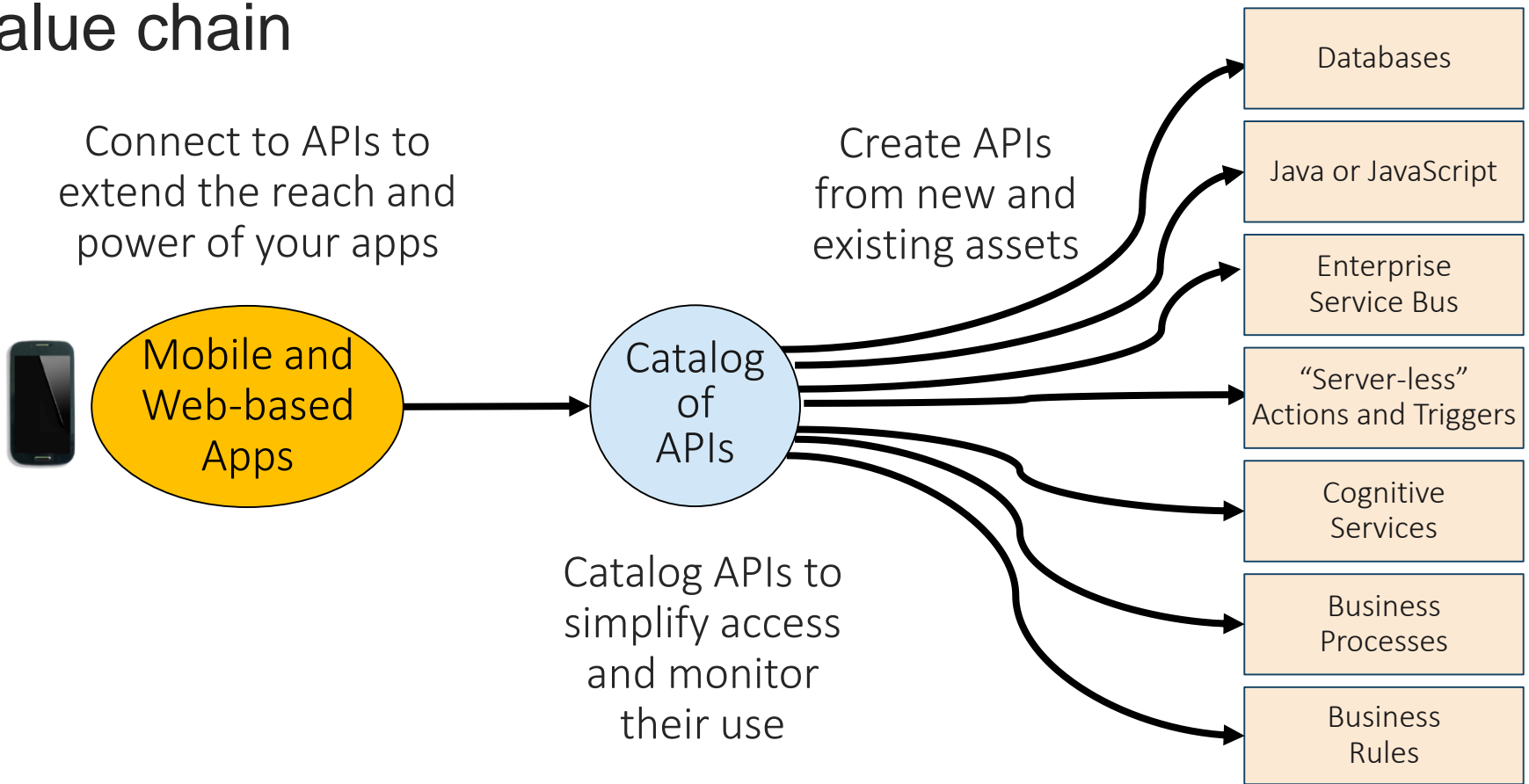


Connect and Transform Your Digital Business with IBM

