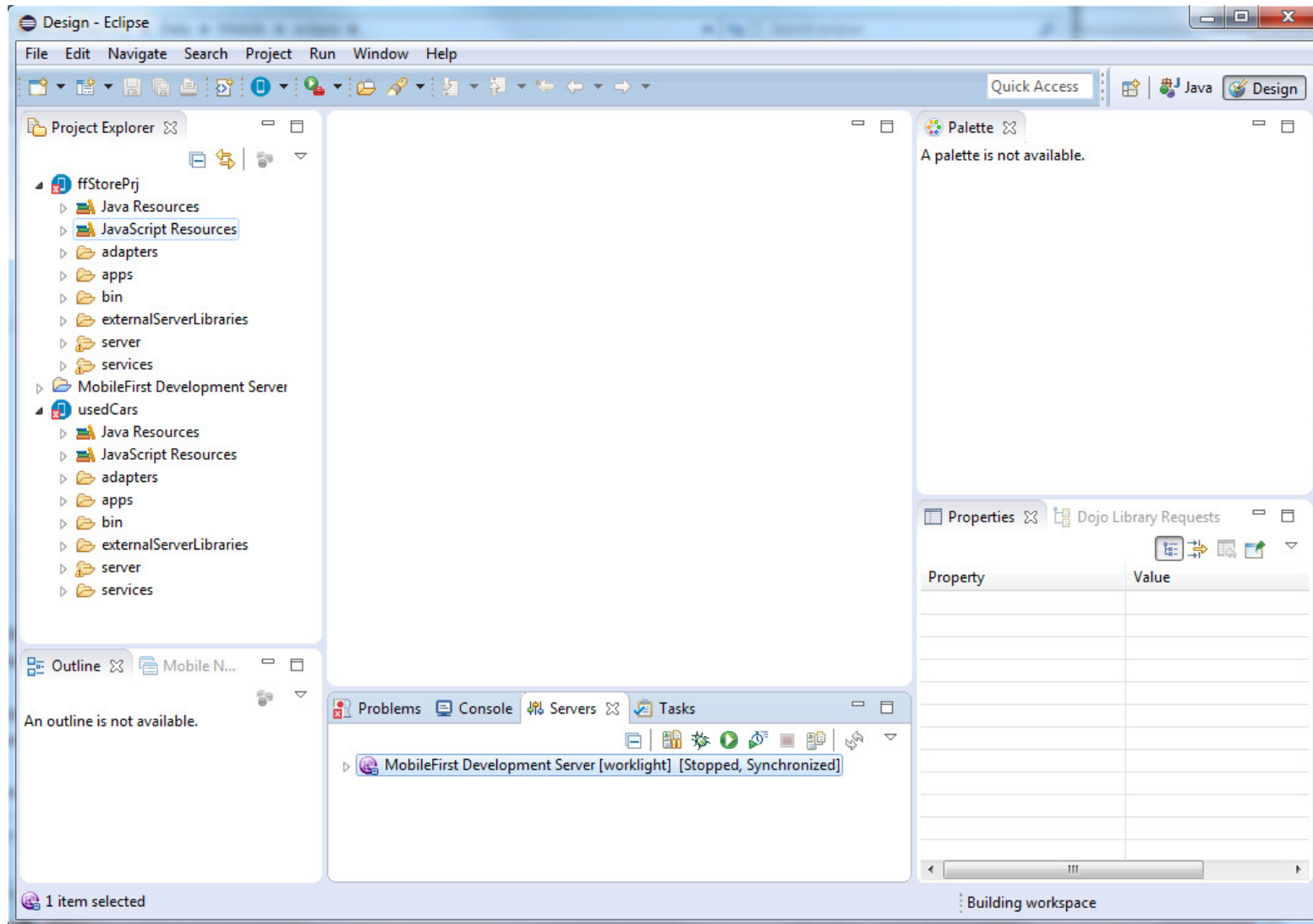


IBM MobileFirst Console

A web-based console for real-time analytics and control of your mobile apps and infrastructure



IBM MobileFirst Studio – an Eclipse Plug-In



1) z/VSE Connectors for Mobile

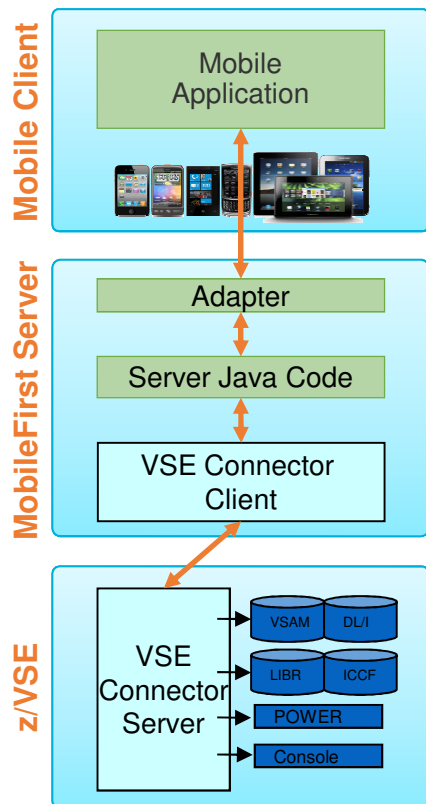
Skeleton in lib 59: SKVSSAMP

Export of a VSAM data in HTML format

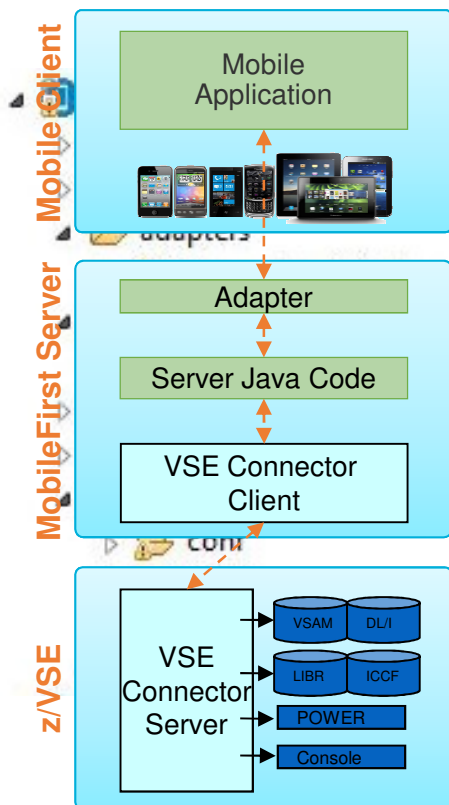
Catalog: VSESP.USER.CATALOG
 Cluster: VSAM.CONN.SAMPLE.DATA
 Map: USED CARS
 Number of records: 7
 Date: 23.12.2014 10:38:23

| ARTICLENO | MANUFACTURER | TYPE | MODEL | HP | DISPLACEMENT | CYLINDERS | COLOUR | FEATURES | PRICE |
|-----------|--------------|------------|------------------|-----|--------------|-----------|---------------------|---------------------|-------|
| 1 | Volkswagen | New Beetle | Petro Model | 115 | 2000 | 4 | Red | Sliding Roof | 17000 |
| 2 | Mustang | GT 2 | DR CONV | 250 | 4600 | 8 | Black | Smoker's Package | 30190 |
| 3 | Ford | Taurus | SE Station Wagon | 200 | 3000 | 6 | Blue | Appearance Package | 23280 |
| 4 | BMW | compact | 316i | 102 | 1600 | 4 | VelvetBlue Metallic | sport edition | 20500 |
| 5 | Mercedes | E220 | Avantgarde | 160 | 2300 | 6 | Grey | Navigation System | 67000 |
| 6 | Porsche | Roadster | | 220 | 2700 | 6 | Silver | Leather,CD Changer | 42300 |
| 7 | Ford | Escort | ZX2 2 Door Coupe | 150 | 2000 | 6 | White | Sp.Seats,Zetec Eng. | 15715 |

