

IBM DevOps: Delivering Core Services at the Speed of Mobile

Enterprise Mobile Roadshow, July 2014

Russell Bonner

Consulting IT Specialist

russell.bonner@uk.ibm.com



Agenda

- Introduction
- IBM DevOps Strategy
- GENAPP – sample CICS TS application
- Executing a simple CICS JSON Web service request from CICS TS
- Creating a simple mobile application ... from scratch
- Summary
- Q & A



Mobile is the next evolution for connecting to the Data Center

91%

Mobile users keep their device within arm's reach 100% of the time

75%

Mobile shoppers take action after receiving a location based message

96%

Year to year increase in mobile cyber Monday sales between 2012 and 2011

90%

Users use multiple screens as channels come together to create integrated experiences

900%

Increase of global machine-to-machine connections by 2022 (2 billion in 2011 to 18 billion at the end of 2022)



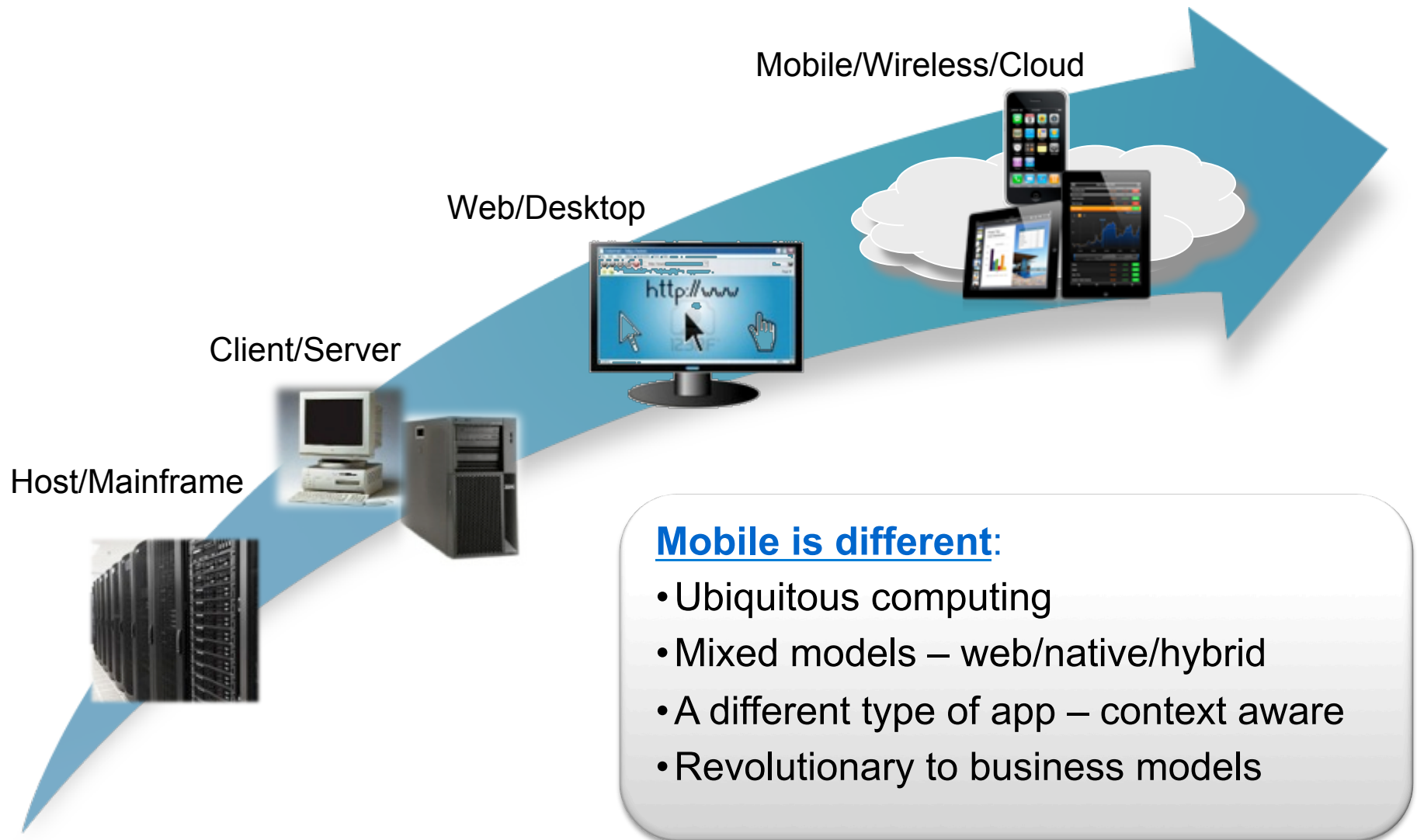


MAKE THE EXTRAORDINARY
POSSIBLE
IBM Mainframe50

Even though the world is awash in unstructured data, it's the **transactional data** that decision makers are focused on right now. And since the mainframe holds the vast majority of that data, **it has a real role to play.**

80%
of world's corporate
data resides or
originates on mainframes

Mobile: Another stage in computing history

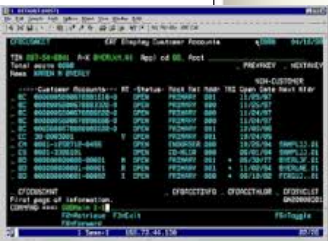


Mobile is changing the way information is used

Information developed using multiple platforms and transformed into web services

Information developed and controlled by users for mobile devices

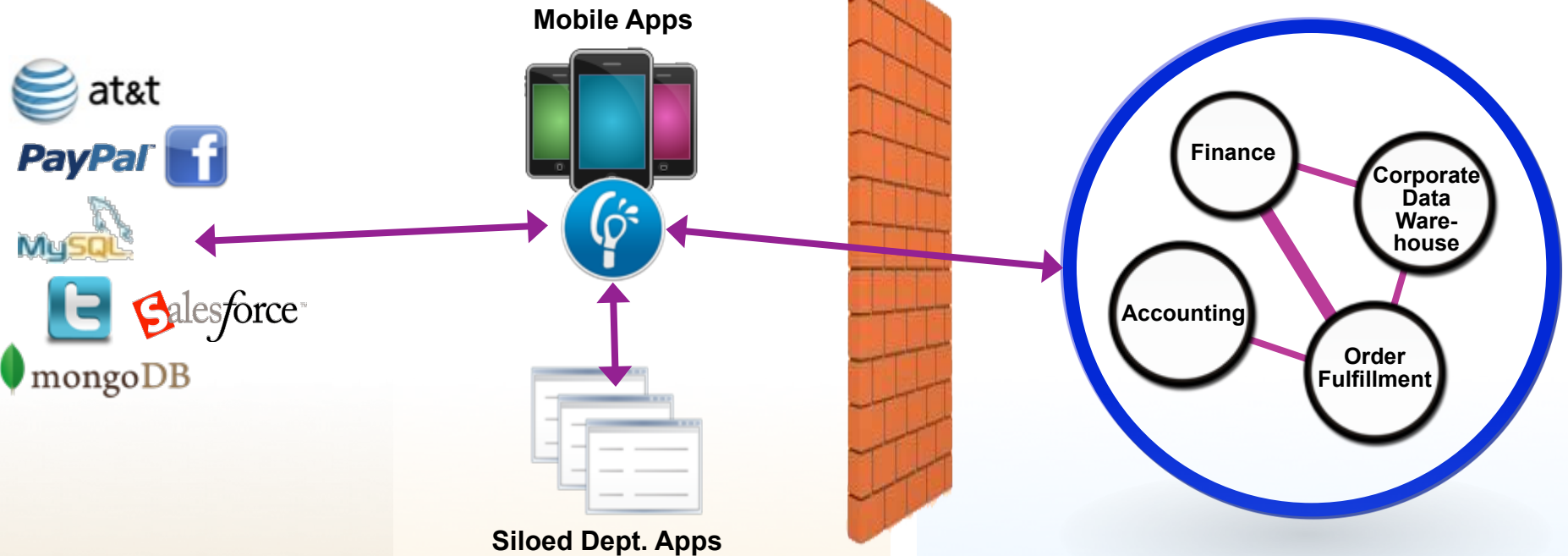
Information restricted and developed in the data center



System z bridges Systems of Record and Systems of Engagement

Systems of Engagement

Systems of Record



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

Linux on IBM System z®

z/OS®

Systems of Record are well integrated, trusted repositories.



