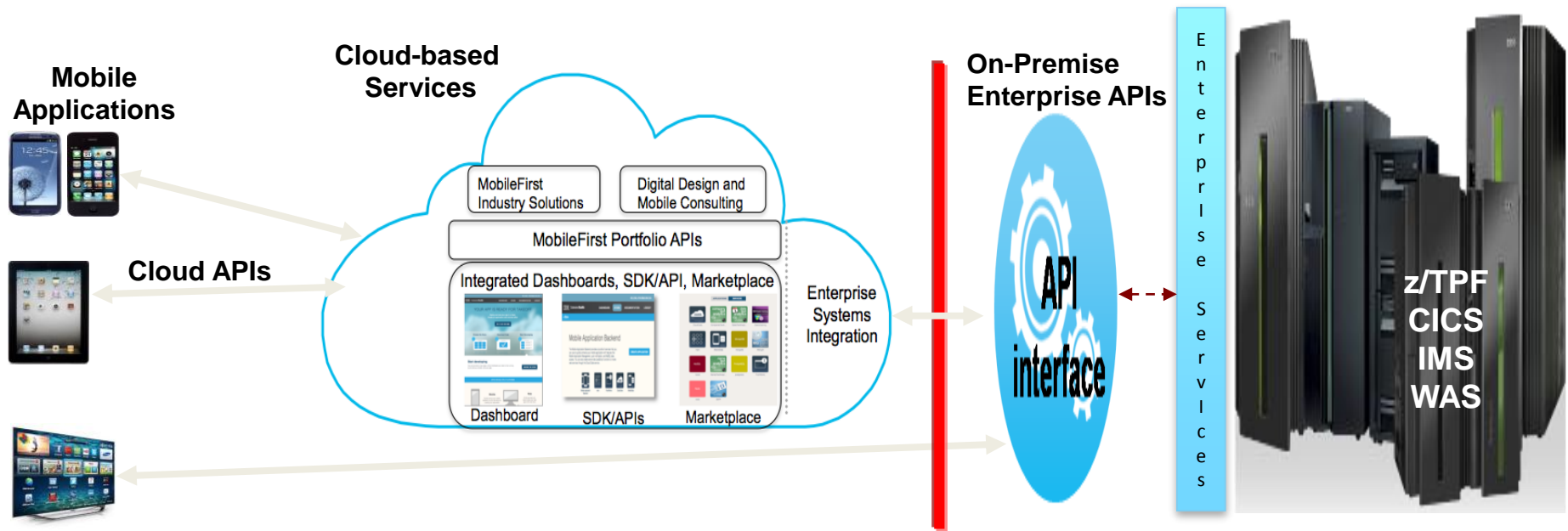# Extending z/TPF using IBM API Management (APIM)

Mark Gambino, TPF Development Lab

March 23, 2015

TPFUG – Dallas, TX

IBM.

The Big Picture Goal

Mobile, Cloud and Third-party Applications invoking Services on z Systems using APIs

Why IBM APIM

- Enterprise Customers have made a significant investment over a long period of time, in developing many valuable assets supporting core business functions
- Leverage these existing assets by exposing as APIs to reach new customers in new markets with new applications
  - Both internal usage and external customers
- Simplified access to existing services
- Improved consumability of existing services
- Better governance of existing services
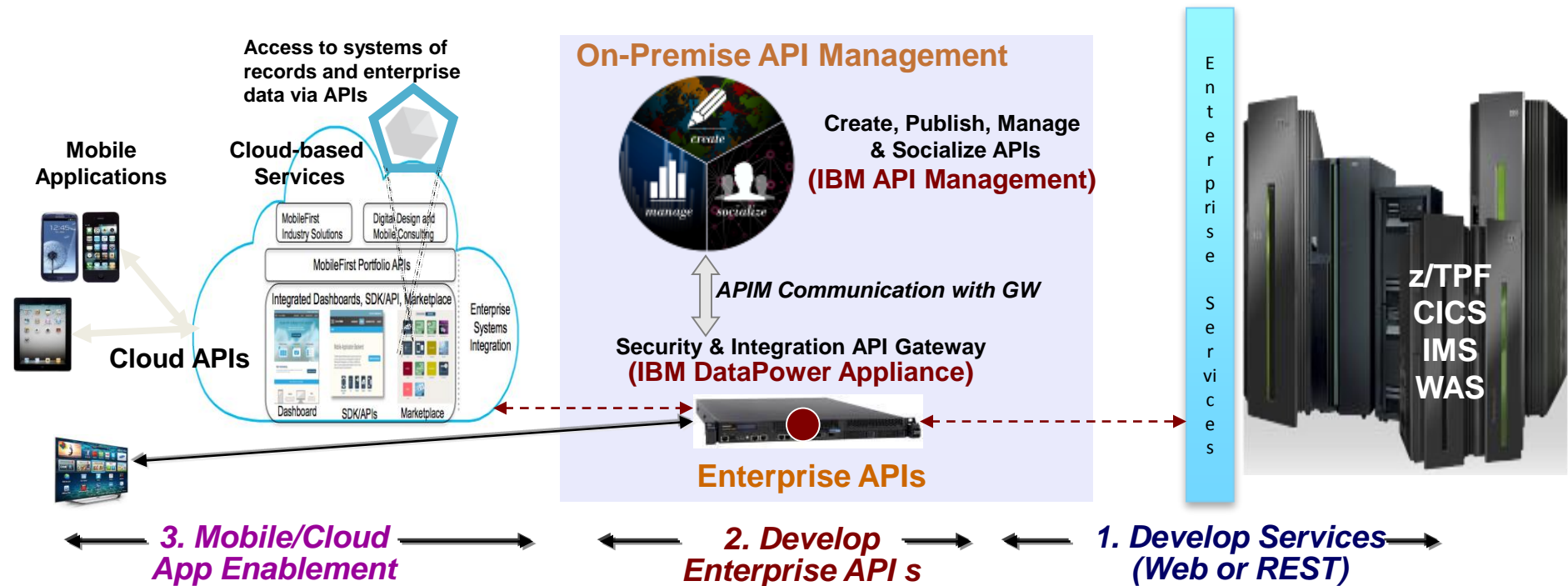- No changes required to existing services on z Systems

Why IBM APIM (Part 2)

- Consumability of the APIs is Key:
  - Easier creation and assembly of API from existing assets/services
  - Visibility of APIs to internal and external developers
  - Easier registration (by consuming applications) and set up including managing entitlement

- Retaining business control and gaining business insight in API invocation

  - Securing APIs using a secure GW from unwanted external invocations (mapping to application level security) and enforcing workload entitlement

  - Business Monitoring of API access in gaining business insight on the use of APIs by external applications, and for accountability and chargeback

Keys to the Kingdom

- **Protecting** mission critical z Systems based services is the number **one, two and three concerns** for all businesses in exposing their core business functions as APIs.
- This is achieved by establishing necessary business control through an additional API (secure GW/Entitlement management/Monitoring) layer
  - Securing services from unwanted invocations through entitlement management
  - Avoiding spikes in workload (and disruptions to existing business functions) through workload control
  - Monitoring API invocations in gaining new insight on API usage
- IBM APIM gives you centralized control to all your services
  - Much better than ad-hoc methods that can result in inconsistent policies, replicated code, and other error prone situations

End-to-End Architecture for Mobile, Cloud and Third-party Applications accessing z Systems Services using APIs
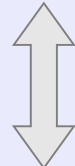
Access to systems of records and enterprise data via APIs

Mobile Applications

Cloud-based Services

On-Premise API Management

Create, Publish, Manage & Socialize APIs
(IBM API Management)

Cloud APIs

APIM Communication with GW

Security & Integration API Gateway
(IBM DataPower Appliance)

Enterprise Services

z/TPF
CICS
IMS
WAS

Enterprise APIs

3. Mobile/Cloud App Enablement

2. Develop Enterprise API s

1. Develop Services (Web or REST)

A Closer Look at the APIM Component

On-Premise API Management

Create, Publish, Manage & Socialize APIs
(IBM API Management)

APIM Communication with GW

Security & Integration API Gateway
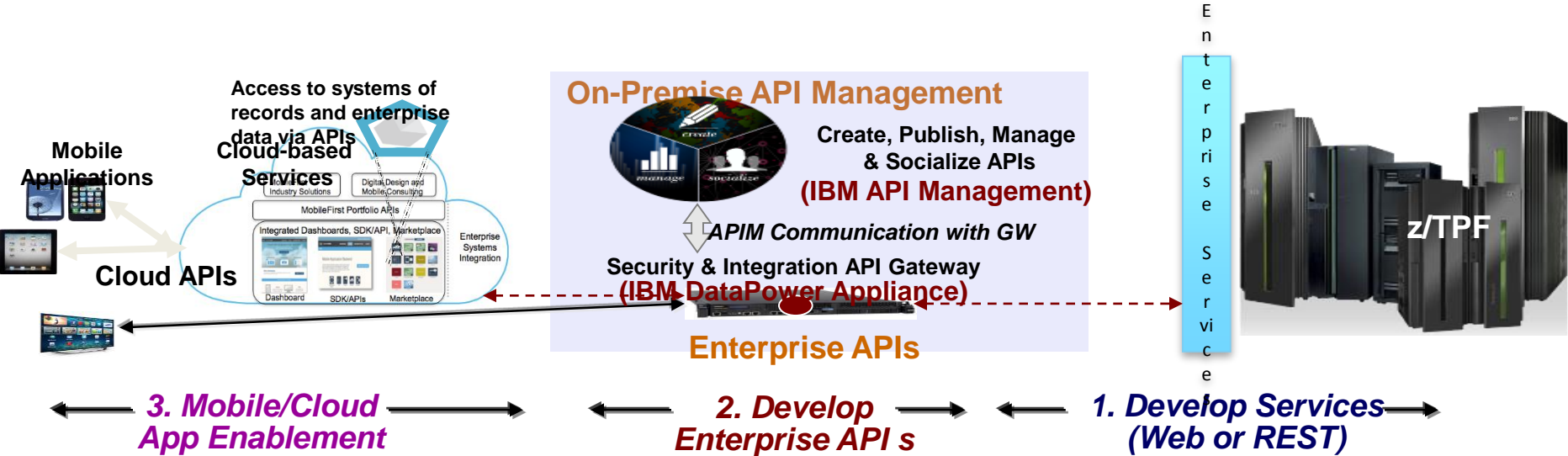**(IBM DataPower Appliance)**