Using Java in MobileFirst adapters

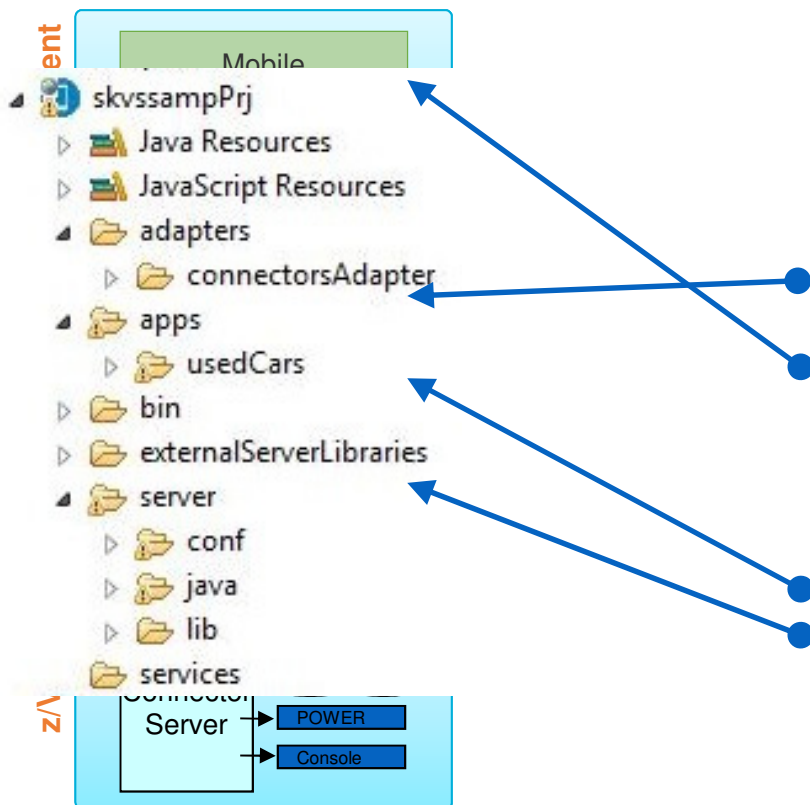


Using Java in MobileFirst adapters



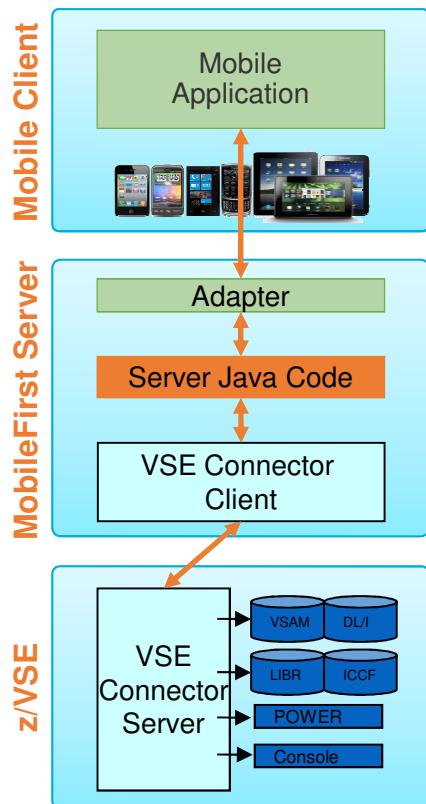
1. Create a project
2. Add *VSEConnector.jar*, *cci.jar*, *ibmjsse.jar*, *ibmpkcs.jar* to your mobile project: copy these libraries to `<your project name>` → `server` → `lib`
3. Your java source code for adapter will be located under `<your project name>` → `server` → `java`

Using Java in MobileFirst adapters



1. Create a project
2. Add *VSEConnector.jar*, *cci.jar*, *ibmjss.jar*, *ibmpkcs.jar* to your mobile project: copy these libraries to *<your project name>* → *server* → *lib*
3. Your java source code for adapter will be located under *<your project name>* → *server* → *java*

z/VSE Connectors: server Java code



<connector client folder> → samples → com → ibm → vse → samples → VsamDisplayExample.java

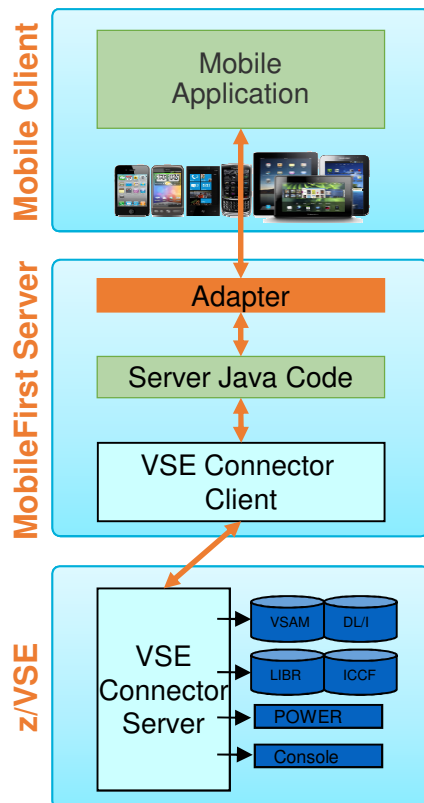
<project> → server → java → new Class → ...

Main java file is called *skvssampJava.java* with the predefined package *com.ibm.zvse.adapter*
addNewCar(...), changeCar(...), deleteCar(...), getInfo()

Code sample:

<ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/download/skvssampPrj.zip>

z/VSE Connectors: create adapter



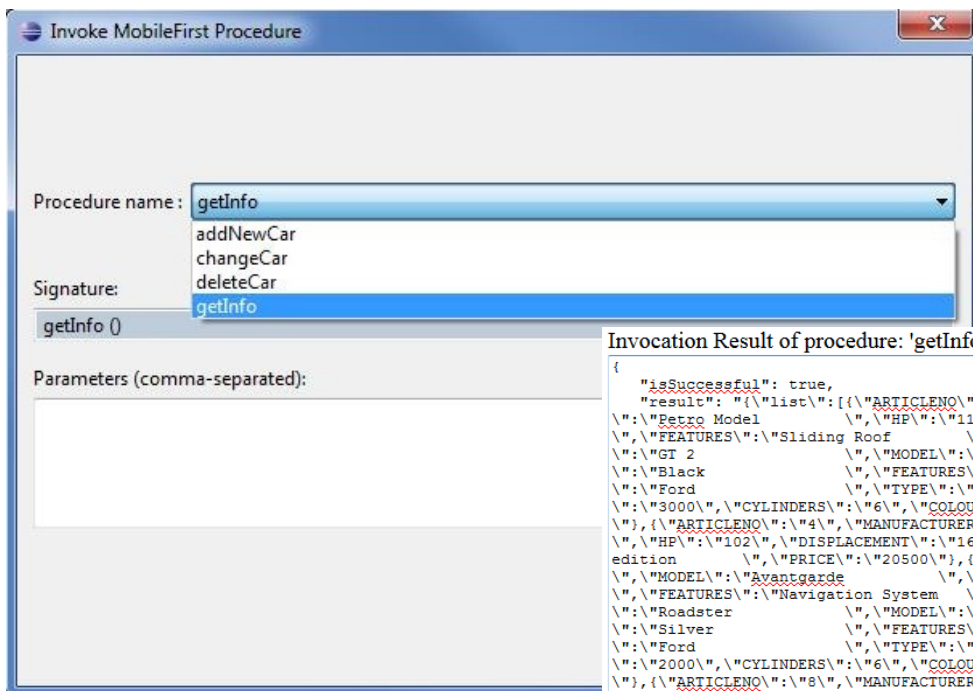
Create a HTTP adapter

- *<your adapter name>.xml* – change connectivity
- *<your adapter name>-impl.js* – change logic

```
function getInfo() {
    var cclInstance = new com.ibm.zvse.adapter.skvssampJava();
    return {
        result: cclInstance.getInfo( )
    };
}
```

