

# C05 Discovery of Enterprise zSystems Assets for API Management

*Unlocking mainframe assets for mobile and cloud applications*

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# Agenda

- What is API?
- Business drivers/opportunities for leveraging z Assets as APIs
  - API Economy, Mobile, Quick Wins and Improving consumability and governance
- End-to-end Architecture and Roles
- Discovery of z based Services



# The Business of API

Not having an API today is like not having a website in the 1990s...



Grow revenues...



“The adoption of Amazon’s Web services is currently driving more network activity than everything Amazon does through their traditional web sites.”

Jeff Bar (Amazon evangelist) / Dion Hinchcliffe (Journalist)



“\$7bn worth of items on eBay through APIs”  
Mark Carges (Ebay CTO)

The API which has easily **10 times more traffic** than the website, has been really very important to us.”  
Biz Stone (Co-founder, Twitter)

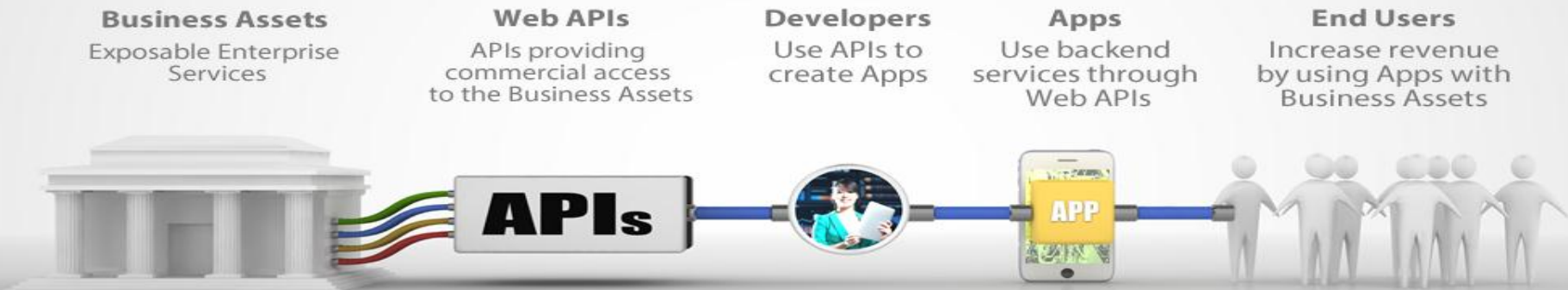


... While reducing overhead



# API Economy

Lifecycle



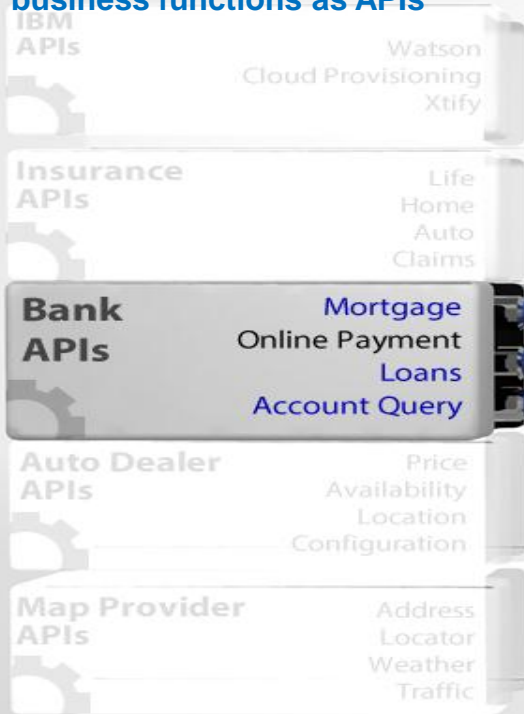
## The API Economy

Where companies [providers] expose their (internal) digital business assets or services in the form of (Web) APIs to third parties [consumers] with the goal of unlocking additional business value through the creation of new assets

# API Economy

Provider Perspective

Creating new opportunities by extending customer "reach" by exposing z based core business functions as APIs



# Mobile App Assemblers

Developers & Partners



New Customers





# Socialize and Discover API

Sabre

Sabre Dev Studio

APIs

REST basics

REST APIs

Release notes

Air

SOAP basics

SOAP APIs

## REST APIs

Infuse travel into y

Power your applications with  
and infrastructure that's mo

Now you can incorporate n  
capability into your applicat  
intelligence services — sho  
book travel.

Help your travelers decide

- When are the best d
- Want to go somewh
- Want to know where
- Is this a good price r

APIs

REST basics

REST APIs

Release notes

Air

Search

Lead Price Calendar

InstaFlights Search

Destination Finder

Intelligence

Utility

SOAP basics

SOAP APIs

API suitability

Method and endpoint

Request

Response

## Destination Finder

The Destination Finder API retrieves a then current nonstop lead fare and an overall lead fare available to destinations from a specific origin on round-trip travel dates from the Sabre® cache. (A lead fare is the then current lowest published fare available via the Sabre cache for an origin, destination, and round-trip date combination.)

### Calling this API

We designed several sets of req  
API. You must pass a single origi

- Provide a single set of round-trip travel dates (in `departuredate` and `returndate`). You can pass any single departure date from the current date to the current date + 192. You can pass any single return date that is equal to or later than the departure date, that does not exceed the maximum length of

Describing details on  
how to invoke an API

Listing and categorizing APIs for easy  
to find

Allow user to specify business metadata for REST  
services

Dynamic service discovery to search and filter list of  
REST services based on business categories or tags

- `theme`. Filters the response for destinations that are based on a theme. A theme is similar to a travel category, and is based on geography or points of interest, such as beaches or national parks.
- `location`. Filters the response for destinations that are based on a country code.
- `minfare` and `maxfare`. Filters the response for lead fares based on these amounts. You can use these parameters together or separately.