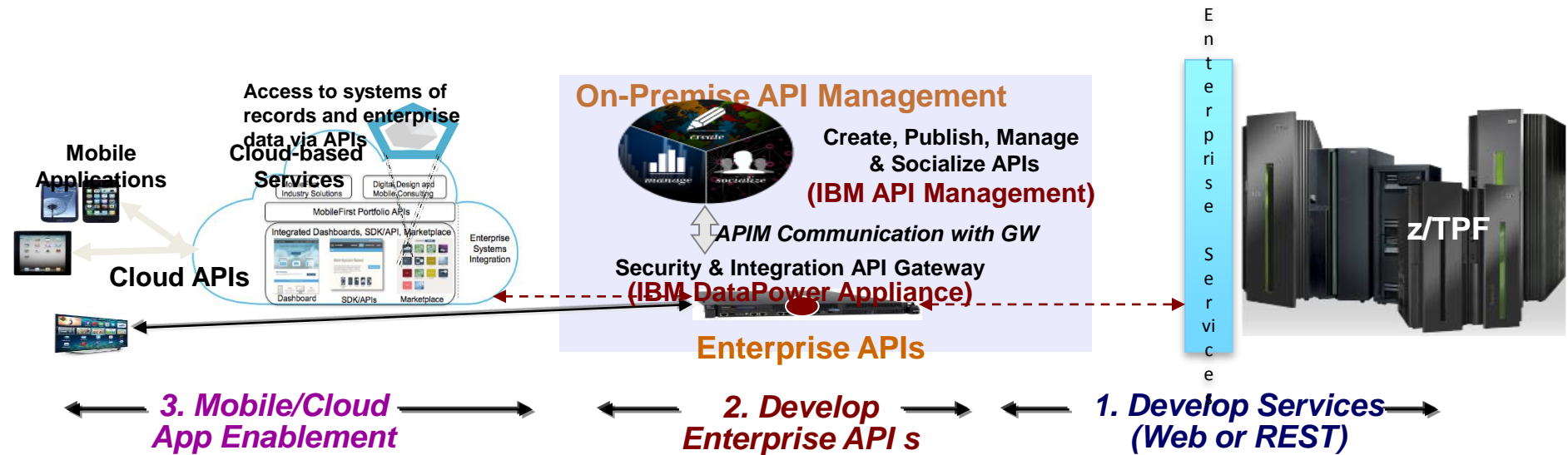**Enterprise APIs**

APIM Roles – Who Does What

Mobile Applications

Access to systems of records and enterprise data via APIs

Cloud-based Services

Cloud APIs

On-Premise API Management

Create, Publish, Manage & Socialize APIs
(IBM API Management)

APIM Communication with GW

Security & Integration API Gateway
(IBM DataPower Appliance)

Enterprise APIs

Enterprise Service

z/TPF

◄── **3. Mobile/Cloud App Enablement** ──►   ◄── **2. Develop Enterprise API s** ──►   ◄── **1. Develop Services (Web or REST)** ──►

Develop services on z/TPF

APIM Roles – Who Does What

3. Mobile/Cloud App Enablement

2. Develop Enterprise API s

1. Develop Services (Web or REST)

- Create APIs from z Systems services
- Entitlement management
- Usage monitoring and analytics

Develop services on z/TPF

APIM Roles – Who Does What

Mobile Applications

Cloud APIs

Access to systems of records and enterprise data via APIs

Cloud-based Services

On-Premise API Management

Create, Publish, Manage & Socialize APIs
(IBM API Management)

APIM Communication with GW

Security & Integration API Gateway
(IBM DataPower Appliance)

Enterprise APIs

Enterprise Service

z/TPF

3. Mobile/Cloud App Enablement

2. Develop Enterprise API s

1. Develop Services (Web or REST)

Create applications that invoke APIs to access back-end services

- Create APIs from z Systems services
- Entitlement management
- Usage monitoring and analytics

Develop services on z/TPF

Tonight

IBM Demo Overview
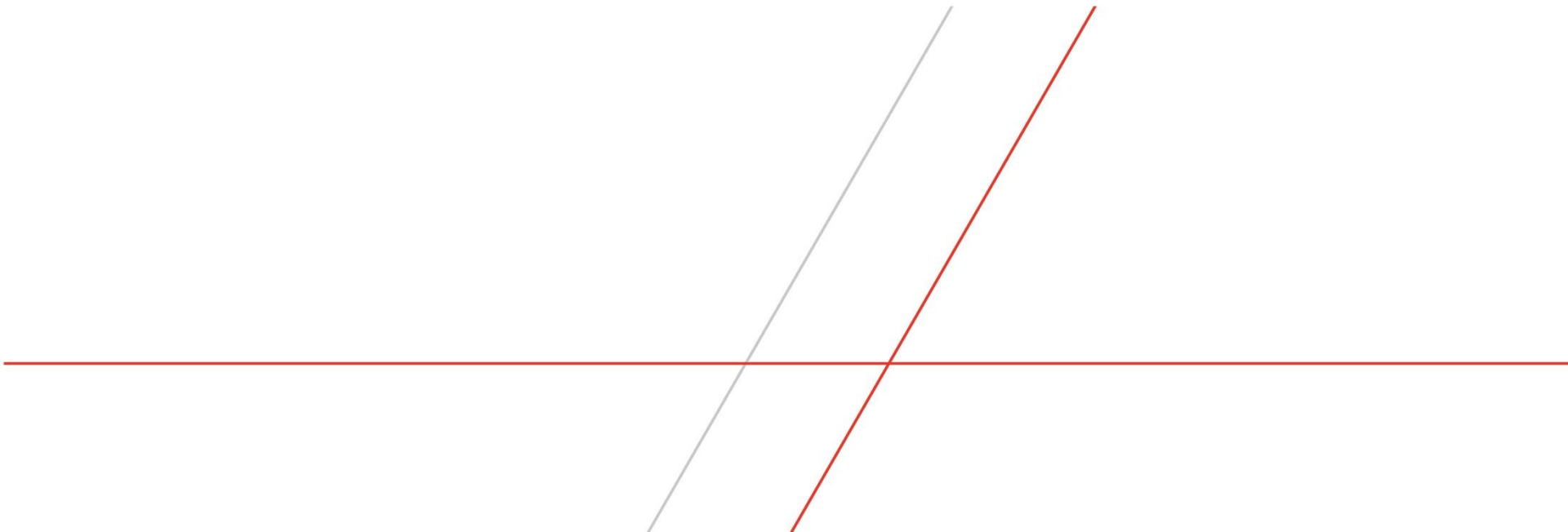
z/TPF APIM Demo Environment
Web Services Exist on your z/TPF System

z/TPF

z/TPF APIM Demo Environment
Use IBM APIM to Define/Deploy APIs that Map to z/TPF Web Services

IBM
APIM

z/TPF

DataPower
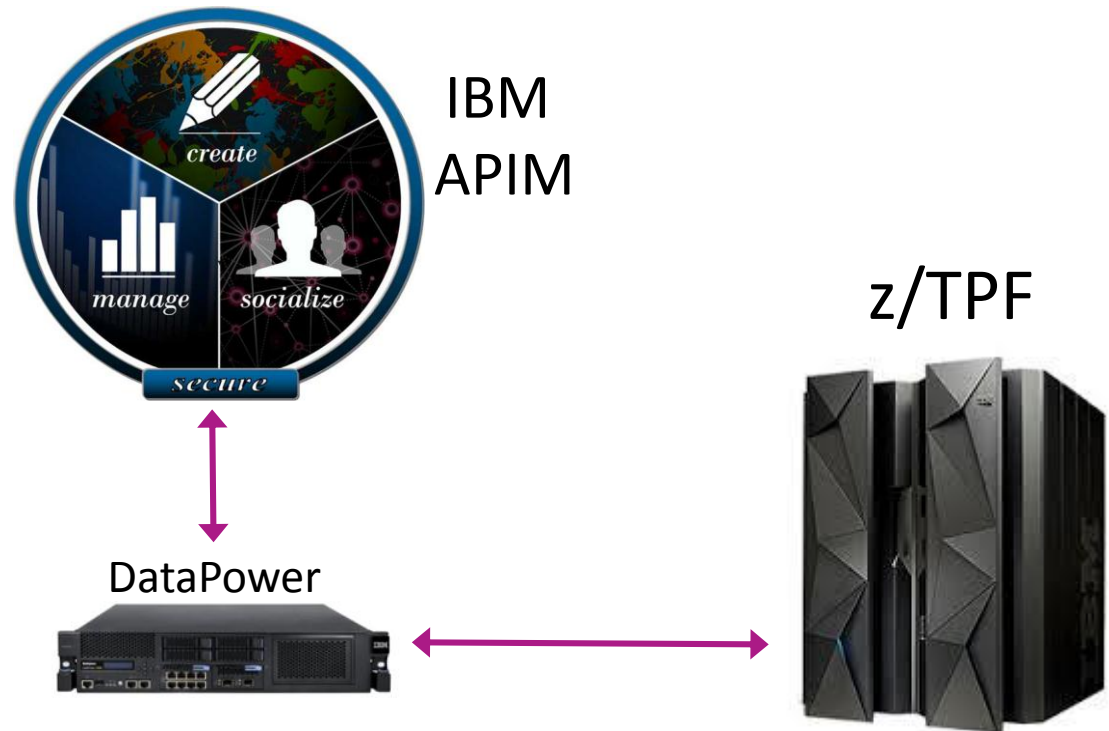
z/TPF APIM Demo Environment
Use IBM MobileFirst to Develop Mobile App Using Published APIs