A lack of continuous delivery impacts the entire business enterprise in the new reality of “Systems Of Interaction”

Line-of-business

Takes too long to introduce or make changes to mobile apps and services

Operations

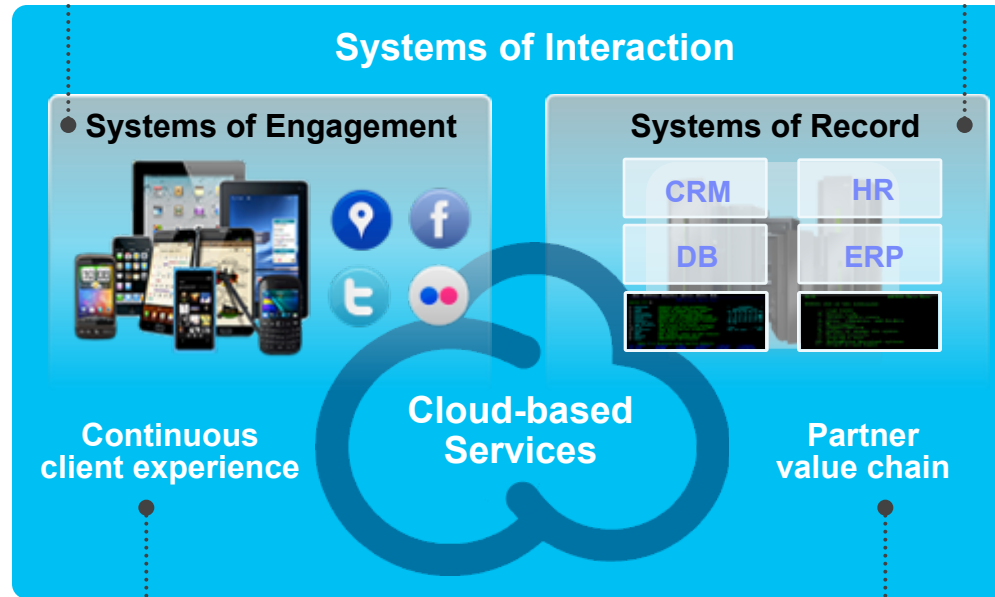
Rapid app releases impact system stability and compliance

>70%

of budgets devoted to maintenance and operations

4-6 weeks

to deliver even minor application changes to customers



>45%

of customers experience production delays

>50%

of outsourced projects fail to meet objectives

Development/Test

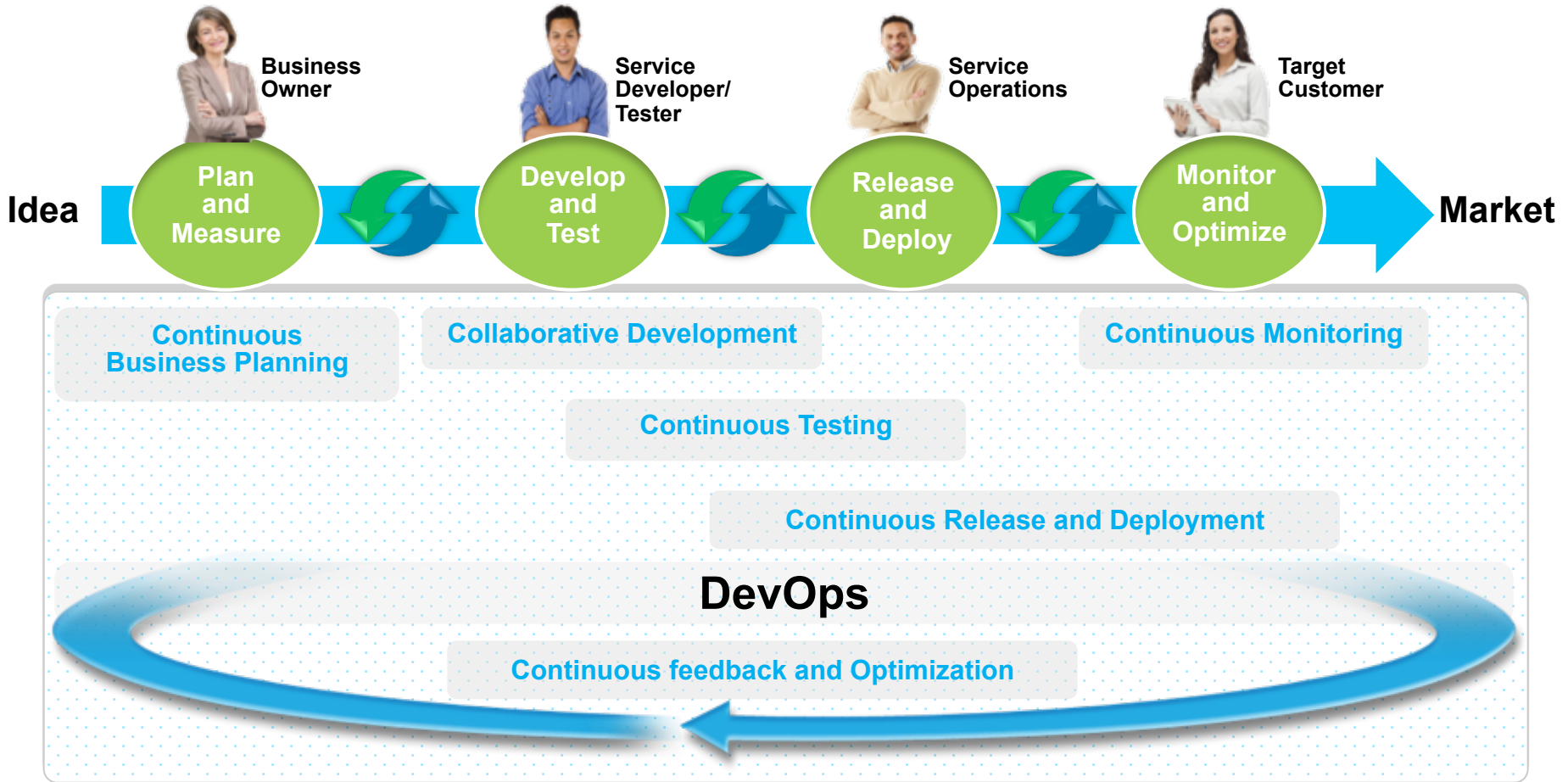
Speed mismatch between faster moving front office and slower moving back office systems, delaying time to obtain feedback

