A11 – Make Your API Catalog Essential to Mobile App Developers and Business Partners with z/OS Connect

Drive new business opportunities through naturally RESTful APIs and JSON

Haley Fung, IMS Development
hfung@us.ibm.com

© 2016 IBM Corporation

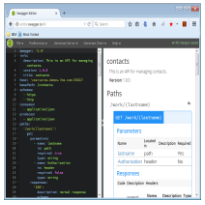
Agenda

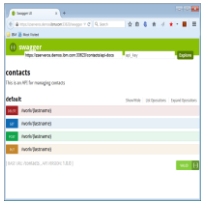
1. Introduction to Swagger
2. REST and API enablement with z/OS Connect
3. How to get z/OS Connect

Swagger-defined REST APIs

Introduction to Swagger and related tools

Swagger Specification and Tools (swagger.io)





Swagger Editor

An editor for designing Swagger specifications from scratch, using a simple YAML structure.

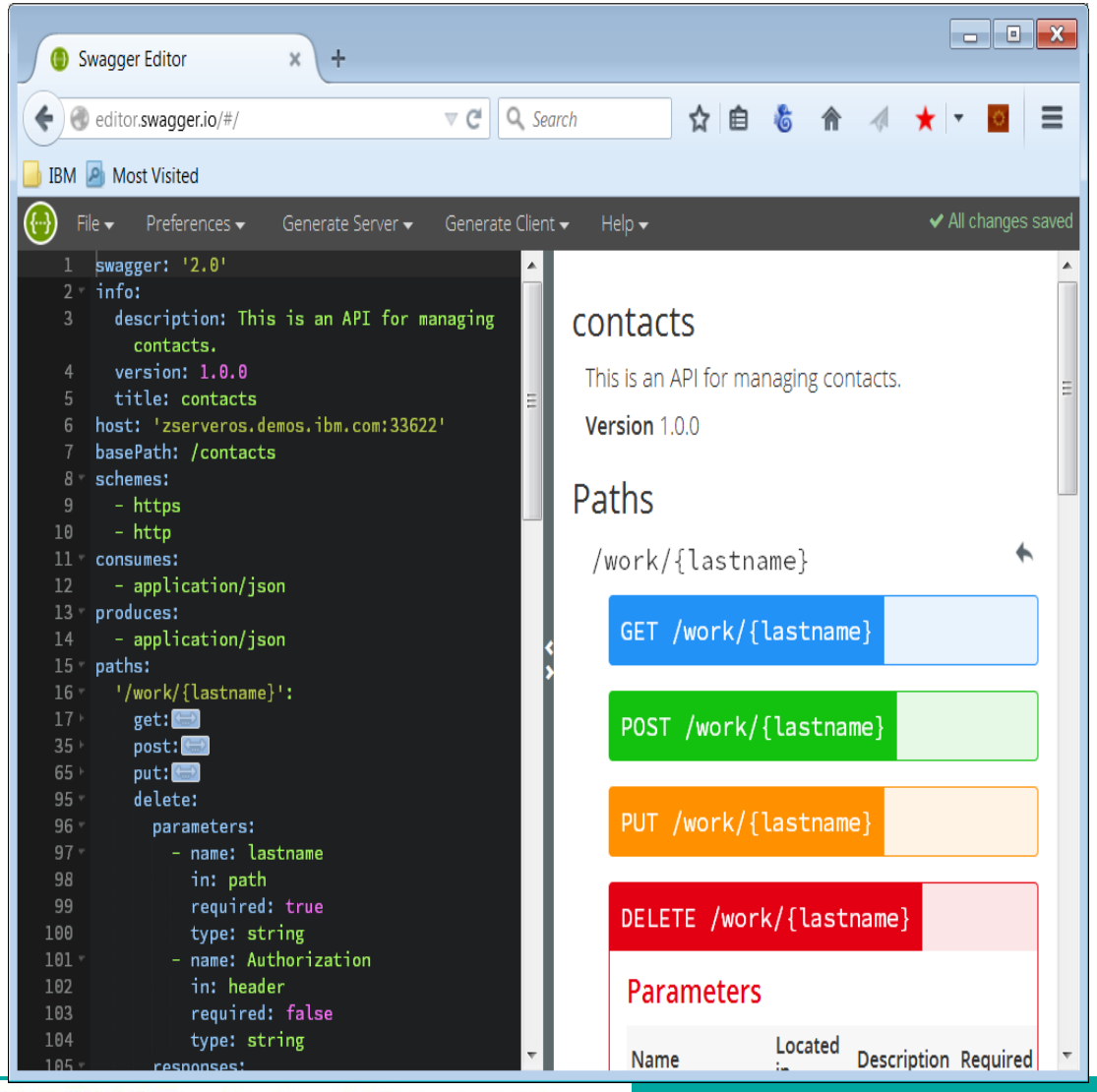
Swagger UI

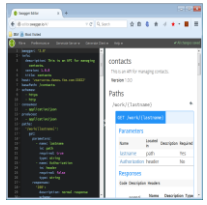
Use a Swagger specification to drive your API documentation.

SDK Generators

Turn an API spec into client SDKs or server-side code with Swagger Codegen.

Swagger Editor – Develop an API Specification





Swagger Editor

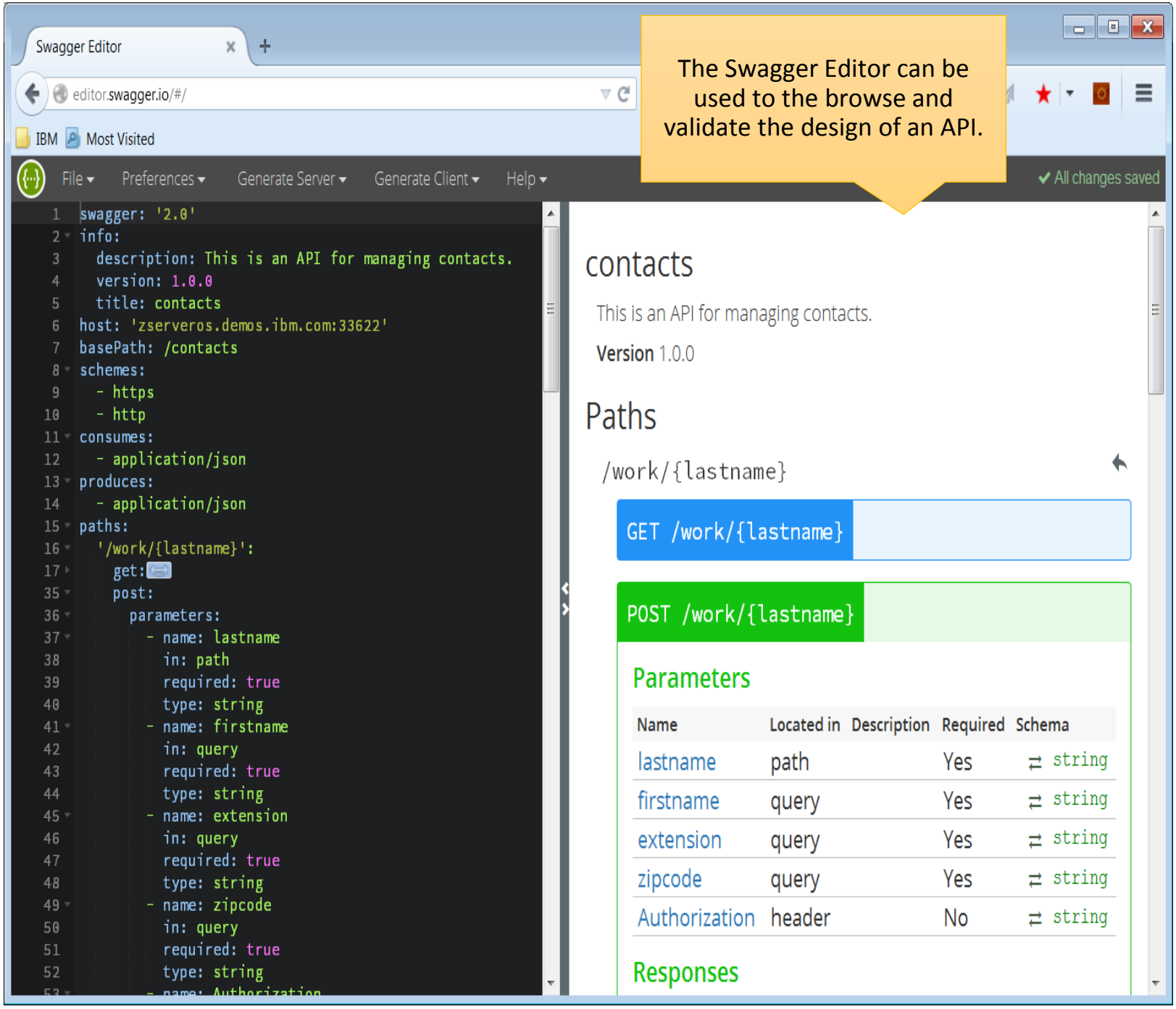
An editor for designing Swagger specifications from scratch, using a simple YAML structure.

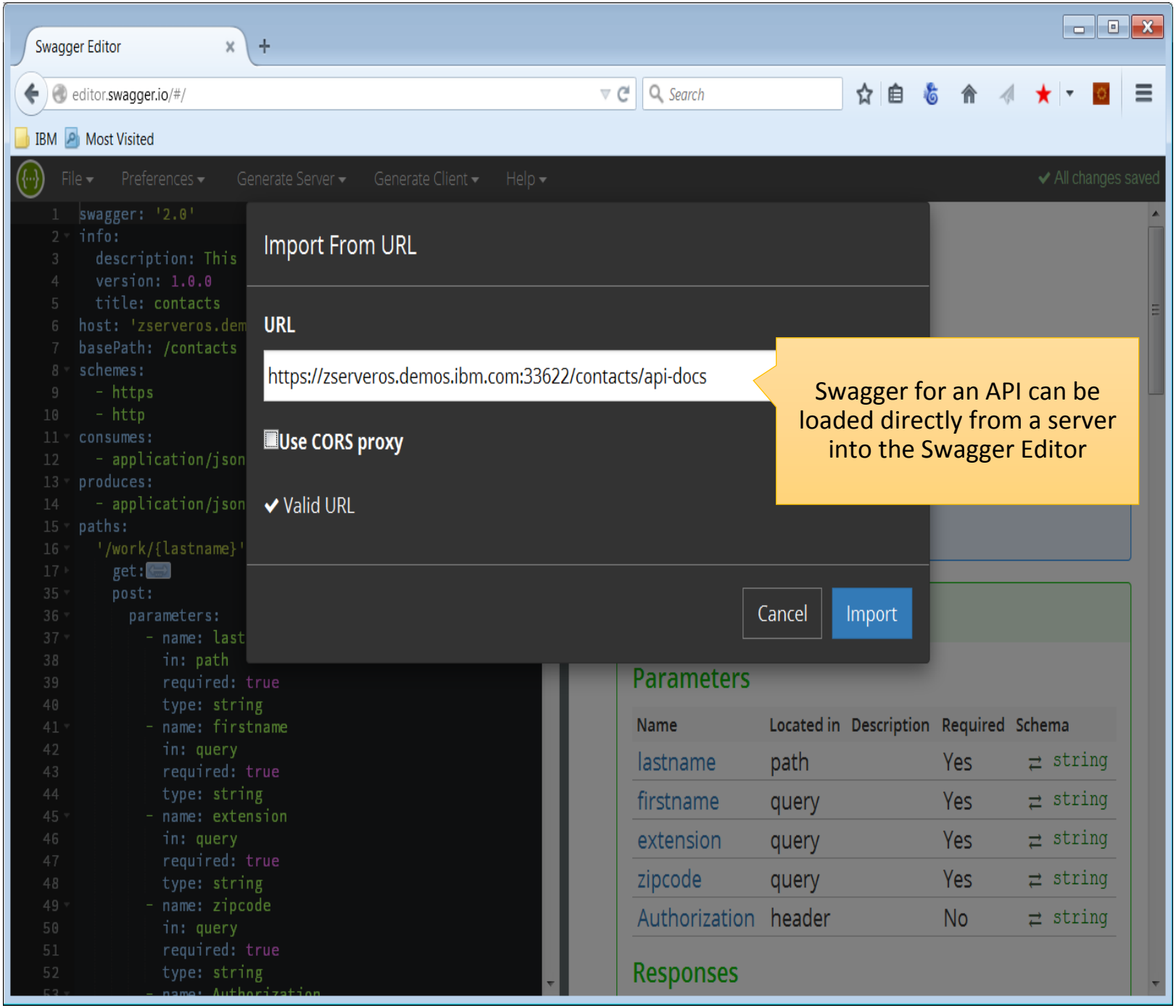
Swagger UI

Use a Swagger specification to drive your API documentation.