IBM
MobileFirst

IBM
APIM

z/TPF

DataPower
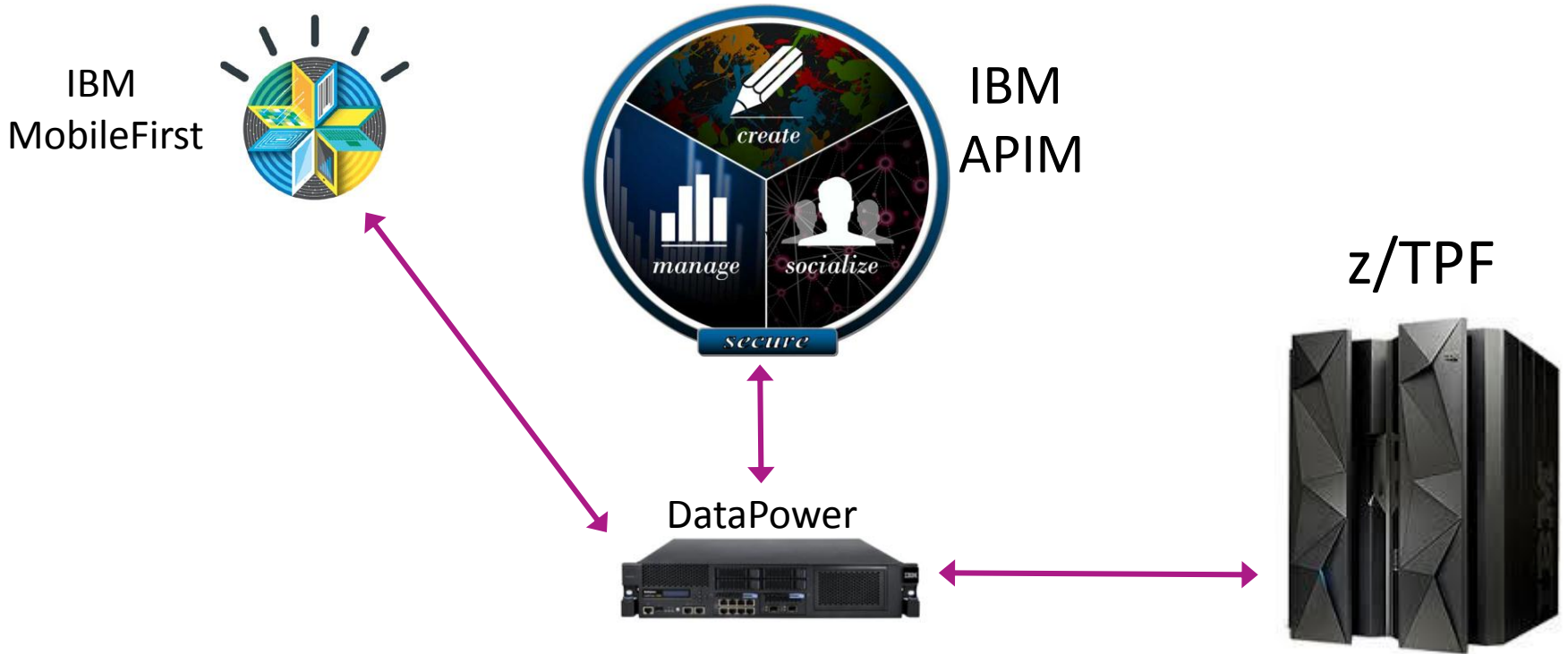
z/TPF APIM Demo Environment
Use IBM MobileFirst to Deploy Mobile App

IBM
MobileFirst

IBM
APIM

z/TPF

DataPower
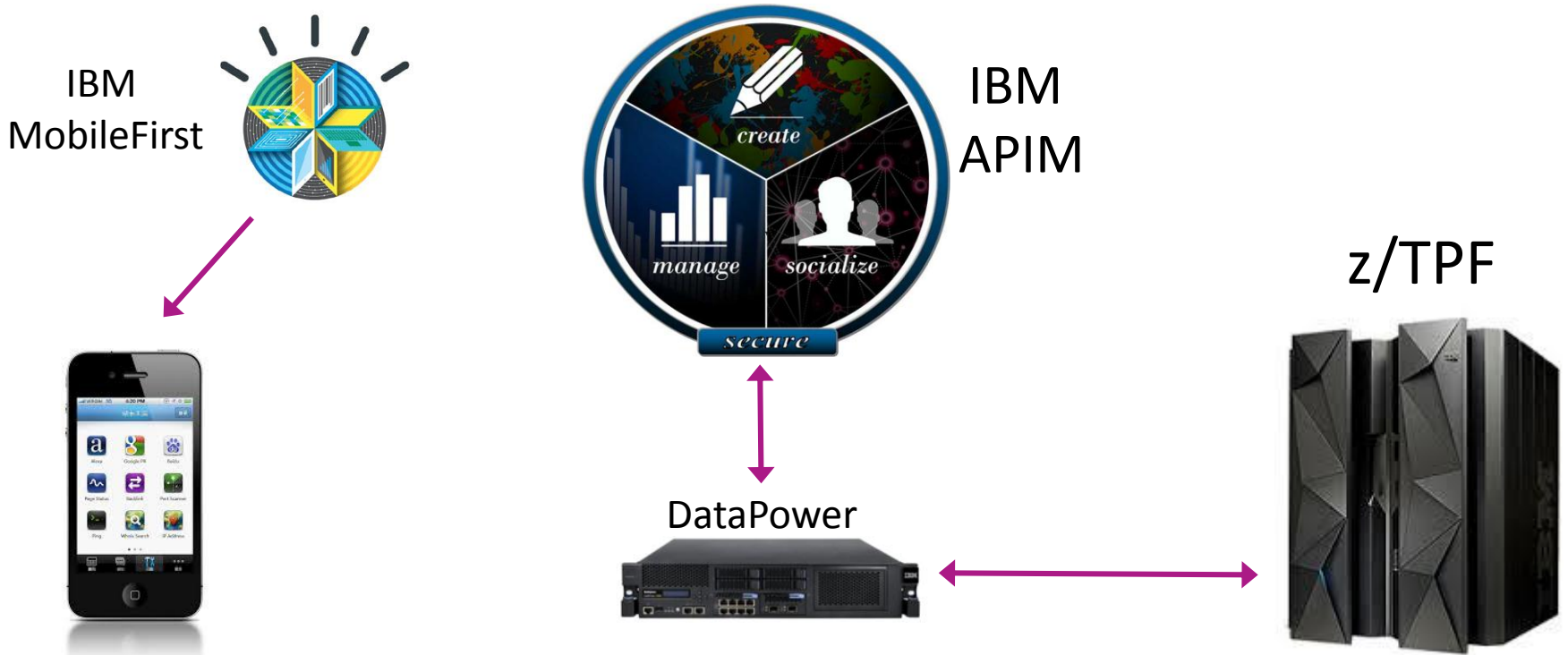
z/TPF APIM Demo Environment Transactional Flows
Mobile App Issues API

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON)

DataPower
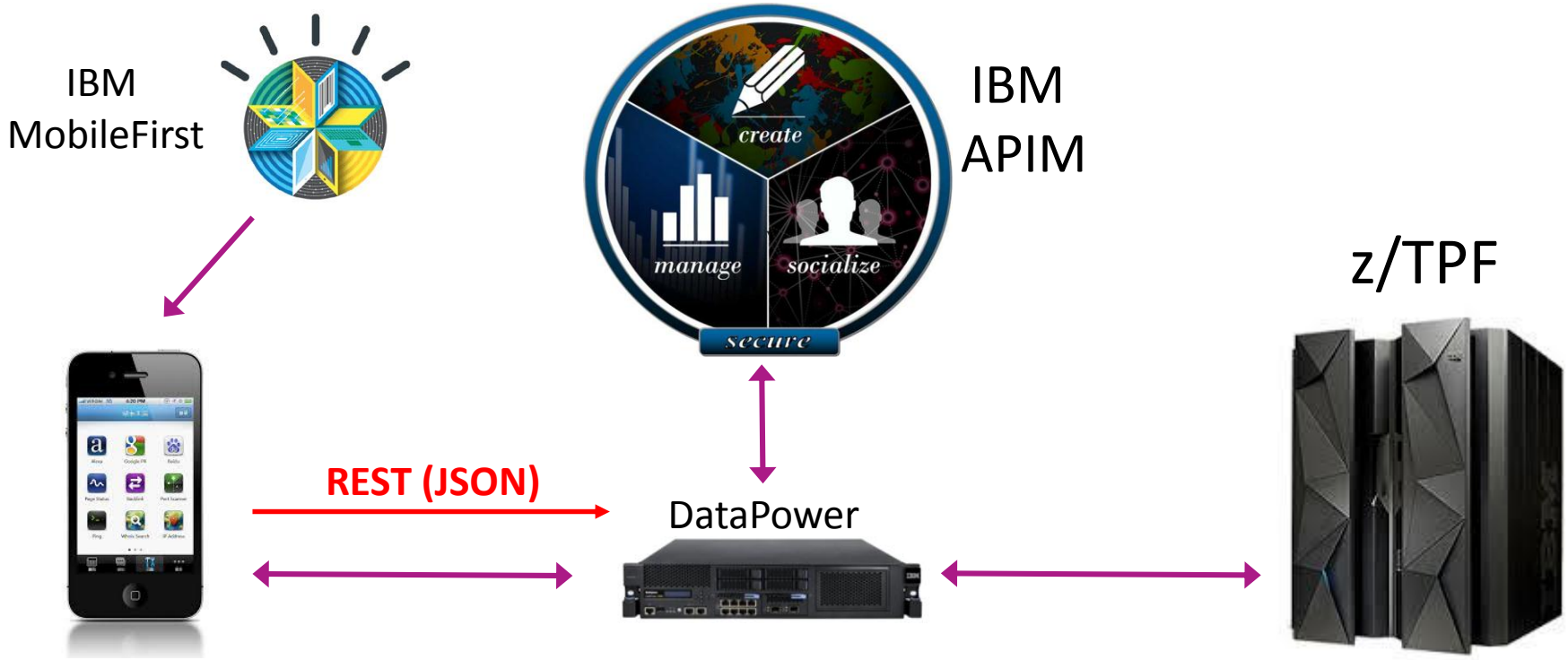
z/TPF APIM Demo Environment Transactional Flows
API is Converted to a Web Services Call to z/TPF

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON)