Ready to try the APIs?

Ready to get your hands dirty?

Ready to launch?

Ready to step up to the

Download the CERT List

Download the PROD List

Socializing API with a public  
website listing its published APIs

Similar to many others Twitter, Amazon, etc.

Name	Category	Function	API type	Docs
▶ Lead Price Calendar	✈ Air	🔍 Search	REST	➔
▶ InstaFlights Search	✈ Air	🔍 Search	REST	➔
▶ Destination Finder	✈ Air	🔍 Search	REST	➔
▶ Low Fare Forecast (beta)	✈ Air	📊 Intelligence	REST	➔

# Businesses are transforming themselves to participate in the API economy

How do you rapidly and securely expose your business to this developer ecosystem?



Expose business services securely as APIs to developer communities, and analyze API usage

Provide self-service API portals to external/internal app developers

Manage & monitor the entire API platform



Off-premise SaaS

On-premise private

Off-premise private

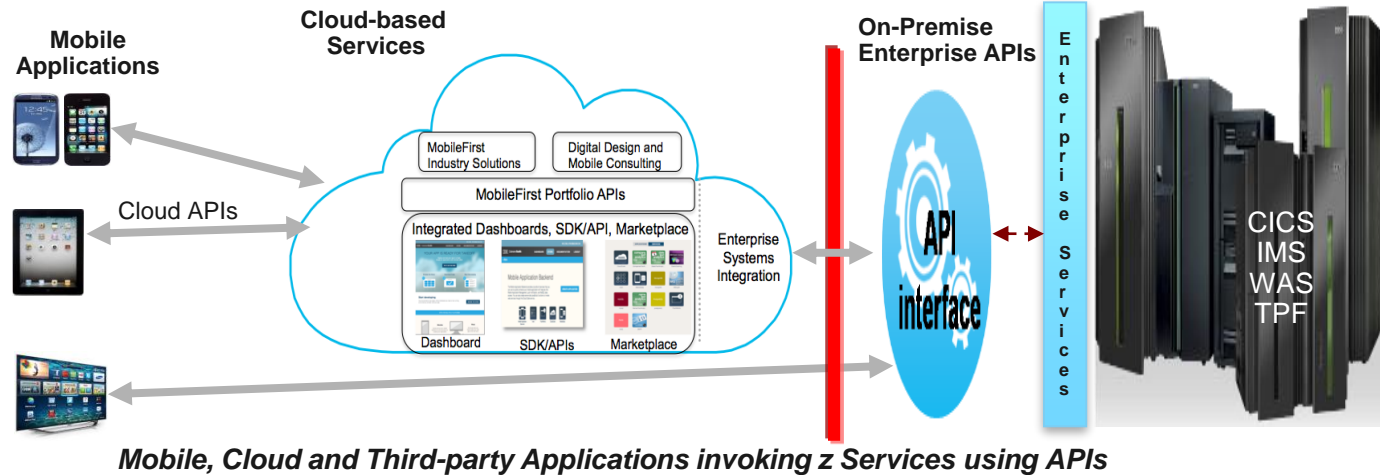
Hybrid





# API Management

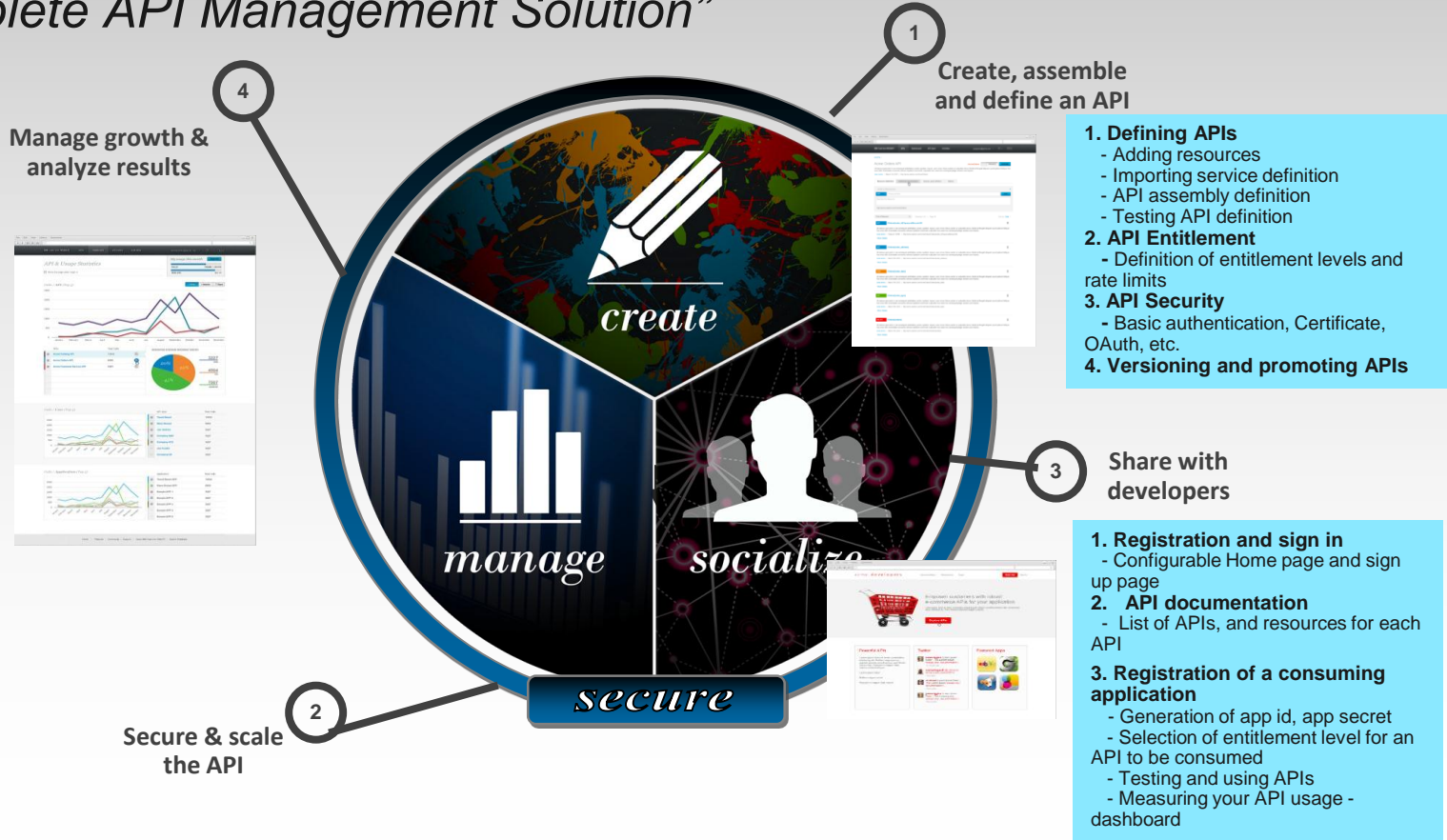
Business challenges addressed with APIM in exposing z based services/assets