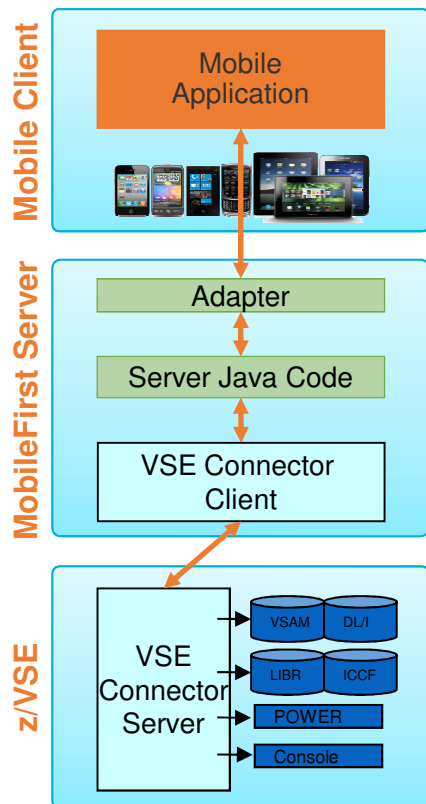
z/VSE Connectors: test adapter

<your adapter name> → Run As → Invoke MobileFirst Procedure



```
Invocation Result of procedure: 'getInfo' from the MobileFirst Server:
{
  "isSuccessful": true,
  "result": "{\list": [{"ARTICLENO": "1", "MANUFACTURER": "Volkswagen", "TYPE": "New Beetle", "MODEL": "Petrol Model", "HP": "115", "DISPLACEMENT": "2000", "CYLINDERS": "4", "COLOUR": "Red", "FEATURES": "Sliding Roof", "PRICE": "17000"}, {"ARTICLENO": "2", "MANUFACTURER": "Mustang", "TYPE": "GT 2", "MODEL": "DR CONV", "HP": "250", "DISPLACEMENT": "4600", "CYLINDERS": "8", "COLOUR": "Black", "FEATURES": "Smoker's Package", "PRICE": "30190"}, {"ARTICLENO": "3", "MANUFACTURER": "Ford", "TYPE": "Taurus", "MODEL": "SE Station Wagon", "HP": "200", "DISPLACEMENT": "3000", "CYLINDERS": "6", "COLOUR": "Blue", "FEATURES": "Appearance Package", "PRICE": "23280"}, {"ARTICLENO": "4", "MANUFACTURER": "BMW", "TYPE": "compact", "MODEL": "316i", "HP": "102", "DISPLACEMENT": "1600", "CYLINDERS": "4", "COLOUR": "VelvetBlue Metallic", "FEATURES": "sport edition", "PRICE": "20500"}, {"ARTICLENO": "5", "MANUFACTURER": "Mercedes", "TYPE": "E220", "MODEL": "Avantgarde", "HP": "160", "DISPLACEMENT": "2300", "CYLINDERS": "6", "COLOUR": "Grey", "FEATURES": "Navigation System", "PRICE": "67000"}, {"ARTICLENO": "6", "MANUFACTURER": "Porsche", "TYPE": "Roadster", "MODEL": "2700", "HP": "220", "DISPLACEMENT": "2700", "CYLINDERS": "6", "COLOUR": "Silver", "FEATURES": "Leather, CD Changer", "PRICE": "42300"}, {"ARTICLENO": "7", "MANUFACTURER": "Ford", "TYPE": "Escort", "MODEL": "ZX2 2 Door Coupe", "HP": "150", "DISPLACEMENT": "2000", "CYLINDERS": "6", "COLOUR": "White", "FEATURES": "Sp.Seats, Zetec Eng.", "PRICE": "15715"}, {"ARTICLENO": "8", "MANUFACTURER": "Volvo", "TYPE": "C30", "MODEL": "ycqh", "HP": "125", "DISPLACEMENT": "1798", "CYLINDERS": "3", "COLOUR": "grey", "FEATURES": "sport", "PRICE": "10000"}, {"ARTICLENO": "9", "MANUFACTURER": "Volvo", "TYPE": "S60", "MODEL": "sdf sdf", "HP": "123", "DISPLACEMENT": "1", "CYLINDERS": "2", "COLOUR": "blau", "FEATURES": "nice", "PRICE": "5000"}]}}
```

z/VSE Connectors: create mobile application



UI : *<your project name>* → apps → *<your app name>* → common → **index.html**

Logic : *<your project name>* → apps →

<your app name> → common → js → **main.js**

```
function getInfo(){
    // call adapter with predefined procedure
    var invocationData = {
        adapter : 'connectorsAdapter',
        procedure : 'getInfo',
        parameters : []
    };
    WL.Client.invokeProcedure(invocationData,{
        onSuccess : showResultSuccess,
        onFailure : showResultFailure
    });
}
```

z/VSE Connectors: create mobile application (cont)

function showResultSuccess(result)

arr = **JSON.parse**(result.invocationResult.result)

arr.list[i]

.MANUFACTURER

.MODEL

etc

Invocation Result of procedure: 'getInfo' from the MobileFirst Server:

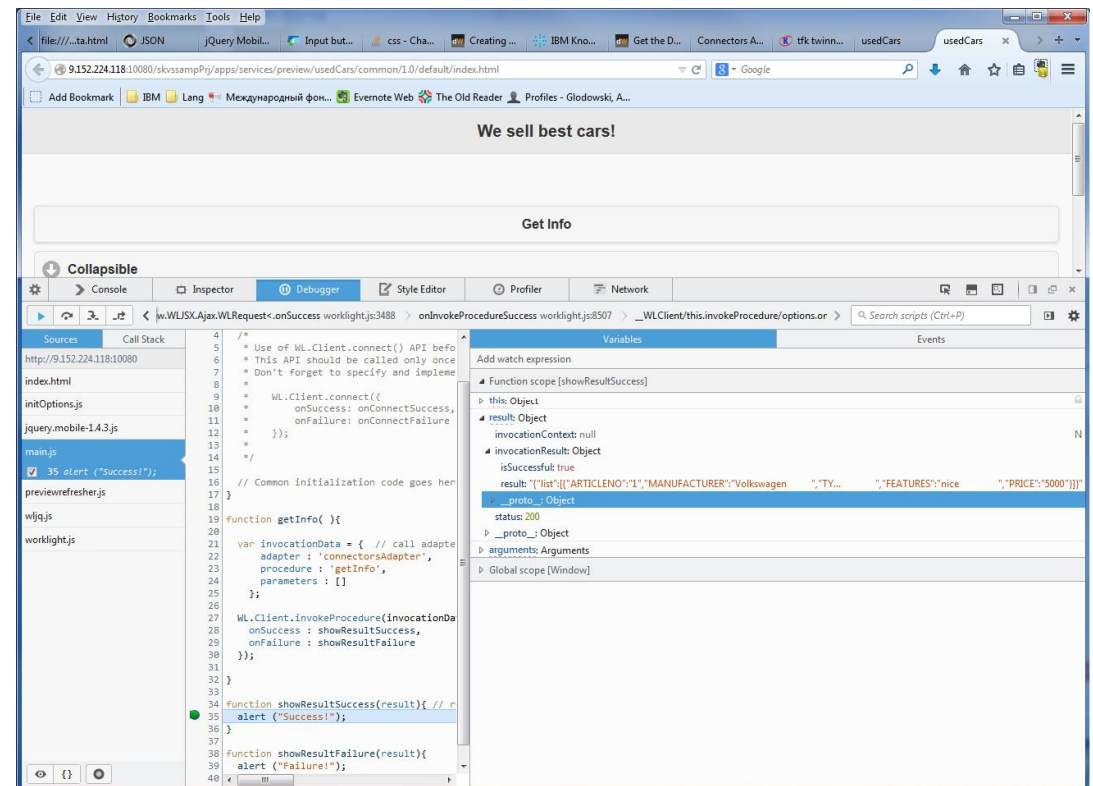
```
{
  "isSuccessful": true,
  "result": {"list": [{"ARTICLENO": "1", "MANUFACTURER": "Volkswagen", "TYPE": "New Beetle", "MODEL": "Petro Model", "HP": "115", "DISPLACEMENT": "2000", "CYLINDERS": "4", "COLOUR": "Red", "FEATURES": "Sliding Roof", "PRICE": "17000"}, {"ARTICLENO": "2", "MANUFACTURER": "Mustang", "TYPE": "GT 2", "MODEL": "DR CONV", "HP": "250", "DISPLACEMENT": "4600", "CYLINDERS": "8", "COLOUR": "Black", "FEATURES": "Smoker's Package", "PRICE": "30190"}, {"ARTICLENO": "3", "MANUFACTURER": "Ford", "TYPE": "Taurus", "MODEL": "SE Station Wagon", "HP": "200", "DISPLACEMENT": "3000", "CYLINDERS": "6", "COLOUR": "Blue", "FEATURES": "Appearance Package", "PRICE": "23280"}, {"ARTICLENO": "4", "MANUFACTURER": "BMW", "TYPE": "compact", "MODEL": "edition", "HP": "102", "DISPLACEMENT": "1600", "CYLINDERS": "4", "COLOUR": "VelvetBlue Metallic", "FEATURES": "sport", "PRICE": "20500"}, {"ARTICLENO": "5", "MANUFACTURER": "Mercedes", "TYPE": "E220", "MODEL": "Avantgarde", "HP": "160", "DISPLACEMENT": "2300", "CYLINDERS": "6", "COLOUR": "Grey", "FEATURES": "Navigation System", "PRICE": "67000"}, {"ARTICLENO": "6", "MANUFACTURER": "Porsche", "TYPE": "Roadster", "MODEL": "", "HP": "220", "DISPLACEMENT": "2700", "CYLINDERS": "6", "COLOUR": "Silver", "FEATURES": "Leather, CD Changer", "PRICE": "42300"}, {"ARTICLENO": "7", "MANUFACTURER": "Ford", "TYPE": "Escort", "MODEL": "ZX2 2 Door Coupe", "HP": "150", "DISPLACEMENT": "2000", "CYLINDERS": "6", "COLOUR": "White", "FEATURES": "Sp.Seats, Zetec Eng.", "PRICE": "15715"}, {"ARTICLENO": "8", "MANUFACTURER": "Volvo", "TYPE": "C30", "MODEL": "vcgh", "HP": "125", "DISPLACEMENT": "1798", "CYLINDERS": "3", "COLOUR": "grey", "FEATURES": "sport", "PRICE": "10000"}, {"ARTICLENO": "9", "MANUFACTURER": "Volvo", "TYPE": "S60", "MODEL": "sdf sdf", "HP": "123", "DISPLACEMENT": "1", "CYLINDERS": "2", "COLOUR": "blau", "FEATURES": "nice", "PRICE": "5000"}]}
}
```

z/VSE Connectors: test and debug

<your mobile app name> → Run As →

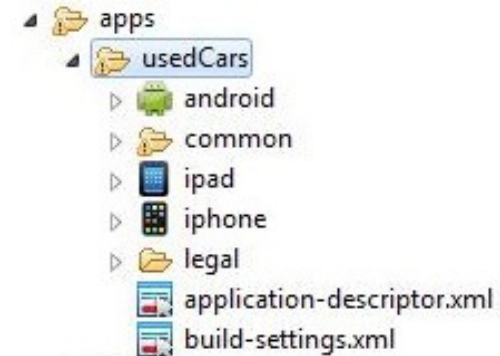
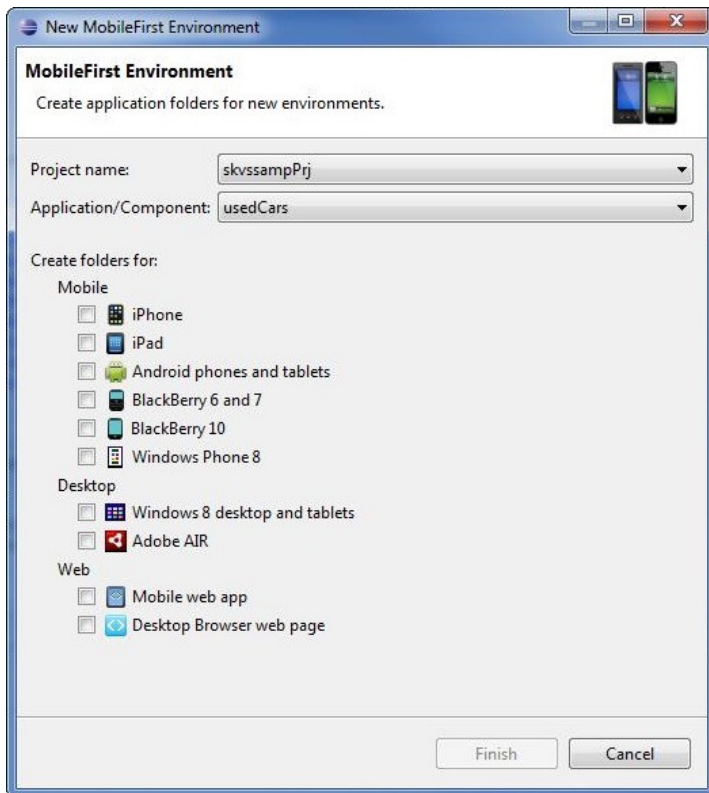
Run on MobileFirst Development Server