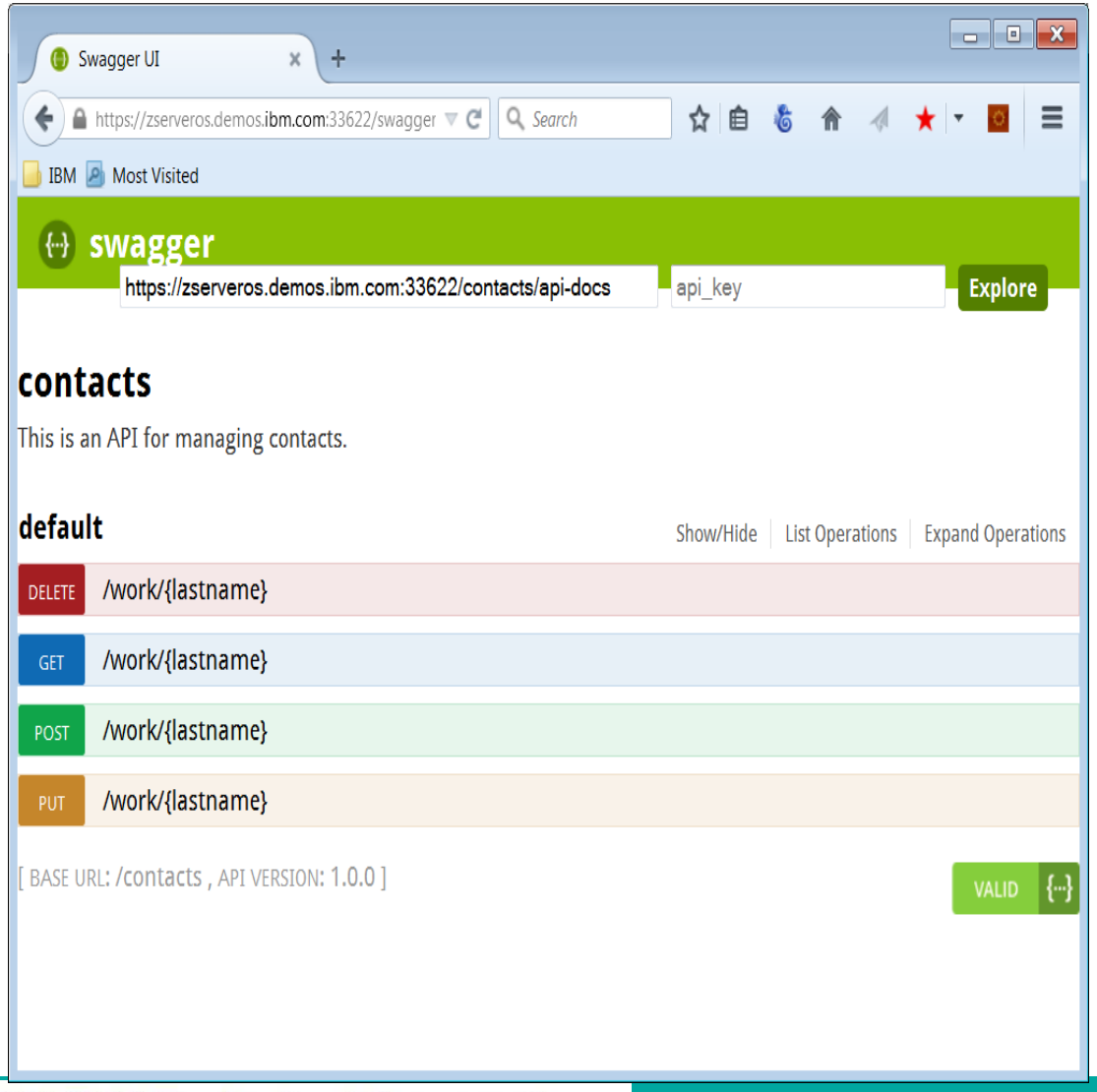
SDK Generators

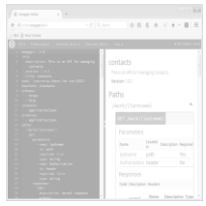
Turn an API spec into client SDKs or server-side code with Swagger Codegen.

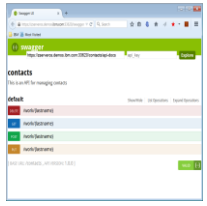

Swagger Editor
editor.swagger.io/#/
IBM
Most Visited
File
Preferences
Generate Server
Generate Client
Help
All changes saved
The Swagger Editor can be used to the browse and validate the design of an API.
swagger: '2.0'
info:
description: This is an API for managing contacts.
version: 1.0.0
title: contacts
host: 'zserveros.demos.ibm.com:33622'
basePath: /contacts
schemes:
- https
- http
consumes:
- application/json
produces:
- application/json
paths:
'/work/{lastname}':
get:
post:
parameters:
- name: lastname
in: path
required: true
type: string
- name: firstname
in: query
required: true
type: string
- name: extension
in: query
required: true
type: string
- name: zipcode
in: query
required: true
type: string
contacts
This is an API for managing contacts.
Version 1.0.0
Paths
/work/{lastname}
GET /work/{lastname}
POST /work/{lastname}
Parameters
Name
Located in
Description
Required
Schema
lastname
path
Yes
string
firstname
query
Yes
string
extension
query
Yes
string
zipcode
query
Yes
string
Authorization
header
No
string
Responses


Swagger Editor
editor.swagger.io/#/
Search
IBM
Most Visited
File
Preferences
Generate Server
Generate Client
Help
All changes saved
swagger: '2.0'
info:
description: This
version: 1.0.0
title: contacts
host: 'zserveros.dem
basePath: /contacts
schemes:
- https
- http
consumes:
- application/json
produces:
- application/json
paths:
'/work/{lastname}'
get:
post:
parameters:
- name: last
in: path
required: true
type: string
- name: firstname
in: query
required: true
type: string
- name: extension
in: query
required: true
type: string
- name: zipcode
in: query
required: true
type: string
Import From URL
URL
https://zserveros.demos.ibm.com:33622/contacts/api-docs
Use CORS proxy
Valid URL
Cancel
Import
Swagger for an API can be loaded directly from a server into the Swagger Editor
Parameters
Name
Located in
Description
Required
Schema
lastname
path
Yes
string
firstname
query
Yes
string
extension
query
Yes
string
zipcode
query
Yes
string
Authorization
header
No
string
Responses