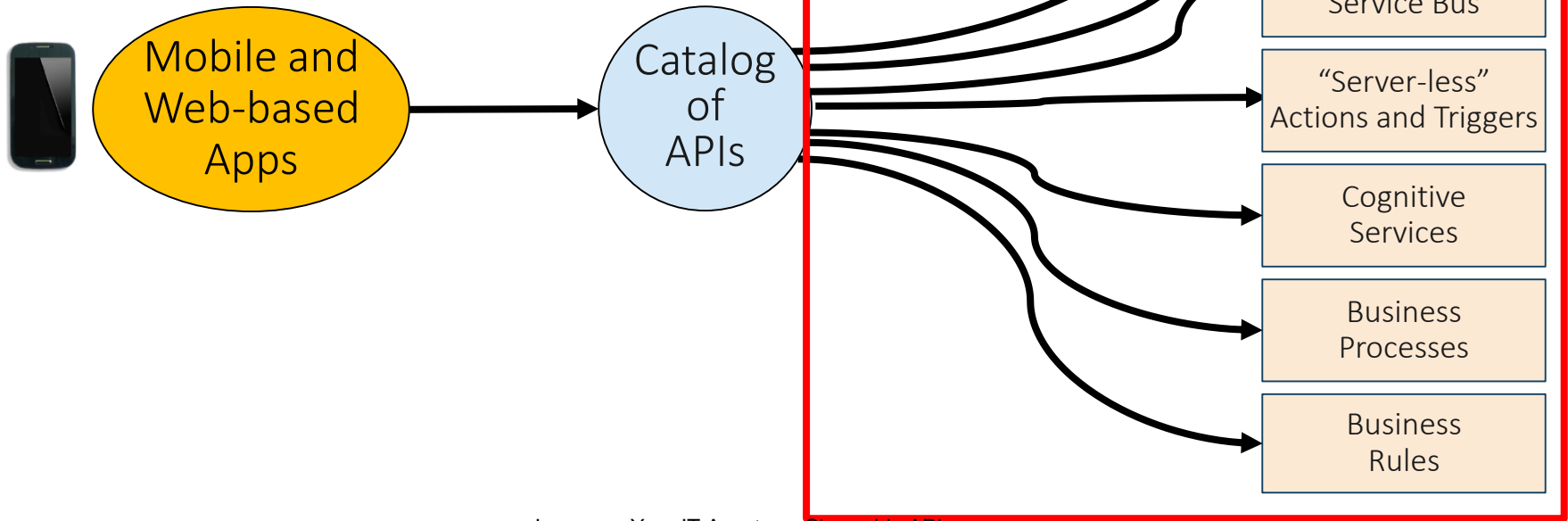
Leverage Your IT Assets as Shareable APIs