<your mobile app name> → Run As → Preview

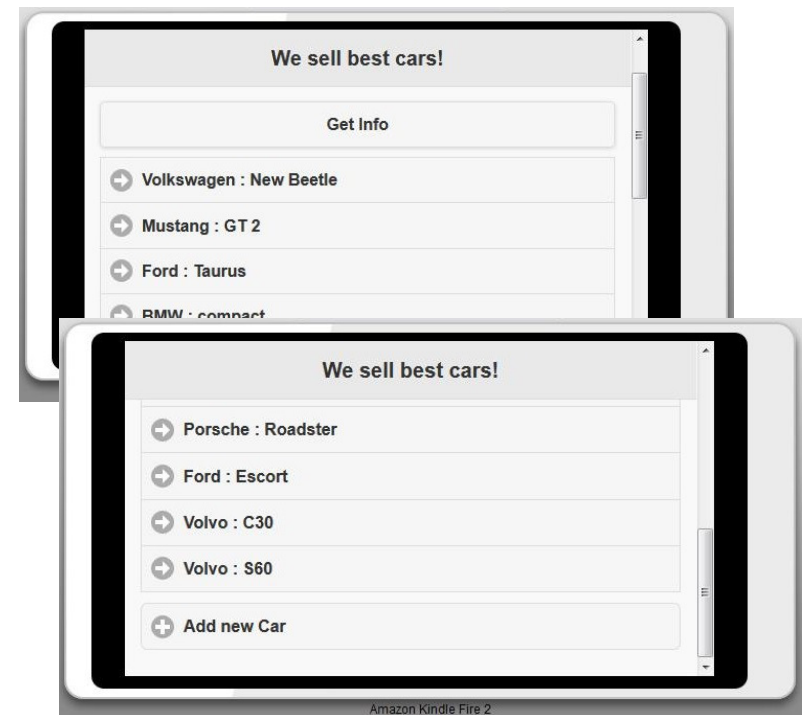
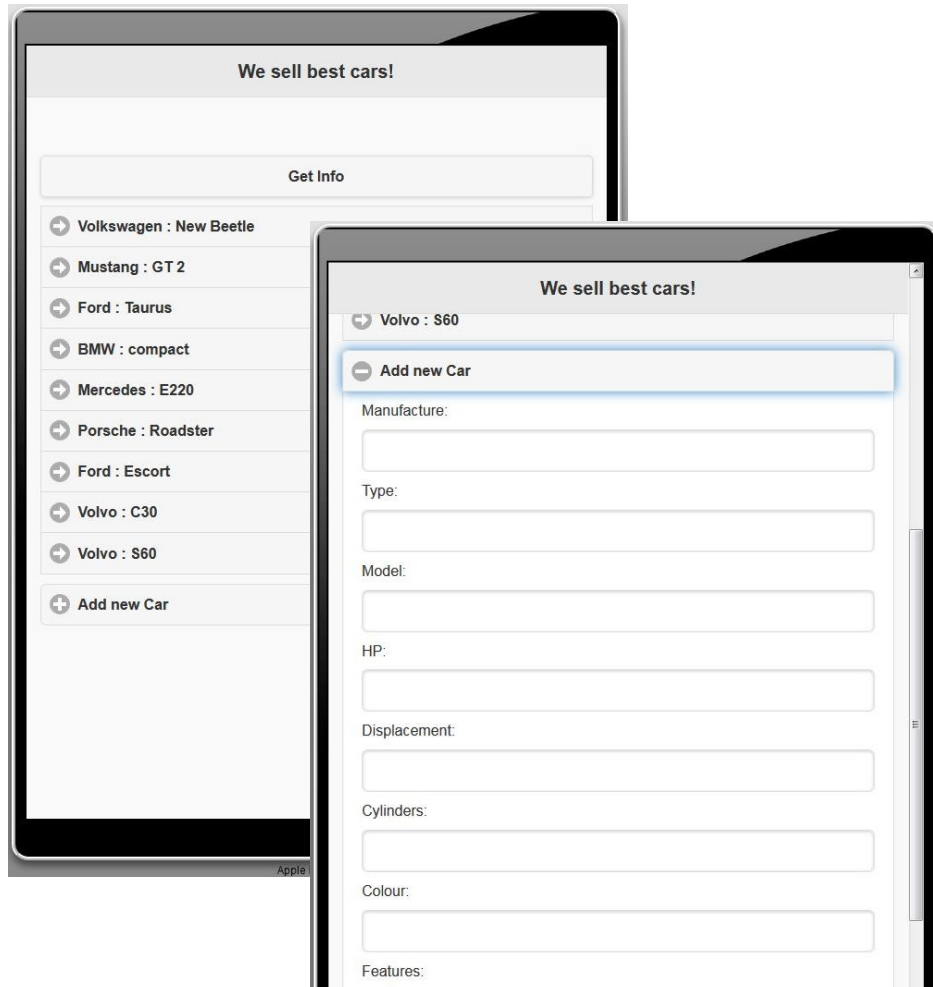


Add MobileFirst environment

<your mobile app name> → New → MobileFirst Environment



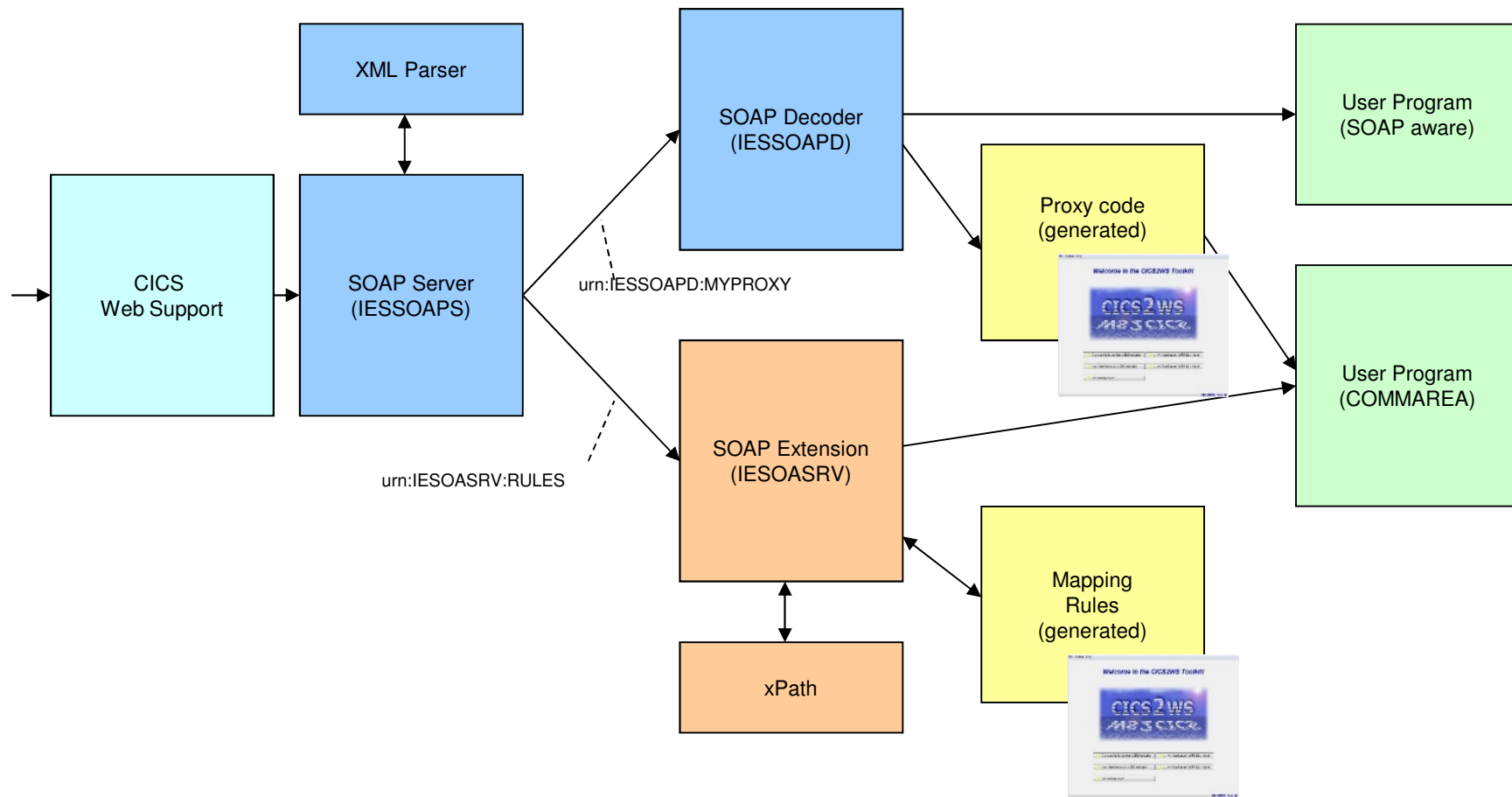
Running app in MobileFirst Environments



Live Virtual Class:
Mobile access to the existing z/VSE application (February 24, 2015)