Swagger UI – “Try out” an API



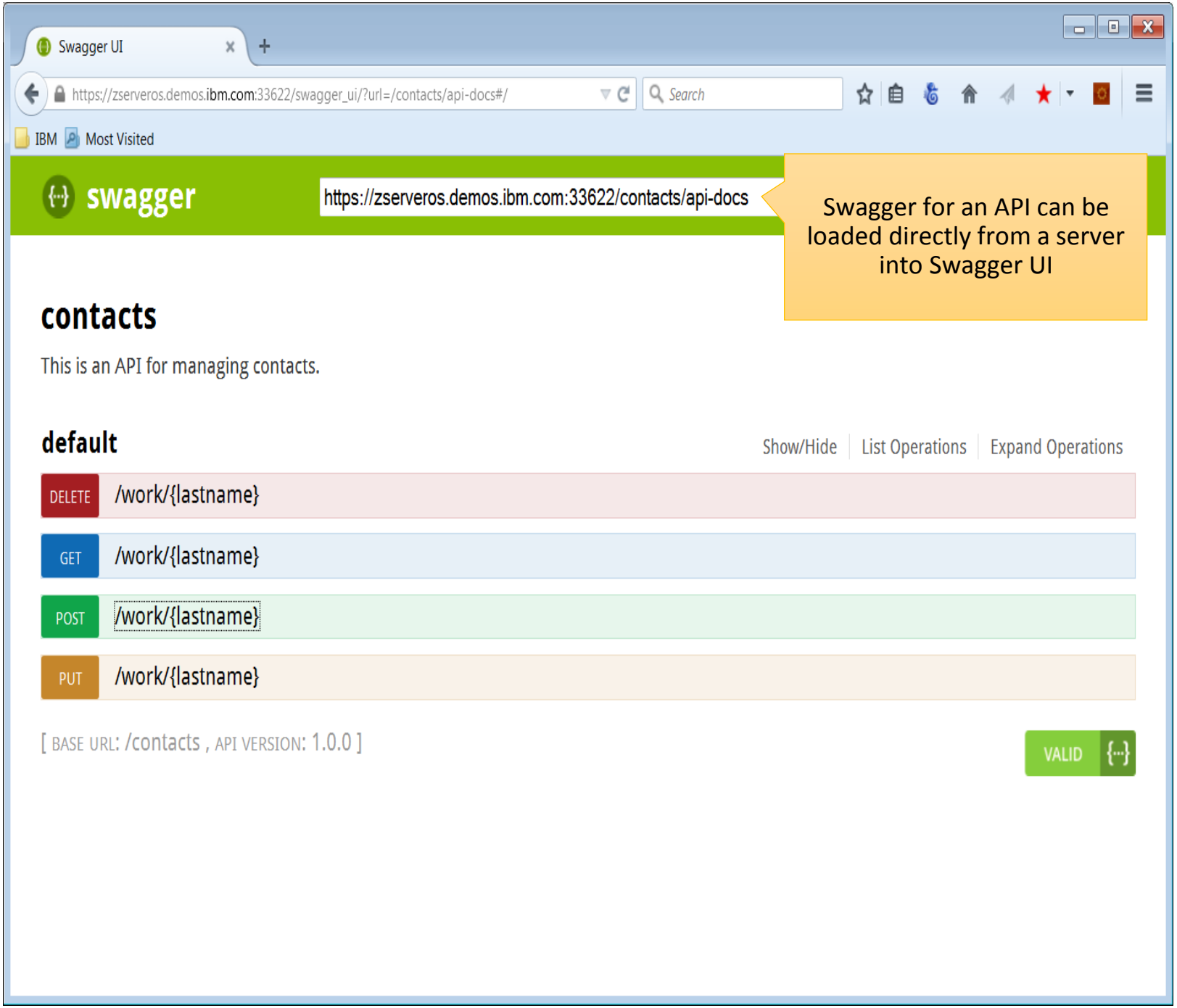


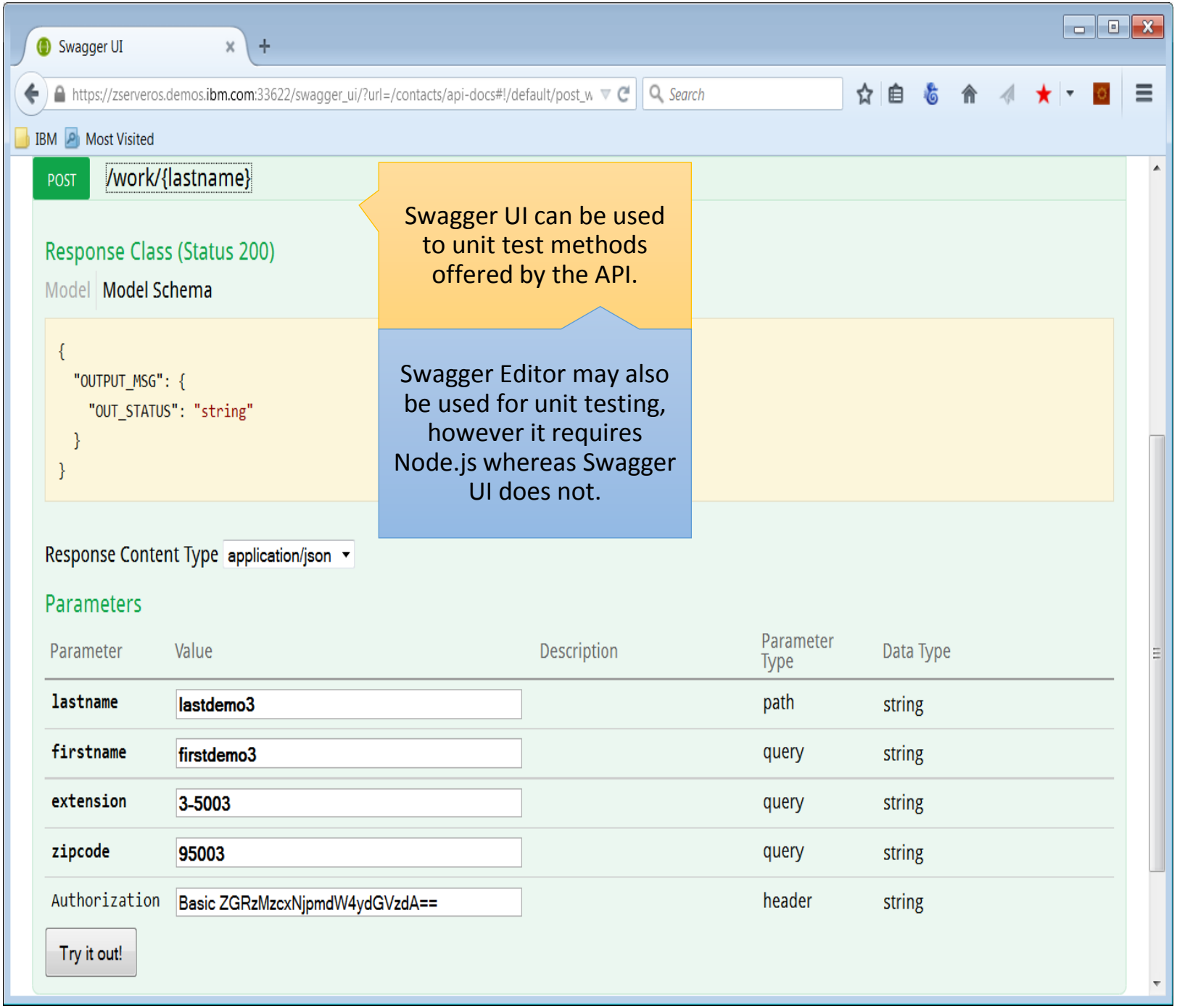


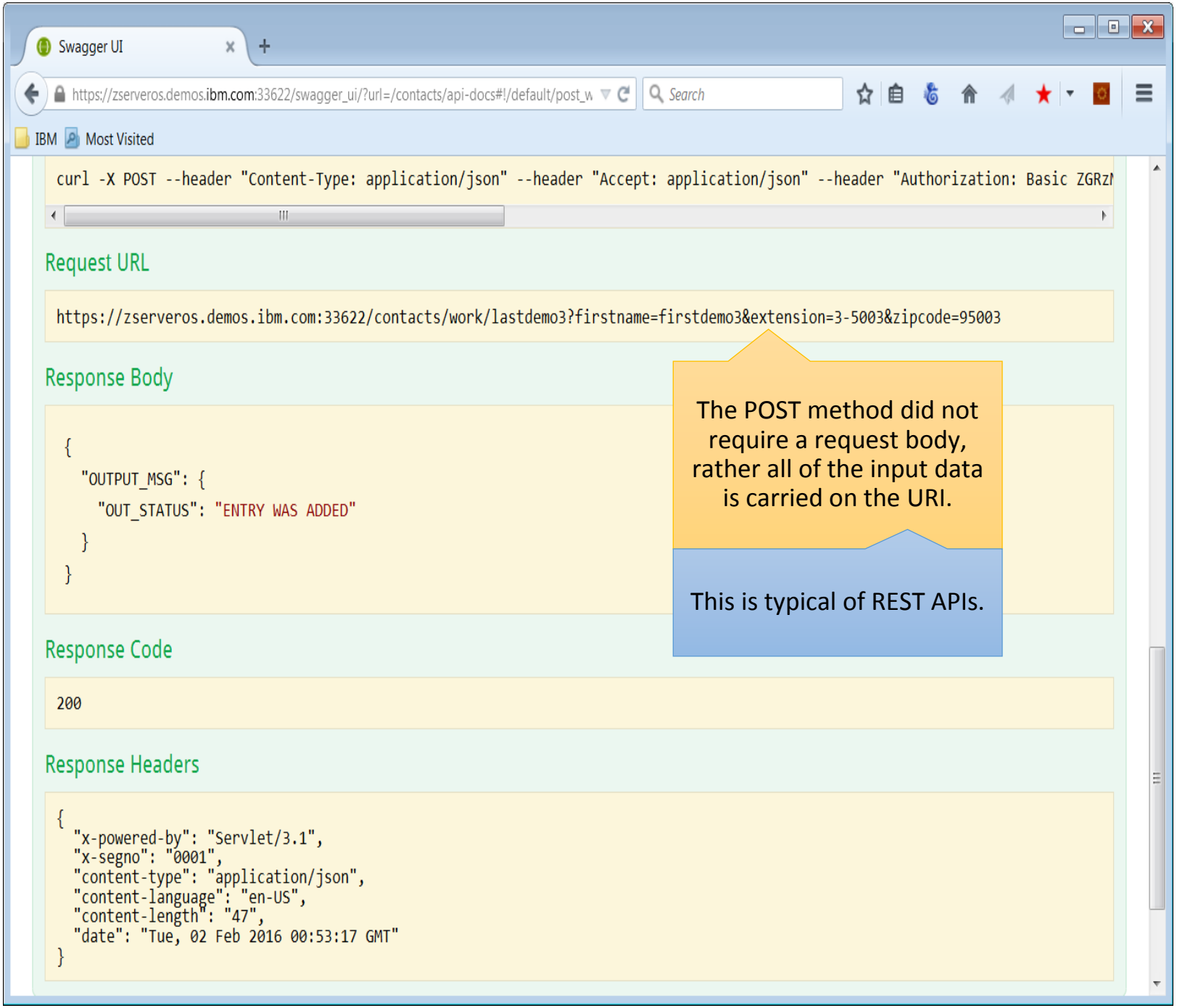
Swagger Editor
An editor for designing Swagger specifications from scratch, using a simple YAML structure.

Swagger UI
Use a Swagger specification to drive your API documentation.

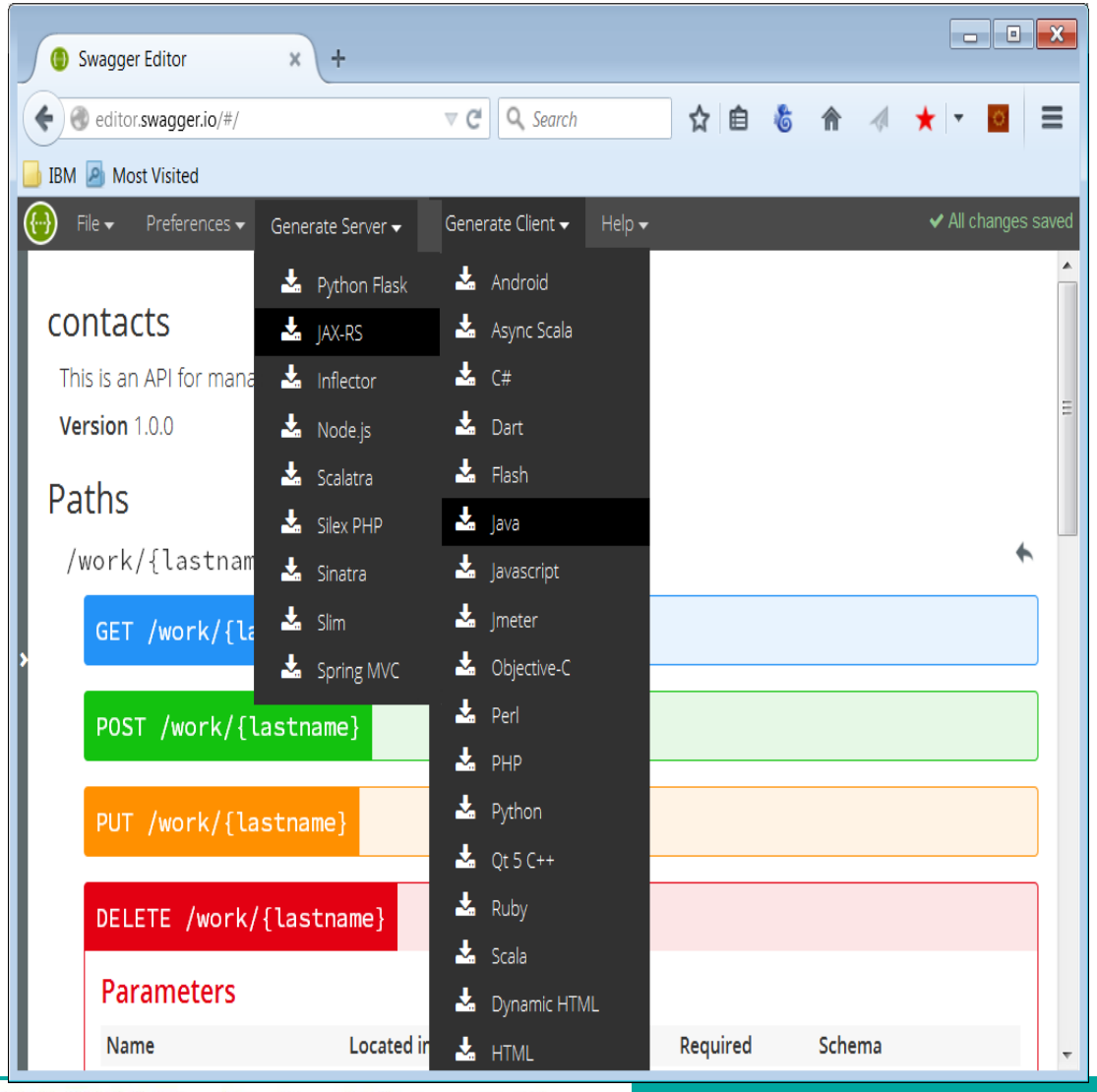
SDK Generators
Turn an API spec into client SDKs or server-side code with Swagger Codegen.

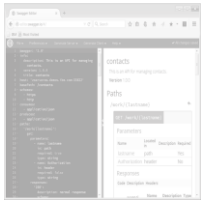

Swagger UI
https://zserveros.demos.ibm.com:33622/swagger_ui/?url=/contacts/api-docs#/
Search
IBM
Most Visited
swagger
https://zserveros.demos.ibm.com:33622/contacts/api-docs
Swagger for an API can be loaded directly from a server into Swagger UI
contacts
This is an API for managing contacts.
default
Show/Hide
List Operations
Expand Operations
DELETE /work/{lastname}
GET /work/{lastname}
POST /work/{lastname}
PUT /work/{lastname}
[BASE URL: /contacts , API VERSION: 1.0.0]
VALID


Swagger UI
https://zserveros.demos.ibm.com:33622/swagger_ui/?url=/contacts/api-docs#!/default/post_w
Search
IBM
Most Visited
POST
/work/{lastname}
Response Class (Status 200)
Model
Model Schema
{
"OUTPUT_MSG": {
"OUT_STATUS": "string"
}
}
Swagger UI can be used to unit test methods offered by the API.
Swagger Editor may also be used for unit testing, however it requires Node.js whereas Swagger UI does not.
Response Content Type
application/json
Parameters
Parameter
Value
Description
Parameter Type
Data Type
lastname
lastdemo3
path
string
firstname
firstdemo3
query
string
extension
3-5003
query
string
zipcode
95003
query
string
Authorization
Basic ZGRzMzcxNjpmdW4ydGVzdA==
header
string
Try it out!


Swagger UI
https://zserveros.demos.ibm.com:33622/swagger_ui/?url=/contacts/api-docs#!/default/post_w
Search
IBM
Most Visited
curl -X POST --header "Content-Type: application/json" --header "Accept: application/json" --header "Authorization: Basic ZGRz
Request URL
https://zserveros.demos.ibm.com:33622/contacts/work/lastdemo3?firstname=firstdemo3&extension=3-5003&zipcode=95003
Response Body
{
"OUTPUT_MSG": {
"OUT_STATUS": "ENTRY WAS ADDED"
}
}
The POST method did not require a request body, rather all of the input data is carried on the URI.
This is typical of REST APIs.
Response Code
200
Response Headers
{
"x-powered-by": "Servlet/3.1",
"x-segno": "0001",
"content-type": "application/json",
"content-language": "en-US",
"content-length": "47",
"date": "Tue, 02 Feb 2016 00:53:17 GMT"
}

SDK Generators – Integrate or Implement an API





Swagger Editor
An editor for designing Swagger specifications from scratch, using a simple YAML structure.

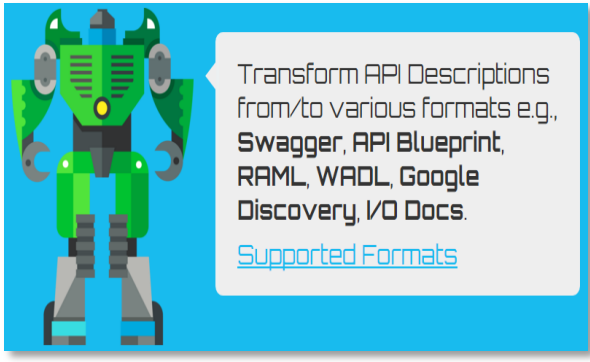
Swagger UI
Use a Swagger specification to drive your API documentation.

SDK Generators
Turn an API spec into client SDKs or server-side code with Swagger Codegen.

Choice of REST API Specifications

- **While Swagger is the "most popular" specification, API developers may choose from other specifications to document REST APIs:**
  - API Blueprint
  - RAML
  - Slate
  - WADL

- **To address proliferation of specifications, tools such as API Transformer help by converting between specification types.**
- **Swagger's SDK is a strong selling point.**



Introducing IBM z/OS Connect Enterprise Edition V2.0

Product key points and RESTful reminder

IBM z/OS Connect Enterprise Edition

40,000ft Enterprise API ecosystem view

Firewall

API management

DataPower

Workload balancing

External API consumers

Internal API consumers

Mixed assets, discoverable as self-describing REST interfaces

APIs described by SWAGGER

HTTP/JSON transport + data

Standard network mediation layers

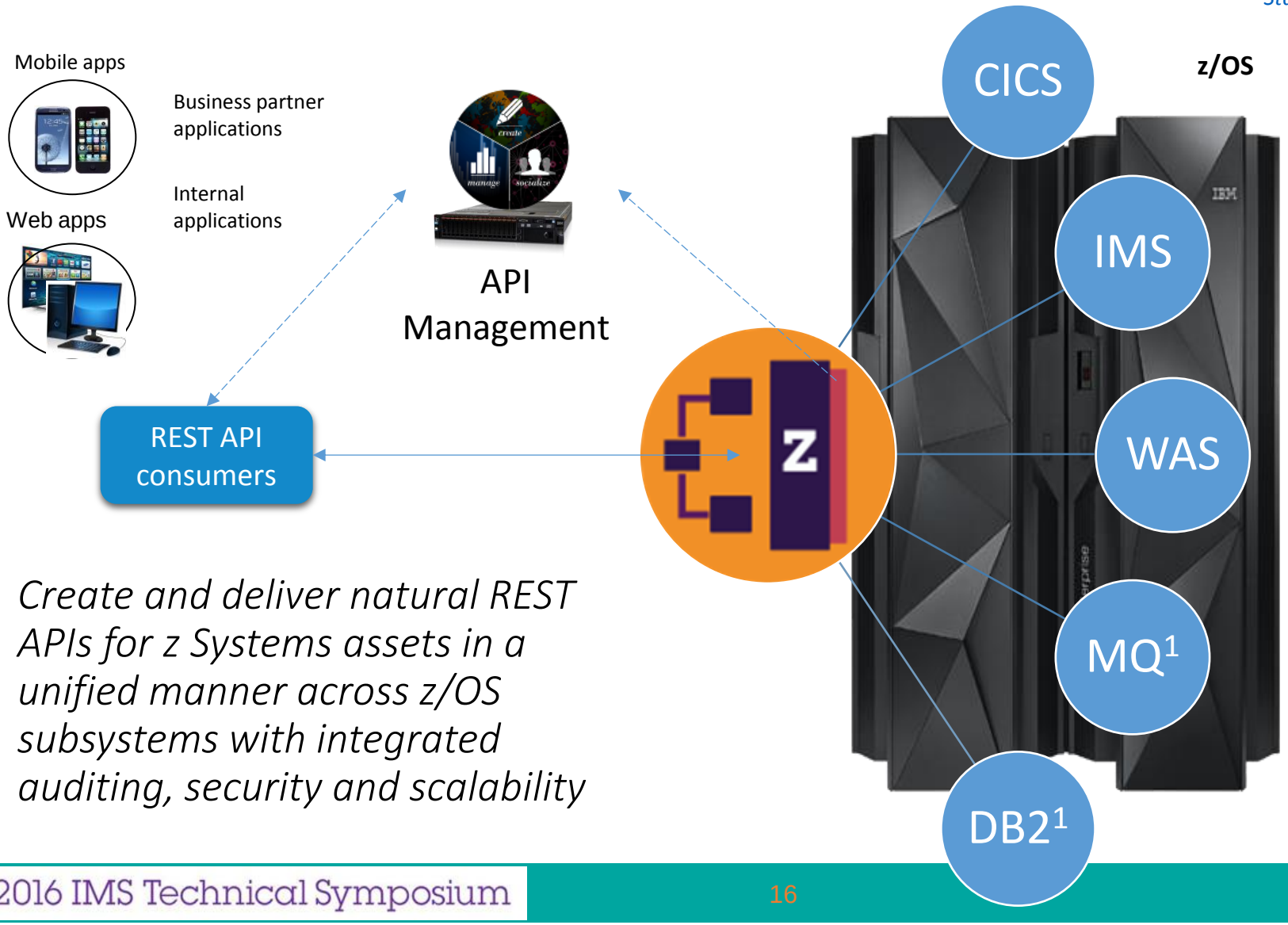
Enterprise API providers

- z Systems
- POWER
- Intel
- Linux
- Public cloud

IBM z/OS Connect Enterprise Edition

10,000ft conceptual view

[1] see ENUS215-493 Statements of Direction



Create and deliver natural REST APIs for z Systems assets in a unified manner across z/OS subsystems with integrated auditing, security and scalability