The API economy requires a complete value chain



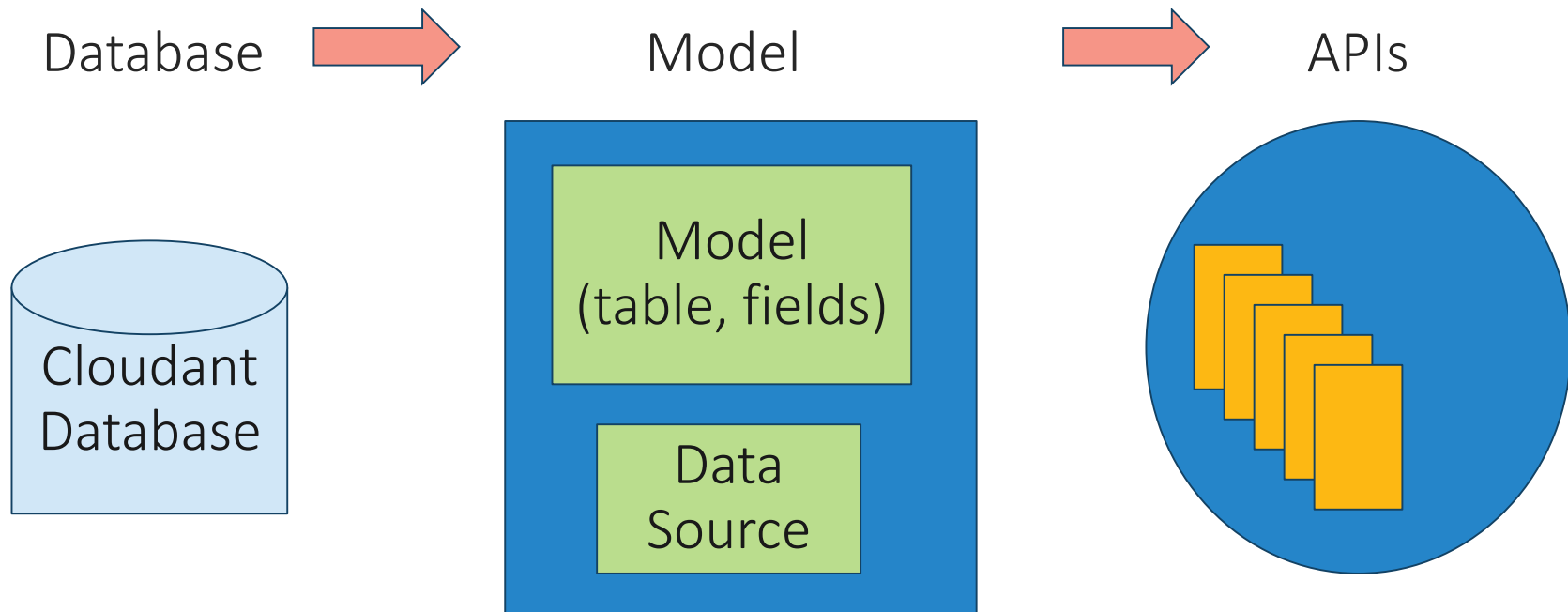
Leverage IT assets as shareable APIs



Quickly create APIs directly from your data models

- Connect to a data source and define a model that represents your tables
- Using StrongLoop LoopBack technology, API Connect will generate for you a complete set of REST APIs to create, read, update and delete data
- Test APIs and publish them to your API catalog in IBM API Connect
- By generating these APIs without writing code, API Connect saves time and reduces a source of error and maintenance – **competitors' solutions do not offer this capability**