- **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 managing entitlement
- **Retaining business control (enforcing entitlement, accountability/chargeback)**
  - Securing APIs from unwanted external invocations (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/chargeback



# IBM API Management: "A Complete API Management Solution"



# APIs for z Assets Adoption Scenarios

## 1. APIM for Mobile

- Client is looking to start/expand a **mobile deployment**
- Mobile app requires **access to backend** services and the ability to **monitor and manage** usage of backend services by new mobile applications

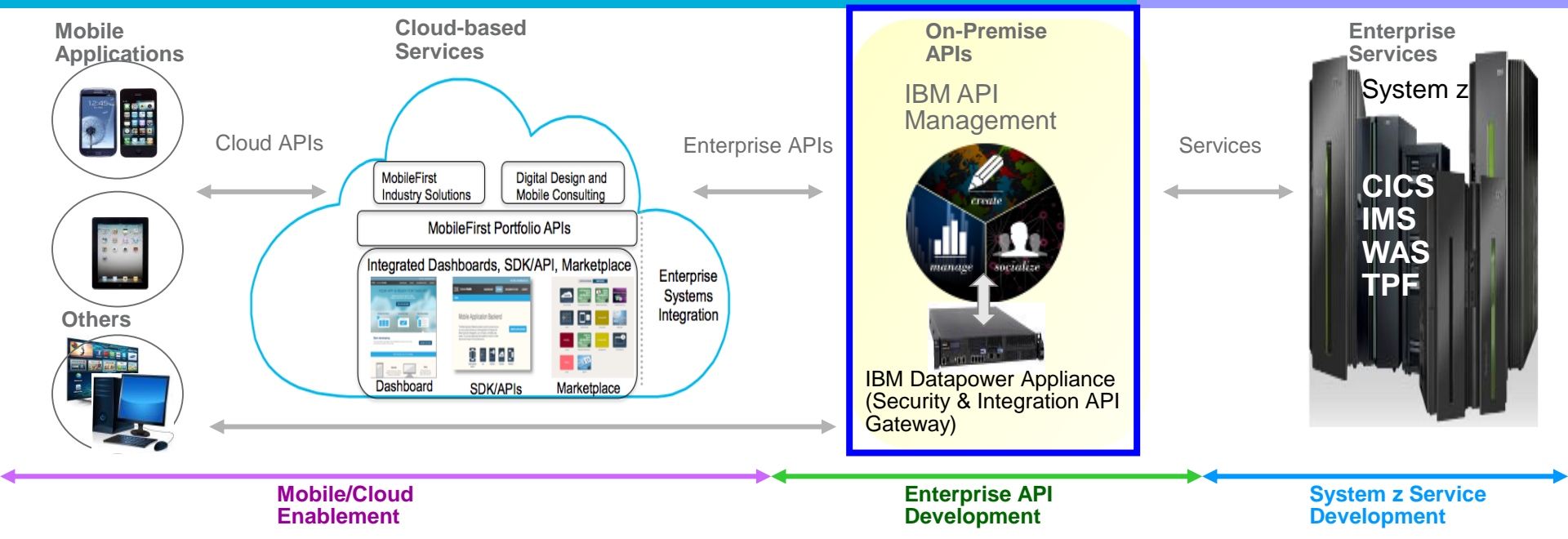
## 2. APIM for Cloud

- Client is looking to develop new applications but in this case **in the cloud**.
- Applications require **access to backend** services and the ability to **monitor and manage** usage of backend services by new mobile applications
- Client need the ability to **publish** these services so the cloud developers (internal or external) can find and access services

## 3. APIM for Existing Services – z System services

- Client is seeking improved **consumability and governance** of existing services
- Looking for the ability to **charge back** usage of existing services
- May be working with **partners** to provide access to existing services
- Client is seeking **quick wins** spurring business innovation





<p><b>Jane</b> <i>Mobile Developer</i> Use API to access z services</p>	<p><b>Shavon</b> <i>API Developer</i> Develop Enterprise APIs from z services</p>	<p><b>Bob</b> <i>System z Service Developer</i> Develop SOAP or REST services for IMS, CICS, other z apps</p>
<p>Mobile/Cloud/Third-party Application Development - Invokes APIs for accessing SOR (System of Record)</p>	<p>API Management - Consumable by internal and external developers (creation and look up) - Entitlement Management (securing, workload enforcement) - Usage monitoring &amp; Analytics</p>	<p>Service Enablement - Enables invocation of z applications by remote applications using standard protocols (WSDL, REST) - Converts SOAP or JSON into application specific (COBOL, PL/I) data and invokes apps</p>