IBM z/OS Connect Enterprise Edition

Two parts to every story

Runtime Server

1

- Includes service capabilities of V1.0
- Adds the ability to hosts APIs
- Integrates with multiple z subsystems
- Liberty + z/OS Connect = “instance”
- You may have multiple instances

Liberty z/OS

z/OS Connect EE server instance

SoR subsystems

CICS, IMS, WAS, DB2, MQ, …

IBM 64-bit SDK for z/OS, Java Technology Edition V7.1.0 or V8.0.0

z/OS Explorer Aqua V3.0

z/OS Connect EE API Editor

Windows, Linux or OS/X with

- IBM CICS Explorer V5.3
- IBM IMS Explorer for Development V3.2
- IBM Explorer for z/OS Aqua V3.0

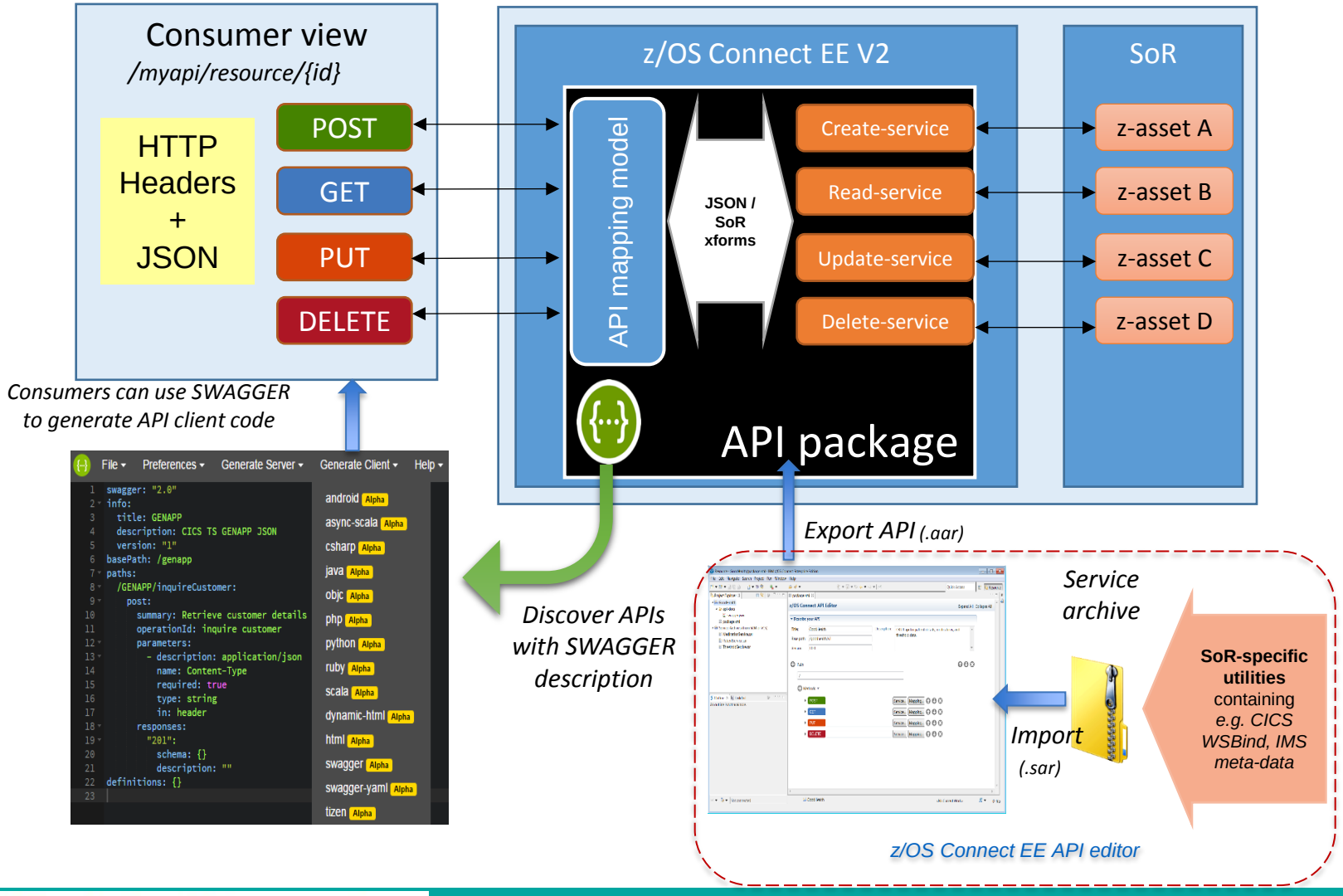
Tooling Platform

2

- Integrates with an Eclipse 4.4 environments
- Defines APIs and generates SWAGGER 2.0
- Compose API mapping models
- Deploy APIs to runtime server
- Export API archive for other tools to deploy

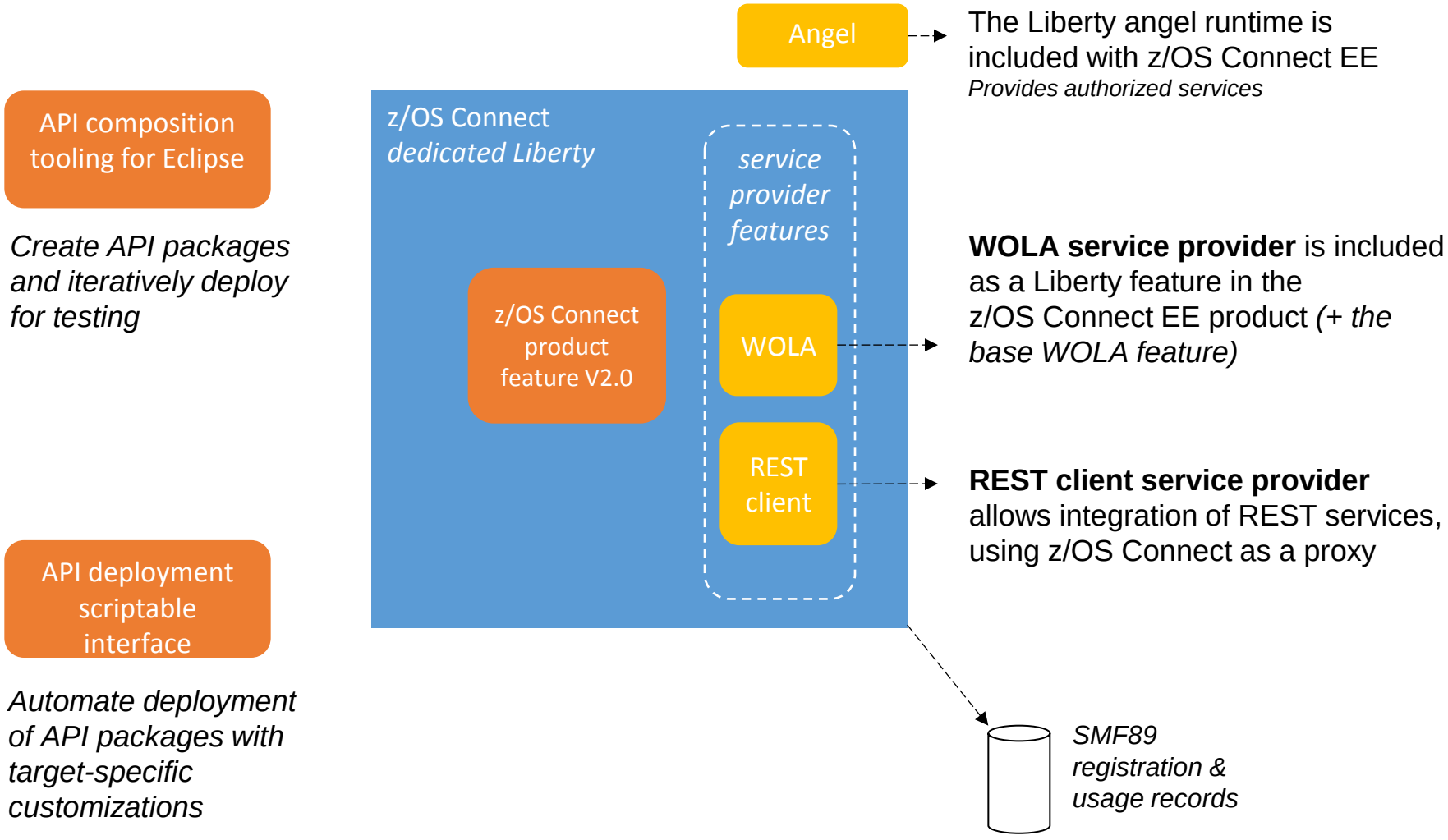
IBM z/OS Connect Enterprise Edition

API consumers, API packages, mapping and transformation, description, discovery and invocation!