Demo: Create APIs associated with a Cloudbant table



Create API in Java using JAX-RS annotations

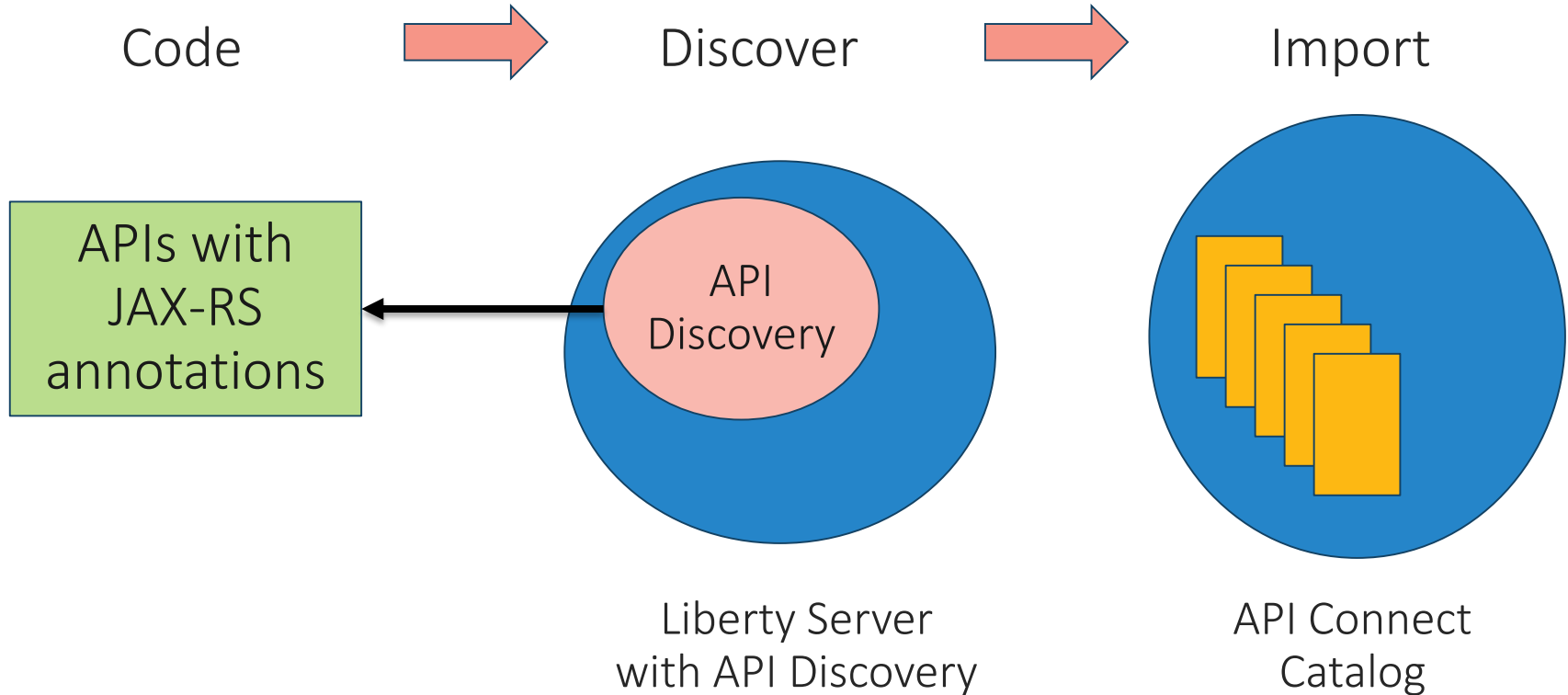
- Java API for RESTful Web Services (JAX-RS) is a Java API that provides support for creating web services according to the Representational State Transfer (REST)
- JAX-RS uses annotations to define the functionality provided by the APIs
- Swagger Annotations can be included with JAX-RS annotations in code

```
@Path("/getSurveySummaryResults")  
@GET  
@Produces("application/json")  
public SurveyResults[] getSurveySummaryResults(@QueryParam("sinceDate")  
String sinceDate) {
```

WAS Liberty has a new feature to make it easier to discover JAX-RS APIs

- API Discovery (“apiDiscovery-1.0”) was added in WAS Liberty 8.5.5.9
- Using the standard Swagger UI, a developer can explore and test all APIs running on a Liberty member via */ibm/api/explorer* or on a Liberty collective via */ibm/api/collective/explorer*
- Generates a Swagger file specifying the interfaces for APIs on a Liberty member (*/ibm/api/docs*) or collective (*/ibm/api/collective/docs*)