# What is Service Discovery?

- ***Identifying an existing service for performing a specific intended business function, and getting detailed definition of the service***
- Identifying: Searching, browsing, understanding and eventually, selecting a service from a set of services
  - Querying to retrieve a list of matching services
  - Browsing information on retrieved services
  - Getting additional details as necessary in understanding a service
  - Selecting a service when a service is deemed a good match
- Getting detailed service definition: Retrieving various details of a selected service
  - Service schema and description (e.g., WSDL or JSON) for API definition
  - Getting additional technical details for API assembly including details on runtime invocation and security protocols



# How to Search for a Matching Business Service?

- **Technical attributes**

- Search on well-known attributes of a service: serviceName, operationName, messageFieldName, serviceSchemaType (WSDL or JSON), etc.
- Example: .../...? serviceName=loanPayment & serviceSchemaType = WSDL

- **Business service classification**

- Search on a list of queryable business tags: serviceClassification tags separated by \$
  - Example: .../...? serviceClassification=loanApplication\$ addressValidation
- Search and navigate across pre-defined service classification hierarchy:
  - Example: .../...? serviceClassificationGroup=loanApplication

- **Keyword search**

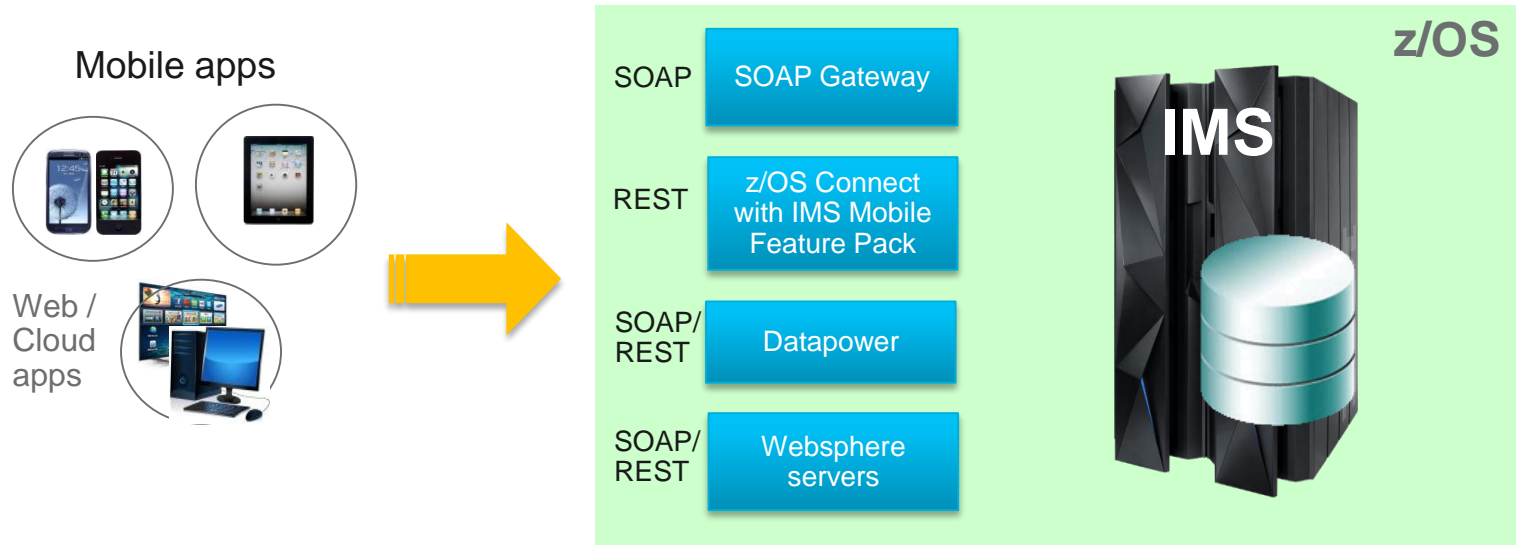
- Search on keywords (separated by \$) on any field on service definition, especially the textual description of service
- Example: .../...? serviceKeyWord= interest rate \$ loan application





# IMS transactions as Enterprise Services

- Today, IMS transactions can be invoke as SOAP or REST services without IMS application change
  - IMS transactions as SOAP services with Enterprise Suite SOAP Gateway
  - IMS transactions as REST services with z/OS Connect and IMS Mobile Feature Pack
  - IMS also provides SOAP/REST capability with Websphere and Datapower