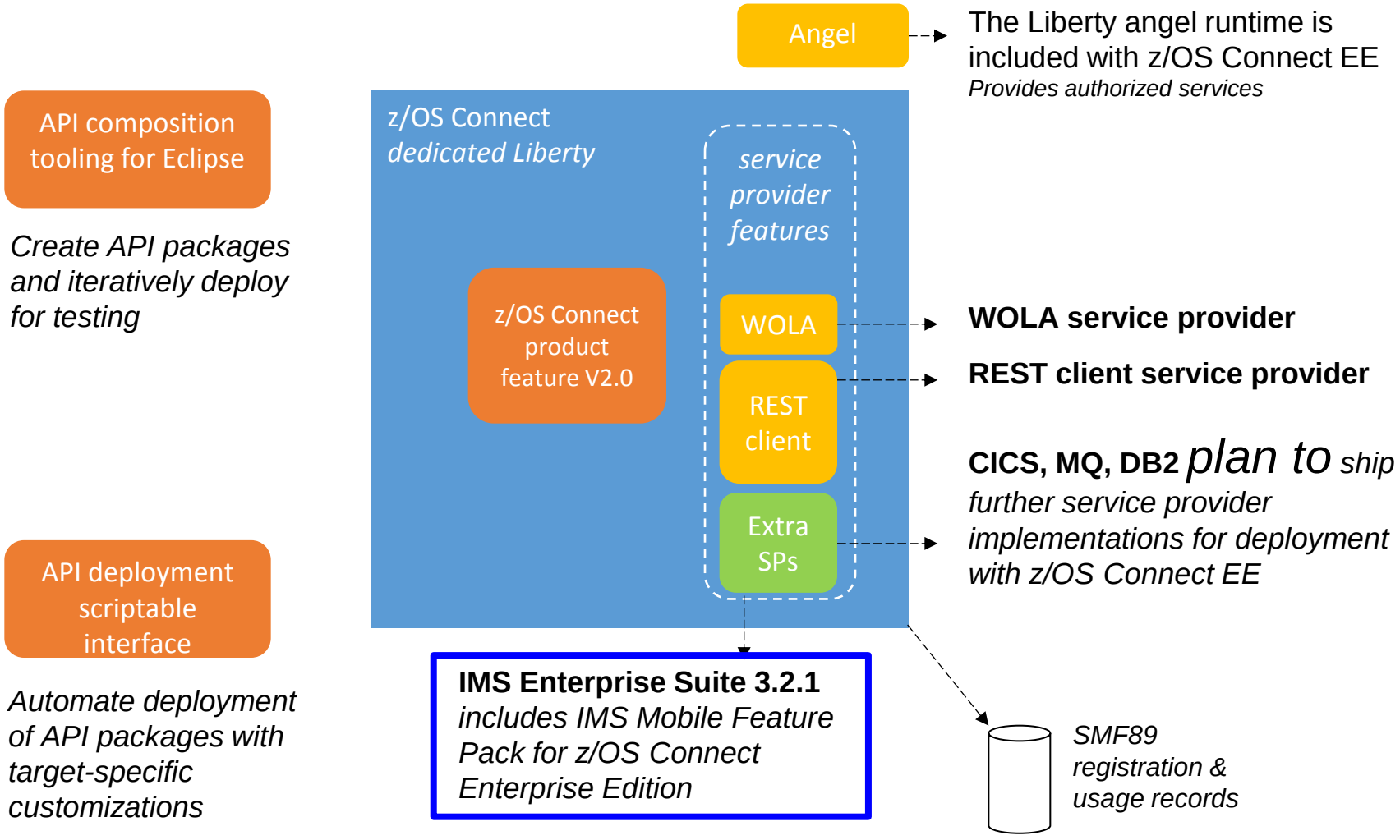
IBM z/OS Connect Enterprise Edition

Runtime component view – *what comes in the box*



IBM z/OS Connect Enterprise Edition

Runtime component view – *extending z/OS Connect EE*



IMS Mobile Feature Pack for z/OS Connect EE

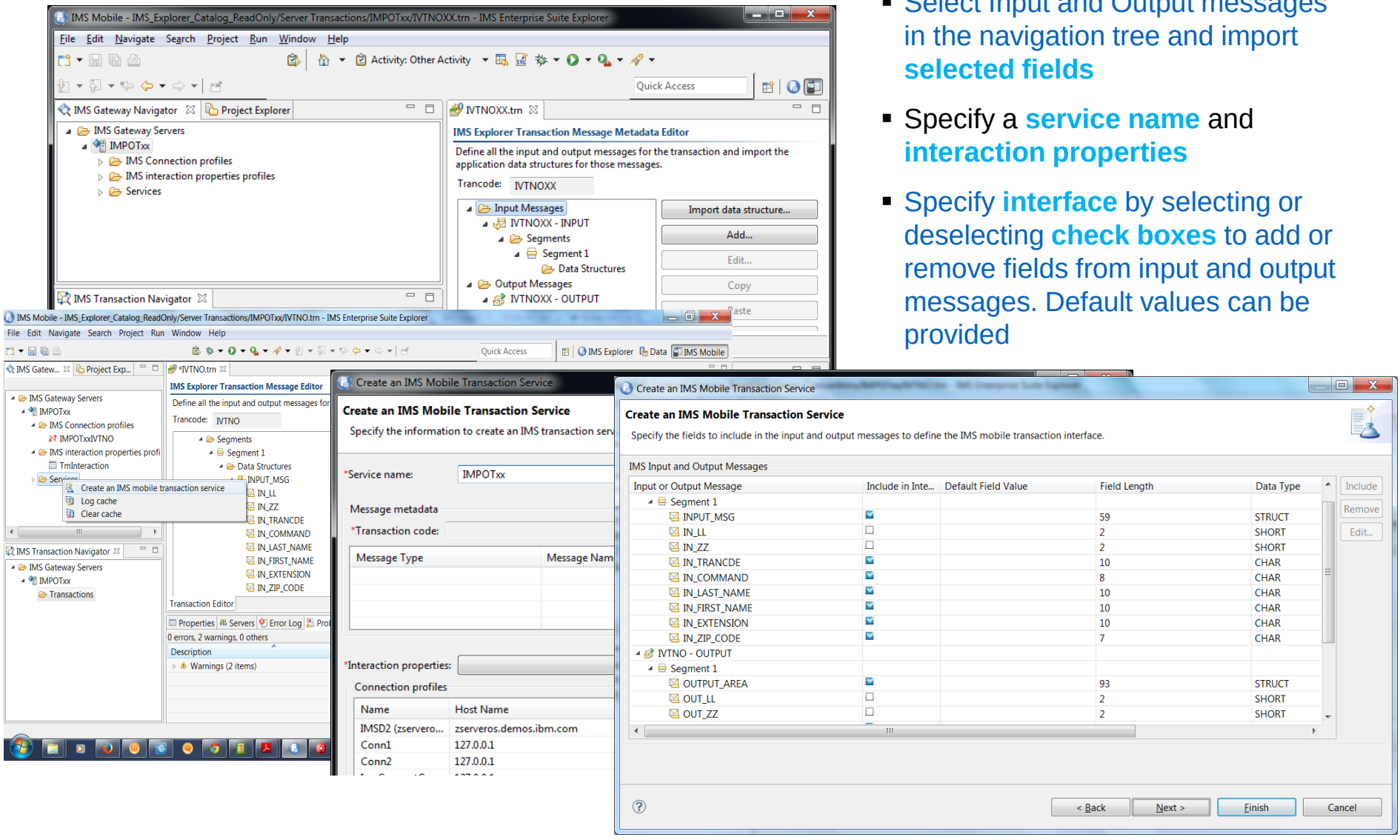
- **Enable mobile and cloud clients to access IMS transactions as REST/JSON services**
  - Transform REST/JSON request to COBOL bytes and transform response back to JSON
  - No change to IMS applications

- **Tooling:**
  - IMS Explorer for Development to easily create RESTful services from existing IMS transactions
  - IBM zExplorer API Editor maps RESTful services as natural REST API

- **Runtime:**
  - Supports both z/OS Connect and z/OS Connect Enterprise Edition

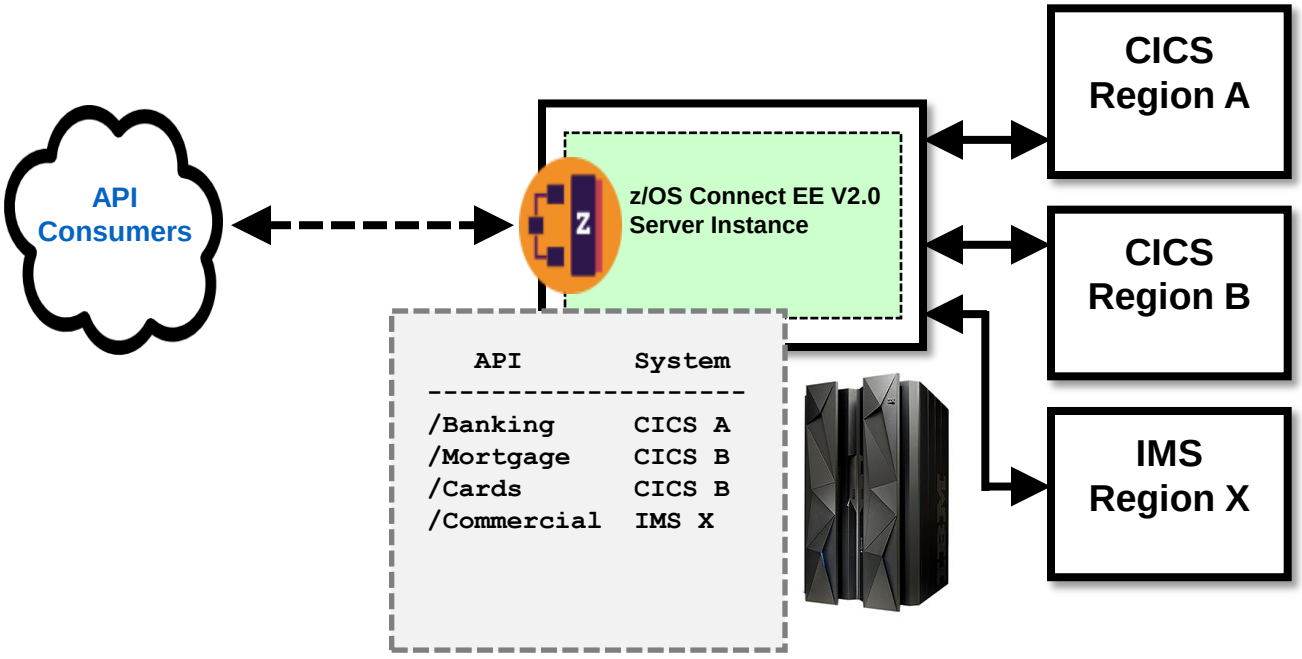
Once published, services and APIs hosted by z/OS Connect EE can be discovered by mobile and cloud application developers

Develop a REST Service from an IMS Transaction with IMS Explorer for Development



- Select Input and Output messages in the navigation tree and import **selected fields**
- Specify a **service name** and **interaction properties**
- Specify **interface** by selecting or deselecting **check boxes** to add or remove fields from input and output messages. Default values can be provided

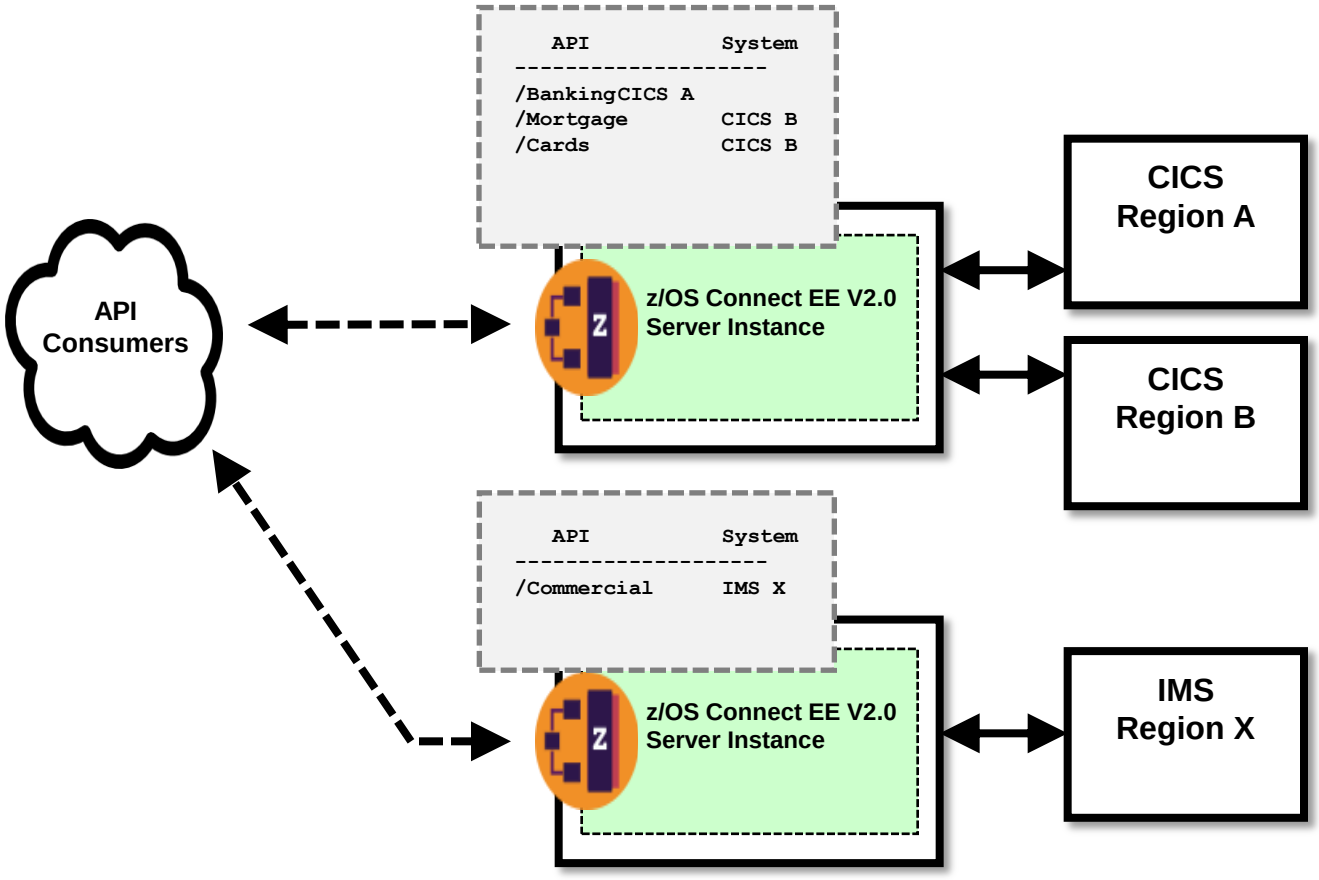
Example 1 - Multiple Backend Systems



z/OS Connect EE V2.0 becomes the REST API entry point to the LPAR for access to several backend systems where the data program resides

Duplicate the z/OS Connect EE V2.0 instance for greater availability and/or greater throughput

Example 2 - Multiple Lines of Business



There are times where the business requires operational separation and isolation. In that case, multiple instances of z/OS Connect EE V2.0 applies.

What's in a URI ?

JSON-RPC style services vs. a "naturally RESTful" API

A collection of individual services

POST `/accounts/create` + *(JSON with account create information)*

POST `/accounts/balance` + *(JSON with account number)*

POST `/accounts/update` + *(JSON with account number and deposit)*

REST interface is very limited, **HTTP method is NOT significant**.
"Good enough" for some use-cases, but falls short the expectations of REST API consumers.

A naturally RESTful API

POST `/accounts?name=Fred` + *(JSON with Fred's information)*

GET `/accounts?number=1234`

PUT `/accounts?number=1234` + *(JSON with dollar amount of deposit)*

DELETE `/accounts?number=1234`

HTTP verb conveys the *operation* against the resources; i.e., POST is for create, GET is for balance, etc.

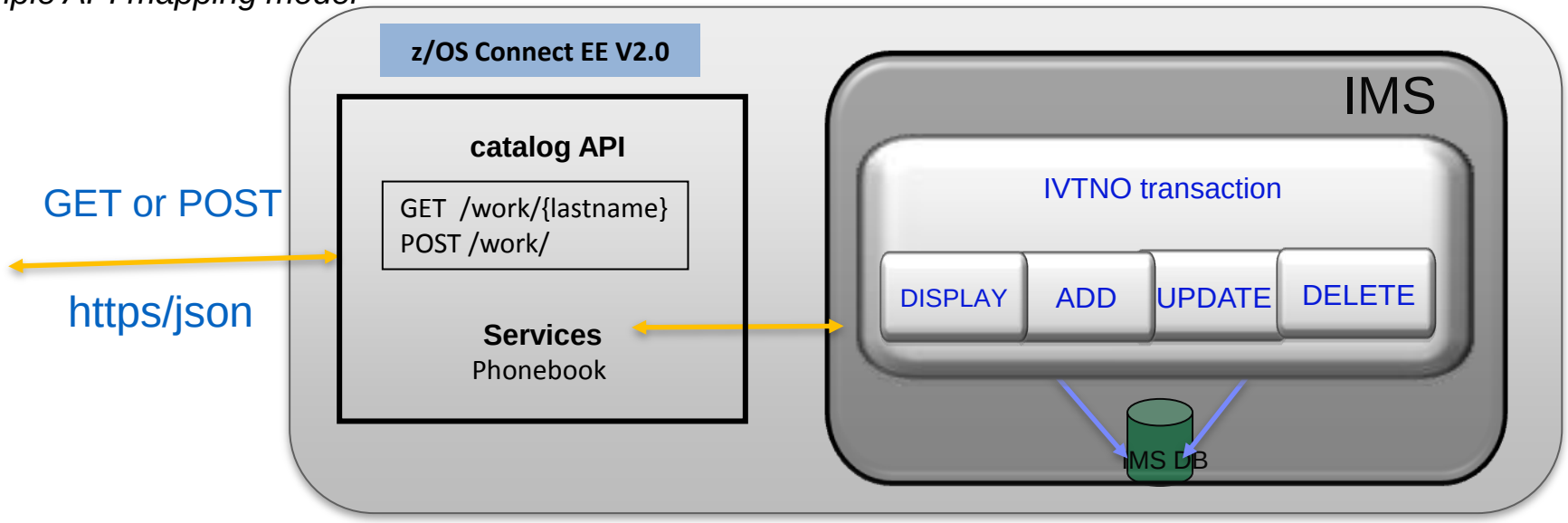
URI conveys the *resource* to be operated upon; i.e., Fred's account with number 1234