Demo: View and test JAX-RS APIs with API Discovery



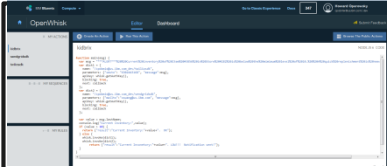
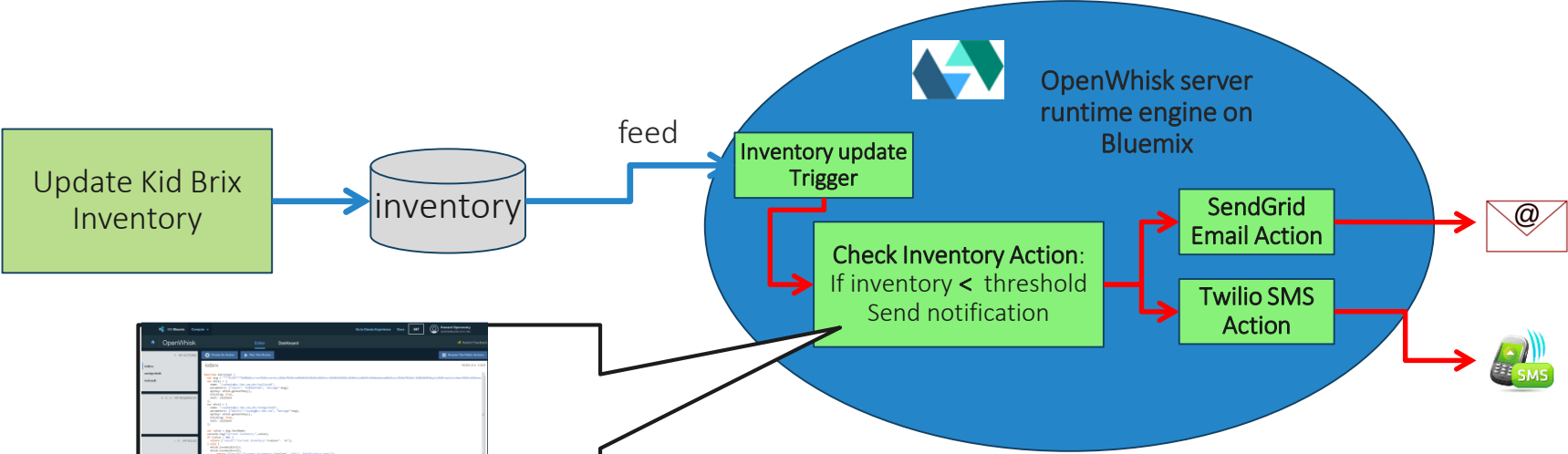
Wildfly and Tomcat API lack discovery and graphical configuration, increasing time and risk

Capability	Liberty	Wildfly	Tomcat
JAX-RS	Yes	Yes	Third-party
Automatic API Discovery	Yes	No (manual discovery)	No (manual discovery)
GUI for developer configuration	Yes	No (hand-edited XML)	No (hand-edited XML)
# of configuration files	1 server.xml	3 standalone.xml web.xml jboss-web.xml	2 server.xml web.xml

Create APIs using “server-less” OpenWhisk technology on Bluemix

- OpenWhisk is an open source server-less environment
- Developer writes code in either Node.js, Java, Python, or Swift
- The code can also be an executable file in a Docker container
- Function gets executed in the OpenWhisk runtime engine on Bluemix
- Can be invoked directly as a REST API or via event-driven model
- Event-driven invocation can be triggered by a database action as well as many other event types

Demo: Create OpenWhisk APIs to notify a KidBrix store manager when inventory is low