<http://www-03.ibm.com/systems/z/os/zvse/education/index.html>

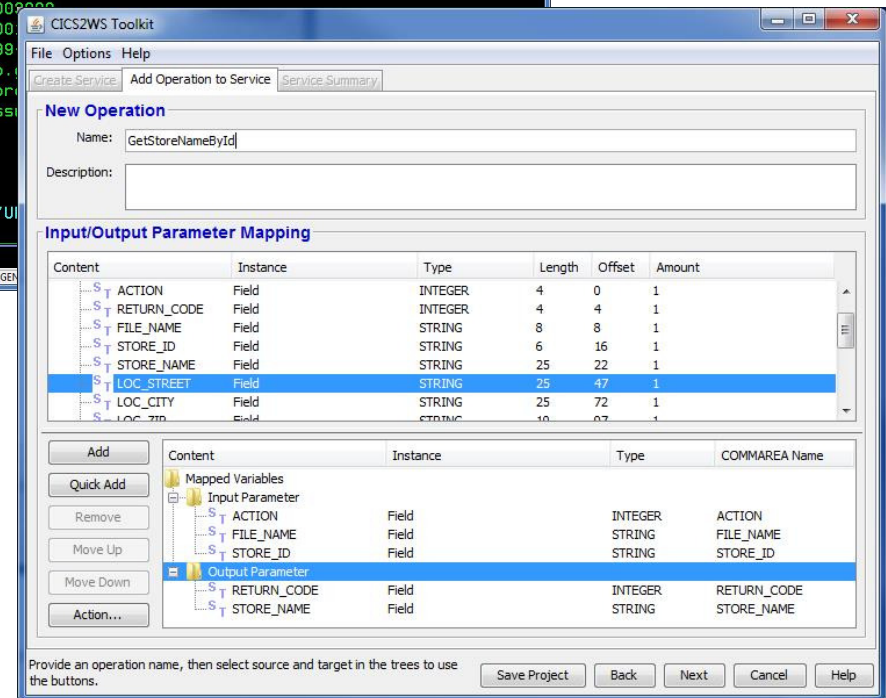
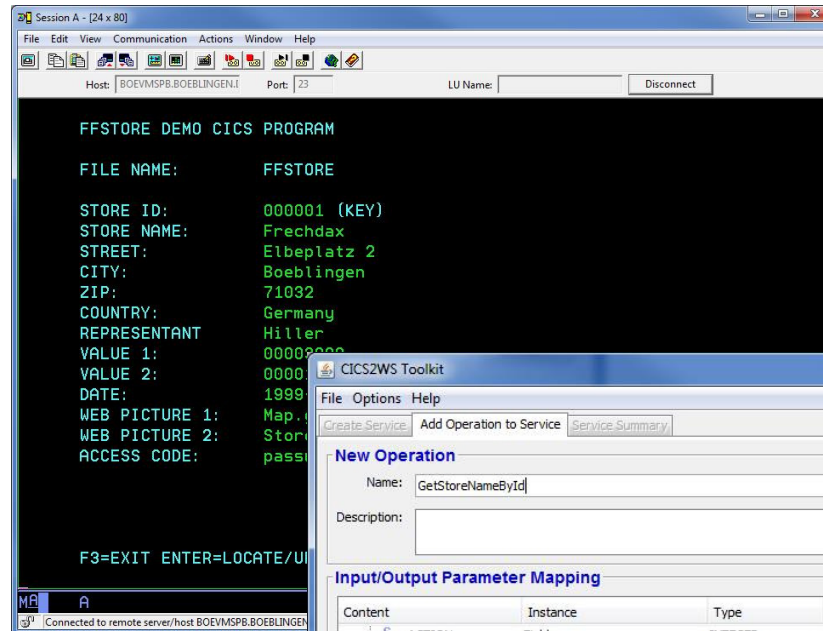
2) Web Services in z/VSE



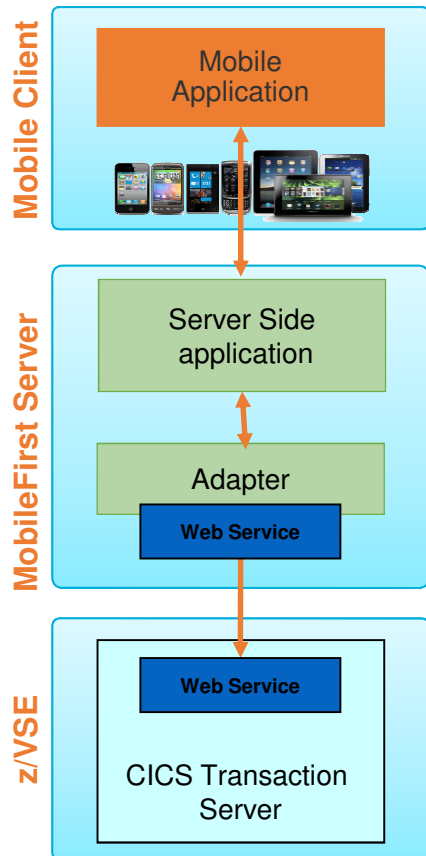
Existing z/VSE application

```

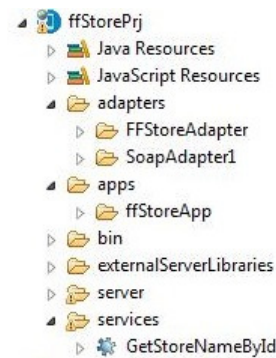
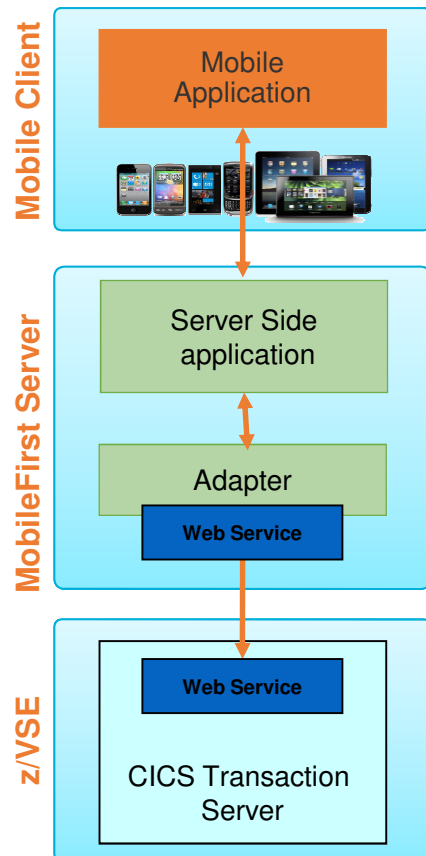
03 FSTIO-MAP.
05 ACTION          PIC 9(8) COMP.
05 RETURN-CODE     PIC 9(8) COMP.
05 FILE-NAME       PIC X(8) .
05 STORE-ID        PIC X(6) .
05 STORE-NAME      PIC X(25) .
05 LOC-STREET      PIC X(25) .
05 LOC-CITY        PIC X(25) .
05 LOC-ZIP         PIC X(10) .
05 LOC-COUNTRY     PIC X(25) .
05 LOC-REP        PIC X(20) .
05 VAL1            PIC 9(8) COMP.
05 VAL2            PIC 9(8) COMP.
05 DATE            PIC X(10) .
05 WEB-PIC1       PIC X(20) .
05 WEB-PIC2       PIC X(20) .
05 A-CODE         PIC X(10) .
05 FILLER         PIC X(6) .
    
```