DataPower

SOAP (XML)
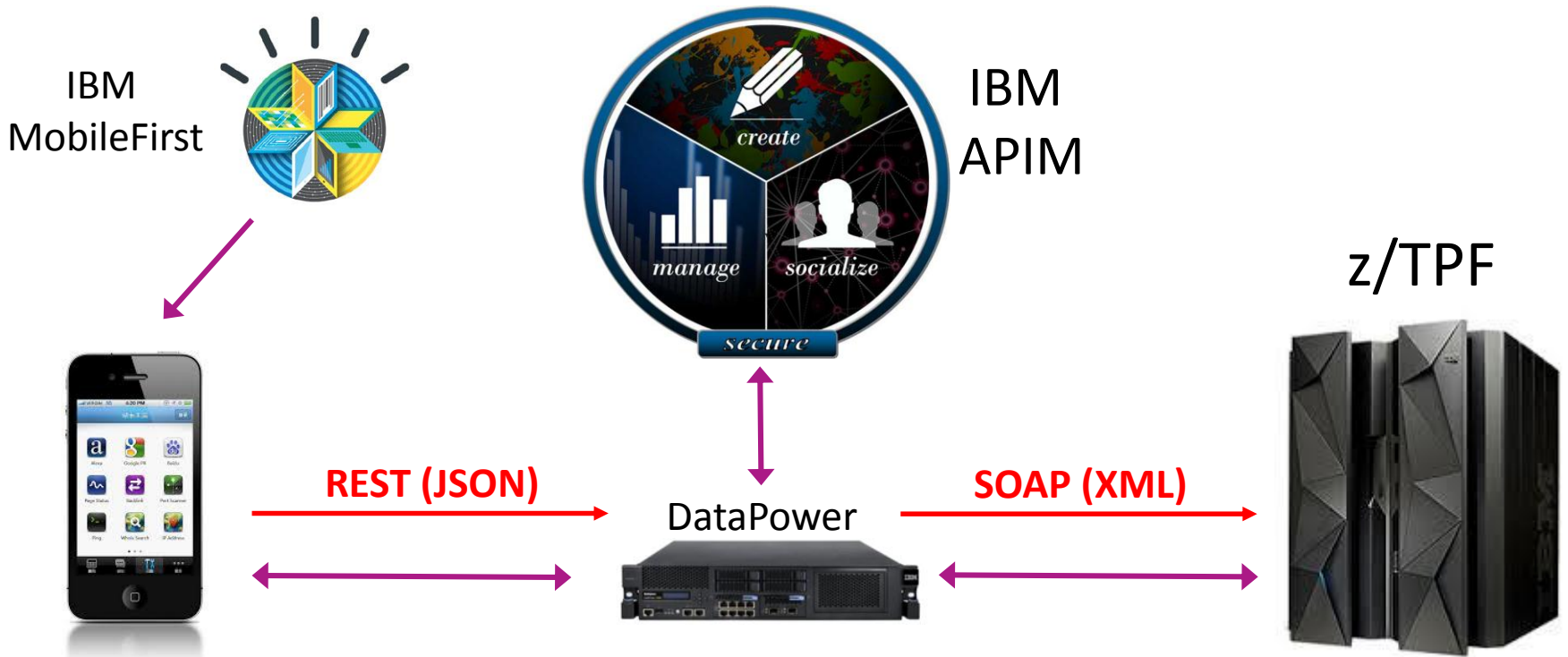
z/TPF APIM Demo Environment Transactional Flows
z/TPF Processes the Request and Sends the Reply

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON)

DataPower

SOAP (XML)

SOAP (XML)
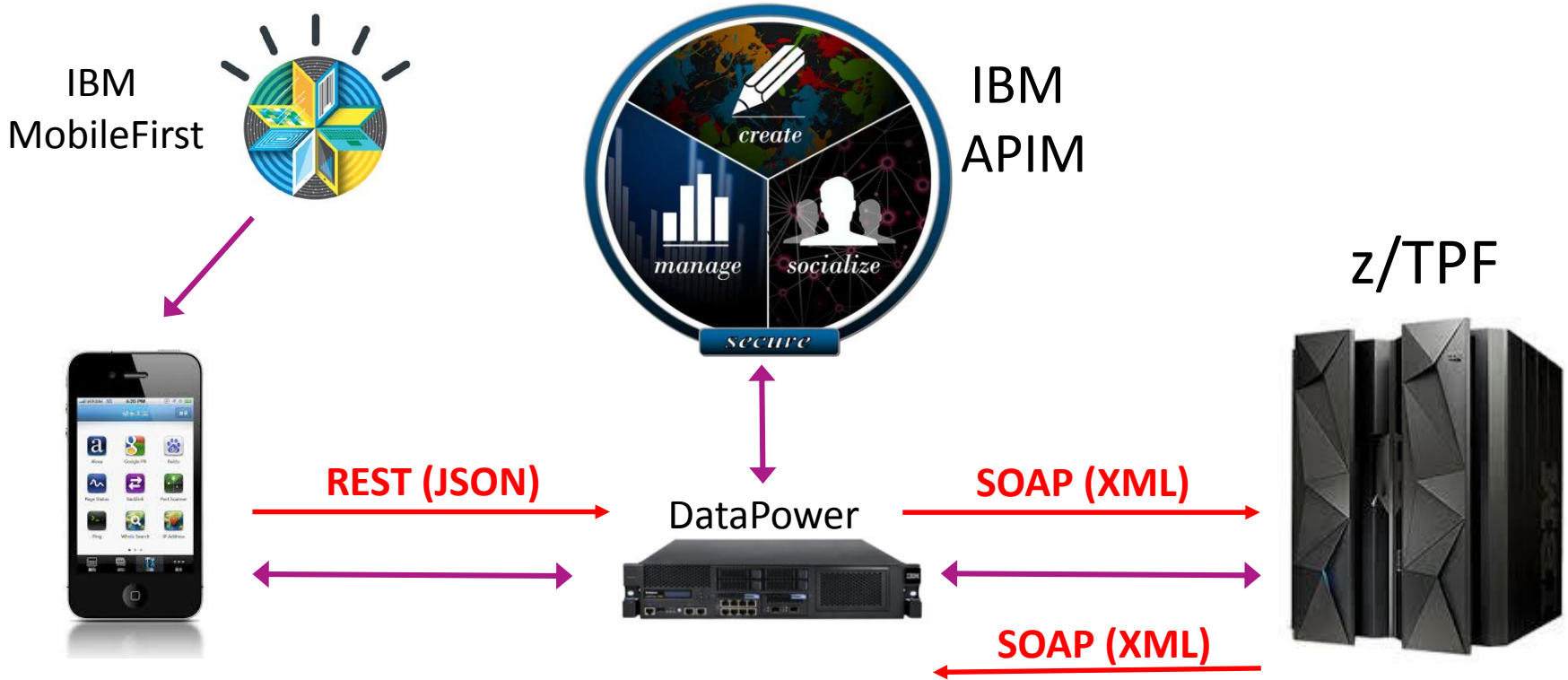
z/TPF APIM Demo Environment Transactional Flows
Web Services Response is Converted to API Response

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON)

DataPower

SOAP (XML)

REST (JSON)

SOAP (XML)
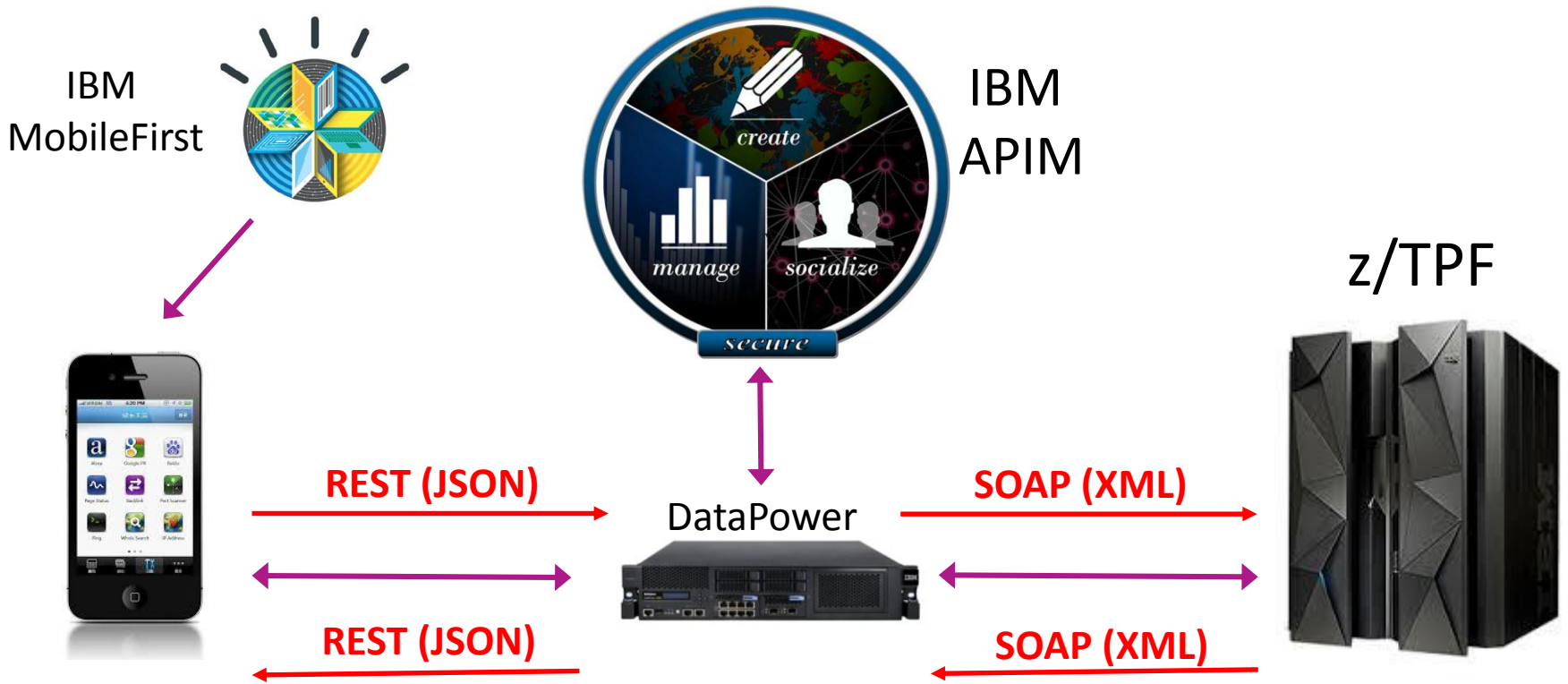
z/TPF APIM Demo Environment Analytics
Examine Different Reports on APIM Console
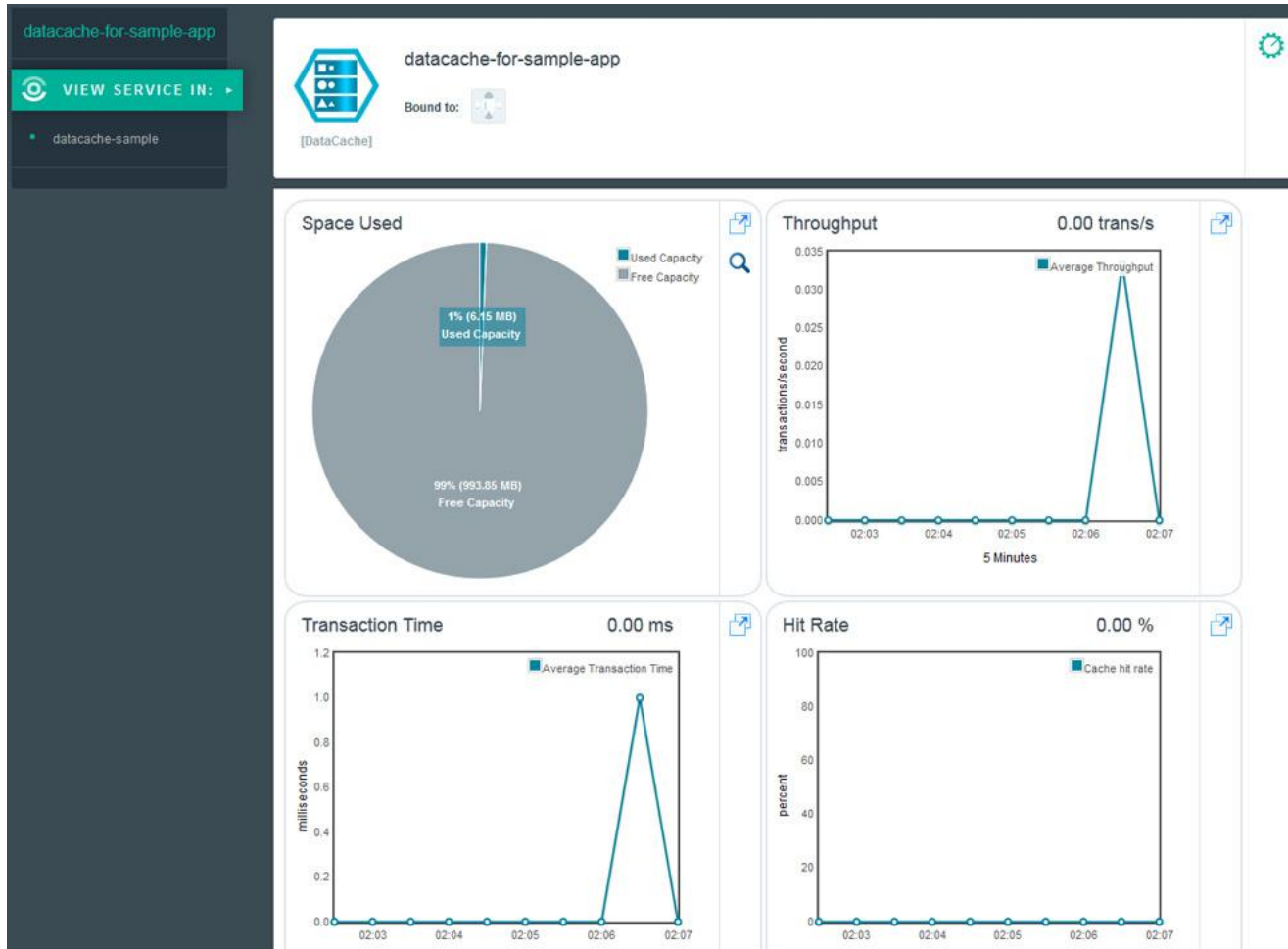
z/TPF APIM Demo Environment Integrated with Social Mobile User Posts on Social Media