Suppliers

Delivery in the context of agile

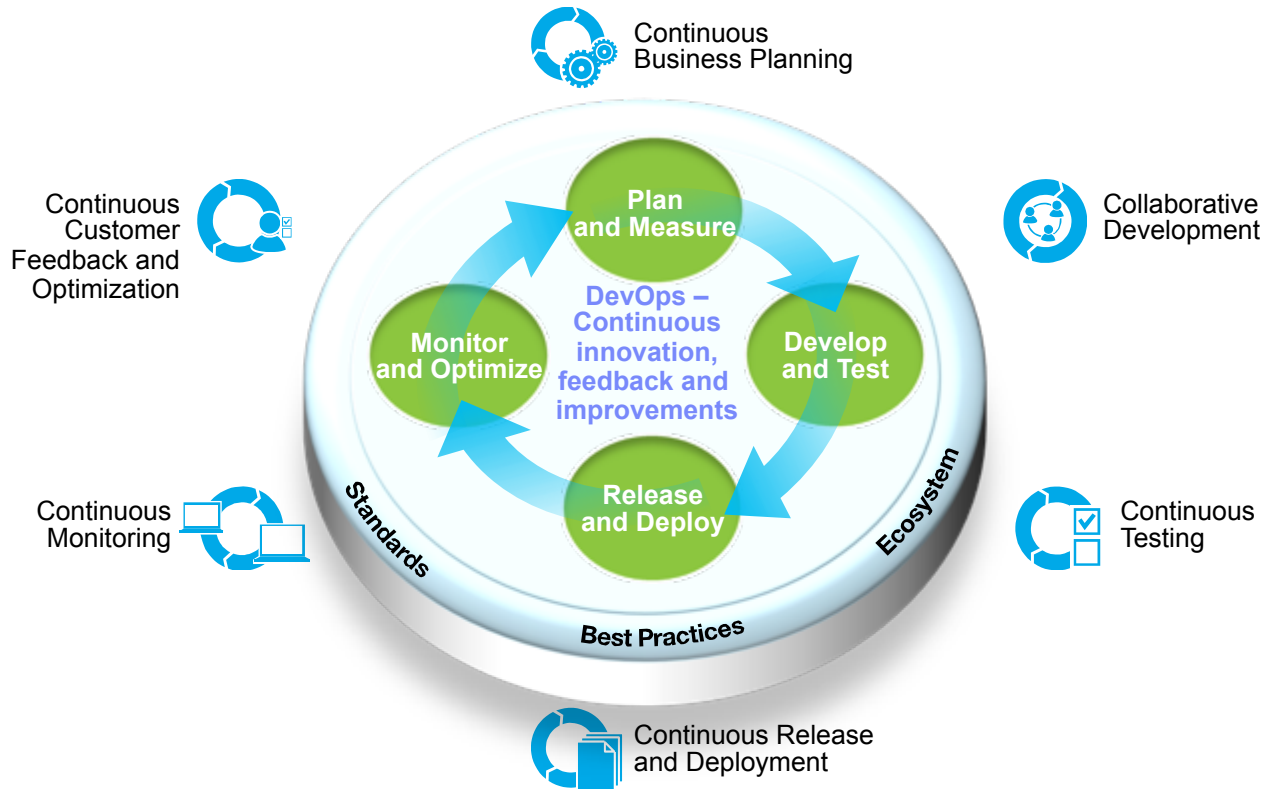
DevOps takes a closed-loop feedback approach to software delivery

Extending Lean and Agile practices across the entire software value chain



IBM DevOps point of view

Enterprise capability for continuous software delivery that enables clients to seize market opportunities and reduce time to customer feedback



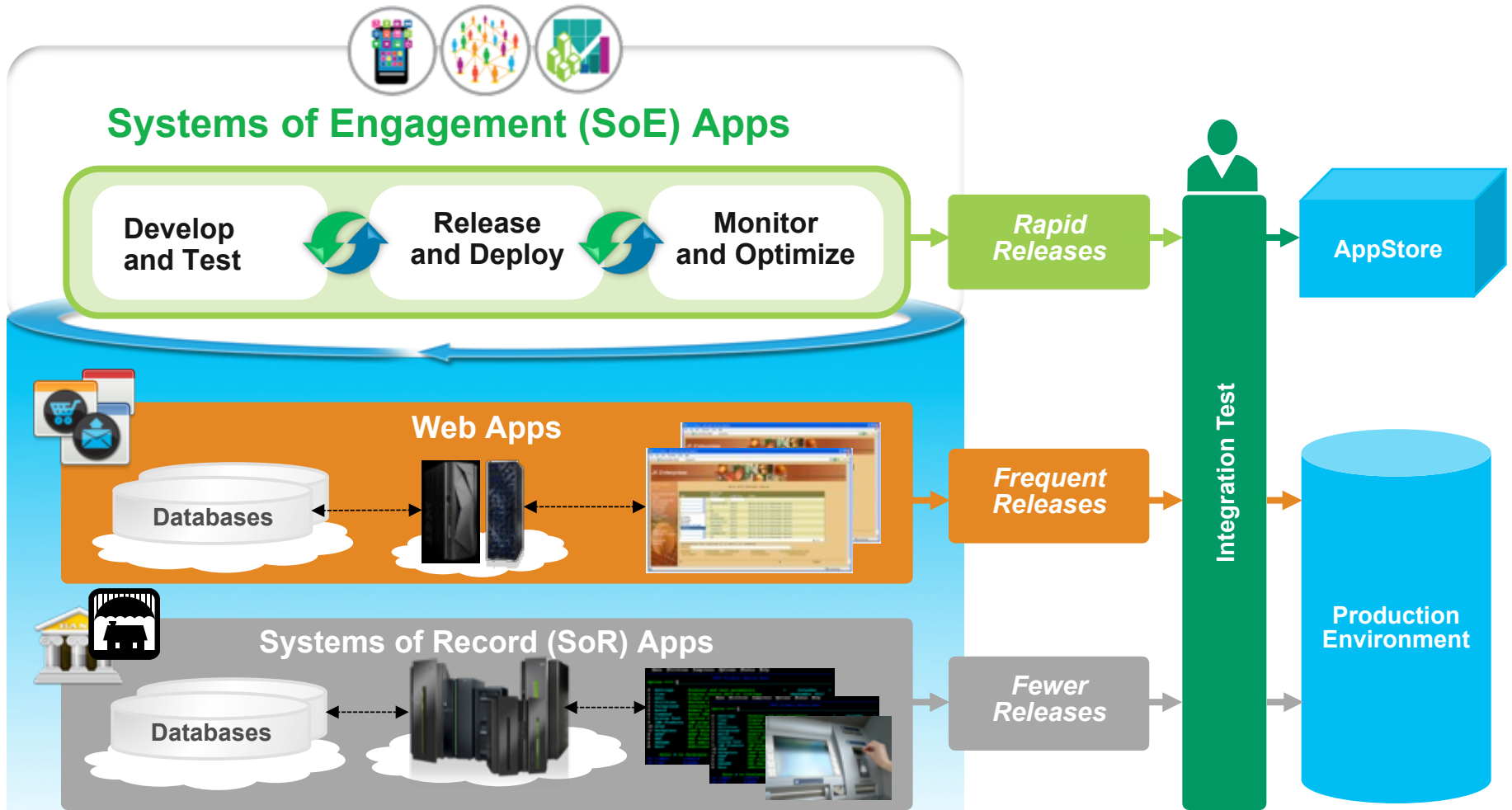
Accelerate software delivery – for faster time to value

Balance speed, cost, quality and risk – for increased capacity to innovate

Reduce time to customer feedback – for improved customer experience

The need: Integrate systems of engagement with systems of record

By bringing together the culture, processes, and tools across the entire software delivery lifecycle – spanning mobile to mainframe platforms