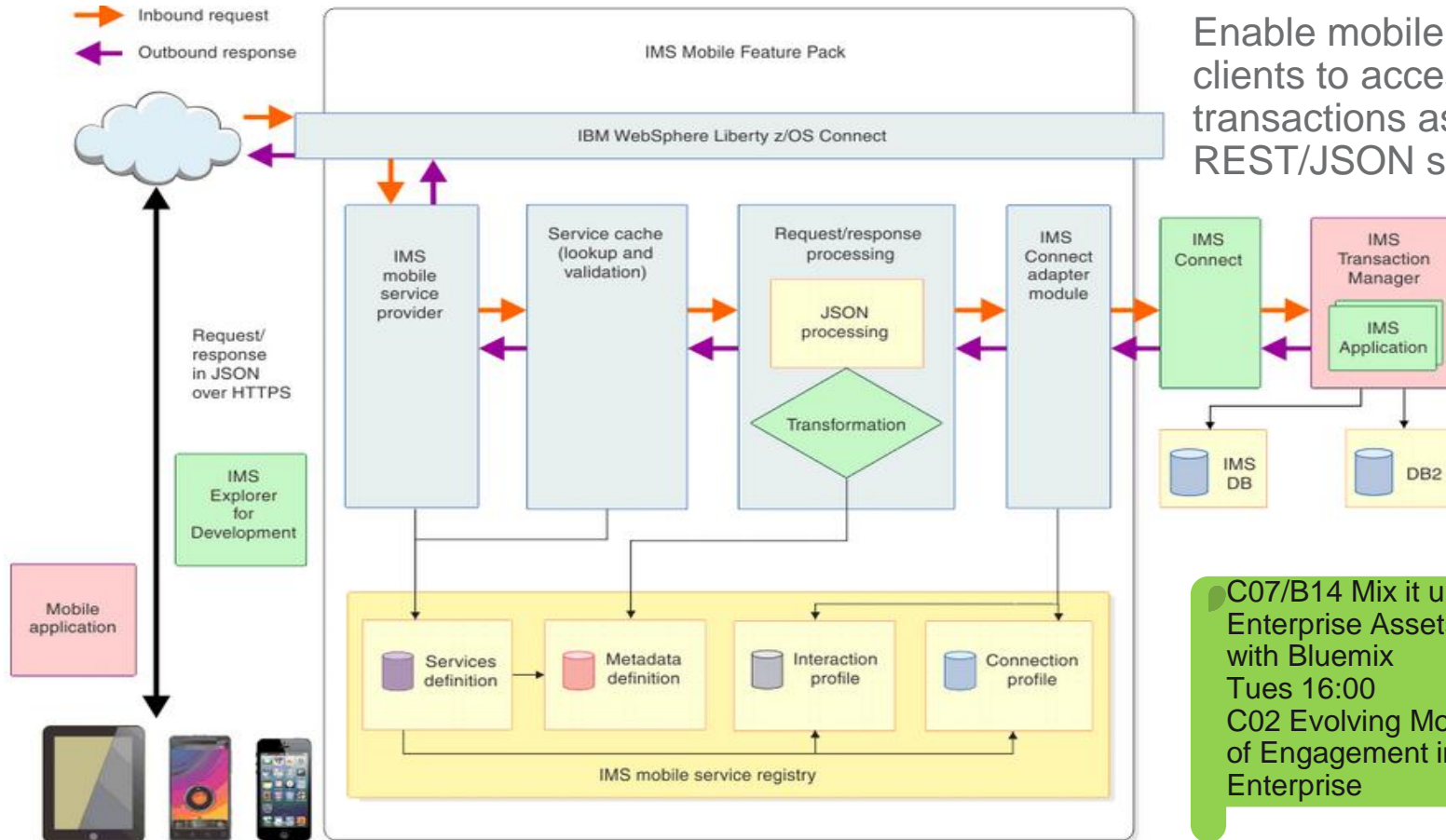
# IMS Mobile Feature Pack

NEW! Enterprise Suite 3.1  
GA 6/2014

- Enable mobile and cloud clients to access IMS transactions as REST/JSON services
  - Transform REST/JSON request to COBOL bytes and transform response back to JSON
  - No change to IMS applications
- Leverage z/OS Connect and WebSphere Application Server for z/OS Liberty Profile
- IMS Explorer for Development to easily create RESTful services from existing IMS transactions
- Available in two package offerings
  - IMS Mobile Feature Pack with embedded z/OS Connect and WAS Liberty Profile
  - IMS Mobile Feature Pack as a feature installable on top of existing WAS Liberty Profile



# IMS Mobile Feature Pack



Enable mobile and cloud clients to access IMS transactions as REST/JSON services

C07/B14 Mix it up: How Your Enterprise Assets Fit Perfectly with Bluemix  
Tues 16:00  
C02 Evolving Mobile Systems of Engagement in your Enterprise

Mobile Applications



Others



Cloud-based Services

Cloud APIs



MobileFirst Industry Solutions    Digital Design and Mobile Consulting

MobileFirst Portfolio APIs

Integrated Dashboards, SDK/API, Marketplace



Enterprise APIs



Enterprise Systems Integration



Mobile/Cloud Enablement

3. API Consumption

On-Premise APIs

IBM API Management



IBM Datapower Appliance (Security & Integration API Gateway)