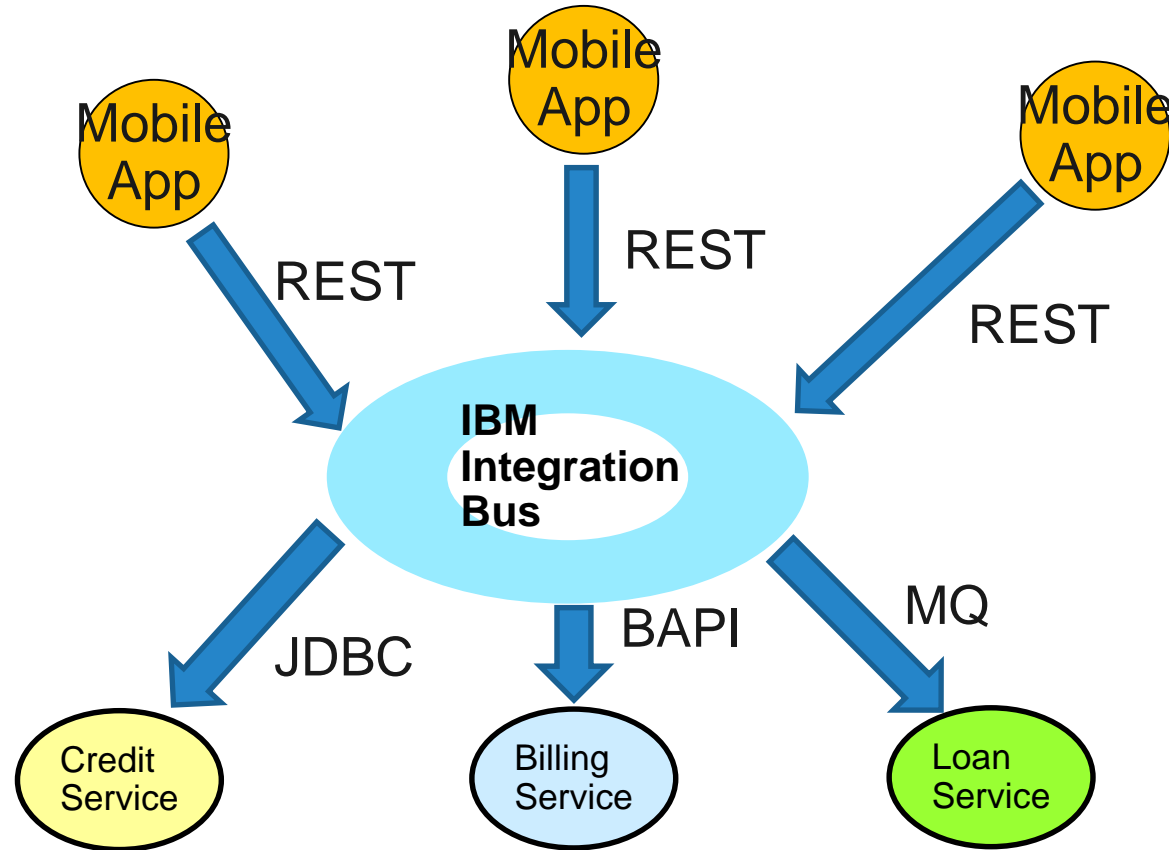


GUI or CLI can be used to create and test actions and triggers.