Leverage common tools to build multiplatform apps



**Rational Developer for the Enterprise
IBM Worklight for MobileFirst platform**

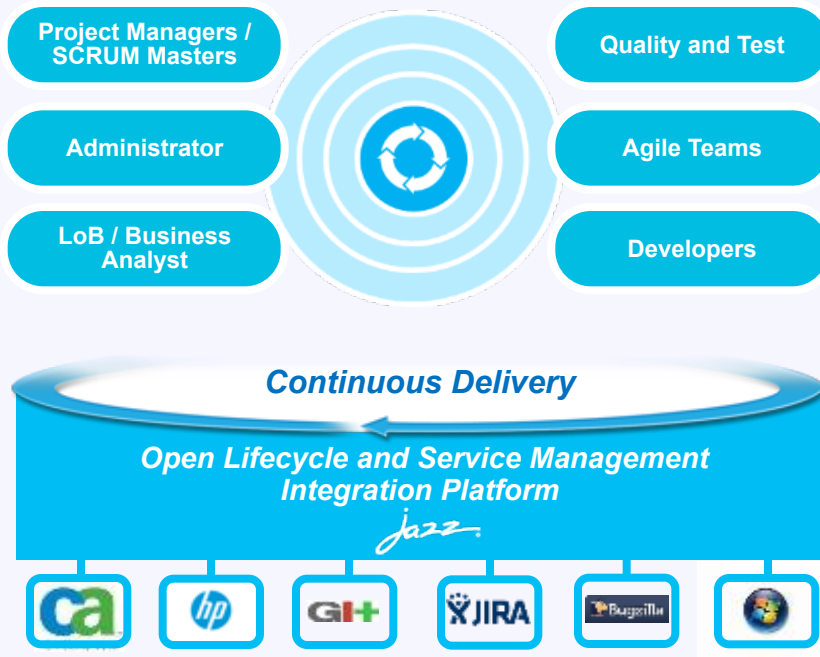
Enabling you to...

- Leverage common Eclipse-based IDEs for all types of development
- Access broad coverage of runtimes, languages, compilers, and platforms
- Access via cloud-based environments like SmartCloud Enterprise+ (SCE+)
- Create agile services from existing mainframe assets



Break down silos by moving to an Agile team environment

Maximize team productivity



Rational Team Concert
 Rational Doors Next Generation
 Rational Quality Manager

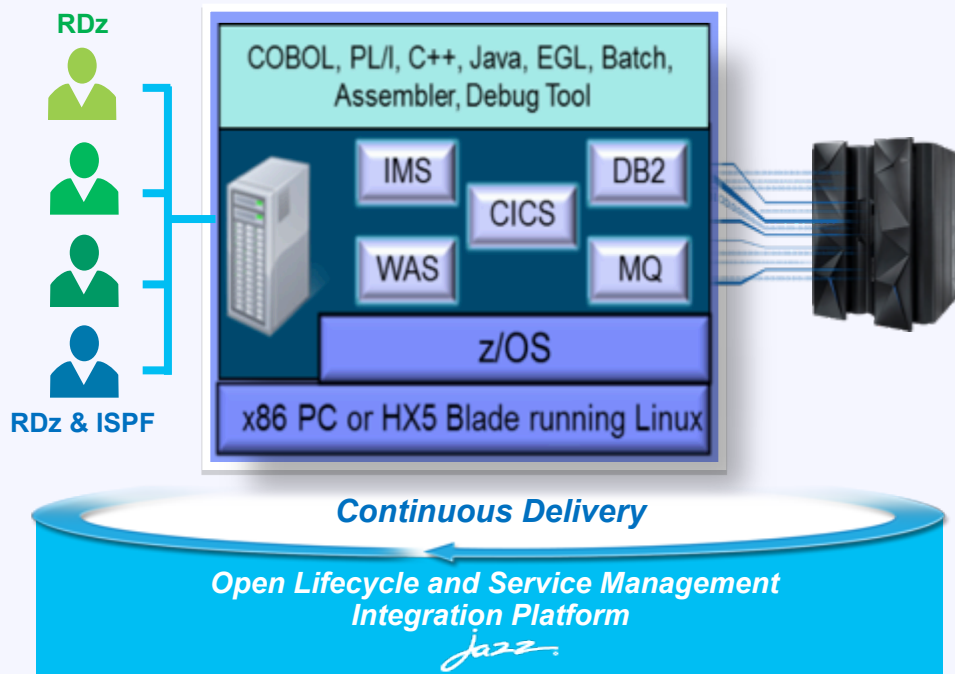
Enabling you to...

- Manage all types of source - JavaScript to COBOL
- Create work items spanning technologies and solutions
- Accelerate agile adoption on the mainframe
- Integrate existing SCMs and deployment tools, e.g. ChangeMan and Endeavor
- Use Lifecycle integration adapters for third-party tools



Offload development and testing to reduce MIPS

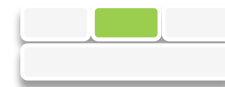
Improve development flexibility



Rational Development and Test Environment for System z

Enabling you to...

- Liberate developers to rapidly prototype new applications
 - Develop and test System z applications anywhere, anytime
 - Free up mainframe development MIPS for production workload
 - Eliminate costly delays by reducing dependencies on operations staff
- New** Try latest middleware, including CICS 5.1, IMS 12.1, and WebSphere 8.5
- System z Development and Test Solution



Develop and test capabilities for mobile applications

Accelerate mobile application development



Rational Test Workbench
 IBM Worklight for MobileFirst platform
 Rational Business Developer
 Rational Application Developer
 Rational Developer for the Enterprise

Enabling you to...

- Quickly design, code, build, test, and deploy mobile apps that run on a wide variety of mobile platforms
- Refactor and extend existing back-end services to provide an optimal mobile experience

New • Stub out back-ends to simplify test and development

New • Automate testing for native and hybrid mobile apps

GENAPP – CICS SupportPac CB12

SupportPac CB12



General Insurance Application (GENAPP) for IBM CICS Transaction Server

The general insurance application

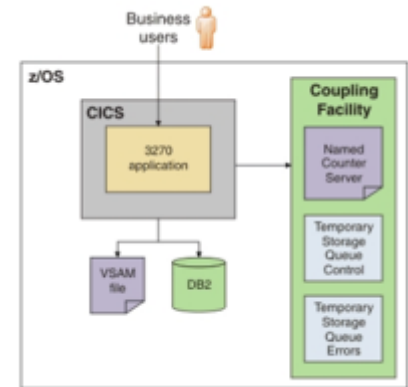
The general insurance application is a working COBOL application that you can use to try out different features of CICS, including modernizing applications.

The general insurance application simulates transactions made by an insurance company to create and manage its customers and insurance policies. The application provides sample data and a 3270 interface for creating and inquiring on customers and policy information. Because the application is designed to simulate the flow of an application, some aspects of the application architecture do not use best practices. However, the application is designed to be extended to demonstrate other ways of accessing and modernizing traditional applications that are best practices.

You can use the general insurance application to try the following CICS features:

- Creating a topology that is managed by CICSplex SM
- Creating web services
- Creating workload simulations with Workload Simulator
- Creating business events and viewing them through a Web 2.0 dashboard (dynamic scripting application)