Services



Enterprise Services

System z



Enterprise API Development

2. Service Discovery and API Creation

System z Service Development

1. Service Creation (e.g. SOAP/ REST for IMS)

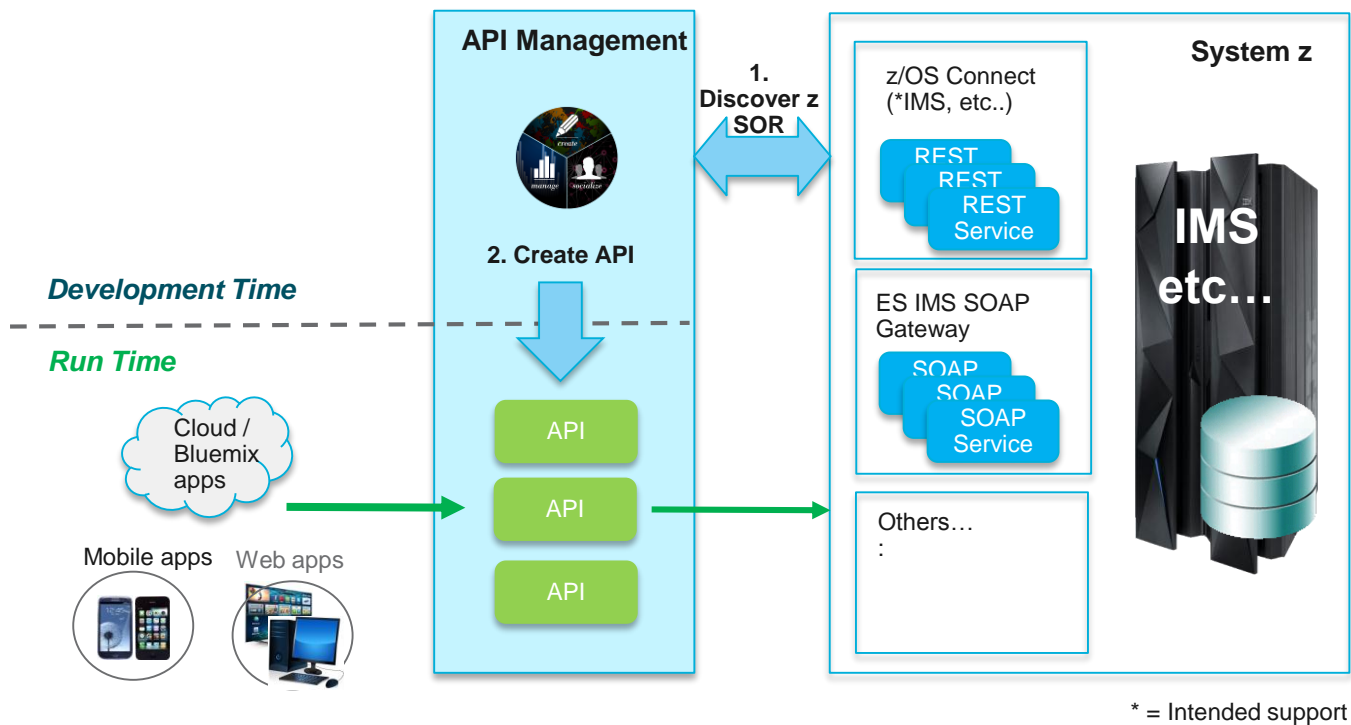


# APIM and z Systems services discovery

- API Management provide custom registry function for discovering z Systems services
  - SOAP services on IMS, etc...
  - REST services on z/OS Connect
- IMS and API Management
  - APIM can discover existing IMS SOAP Gateway services
    - APIM 3.0.1 or later
    - Enterprise Suite SOAP Gateway 3.1.0.3 or later
    - Enterprise Suite SOAP Gateway SOAP Service Technology Preview code
  - Intended support: APIM to discover REST services on IMS Mobile Feature Pack / z/OS Connect



# APIM and z Systems service discovery



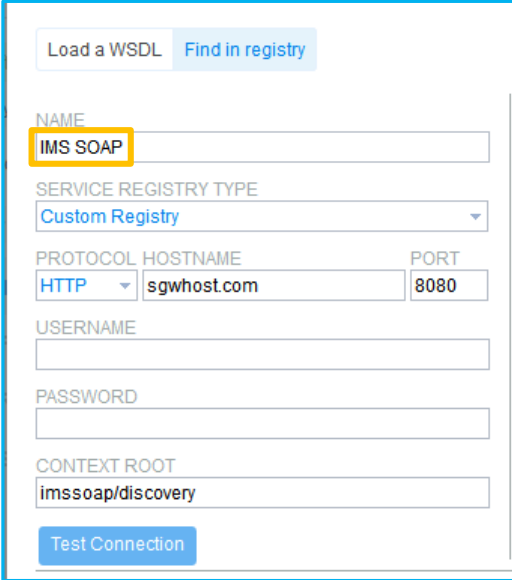
## Discovery of zSOR for API Development

- 1a. Get a list of deployed services (Service Identification)
  - Filter based on technical and business service attributes
- 1b. Get schema for a specific service (API Definition)
- 1c. Get additional deployment details for a service (API Assembly)
  - e.g., security protocol support, invocation uri





# 1. Define Service Registry in APIM



The screenshot shows a web form for defining a service registry. At the top, there are two buttons: "Load a WSDL" and "Find in registry". Below these are several input fields:

- NAME:** A text input field containing "IMS SOAP", which is highlighted with a yellow box.
- SERVICE REGISTRY TYPE:** A dropdown menu with "Custom Registry" selected.
- PROTOCOL:** A dropdown menu with "HTTP" selected.
- HOSTNAME:** A text input field containing "sgwghost.com".
- PORT:** A text input field containing "8080".
- USERNAME:** An empty text input field.
- PASSWORD:** An empty text input field.
- CONTEXT ROOT:** A text input field containing "imsssoap/discovery".

At the bottom of the form is a blue button labeled "Test Connection".

- Add SOAP Gateway as a custom registry in APIM
- Specify host, port and the context root of the SOAP Gateway service registry
- Test and save connection



## 2. Discover, search and add API for z System services

The screenshot shows a web interface for adding a new SOAP API. At the top, it says "Add a new SOAP API by proxying an existing SOAP service." Below this, there is a section "Load a WSDL" with a link "Find in registry". A search field contains the text "IMS SOAP" and a dropdown menu shows "IMS". To the right of the search field is a search icon (magnifying glass) circled in red. Below the search field, it says "2 results found". The results are listed as follows:

Service Name	Version	Description	Selected
IMSPHBKService	(1.0)	Service description	<input checked="" type="checkbox"/>
IMSSOAPIVPSERVICE	(1.0)	Service description	<input type="checkbox"/>