IBM
MobileFirst

IBM
APIM

z/TPF

DataPower
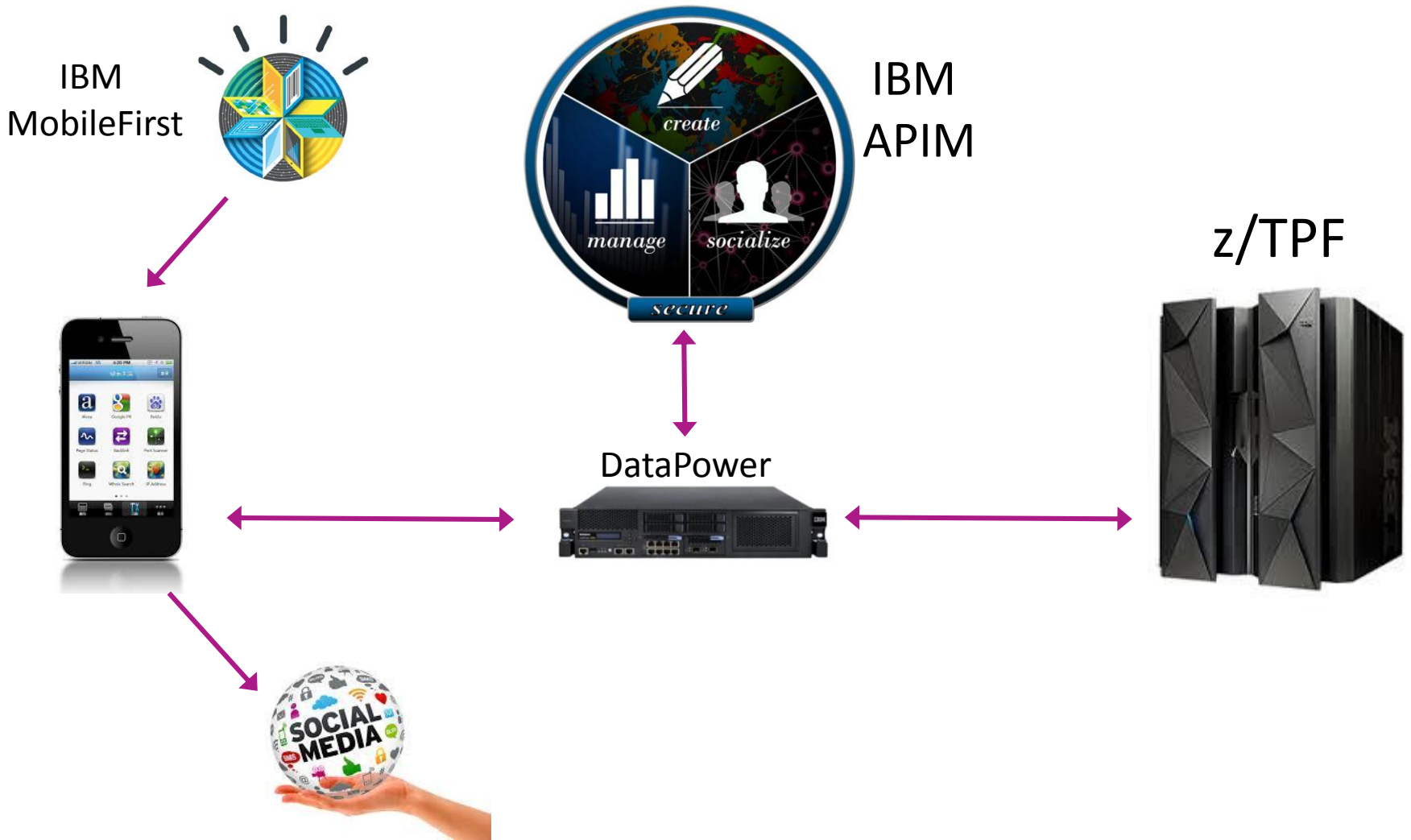
z/TPF APIM Demo Environment Integrated with Social Linux Server Monitors Social Media Updates

IBM MobileFirst

IBM APIM

z/TPF

DataPower

SOCIAL MEDIA
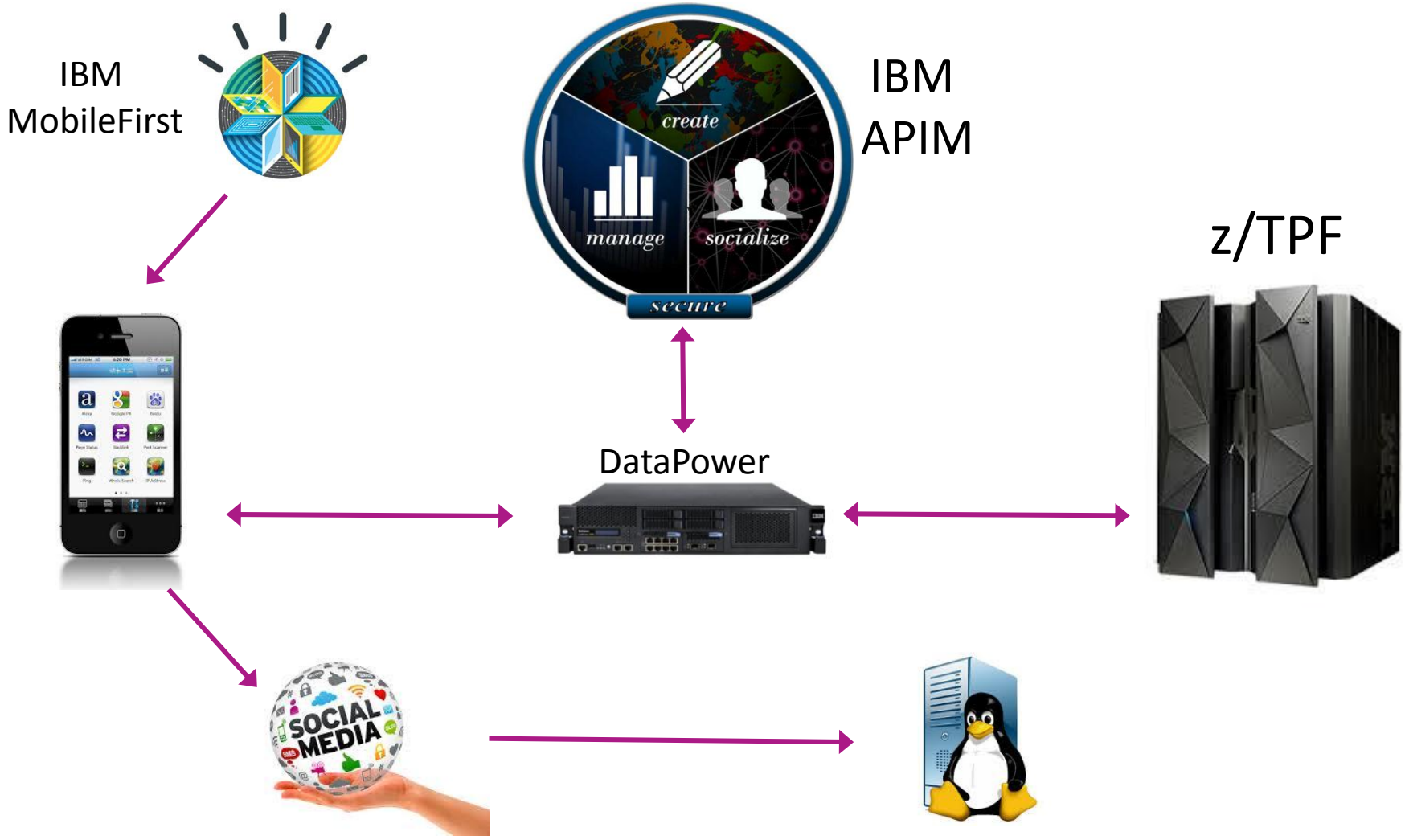
z/TPF APIM Demo Environment Integrated with Social