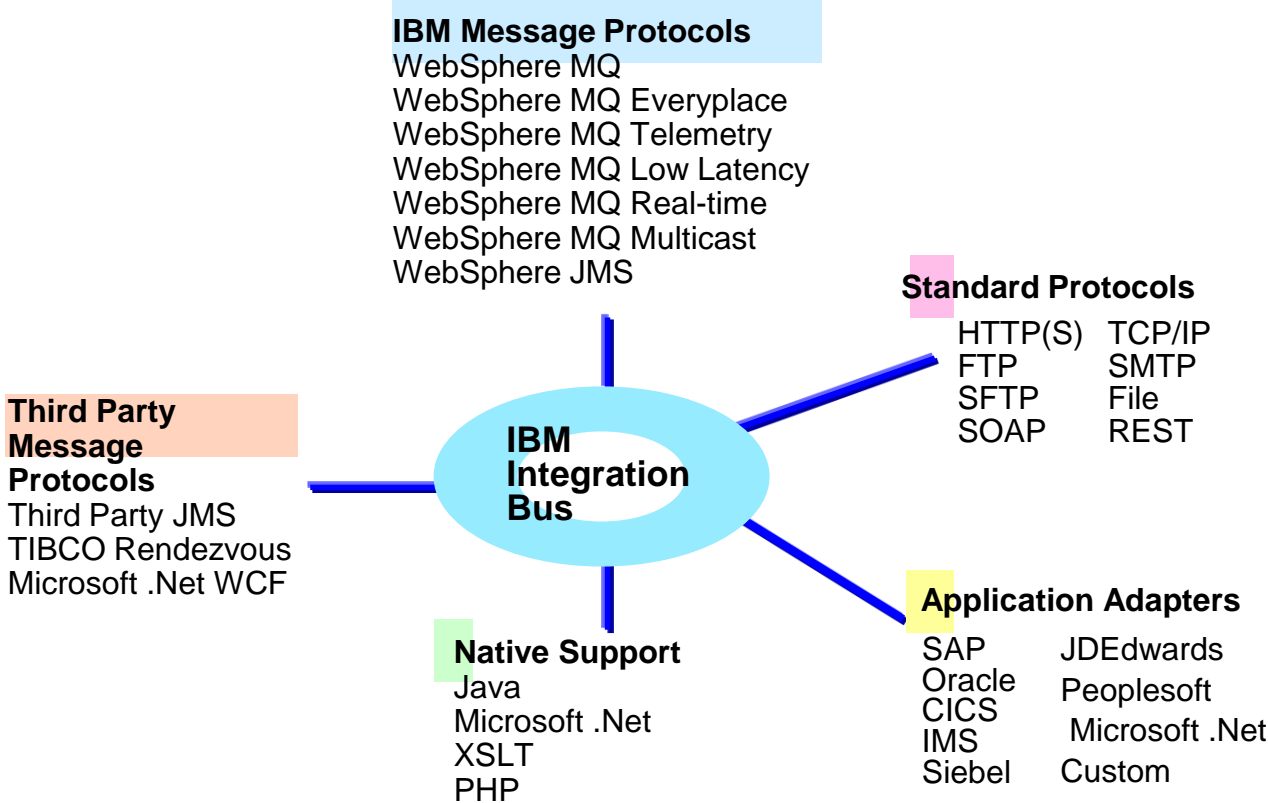
OpenWhisk has advantages over Lambda

Features	IBM OpenWhisk	AWS Lambda
Server less environment (no maintenance required)	Yes	Yes
Scales automatically	Yes	Yes
Open source	Yes	No
Available on both public and private cloud	Yes. On Bluemix and can be installed on a server user chooses	No. AWS public cloud only.
Polyglot language support	Yes. Node.js, Java, Python, Swift, and others via Docker containers	No. Node.js, Java, Python only
Functions/actions can be invoked by other functions/actions	Yes. Actions can invoke one another, to be combined into a sequence.	No.

IBM Integration Bus makes it easy to implement REST APIs that access enterprise resources



IBM Integration Bus connects to a broad range of message formats and protocols



Demo: Define the API interface and implement it with IBM Integration Bus

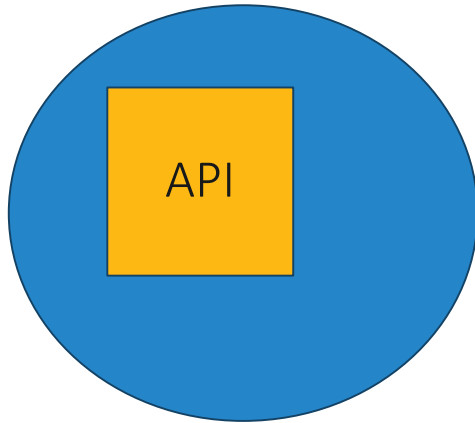
Define the API interface in API Connect



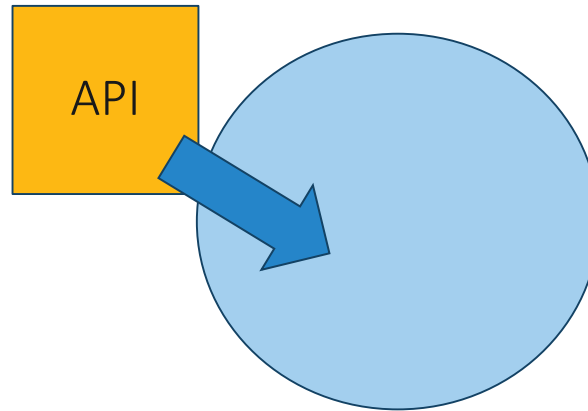
Import the Swagger into IBM Integration Bus