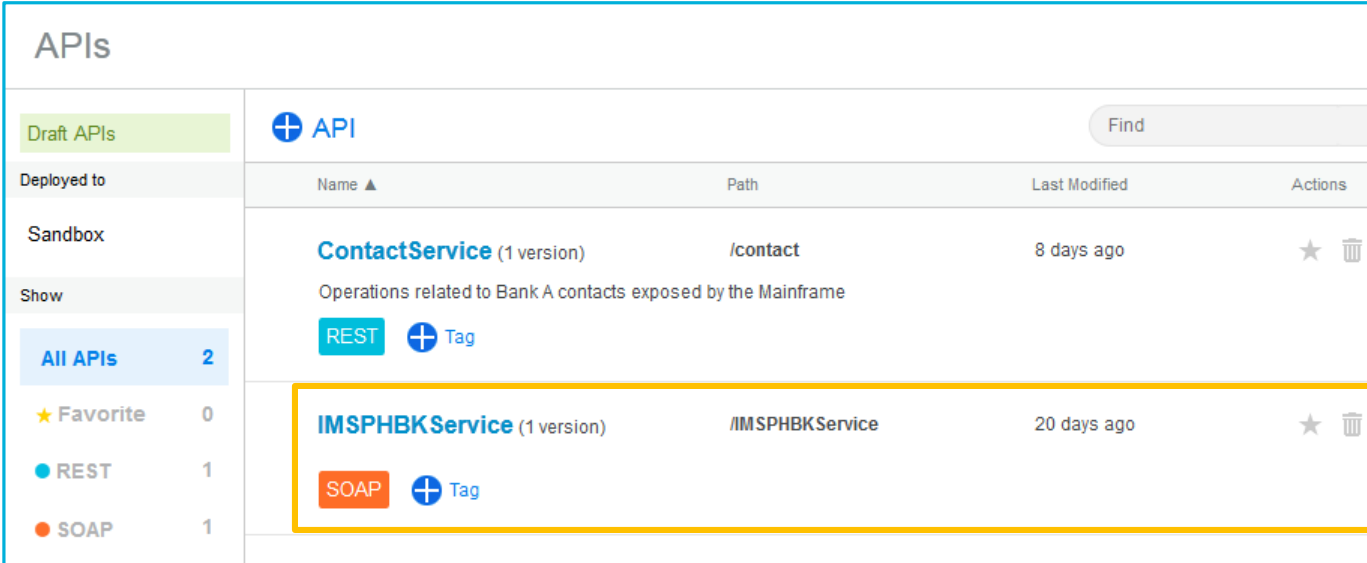
Annotations on the screenshot:

- 2a. Specify text to search for specific service or leave blank for all services (points to the search field)
- 2b. A list of service containing the search text "IMS" is returned (points to the list of results)
- 2c. Select the desired service to create API (points to the checked checkbox for IMSPHBKService)
- Click icon to Search (points to the search icon)

- With the SOAP Gateway registry selected, discover services by clicking the search icon
- You can specify a text string to search for specific service. Or leave the search field blank to retrieve all services.
- Once the list of matching services returned, select check box for the desired service to create API.



### 3. API for z System service is created



The screenshot shows the APIM console interface. On the left, there is a sidebar with navigation options: Draft APIs, Deployed to, Sandbox, Show, All APIs (2), Favorite (0), REST (1), and SOAP (1). The main area displays a table of APIs. The table has columns for Name, Path, Last Modified, and Actions. Two APIs are listed: 'ContactService' (1 version) with path '/contact' and 'IMSPHBKService' (1 version) with path '/IMSPHBKService'. The 'IMSPHBKService' row is highlighted with a yellow border. Below the table, there are filters for REST and SOAP, and a 'Tag' button.

Deployed to	Name ▲	Path	Last Modified	Actions
Sandbox	<b>ContactService</b> (1 version)	/contact	8 days ago	★ 🗑️
Operations related to Bank A contacts exposed by the Mainframe				
	REST	+ Tag		
	<b>IMSPHBKService</b> (1 version)	/IMSPHBKService	20 days ago	★ 🗑️
	SOAP	+ Tag		

- A new API is created for the IMS SOAP service. It is added to the list of APIs managed by APIM
- APIs can be published and make visible publicly for internal or external users



Mobile Applications



Others



Cloud-based Services

Cloud APIs



MobileFirst Industry Solutions  
Digital Design and Mobile Consulting

MobileFirst Portfolio APIs

Integrated Dashboards, SDK/API, Marketplace



Enterprise APIs

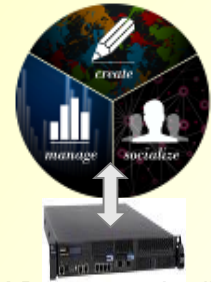


Enterprise Systems Integration



On-Premise APIs

IBM API Management



IBM Datapower Appliance (Security & Integration API Gateway)

Services



Enterprise Services

System z



CICS  
IMS  
WAS  
TPF

Mobile/Cloud Enablement

Enterprise API Development

System z Service Development

3. API Consumption

2. Service Discovery and API Creation

1. Service Creation





Industries & solutions

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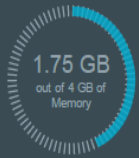
Search



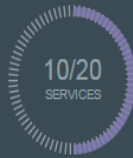
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Run an app in the language of your choice