The **HTTP body encoded in JSON** carries the specific data resulting from the action (verb) against the resource (URI)

Aligned with API consumer expectations for REST APIs

Designing an API for the IMS Phonebook sample

A sample API mapping model



IMS Phonebook: sample API mapping model

API	HTTP verb	URL
Get Phone entry	GET	https://zosconnecthost:port/contacts/work/{lastname}
Add Phone entry	POST	https://zosconnecthost:port/contacts/work/{lastname}?firstName=DEMO1&extension=11111&zipcode=22222
Update Phone entry	PUT	https://zosconnecthost:port/contacts/work/{lastname}?firstName=&extension=11111&zipcode=22222
Delete Phone entry	DELETE	https://zosconnecthost:port/contacts/work/{lastname}

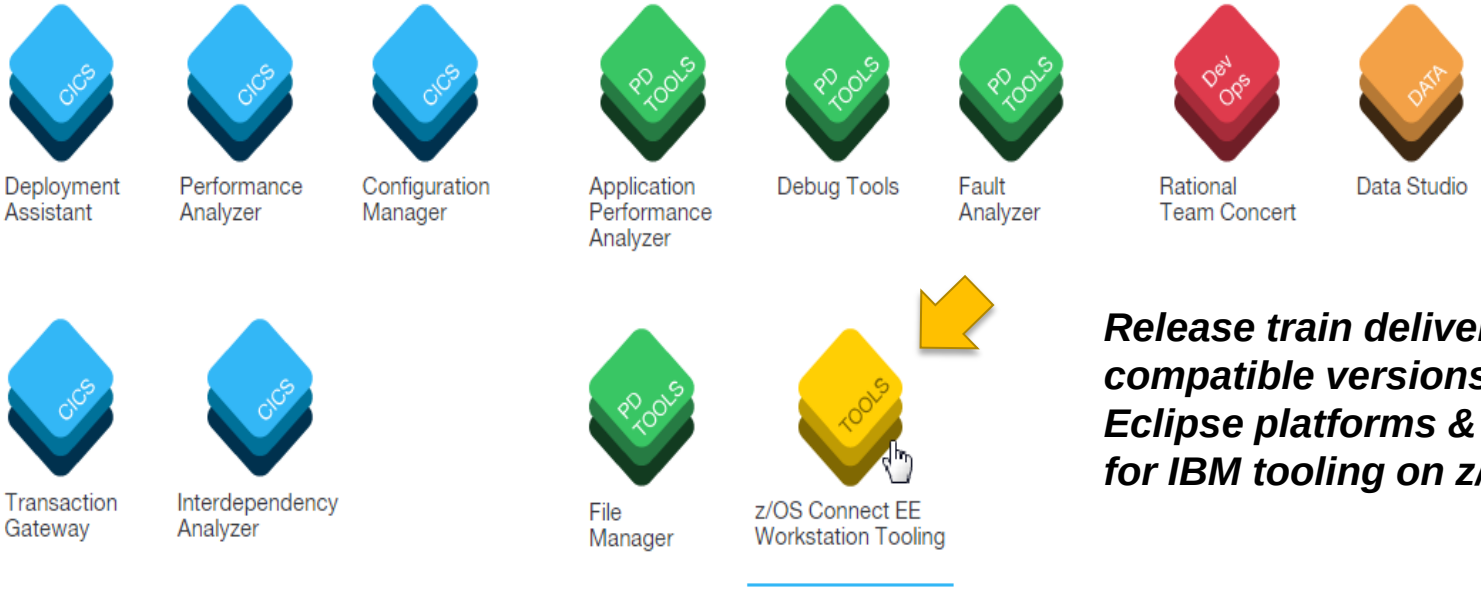
z/OS Connect EE API Editor

API composition

Eclipse Tools for Mainframe Development

Composite update site hosts compatible versions of Eclipse platforms & plugins

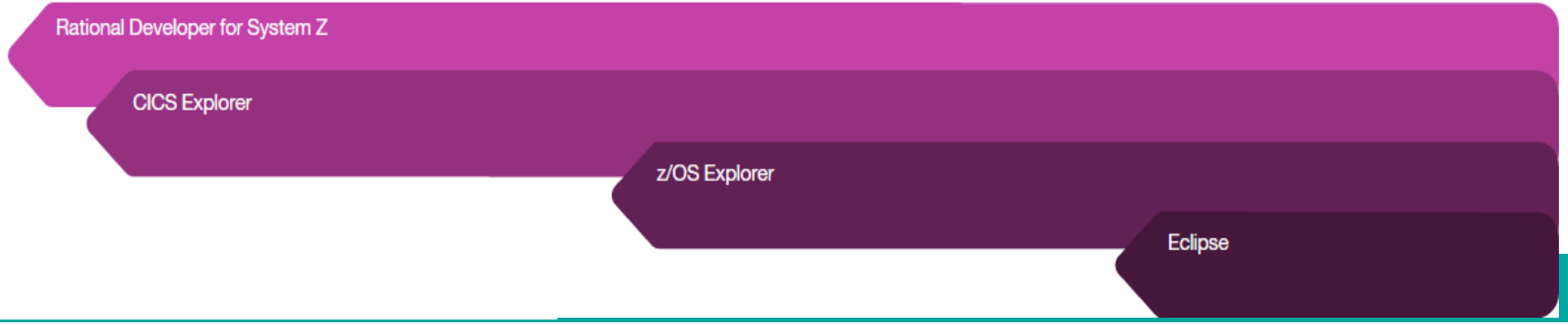
Plug-ins



Release train delivering compatible versions of Eclipse platforms & plugins for IBM tooling on z/OS.

Platforms

https://developer.ibm.com/mainframe



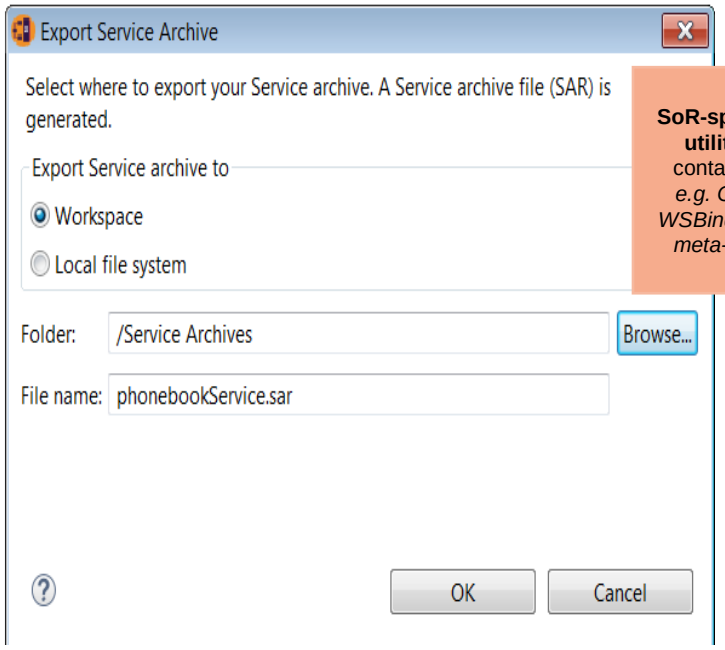
z/OS Connect EE API Editor

Model and create natural REST APIs based on z/OS Connect services

https://developer.ibm.com/mainframe/products/zosconnect

z/OS Connect EE API Editor

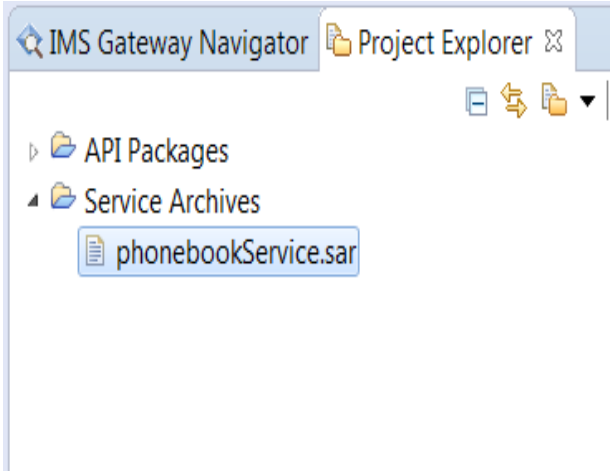
Composing an API from service archives



SoR-specific utilities containing *e.g. CICS WSBind, IMS meta-data*

Service archive

Import SAR files to z/OS Connect EE API Editor



***SoR-specific utilities** for SAR generation*

IMS Explorer for Development (shown)

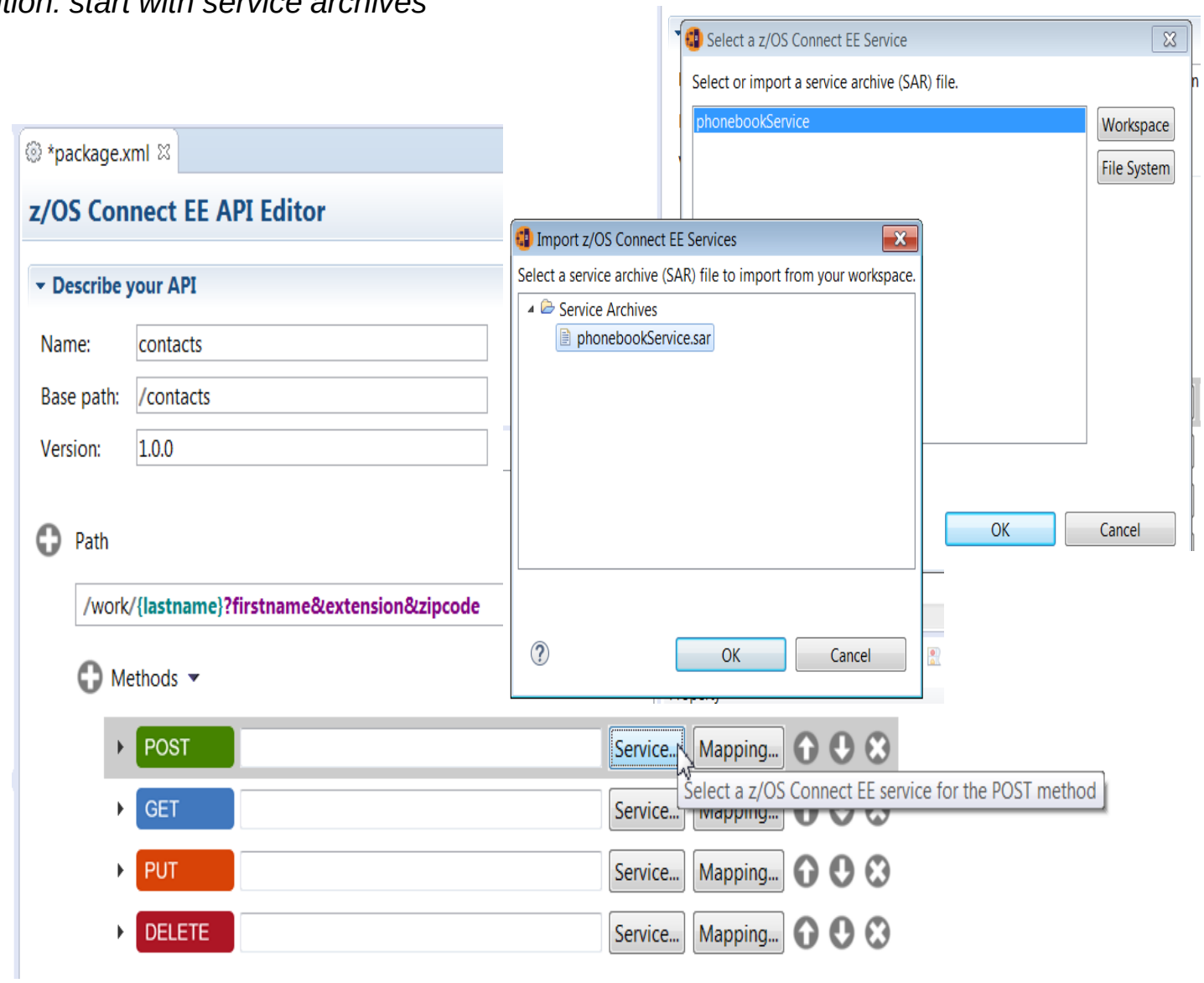
- IMS Transaction data xforms

BAQJS2LS / BAQLS2JS utilities (supplied)