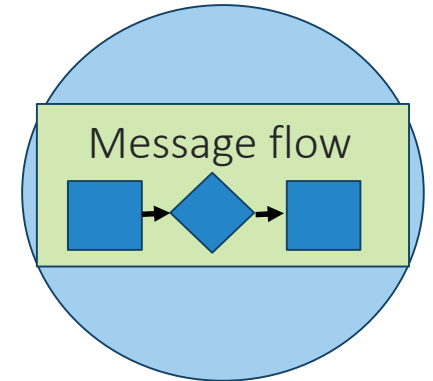
Implement the API as a message flow



API Connect



IBM Integration Bus

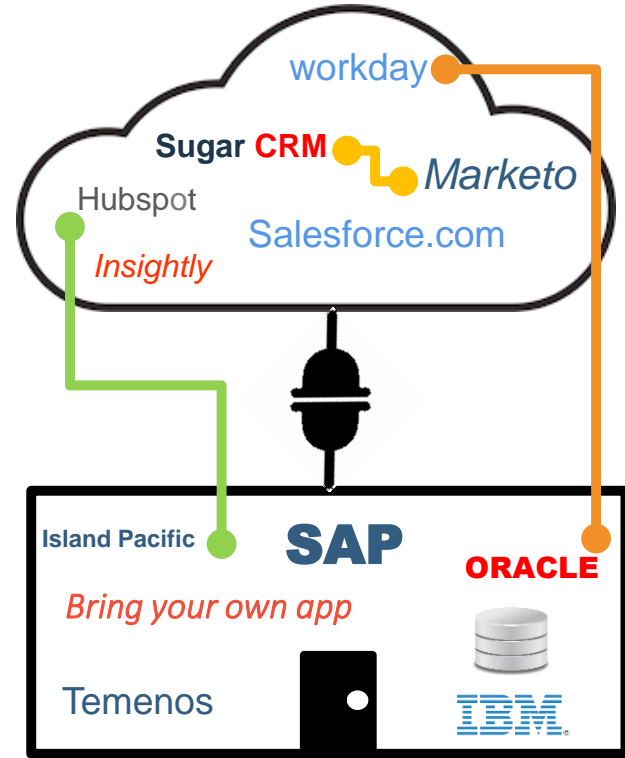


IBM Integration Bus

IBM App Connect

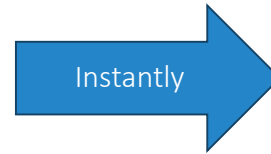
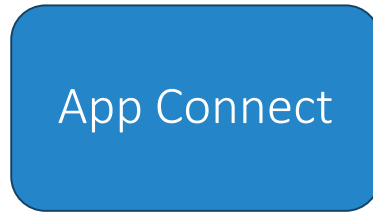
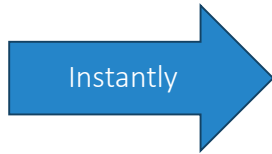
“Integration for people who don’t do integration”

- ✓ “App awareness” allows you to **connect applications in minutes**
- ✓ Automation of manual tasks – notifications, events & updates
- ✓ Connect your applications wherever they are... cloud or local
- ✓ Keep customer and other data in sync between multiple applications
- ✓ “Bring your own app” – tooling for your tech team to include your enterprise applications



Applications shown are for discussion purposes only; no claim is made of inclusion in product

With App Connect – turning registrations into sales leads is automated



User registers
for webinar

Registration triggers
an App Connect flow

App Connect calls
salesforce.com API to
create new lead

IBM has powerful and unique capabilities across the API economy value chain