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Community



PHP  
Community



Python  
Community



Ruby on Rails  
Community



Ruby Sinatra  
Community



Bring Your Buildpack  
Community

Applications



CREATE AN APP



AskWatson

askwatson-hfung.mybluemix.net



Running



CloudTrader\_IMS\_Haley

CloudTrader\_IMS\_Haley.mybluemix.net



Running



GoodHealth-hfung

goodhealth-hfung.mybluemix.net



Running



Hello World Haley

Hello-World-Haley.mybluemix.net



Running



IMS Phone Book

ims-phone-book.mybluemix.net



Running



**Mobile**  
Quickly get started with your next app



Advanced Mobile Acc...  
IBM BETA



Mobile Application Se...  
IBM



Mobile Data  
IBM



Mobile Quality Assura...  
IBM



Push  
IBM



Push iOS 8  
IBM BETA



Twilio  
Third Party



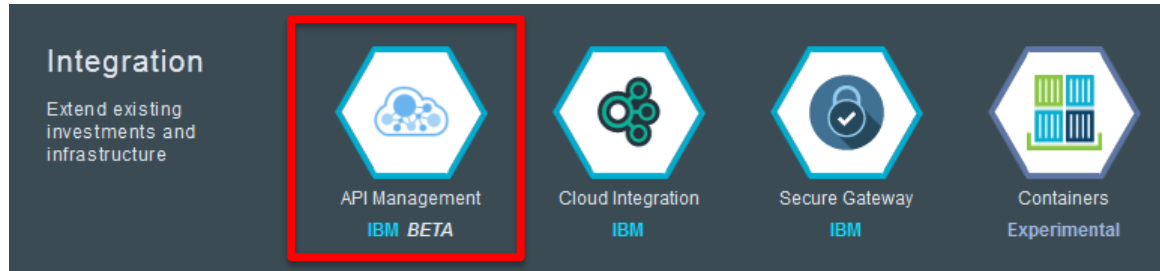
Mobile Quality Extensi...  
Experimental



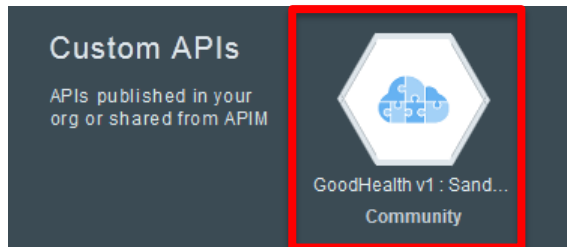


# APIM and Bluemix

- APIM integrates with Bluemix to enable Bluemix developer to discover APIs in APIM

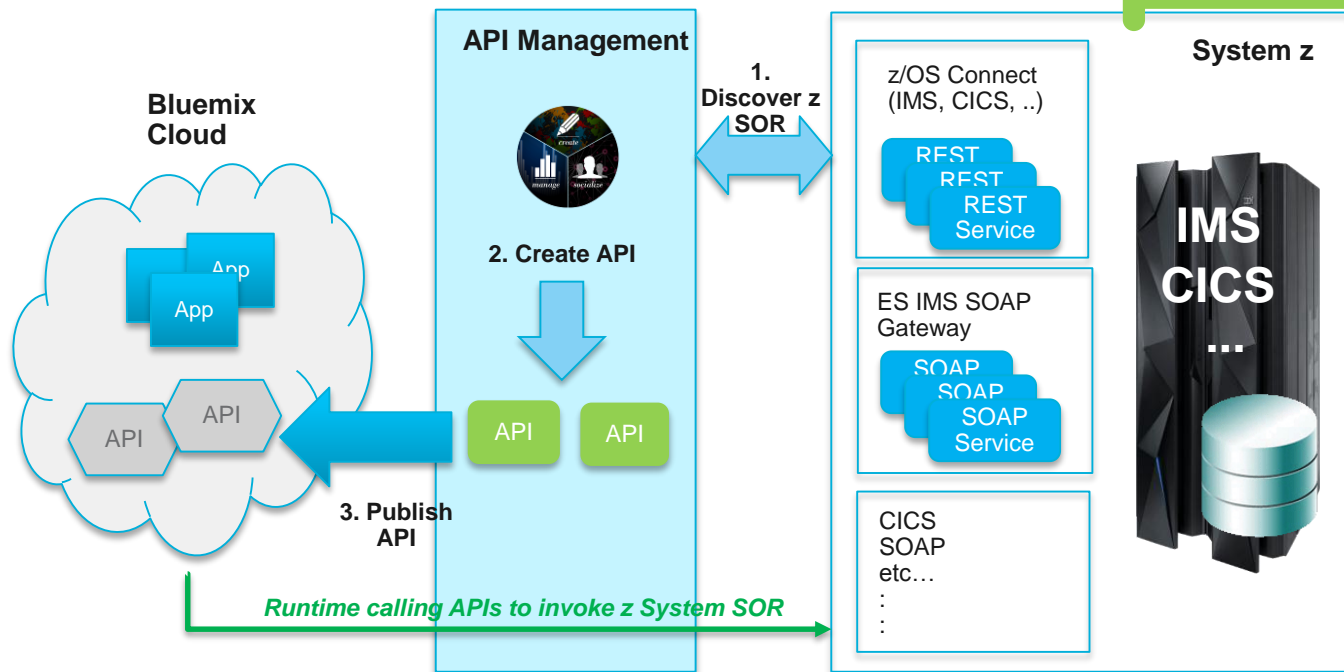


- APIs in APIM can be published and accessible by Bluemix applications as Custom APIs



# Bluemix, APIM and z Systems SOR

C07/B14 Mix it up: How Your Enterprise Assets Fit Perfectly with Bluemix  
Tues 16:00



- APIM integrates with Bluemix to enable APIs to be published from APIM to Bluemix as Custom API
- Bluemix application can bind to the APIs and invoke z Systems services at runtime



# Call to Action

## ✓ Leverage existing z assets by exposing as APIs

- Reach out to **z asset owners** in exploring scenarios around the three entry points
  1. Reach **new customers** and **markets** with new applications and solutions accessing core business functions, through business partners
  2. Improve experience of existing customers and/or deliver new services with **Mobile applications**
  3. Gain more **business control** and **insight** over access to the enterprise services, while improving consumability and simplifying access to z assets
- Team up with **enterprise architects and z architects** - both from the customer side and IBM – for designing an end-to-end solution architecture

## ✓ Work with IBM through POC

- Use IBM APIM and z product capabilities in developing API based solution
- Identify/define incremental business scenarios, and try out through POCs