- CICS program data xforms

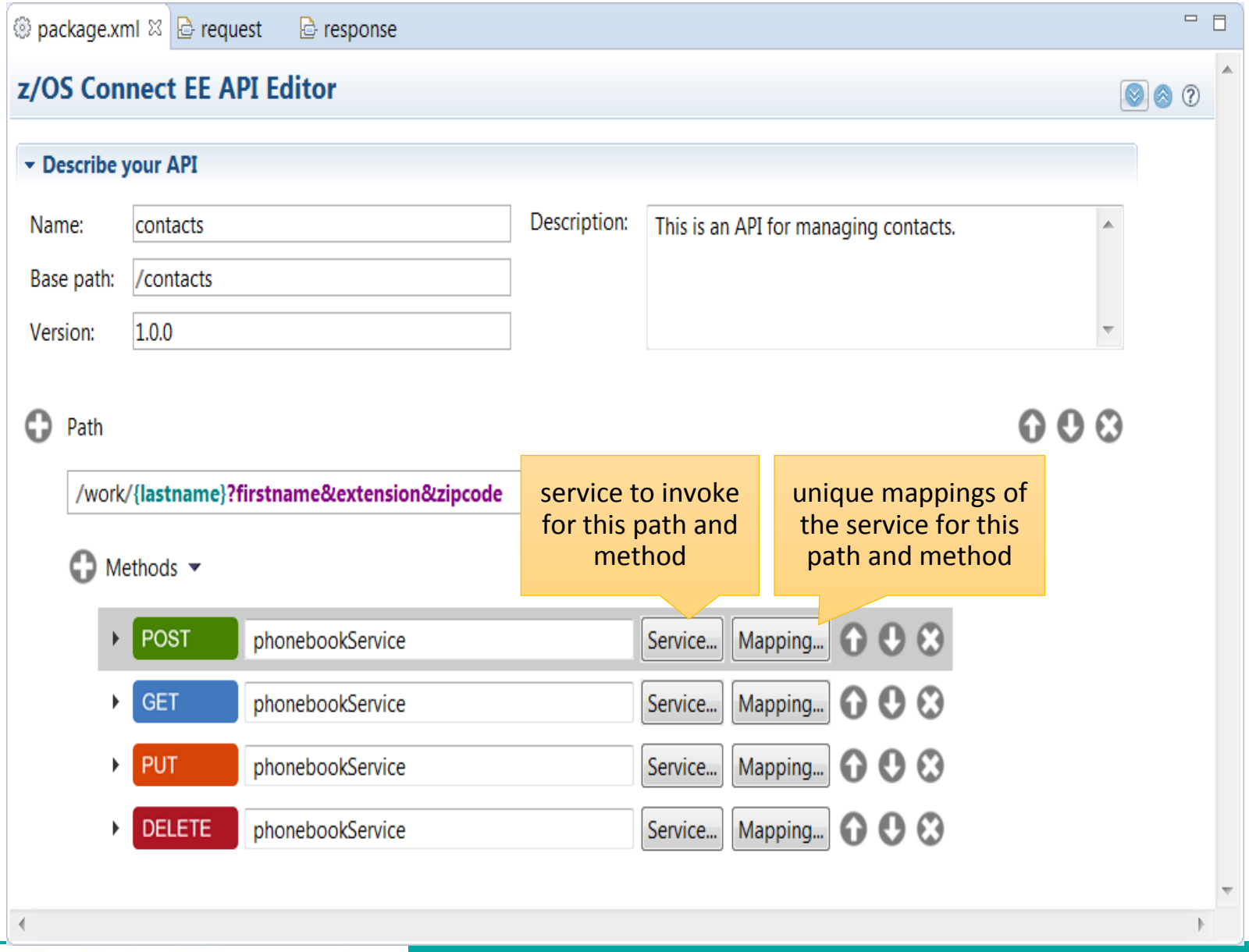
z/OS Connect EE API Editor

API composition: start with service archives



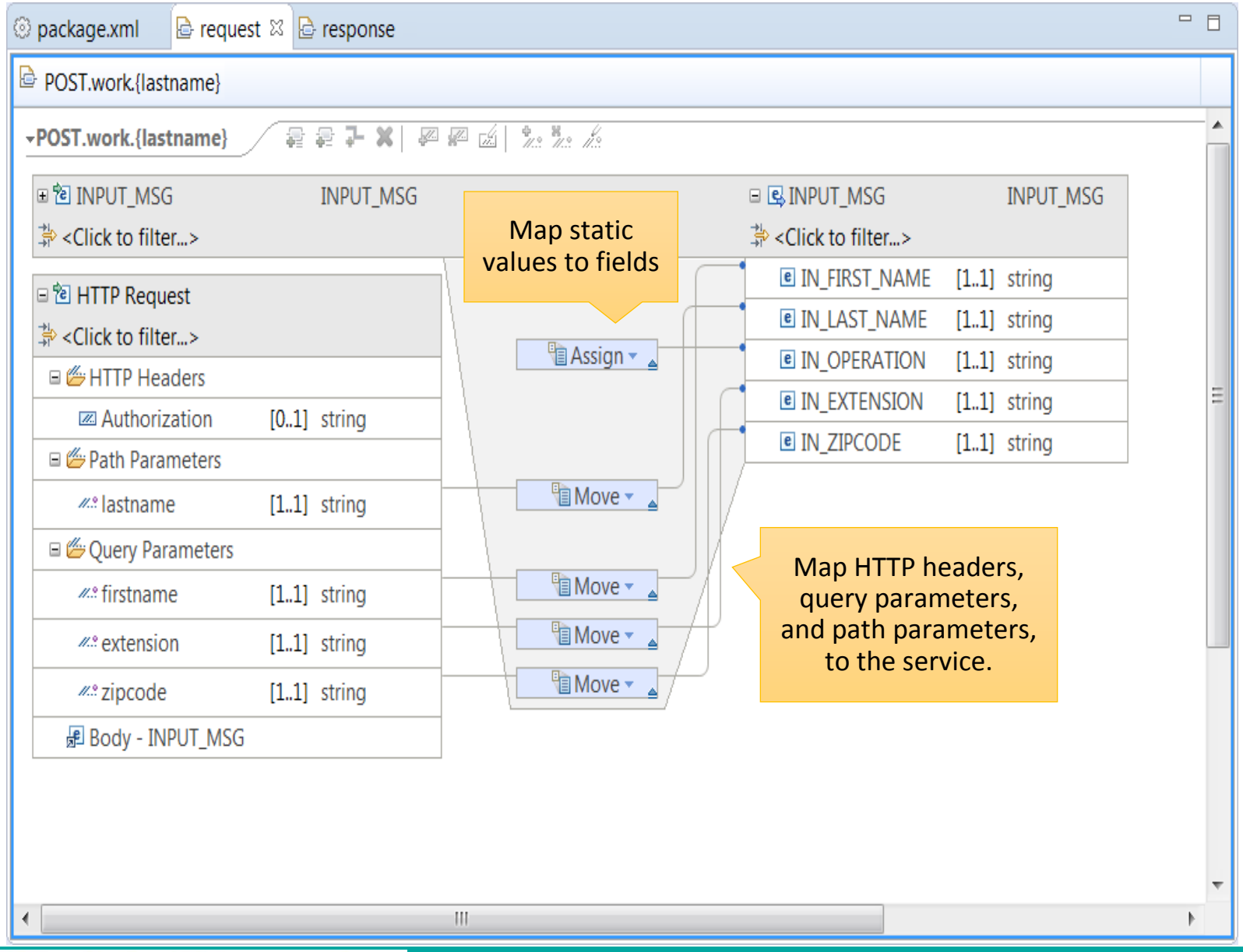
z/OS Connect EE API Editor

Create the paths and methods supported by your REST API



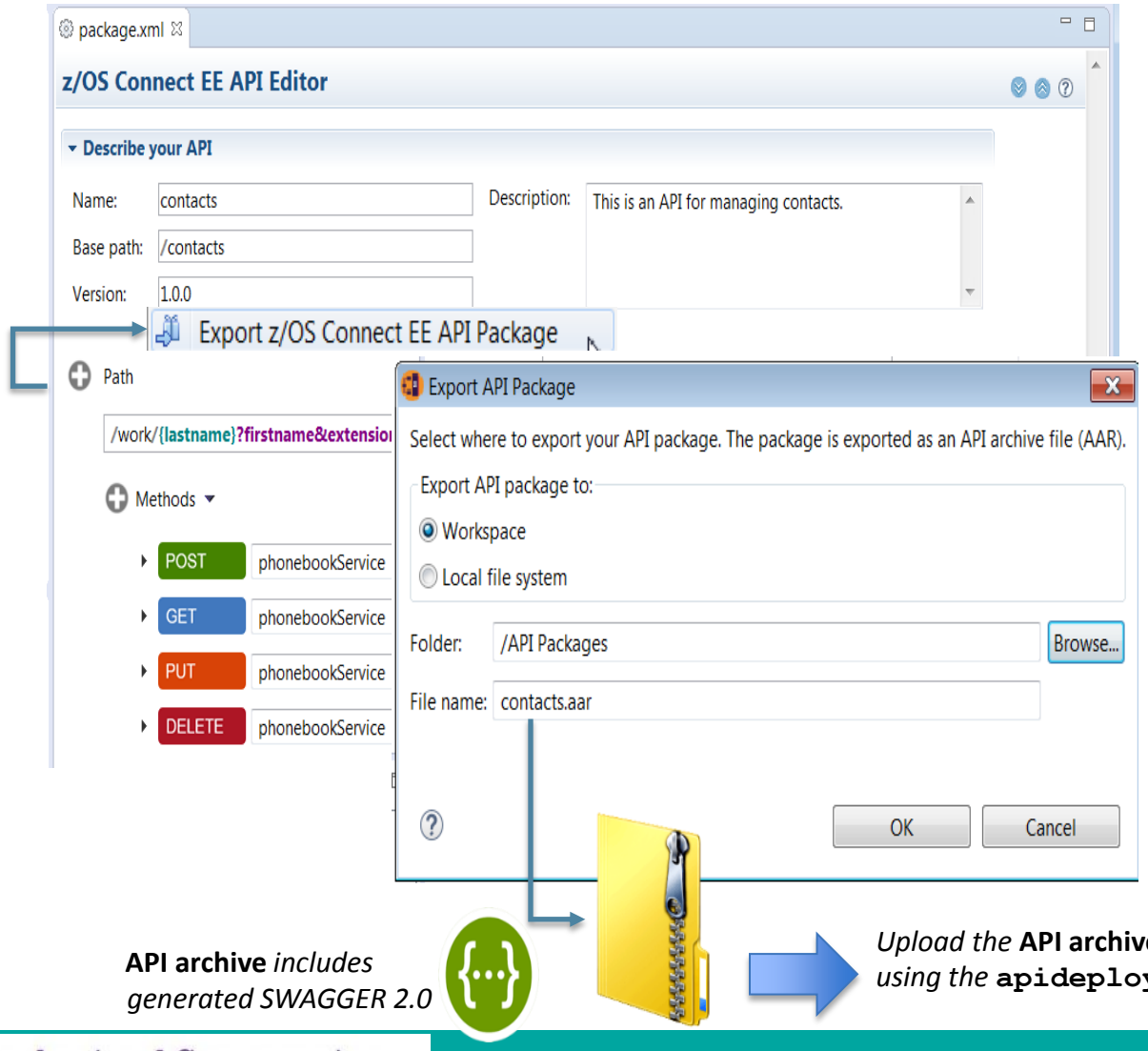
z/OS Connect EE API Editor

Create unique RESTful mappings of z/OS Connect services per path and method



z/OS Connect EE API Editor

API composition: export API package as API archive (AAR)

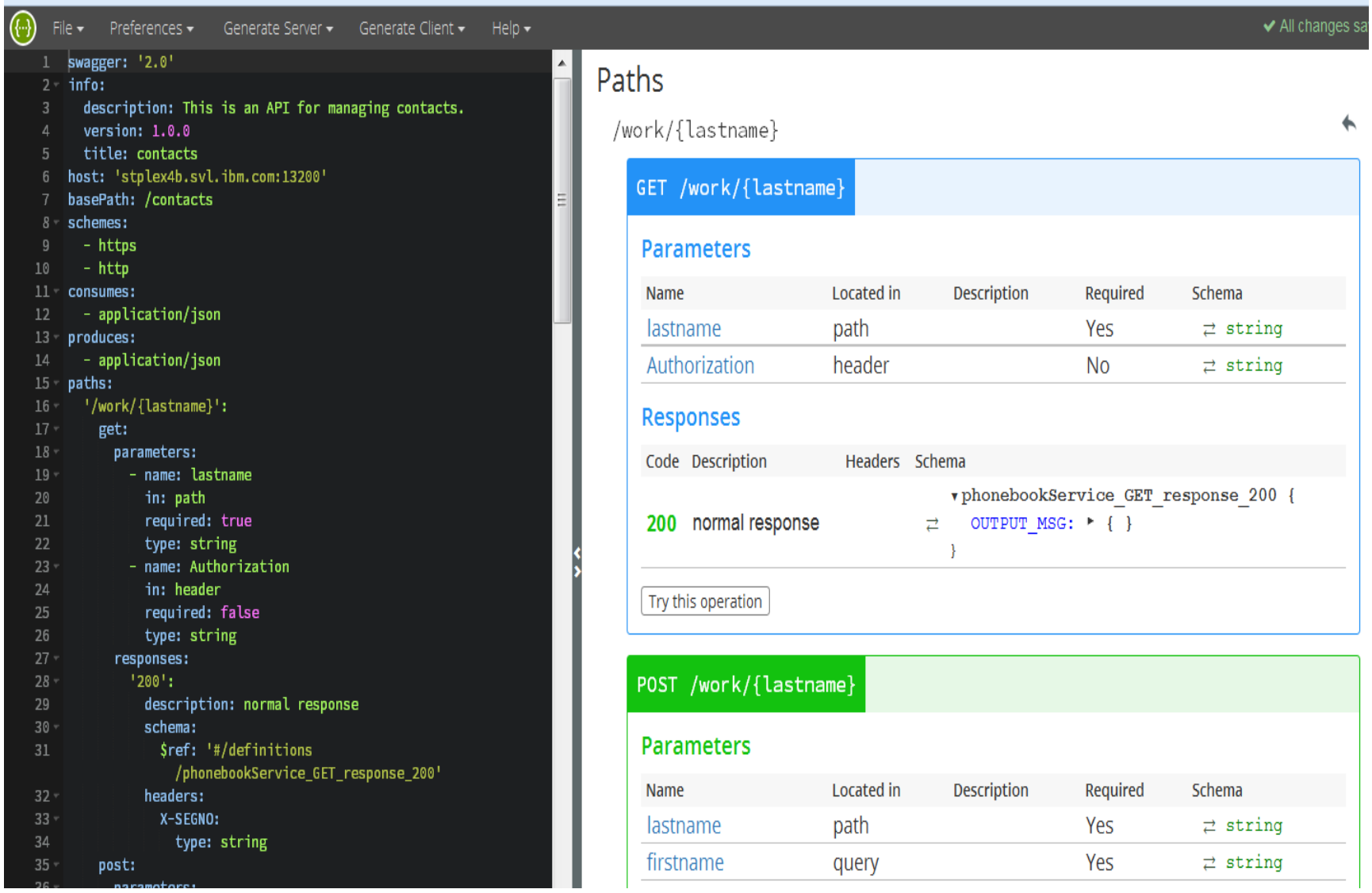


API archive *includes generated SWAGGER 2.0*

Upload the **API archive** *to zFS and deploy using the* **`apideploy`** *command*

z/OS Connect EE API Editor

API composition: Generated SWAGGER (shown in SWAGGER editor)



Managing your APIs

Secure, scale, manage, monitor, and socialize APIs

API Management

- **APIs hosted on a zEE server are not "managed", therefore an API management (APIm) solution should be used.**
- **IBM APIm enhances zEE APIs with the following capabilities:**
  - Secure and scale
    - manage access to APIs by using API keys and secret keys.
  - Manage and monitor
    - extract API usage and analytics data to quickly react to new opportunities.
  - Administration portal
    - self-registration, quotas, key management and security policies.
  - Developer portal
    - engage application developers and foster use of published APIs.
    - customize with branding to advertise, market, socialize and sell APIs.