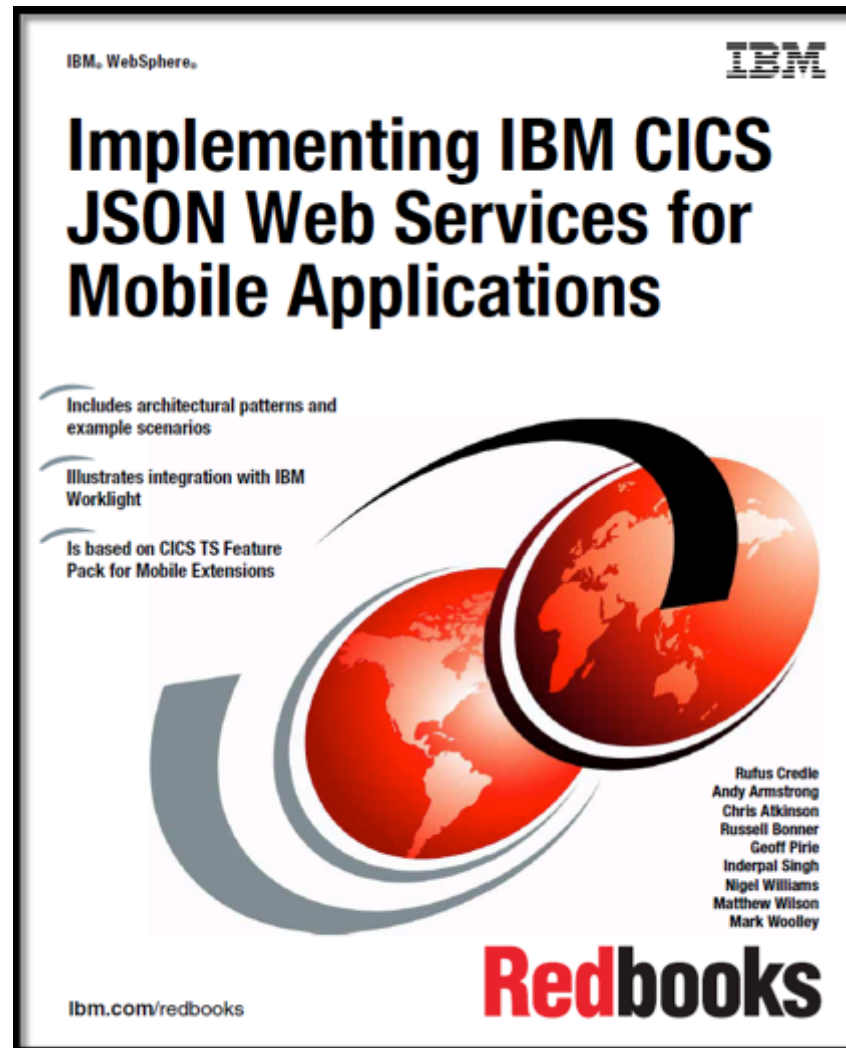
GENAPP Application Architecture



The application has a 3270 interface that can be accessed from a terminal. The application uses a BMS map to control the screen layout for the 3270 interface. The application has five transactions that you can run to perform different tasks in the application:

- Run SSC1 to inquire on existing customer records and add customer records
- Run SSP1 to create a motor insurance policy
- Run SSP2 to create an endowment insurance policy
- Run SSP3 to create a house insurance policy
- Run SSP4 to create a commercial property insurance policy

IBM Redbook Publication (SG24-8161)



Mobile Demo Scenario

Connect directly to CICS from Worklight using end-to-end JSON

```
./android/mobileapp/lat_request.json II
{
  "schema": "http://1/1/json-schema.org/raft-04/schema#",
  "description": "Request schema for the STPN002 2008 interface",
  "type": "object",
  "properties": {
    "STPN002operation": {
      "type": "object",
      "properties": {
        "small record for webservice": {
          "type": "object",
          "properties": {
            "st_ip.com": {
              "type": "object",
              "properties": {
                "cid": {
                  "schema": "http://1/1/json-schema.org/raft-04/schema#",
                  "description": "Request schema for the STPN002 2008 interface",
                  "type": "object",
                  "properties": {
                    "STPN002operation": {
                      "type": "object",
                      "properties": {
                        "small record for webservice": {
                          "type": "object",
                          "properties": {
                            "st_ip.com": {
                              "type": "object",
                              "properties": {
                                "cid": {
                                  "type": "string",

```

```
function getCustomerDetails(custNum) {
  var pathURL = "GENAPP/getCustomerDetails";
  var request=
  {
    "LGICUS01operation":{
      "ca" : {
        "ca_request_id" : "01ICUS",
        "ca_return_code" : "00",
        "ca_customer_num" : custNum,
        "ca_num_policies" : ""
      }
    }
  };
};
```



Step 1

DFHLS2JS to generate the JSON artefacts for the target CICS service.

Step 2

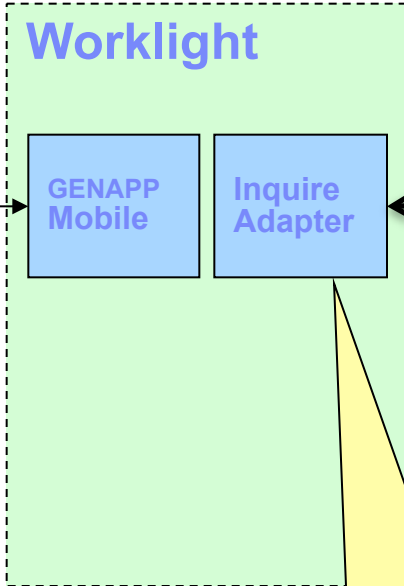
Mobile developer uses JSON schema to build a Worklight adapter.

Step 3

Frontend mobile developer calls the Worklight adapter which calls the service hosted in CICS.

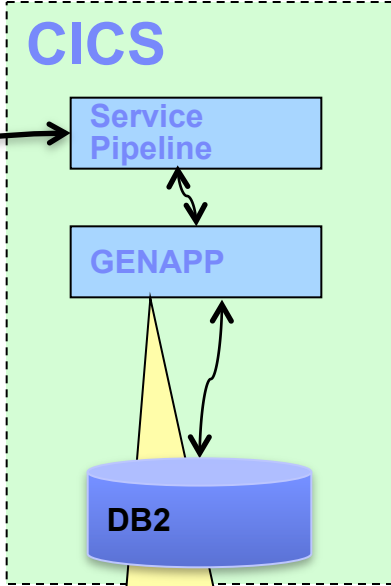
GENAPP Mobile Application

1. Mobile user sends an insurance customer request



2. The CICS application is invoked by a Worklight adapter

3. CICS service handler converts the request to the COMMAREA interface of the GENAPP application



4. The GENAPP Cobol application processes the insurance policy customer details

Demonstration

DEMO

Enterprise Mobile and DevOps: Proof of Technology Event

Thursday 11th September 2014, London

Invited

Discovering the value: Developing, Deploying and Integrating Mobile Applications with System z

AN IBM PROOF OF TECHNOLOGY

Date: Thursday 11th September 2014

Time: 9:00 AM – 4:30 PM

Location: IBM Southbank, London

INTRODUCTION

Systems of Engagement, such as mobile, offer new forms of interaction between consumers and organisations, which is driving new business growth. In order for organisations to provide a rich, integrated mobile experience to their customers, they need to integrate and exploit their Systems of Record. System z is the most commonly held System of Record and delivers highly resilient enterprise services, which can encapsulate the core applications and data, and also the Mobile Enterprise Application Platform.

OBJECTIVE

This Proof of Technology session provides attendees with basic skills and hands-on exposure to the major features of integrating mobile with System z. Attendees will develop mobile interfaces to CICS Transaction Server, and develop a simple mobile application using Rational and Worklight technologies. A demonstration will also be included that shows how the application can be deployed onto a Worklight Server hosted on Linux for System z.