Web Services for mobile

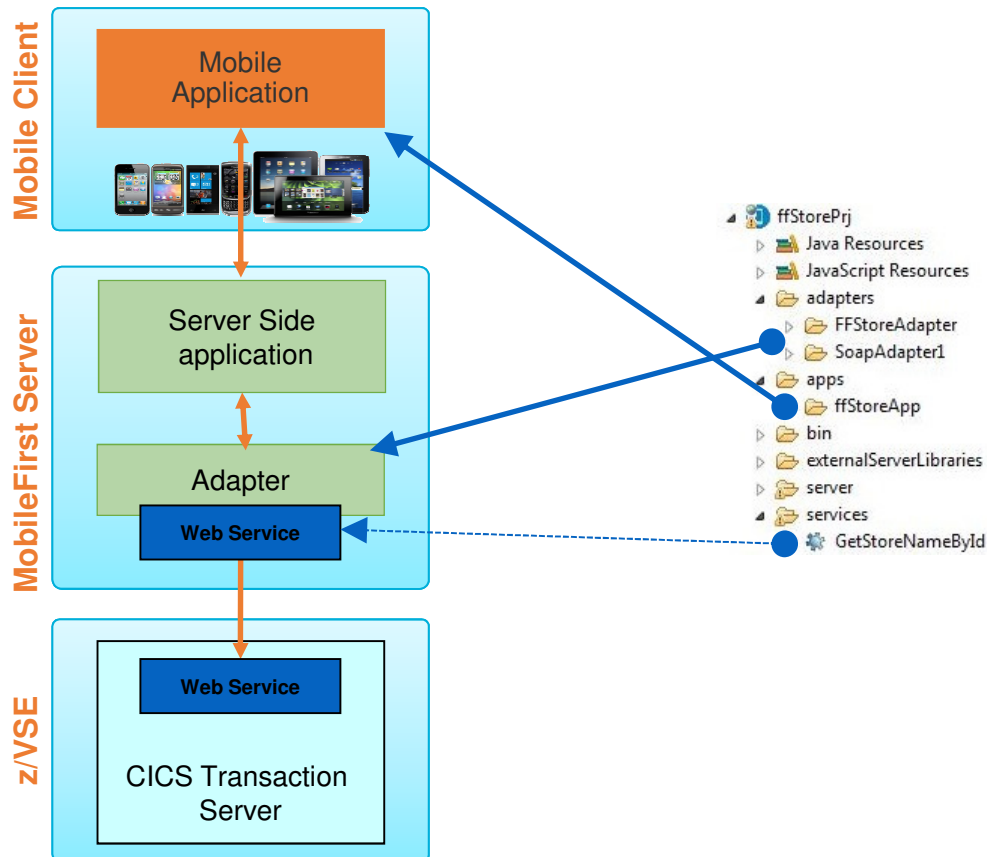


Web Services for mobile



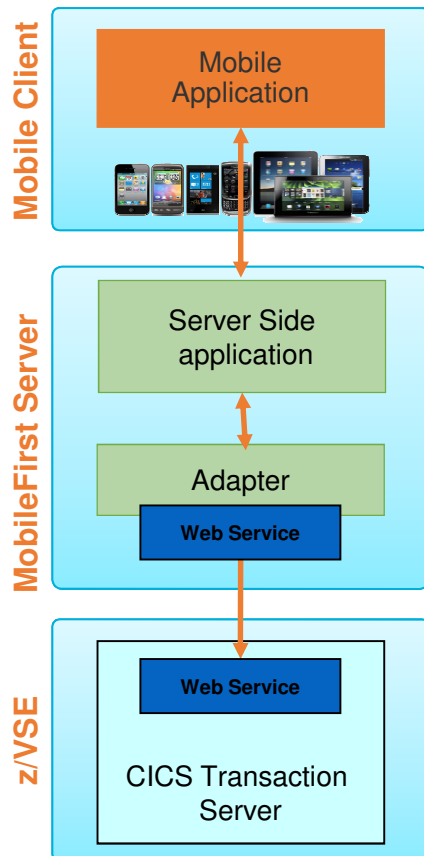
- Create a project
- Create an adapter
 - SOAP adapter
 - Pure HTTP adapter

Web Services for mobile



- Create a project
- Create an adapter
 - SOAP adapter
 - Pure HTTP adapter

Web Services: create adapter



1. *<your project name>* → services → "Discover Back end"

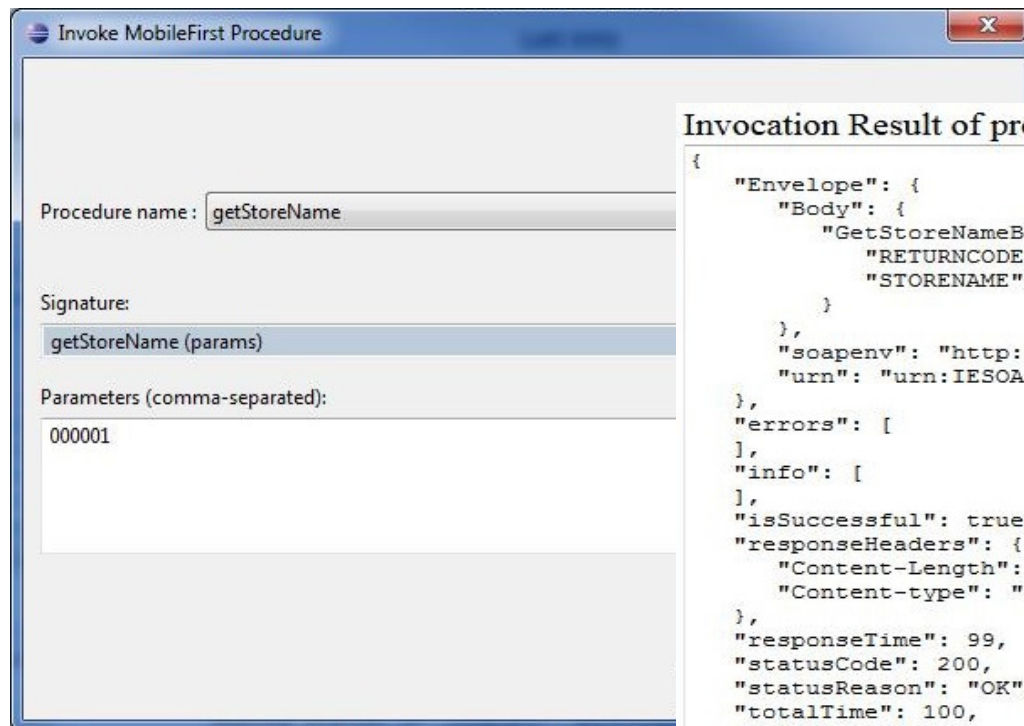
2. *<your project name>* → adapters → New → MobileFirst Adapter

MobileFirst will automatically create a simple adapter for you. You need to change files:

- *<your project name>* → adapters → *<your adapter name>.xml*
- *<your project name>* → adapters → *<your adapter name>-impl.xml*

Web Services: test adapter

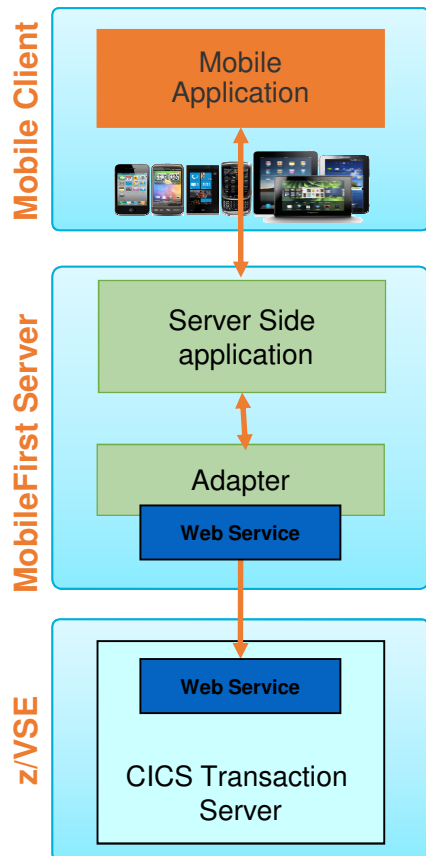
<your adapter name> → Run As → Invoke MobileFirst Procedure



Invocation Result of procedure: 'getStoreName' from the MobileFirst Server:

```
{
  "Envelope": {
    "Body": {
      "GetStoreNameByIdResponse": {
        "RETURNCODE": "0",
        "STORENAME": "Frechdax"
      }
    },
    "soapenv": "http://schemas.xmlsoap.org/soap/envelope/",
    "urn": "urn:IESOASRV:FFSTRL"
  },
  "errors": [
  ],
  "info": [
  ],
  "isSuccessful": true,
  "responseHeaders": {
    "Content-Length": "00000292",
    "Content-type": "text/xml; charset=utf-8"
  },
  "responseTime": 99,
  "statusCode": 200,
  "statusReason": "OK",
  "totalTime": 100,
  "warnings": [
  ]
}
```