Linux Server Drives APIs to Gather/Save Offers in z/TPF

IBM
MobileFirst

IBM
APIM

z/TPF

DataPower
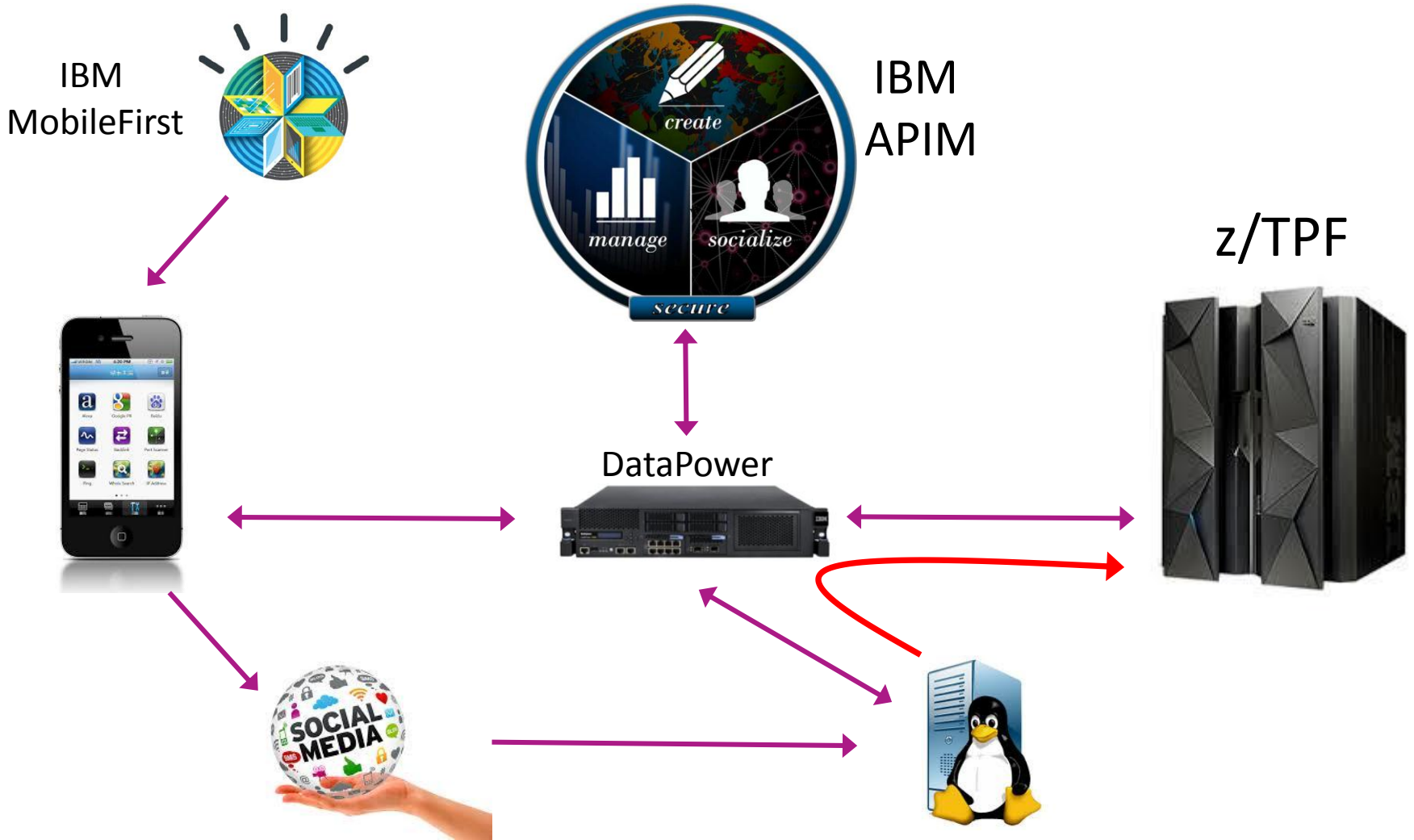
z/TPF APIM Demo Environment Integrated with Social
Mobile User clicks "My Offers" which issues API

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON)

SOAP (XML)

DataPower
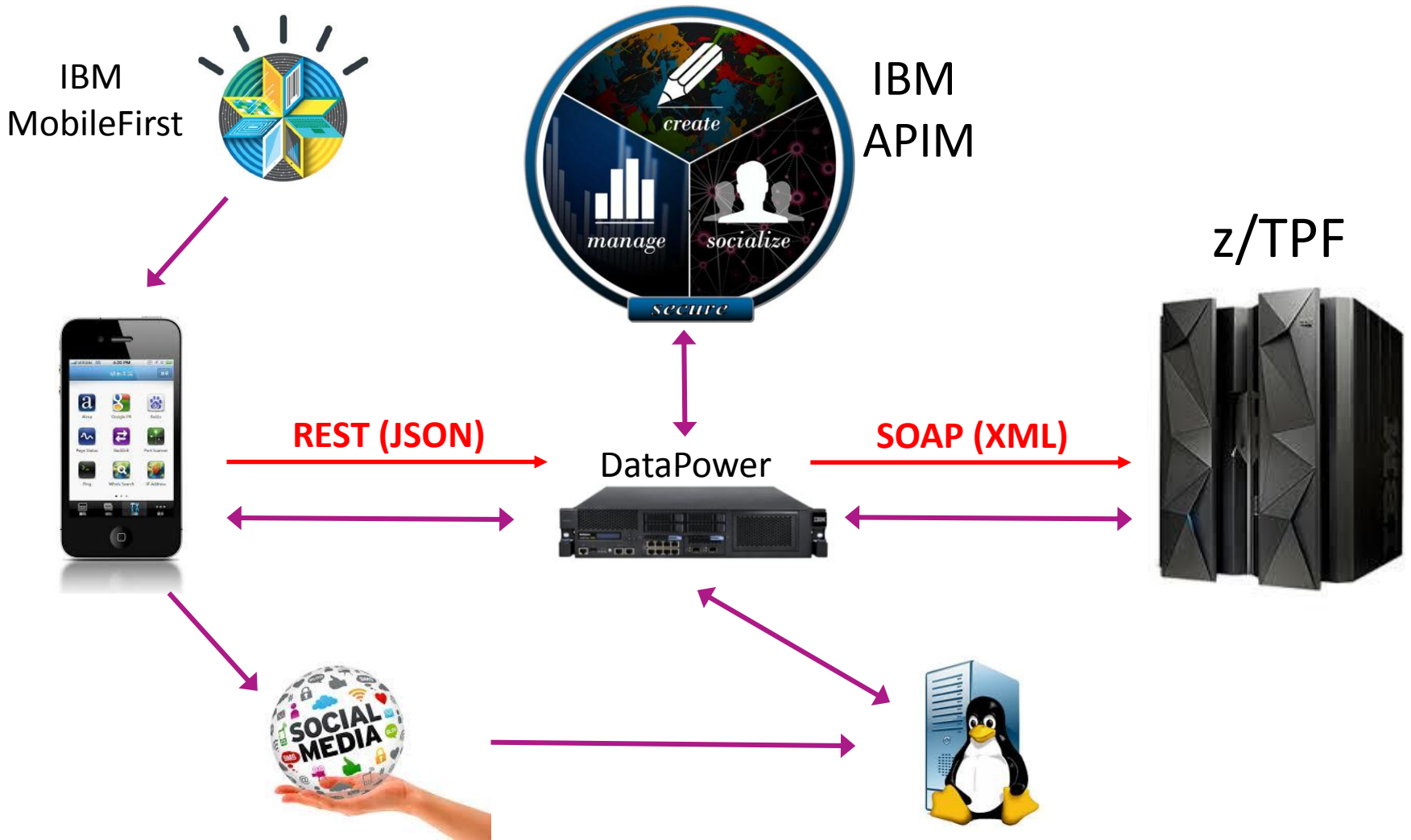
z/TPF APIM Demo Environment Integrated with Social
z/TPF Sends Saved Offers Back to Mobile User