Client Successes with DevOps



Laminar Medica reduced new product development time and costs by 25%, contributing to 10% increase in competitive wins



SIBRA GmbH keeps a vital project within budget and on time



Nationwide improved code quality 50%, reduced end-user downtime by 70%, and increased on-time delivery 90%



A healthcare information provider cuts deployment time down to minutes



China Merchants Bank profits from a unified collaboration platform



Sandhata increased productivity 100%, and added tens of millions in new revenue



IBM CICS development team simplifies software builds and helps support agile development, improve collaboration



Sky Bet monitors the online customer experience to increase overall revenues



INTER Versicherungsgruppe increases productivity in application development



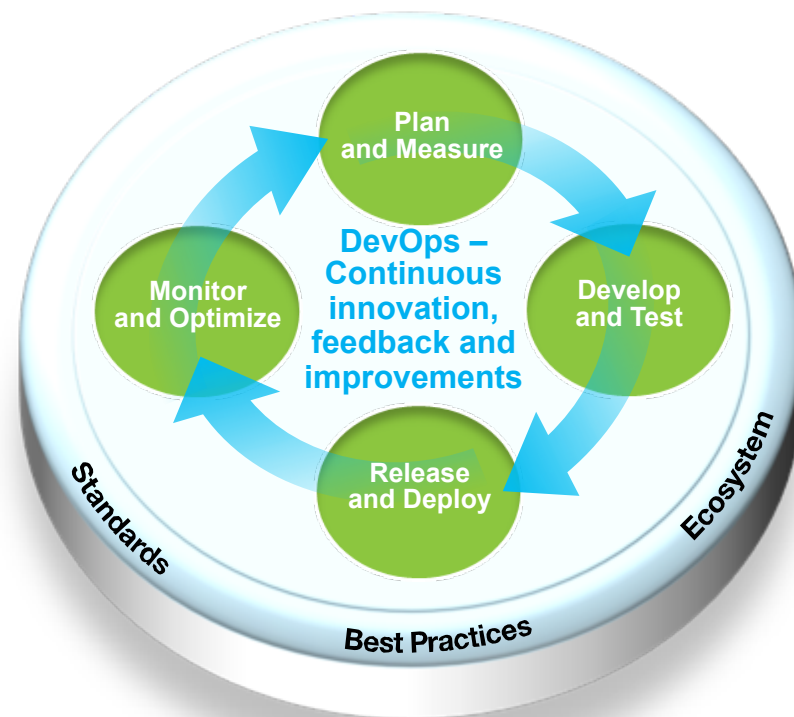
IBM Watson team is reducing delivery cycles from 9 weeks to 3 weeks, & has achieved zero maintenance window downtime



Aon Integramark establishes a dynamic SOA environment that automates data synchronization

Summary

- There are challenges to delivering software-driven innovation
- Disruptive technologies are driving greater need to innovate
- DevOps is critical to your success
- IBM has first class DevOps solutions and is continuing to invest and improve upon these solutions
- DevOps is just as relevant, if not more so, for the Mainframe as it is for mobile, cloud, and distributed platforms



QUESTIONS



www.ibm.com/devops



© Copyright IBM Corporation 2014. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. IBM shall not be responsible for any damages arising out of the use of, or otherwise related to, these materials. Nothing contained in these materials is intended to, nor shall have the effect of, creating any warranties or representations from IBM or its suppliers or licensors, or altering the terms and conditions of the applicable license agreement governing the use of IBM software. References in these materials to IBM products, programs, or services do not imply that they will be available in all countries in which IBM operates. Product release dates and/or capabilities referenced in these materials may change at any time at IBM's sole discretion based on market opportunities or other factors, and are not intended to be a commitment to future product or feature availability in any way. IBM, the IBM logo, Rational, the Rational logo, Telelogic, the Telelogic logo, and other IBM products and services are trademarks of the International Business Machines Corporation, in the United States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.

IBM

Backup Material

Screen shots

1. GENAPP Customer Inquiry Function (3270)

The screenshot shows a 3270 terminal window titled "winmvs51.hce". The main display area shows a menu titled "SSC1 General Insurance Customer Menu" with the following options:

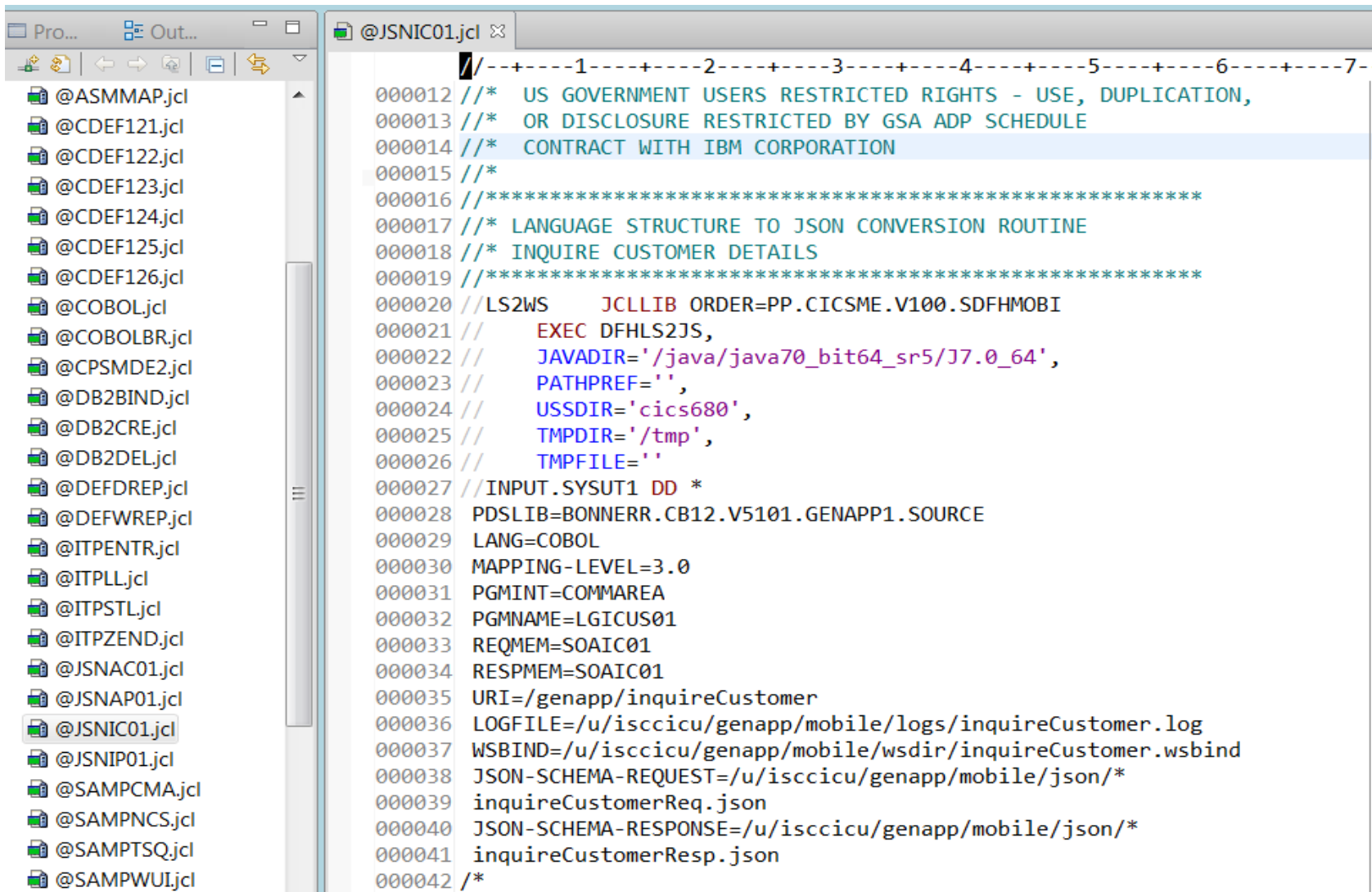
- 1. Cust Inquiry
- 2. Cust Add
- 4. Cust Update

Below the menu, the details for a customer are displayed:

Cust Number	0000000008
Cust Name :First	Johnny
:Last	Morris
DOB	1961-06-20 (yyyy-mm-dd)
House Name	
House Number	72
Postcode	BS83HA
Phone: Home	0345 245245
Phone: Mob	0345 245245
Email Addr	JM@ZOO LAND.CO.UK

At the bottom of the screen, it says "Select Option 1". The terminal prompt "MA" and a cursor are visible at the bottom left, and the date "04/051" is at the bottom right.