Web Services: create mobile application



User Interface

<your project name> → apps → *<your app name>* → common → **index.html**

```
<div data-role="content" style="padding: 15px">
  <!--application UI goes here-->
  <label for="text">Type Store ID:</label> <input type="number" name="storeID" id="storeID" value="00001">
  <a href="#" data-role="button" onclick="getStoreNameById();" id="button" data-icon="forward">Get Store Name</a>
  <label id="storeName">Result:</label>
</div>
```

Logic

<your project name> → apps → *<your app name>* → common → js → **main.js**

```
function getStoreNameById( ){
  // Get input parameters
  var storeId = document.getElementById('storeID').value;

  // Predefine adapter data
  var invocationData = {
    adapter : 'FFStoreAdapter',
    procedure : 'getStoreName',
    parameters : [storeId]
  };

  // Call adapter and show results
  WL.Client.invokeProcedure(invocationData,{
    onSuccess : showResultSuccess,
    onFailure : showResultFailure
  });
}
```


Web Services: test and debug

<your mobile app name> → Run As →

Run on MobileFirst Development Server

<your mobile app name> → Run As → Preview

The screenshot shows the 'FFStore App' interface with a 'Type Store ID:' field containing the value '1' and a 'Get Store Name' button. Below the interface is a debugger window with the following code:

```

16 // Common initialization code goes here
17
18 }
19
20 function getStoreNameById( ){
21
22 // Get input parameters
23 var storeId = document.getElementById('storeId').value;
24
25 // Predefine adapter data
26 var invocationData = {
27   adapter : 'FFStoreAdapter',
28   procedure : 'getStoreName',
29   parameters : [storeId]
30 };
31
32 // Call adapter and show results
33 ML_Client.invokeProcedure(invocationData,{
34   onSuccess : showResultSuccess,
35   onFailure : showResultFailure
36 });
37 }
38
39 // Successful connection, not necessary successful result
40 function showResultSuccess(result){
41   alert("Connection was successful");
42 }

```

The screenshot shows the 'FFStore App' interface in preview mode. The 'Type Store ID:' field contains '1', and the 'Get Store Name' button has been clicked. The 'Result:' field now displays 'Frechdax'.

Interested in mobile with z/VSE and z Systems ?

Next steps...

- **Boeblingen is a European Center of Competence (CoC) for Mobile**
- Request a Briefing, Demo or workshop
 - Industry independent
- Read our [Point-of-View paper](#).
- Read the [Mobile Solution Guide](#)
- [IBM z Systems Mobile home page](#)
 - Customer case studies
 - Analyst reports
 - Customer Videos

Contact us: zvse@de.ibm.com
tmcc@de.ibm.com

System z in a Mobile World

An IBM Redbook® Point-of-View publication by the IBM Client Center, Montpellier

By Nigel Williams, Certified IT Specialist, and Frank van der Wal, Certified IT Specialist

Mobile from an enterprise perspective

As organizations engage with customers, partners, and employees who are increasingly using mobile as their primary general-purpose computing platform, these organizations have tremendous opportunity to transact—everything from exchanging information to exchanging goods and services, from employee self-service to customer service. This mobile engagement allows you to build new insight into your customer's behavior so that you can anticipate their needs and gain a competitive advantage by offering new services.

Becoming a mobile enterprise is about re-imagining your business around constantly connected customers and employees. The speed of mobile adoption dictates transformational innovation rather than incremental innovation. Mobile really is a "disrupt or be disrupted" technology.

This brings some specific challenges:

- Reacting to a new set of user expectations about the way they interact with your company
- Delivering high-quality mobile applications quickly and efficiently available
- Coping with sudden unexpected increases in mobile-initiated transactions, for example when a new sales offer becomes available
- Managing a wide range of different devices and adapting the existing enterprise security framework to the unique security challenges of a mobile environment

Business benefits of mobility

Mobile solutions are pushing companies to rethink the user experience, from the presentation of data to the interaction patterns that are required to integrate new and existing business services. This change in the way that you interact with customers can improve service and enable new business opportunities.

Figure 1 on page 2 shows how mobile enablement can be used to improve customer service in banking. It shows the following scenarios:

1. When a large or unusual payment is captured, the client is asked to authorize the transaction using a mobile device (for example, by using a biometric authentication). This type of solution improves fraud detection and, therefore, potentially saves the bank money.
2. If the client's credit card is not returned by an ATM, a message can be sent informing the client of the location of the nearest branch. This solution limits the risk of customer dissatisfaction.

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IBM z Systems unique Characteristics to support Mobile

- Massive scalability in a single footprint, to handle the workload of millions of devices and sensors
- Workload Management to provide a quick reaction to sharp spikes in demand
- Co-location of the MobileFirst server application with data and transactions on z/VSE reduces the latency of access to z/VSE data.
- Hipersockets provides the best communication between MobileFirst apps and z/VSE System of Record.
- Hardware encryption speeds SSL applications
- Business Resiliency for critical mobile apps

Infrastructure matters for mobile applications. The IBM z Systems platform's scalability, security, and resilience can enhance critical mobile applications.



Resources

- MobileFirst Foundation <http://www-03.ibm.com/software/products/en/mobilefirstfoundation>
- MobileFirst Platform <https://developer.ibm.com/mobilefirstplatform/>

- z/VSE Connectors Tools <http://www-03.ibm.com/systems/z/os/zvse/downloads/index.html>
- How to use Web Services with z/VSE
<ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/HowToUseWebServicesWithzVSE.pdf>
- Getting started with Mobile Development for z/VSE
<ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/download/GettingStartedWithMobileDevelopmentForVSE.pdf>
- Samples source code <ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/download/skvssampPrj.zip>

- IBM white paper: An overview of IBM MobileFirst Platform
<http://public.dhe.ibm.com/common/ssi/ecm/en/wsw14181usen/WSW14181USEN.PDF>
- IBM white paper: Native, web or hybrid mobile-app development
<ftp://public.dhe.ibm.com/software/pdf/mobile-enterprise/WSW14182USEN.pdf>
- IBM MobileFirst Strategy Software Approach <http://www.redbooks.ibm.com/redbooks/pdfs/sg248191.pdf>
- User interface design for the mobile web <http://www.ibm.com/developerworks/web/library/wa-interface/index.html>

z/VSE Live Virtual Classes

z/VSE @ <http://www.ibm.com/zvse/education/>
LINUX + z/VM + z/VSE @ <http://www.vm.ibm.com/education/lvc/>

Read about upcoming LVCs on @ <http://twitter.com/IBMzVSE>

Join the LVC distribution list by sending a short mail to zvse@de.ibm.com



Environment Setup

Make use of developerworks documents:

<http://www.ibm.com/developerworks/mobile/worklight/getting-started.html#basics>

- **Install IBM Installation Manager**
- **Install a web application server**
 - WAS Liberty 8.5.5 or WAS Full Profile 8.5 or WAS ND
- **Install a database for MobileFirst**
 - DB2 LUW or Oracle
- **Install IBM MobileFirst server**

For development, install on a workstation or Apple laptop:

- Eclipse Kepler or Eclipse Juno 4.22
 - MobileFirst Studio – will be installed via the Eclipse update/plugin function
 - **you get a development environment with a full MobileFirst server included**
 - **Download the development environment from:**
<https://marketplace.eclipse.org/content/ibm-worklight-developer-edition>

Questions?



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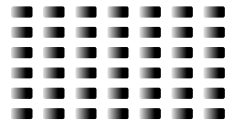
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Wellcome to the Mobile era !



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