IBM
MobileFirst

IBM
APIM

z/TPF

REST (JSON) →

DataPower

SOAP (XML) →

REST (JSON) ←

SOAP (XML) ←
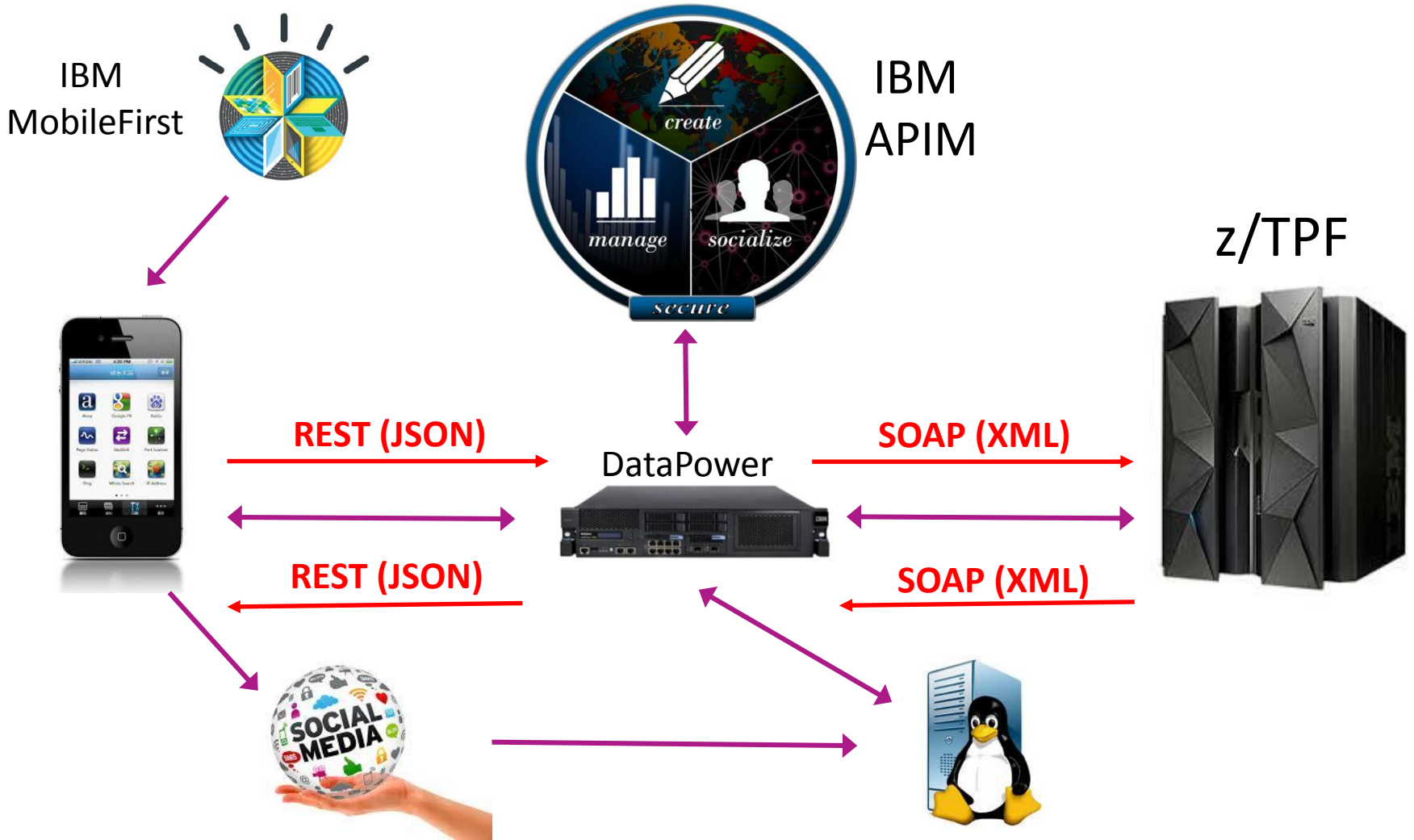
Sample Screen Shots from the Demo

Using APIM to Create Booking API based on the Booking Web Service
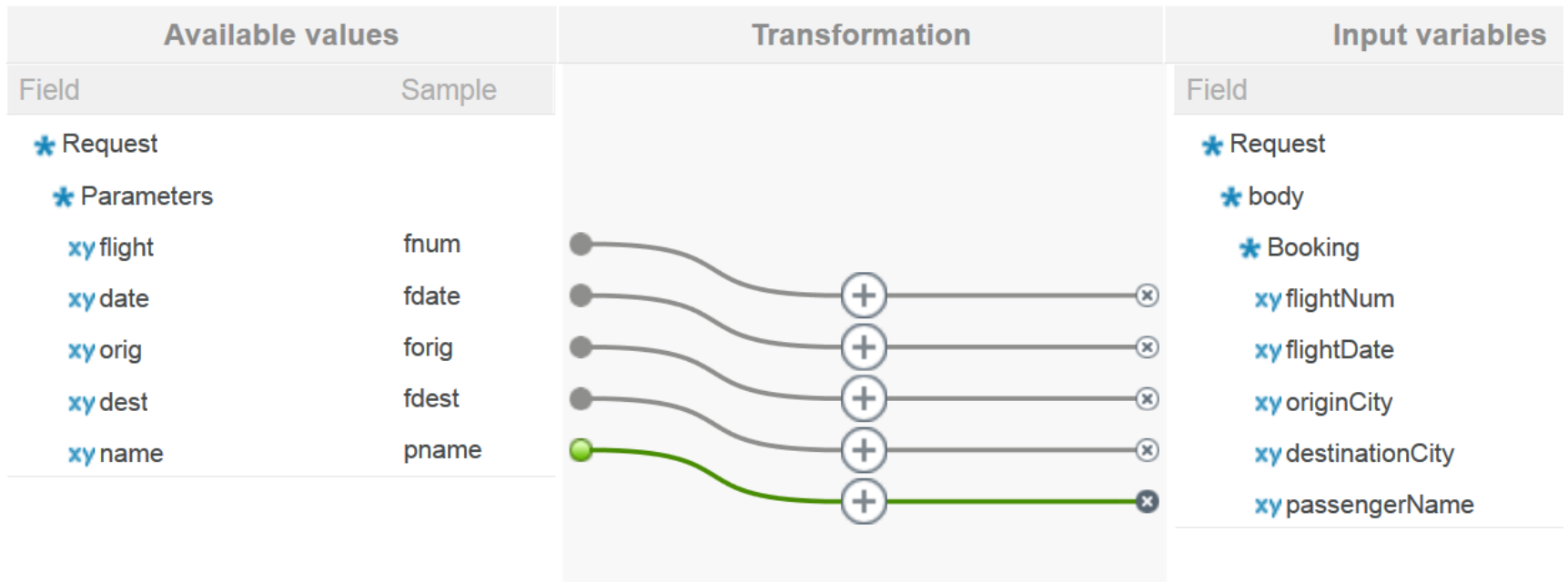
Use APIM Test Wizard to Verify the New Booking API

	Resources	Security	Properties	Documentation

⊕ Resource   Find   ✕ 🔍

Method	Path ▲	Display name (optional)	Description (optional)	Identification	Authentication	Actions
GET	/bookit?flight={fnu			☐	☐	✕

Overview	Implementation	**Test**

Environment   Plan

Sandbox ▼   Business A Reservations (Version 1) ▼   ⬆
                                                                  Invoke

	Name	Description	Required	Value
Parameters	flight		☑	JO100
Response	date		☑	DEC02
	orig		☑	JFK
	dest		☑	ODR
	name		☑	JIMBO

Test Wizard Booking API Response Screen

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Use APIM to Set Limits for Availability API within a Given Plan

APIM Developer Portal View of APIs Available to this Application Developer

Mobile App Check Flight Availability Screen
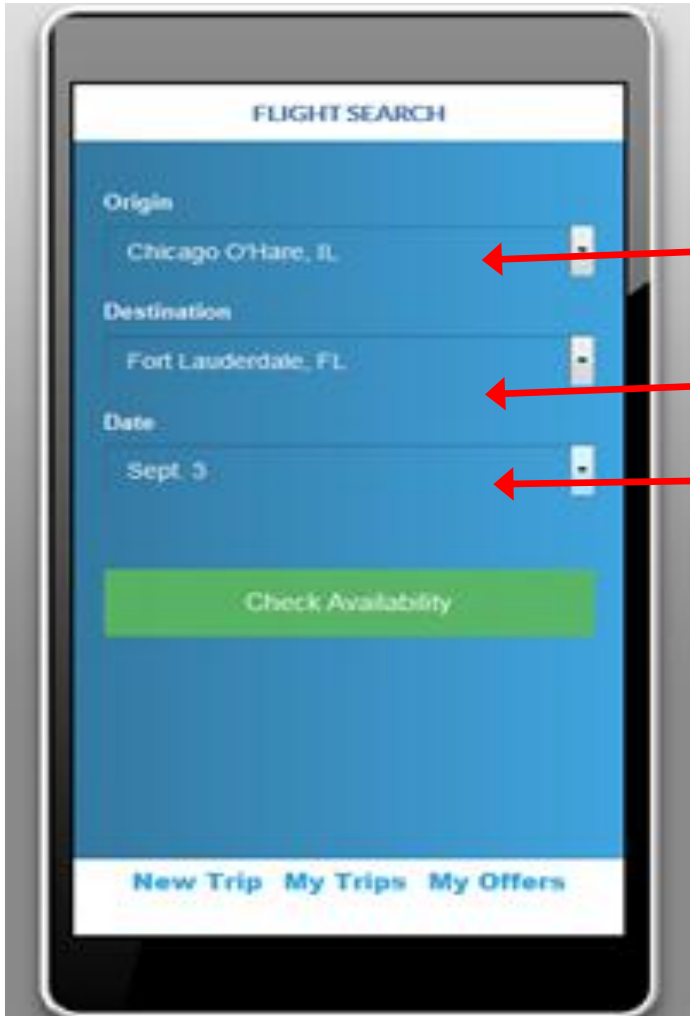
Origin City

Destination City

Date

Mobile App Check Flight Availability Response
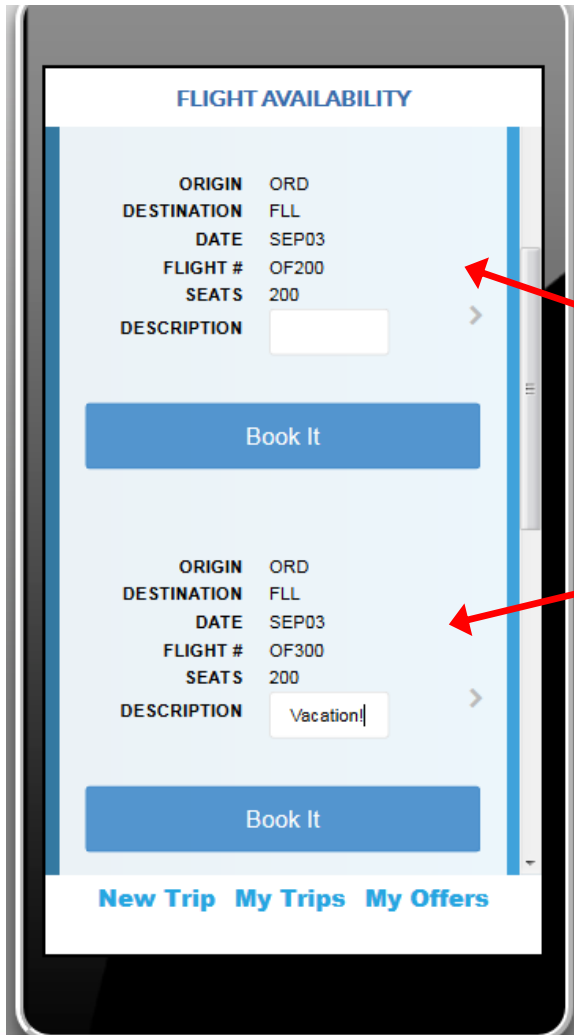
Various Flight Options Displayed