2. Create the CICS JSON Web Service for GENAPP



```

000012 /*-----1-----2-----3-----4-----5-----6-----7-----
000012 /* US GOVERNMENT USERS RESTRICTED RIGHTS - USE, DUPLICATION,
000013 /* OR DISCLOSURE RESTRICTED BY GSA ADP SCHEDULE
000014 /* CONTRACT WITH IBM CORPORATION
000015 /*
000016 /******
000017 /* LANGUAGE STRUCTURE TO JSON CONVERSION ROUTINE
000018 /* INQUIRE CUSTOMER DETAILS
000019 /******
000020 //LS2WS      JCLLIB ORDER=PP.CICSME.V100.SDFHMOBI
000021 //      EXEC DFHLS2JS,
000022 //      JAVADIR='/java/java70_bit64_sr5/J7.0_64',
000023 //      PATHPREF='',
000024 //      USSDIR='cics680',
000025 //      TMPDIR='/tmp',
000026 //      TMPFILE=''
000027 //INPUT.SYSUT1 DD *
000028 PDSLIB=BONNERR.CB12.V5101.GENAPP1.SOURCE
000029 LANG=COBOL
000030 MAPPING-LEVEL=3.0
000031 PGMINT=COMMAREA
000032 PGMNAME=LGICUS01
000033 REQMEM=SOAIC01
000034 RESPMEM=SOAIC01
000035 URI=/genapp/inquireCustomer
000036 LOGFILE=/u/isccicu/genapp/mobile/logs/inquireCustomer.log
000037 WSBIND=/u/isccicu/genapp/mobile/wmdir/inquireCustomer.wsbind
000038 JSON-SCHEMA-REQUEST=/u/isccicu/genapp/mobile/json/*
000039 inquireCustomerReq.json
000040 JSON-SCHEMA-RESPONSE=/u/isccicu/genapp/mobile/json/*
000041 inquireCustomerResp.json
000042 /*

```

3. Create the CICS Pipeline for JSON and activate

```

000014 /*
000015 /*******
000016 /******* CSD pipeline definition for JSON WEBSERVICES
000017 /*******
000018 //CSDDEFS EXEC PGM=DFHCSDUP,REGION=1M
000019 //STEPLIB DD DISP=SHR,DSN=CTS510.CICS680.SDFHLOAD
000020 //DFHCSD DD DSN=CTS510P8.IYEMZC2S.DFHCSD,DISP=SHR
000021 //SYSUT1 DD UNIT=SYSDA,SPACE=(1024,(100,100))
000022 //SYSPRINT DD SYSOUT=*
000023 //SYSIN DD *
000024 ****
000025 Define Pipeline(GENAPIP2) Group(GENAWSRV)
000026     Configfile(/cics/mobilefp/samples/pipelines/jsonjavaprovider.xml)
000027     Shelf(/u/isccicu/genapp/shelf)
000028     WDir(/u/isccicu/genapp/mobile/wmdir)
000029 /*
    
```

Region	Name	Use Count	WS Directory	Configuration File	Status
IYEMZC2S	DFH0MOBI	0		/usr/lpp/cicsts/mobilefp/samples/pipelines/jsonjavaprovider.xml	✓ ENABLED
IYEMZC2S	EXPIPE01	0	/u/isccicu/catalog/wmdir/	/cics/cics680/samples/pipelines/basicsoap11provider.xml	✓ ENABLED
IYEMZC2S	EXPIPE03	0	/u/isccicu/catalog/mobile/wmdir/	/cics/mobilefp/samples/pipelines/jsonjavaprovider.xml	✓ ENABLED
IYEMZC2S	GENAPIP1	0	/u/isccicu/genapp/wmdir/	/cics/cics680/samples/pipelines/basicsoap11provider.xml	✓ ENABLED
IYEMZC2S	GENAPIP2	0	/u/isccicu/genapp/mobile/wmdir/	/cics/mobilefp/samples/pipelines/jsonjavaprovider.xml	✓ ENABLED
IYEMZC2S	WSPIPE01	0	/u/isccicu/wmdir/	/cics/cics680/samples/pipelines/basicsoap11provider.xml	✓ ENABLED

4. Test the CICS JSON Web Service

Normal Basic Auth Digest Auth OAuth 1.0  No environment ▼

http://winmvs51.hursley.ibm.com:9041/genapp/inquireCustomer

form-data x-www-form-urlencoded raw JSON ▼

```

1 {
2   "LGICUS01operation": {
3     "ca": {
4       "ca_customer_num": 8
5     }
6   }
7 }
8
9
10

```

Body Cookies (19) Headers (5) STATUS 200 OK TIME 66 ms

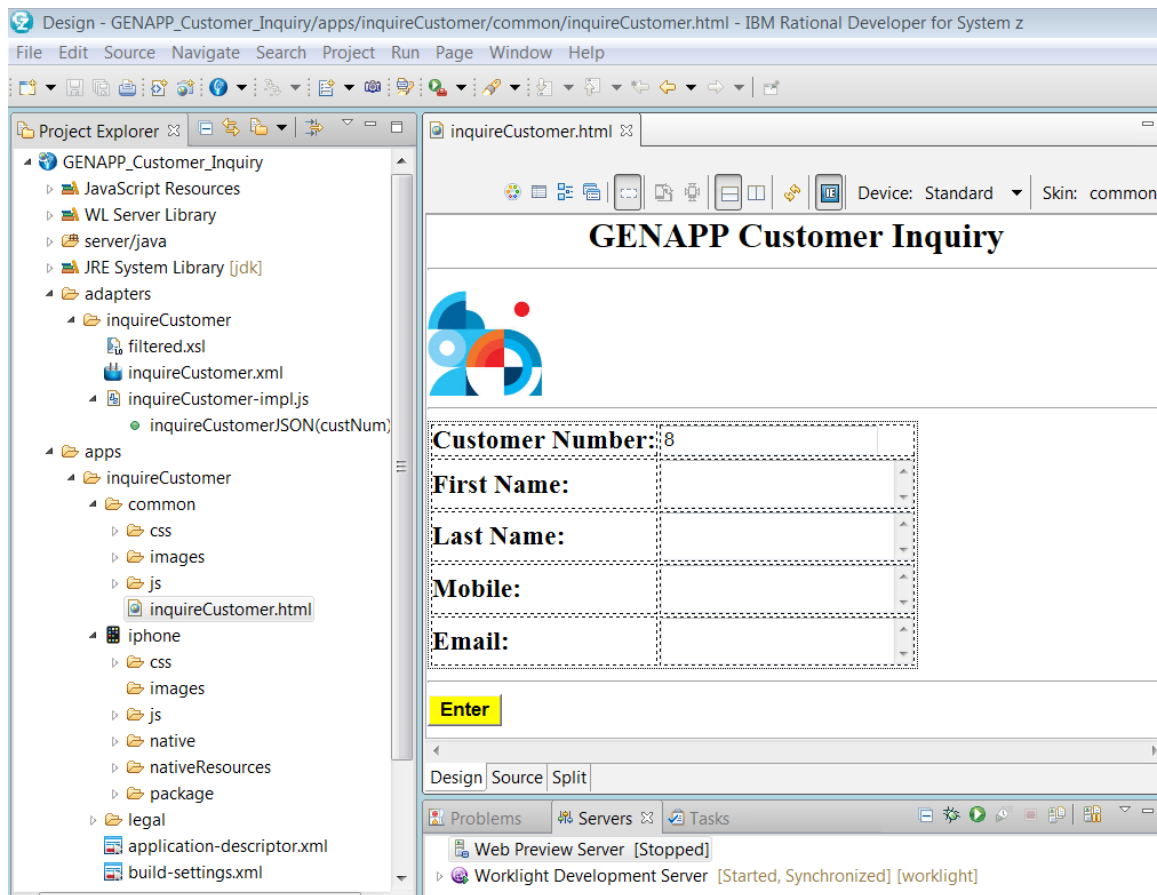
Pretty Raw Preview   JSON XML

```

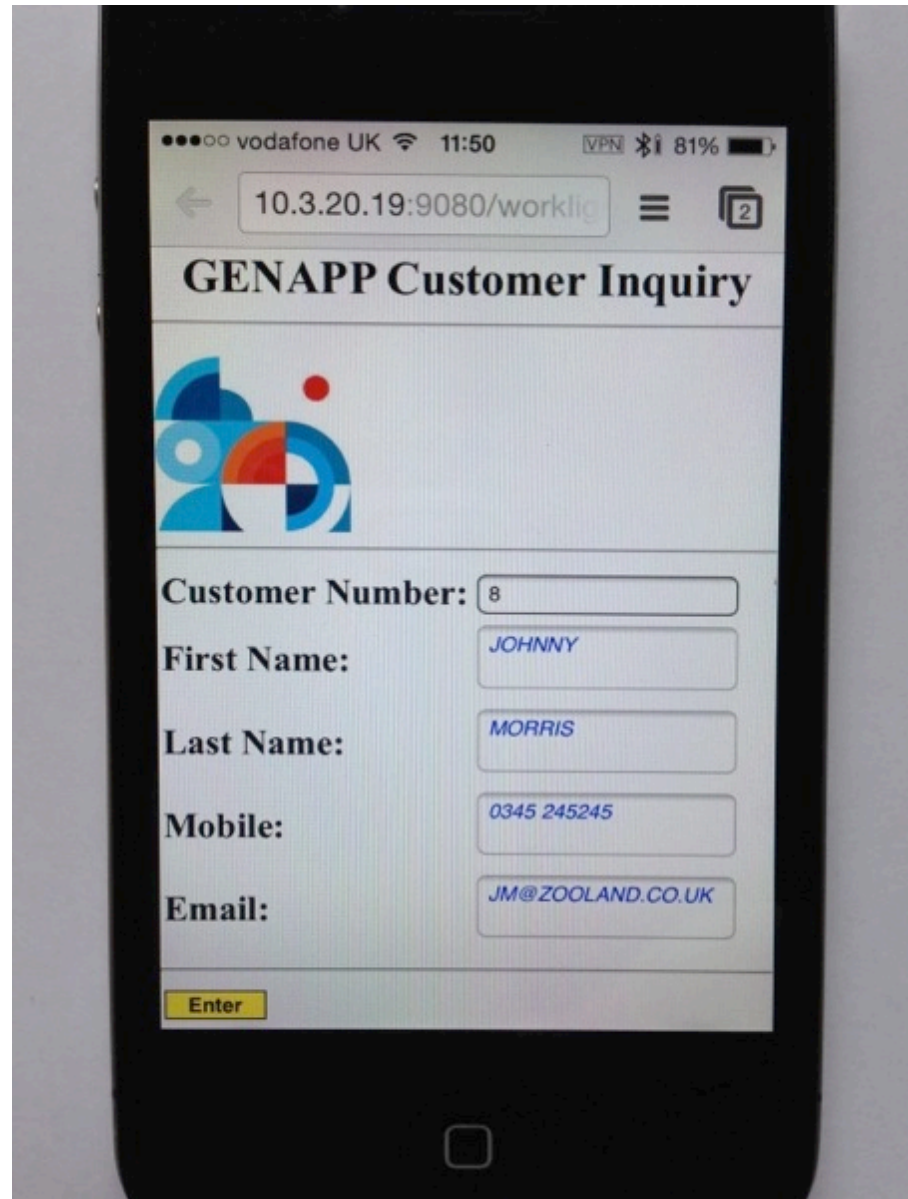
1 {
2   "LGICUS01operationResponse": {
3     "ca": {
4       "ca_request_id": "",
5       "ca_return_code": 0,
6       "ca_customer_num": 8,
7       "ca_first_name": "Johnny",
8       "ca_last_name": "Morris",
9       "ca_dob": "1961-06-20",
10      "ca_house_name": "",
11      "ca_house_num": 72,
12      "ca_postcode": "BS83HA",
13      "ca_num_policies": 0,
14      "ca_phone_mobile": "0345 245245",
15      "ca_phone_home": "0345 245245",
16      "ca_email_address": "JM@ZOO LAND.CO.UK",
17      "ca_policy_data": ""
18    }
19  }
20 }

```


5. Create the GENAPP-based mobile application with Worklight Studio



6. GENAPP – App Deployment



7. Drive CICS JSON Web Service workload with IBM Workload

```

#02ICUS
000029 End
000030
000031 Found = Off
000032 S5 = ''
000033
000034 /* S2 = '{"LGICUS010operation":{"ca":{"ca_customer_num":8}}}' */
000035
000036 S2 = '{"LGICUS010operation":{"ca":{"ca_customer_num":' ||
000037 '0D25'x ||
000038 Right(Char(Random(1,10)),10,'0')||',
000039 '0D25'x ||
000040 '}}}'
000041
000042 S1 = 'POST /genapp/inquireCustomer HTTP/1.1' ||
000043 '0D25'x ||
000044 'Host: hostname.ibm.com:12001' ||
000045 '0D25'x ||
000046 'Content-Type: application/json; charset=utf-8' ||
000047 '0D25'x ||
000048 'Content-Length: ' || Char(Length(S2)) ||
000049 '0D25'x ||
000050 'Connection: close' ||
000051 '0D25'x ||
000052 '0D25'x ||
000053
000054 Type Translate(S1,E2A)||Translate(S2,E2A)
000055 Transmit and Wait Until OnIn Found = ON
000056
000057 @Include JSNerror
000058
000059 endtxt
    
```

```

RECVC 8000 000002 600 93 #02ICUS 00
/1.1 200 OK > *...&.....|.....*
..c> *.....*
nt-type: application> *?>...../..%/..?>*
n; charset=utf-8..Da> *...?>...../...../*
Tue, 04 Feb 2014 12:> *.....*
5 GMT..Server: IBM_C> *.....(.....(-.*
Transaction_Server/5> *...-../>./..?>-.....*
(zOS)..Content-Lengt> *.....:|.....?>..>.<.>.*
000000000000367..Conn> *.....?>.....?>.....*
on: Close....."LGICU> *.....?>.....%?.....#.<.....*
perationResponse":.> *...|.../..?>.....?>.....#.*
."ca_request_id":"","> *./..#../-.....-.....*
return_code":0,"ca_c> *.../-.....>-?...../-.....*
mer_num":8,"ca_first> *.../_...->...../.....*
e":"Johnny","ca_last> *->/_.....?>...../..%/. *
e":"Morris","ca_dob"> *->/_.....(?...../..?.. *
61-06-20","ca_house_> *...../..?..... *
":","ca_house_num":> *>/_...../..?.....->..... *
ca_postcode":"BS83HA> *...../..?.....?..... *
a_num_policies":0,"c> *...../..>.._..?%..... *
<a_phone_mobile":"0345 24> */-..?>-?..%..... *
<5245"ca_phone_home":"0> *...../..?>-? *
    
```

```

22303334 35203234 <a_phone_mobile":"0345 24>
686E6D65 223A2230 <5245"ca_phone_home":"0>
    
```

Region	Name	Use Count	Pipeline	State	URI Map
IYEMZC2S	inquireCustomer	1082	GENAPIP2	INSERVICE	\$146460