Mobile App Booking Response

Mobile App "My Trips" Response

FLIGHTS BOOKED

RESERVATION ID	WAPZNW
PASSENGER	zTPFAPIM
DESCRIPTION	Vacation!
ORIGIN	ORD
DESTINATION	FLL
DATE	SEP03
FLIGHT #	OF300

Cancel
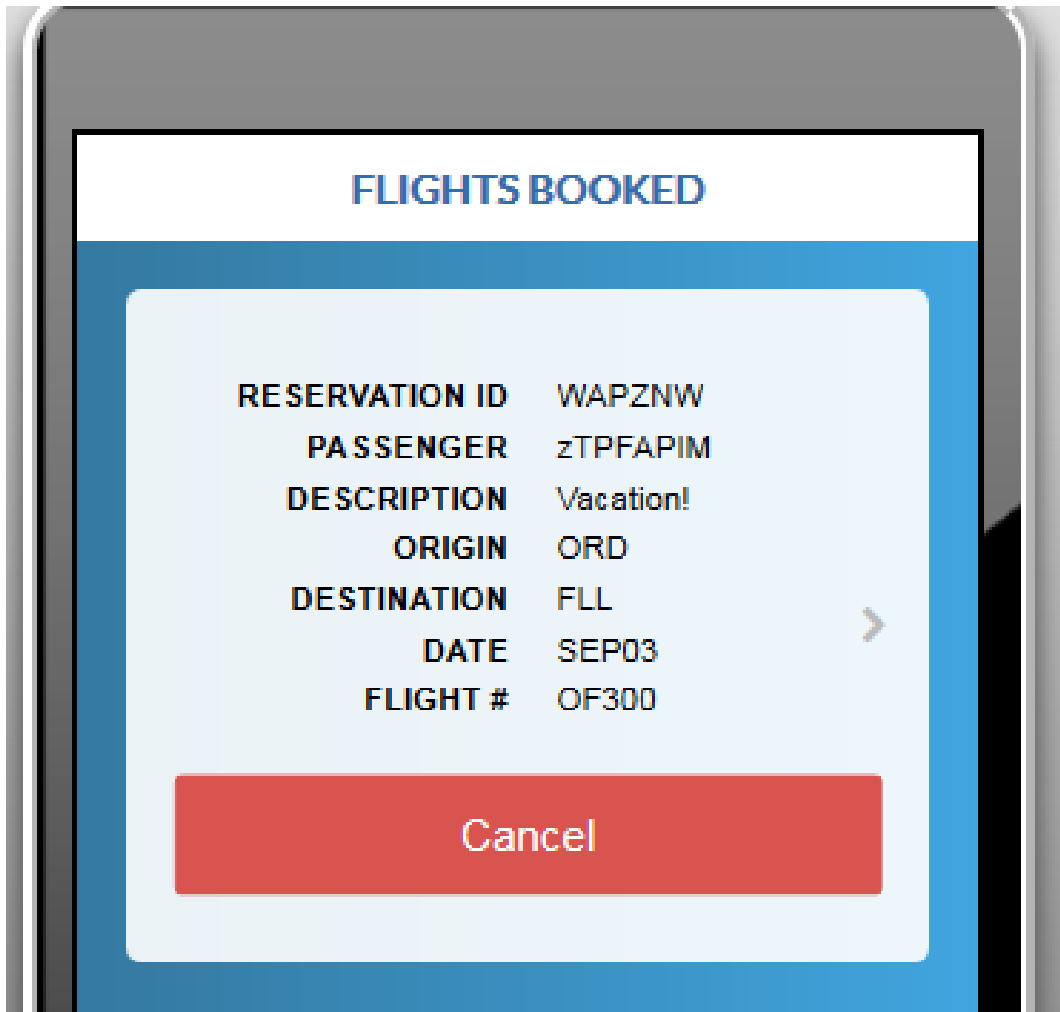
Use APIM to Examine API Usage

Show statistics from zTPF_APIM_Demo ▾

5 Most Active APIs

● facebookAgent ● rQuery ● rAvailability ● booking ● rCancel
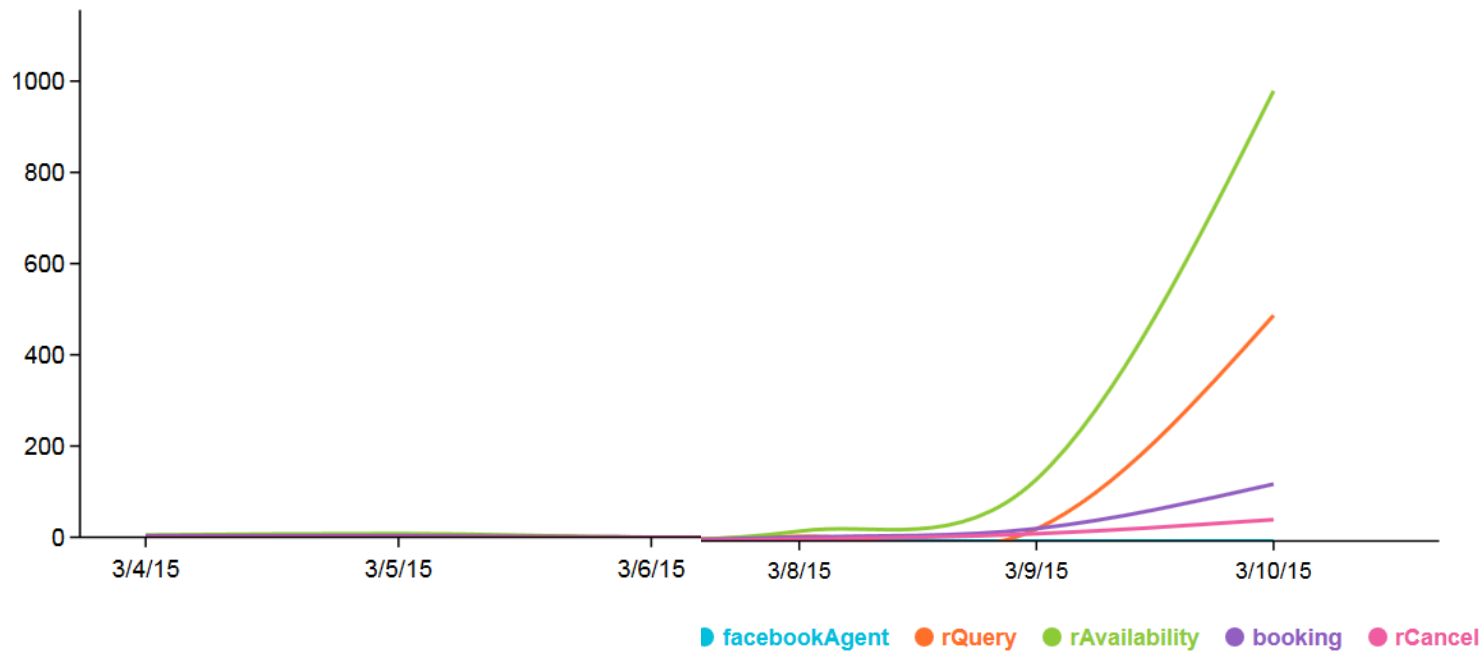
Use APIM to Examine Total API Calls
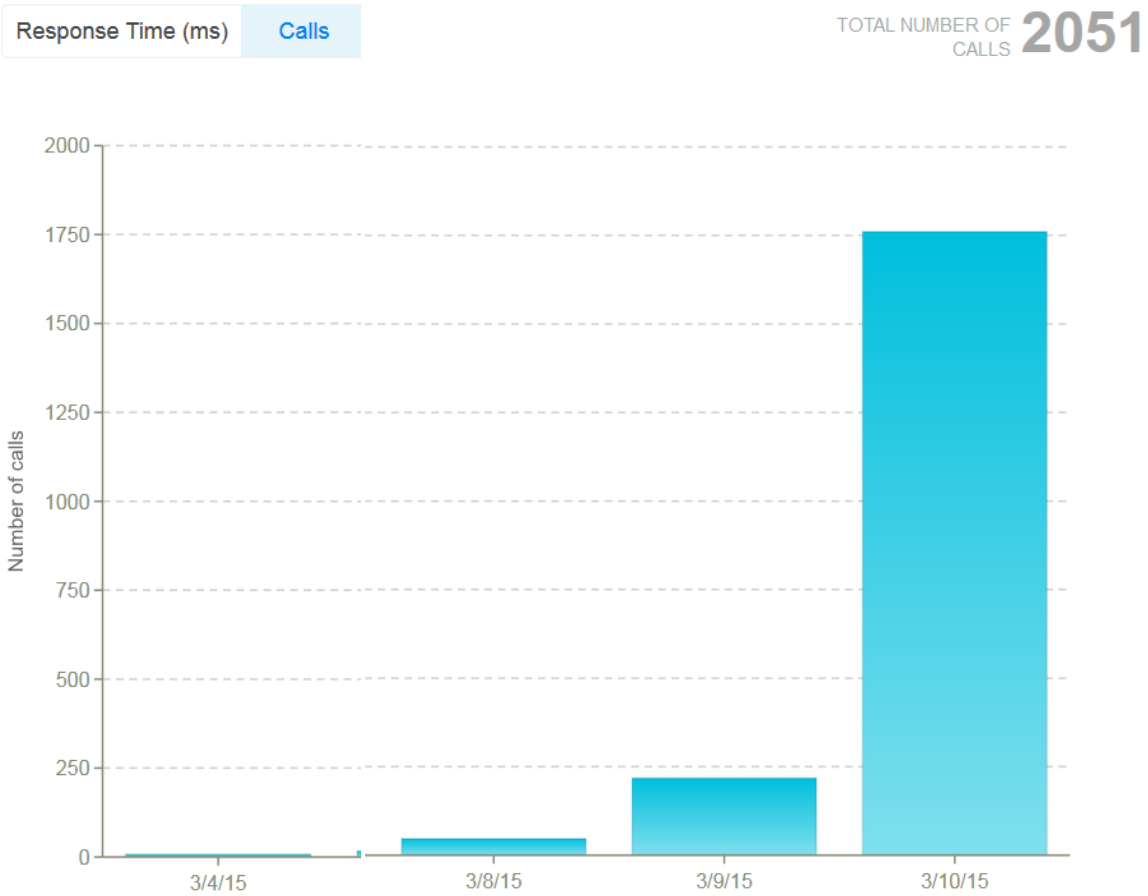
Summary

- IBM provides technology that allows you to develop an end-to-end secure mobile solution integrated with your z/TPF system
  - MobileFirst – create/deploy the mobile app
  - APIM – define/deploy/manage APIs
  - DataPower – secure gateway
- Did I mention there's a demo tonight?

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Notes

- Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

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