Session B14 for more info…

Demo

Create a Swagger-defined API using z/OS Connect

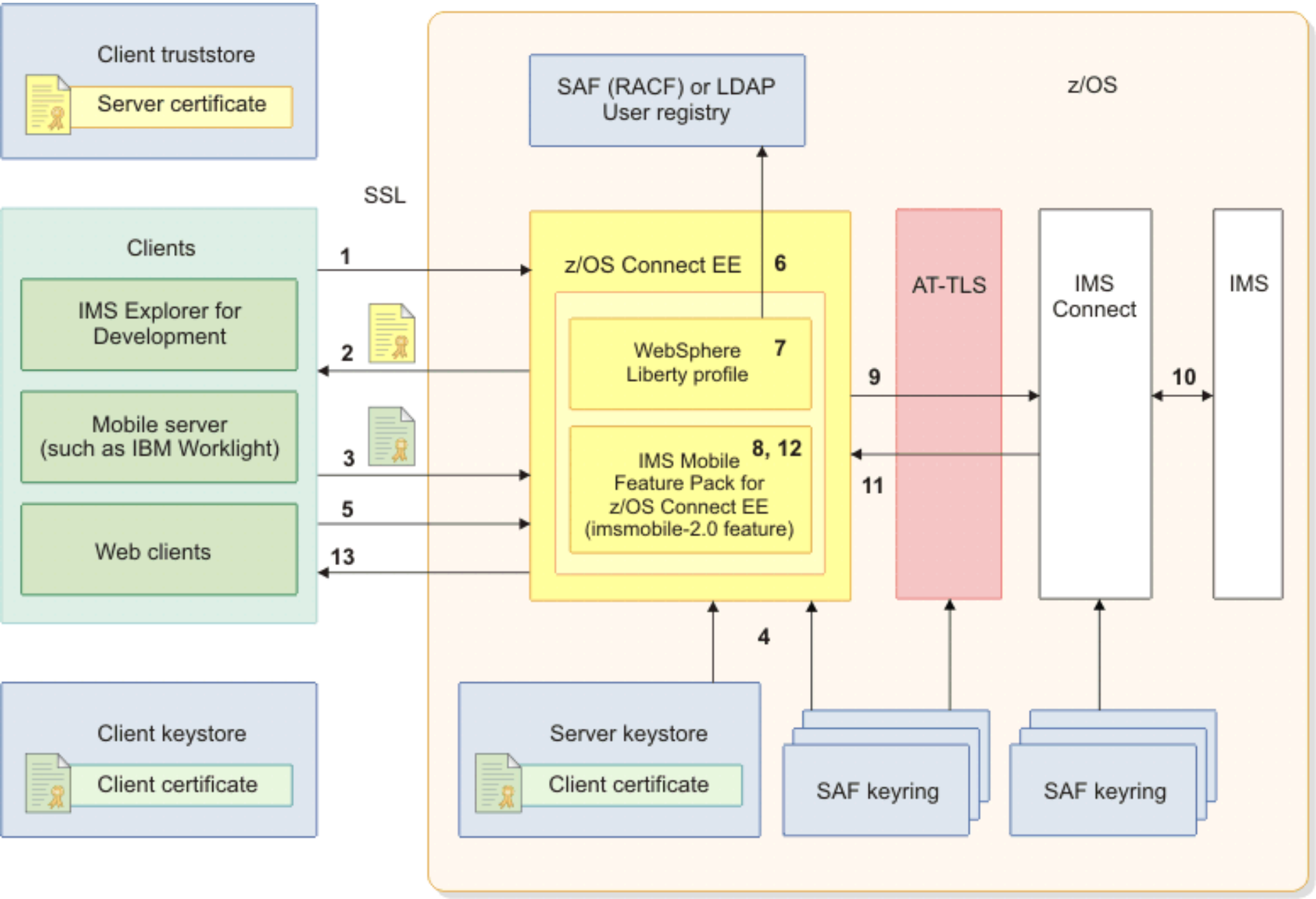
Security

z/OS Connect / IMS Mobile Feature Pack security

- **End-to-end security flow can be divided into two layers:**
  - Security between REST client and z/OS Connect server
  - Security between IMS Mobile Feature Pack and backend IMS

- **Security can be discussed in three areas:**
  - Authentication/Encryption
  - Authorization
  - Identity Assertion

End-to-end Security flow



Authentication / Encryption

- **Between REST client and z/OS Connect server**
  - HTTPS/SSL can be used to secure communication between REST client and z/OS Connect server. Default = SSL is on.
  - If SSL is enabled, user can choose to use Client authentication (default) or Basic Authentication.
  - User registry for authentication can be Basic, LDAP or SAF.

- **Between z/OS Connect(IMS Mobile) and IMS**
  - AT-TLS can be used to secure communication between the z/OS Connect (IMS Mobile) server and IMS Connect.
  - IMS Connect can authenticate the UserID/password if RACF=Y

Authorization

- **Authorization in z/OS Connect server**
  - Authorization take place at the z/OS Connect server to determine what kind of action is allowed to be performed on the REST service
  - Three authorization levels:
    - Administrator = all actions
    - Operations = start, stop, getRequestSchema, getResponseSchema, getStatistics, etc
    - Invoke = invoke API
  - Interceptors can be configured at the global or individual API level for authorization group control. It supports both LDAP and SAF.

- **Authorization in IMS**
  - Authorization take place in IMS to determine if the user is authorized to run the IMS transaction. (IMS OTMA authorization profile setup)

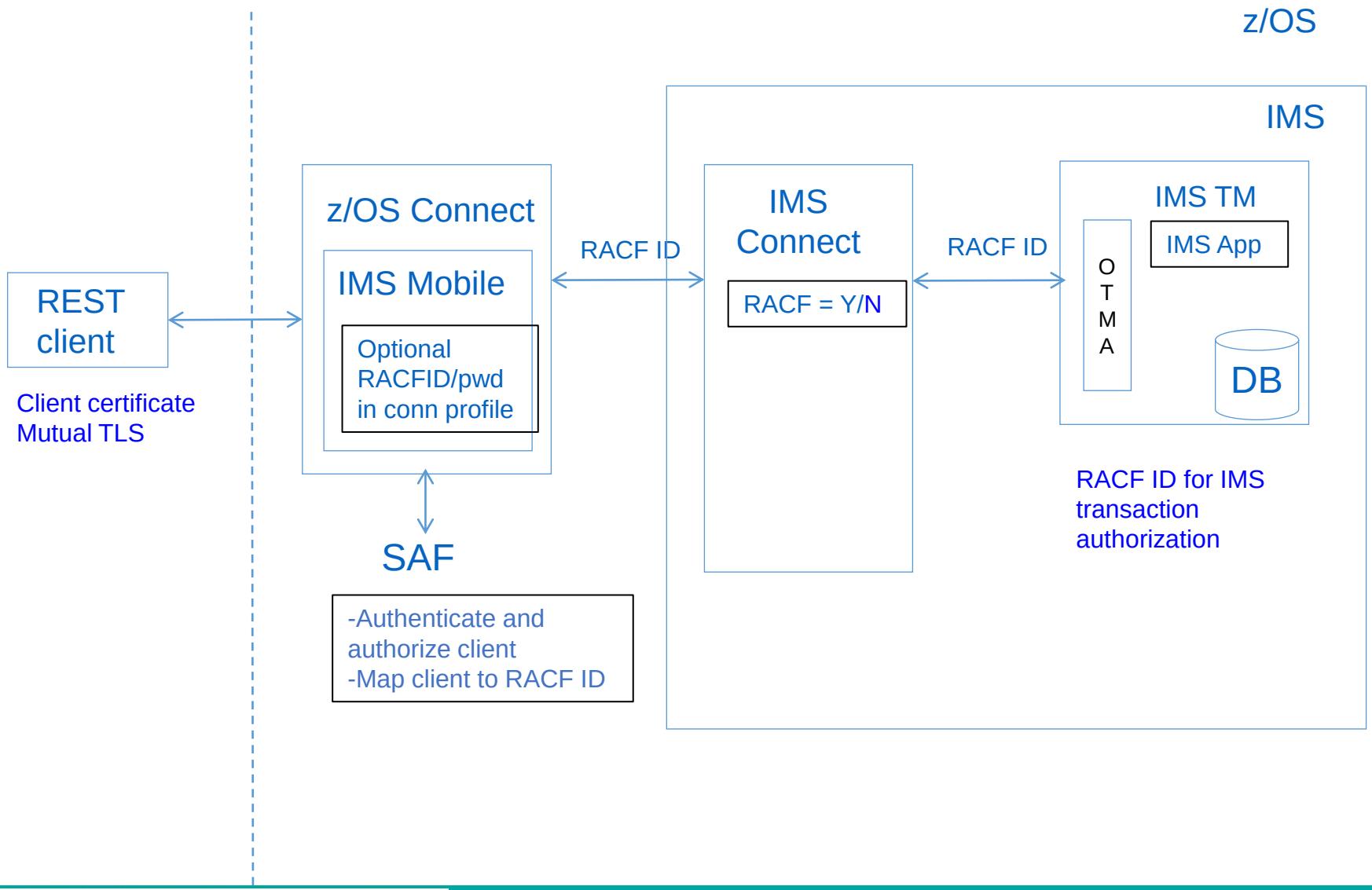
Identity Assertion

- **User Identity in z/OS Connect server**
  - Once the client is authenticated/authorized by z/OS Connect, the user identity will be propagated to the IMS Mobile.
  - The user identity could be the originating client ID or the mapped RACF ID.

- **User Identity in IMS**
  - IMS Mobile can either take
    - the User ID passed along by z/OS Connect server (User ID only, no password) OR
    - the User ID and password specified in the IMS Connection profile

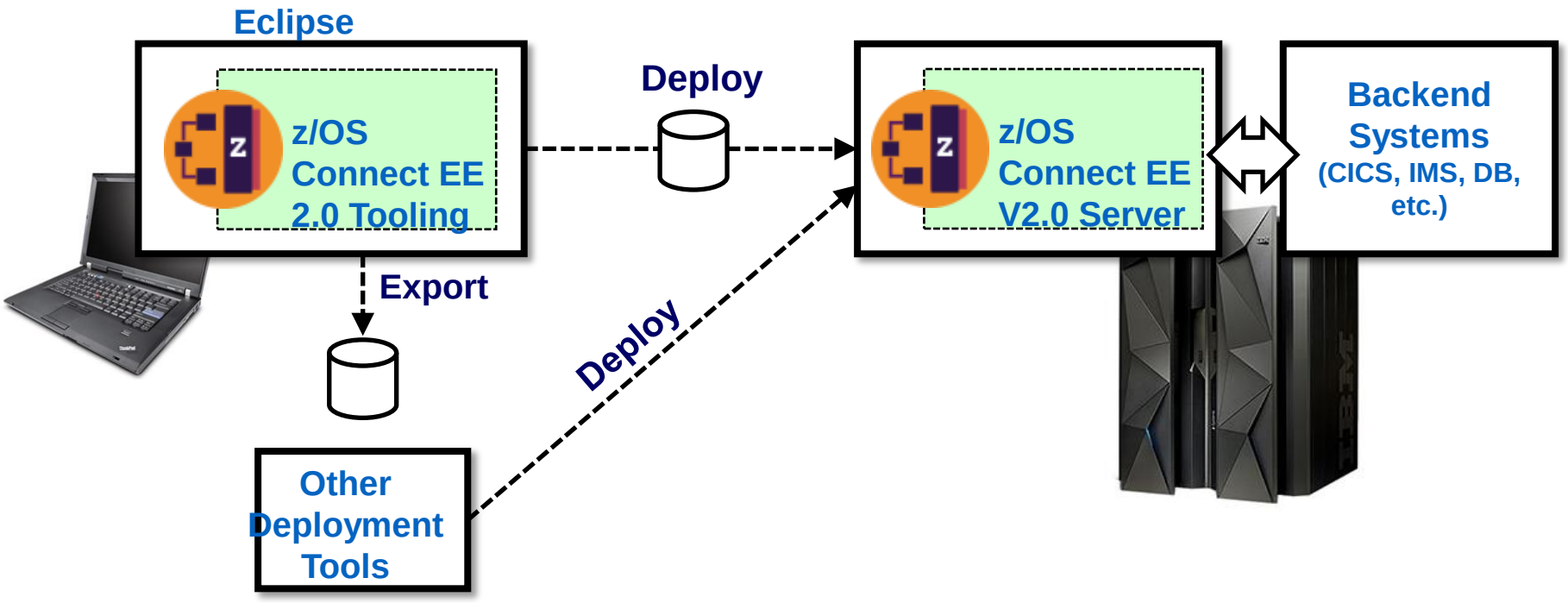
    and then pass along to IMS Connect/IMS.

End-to-End Security



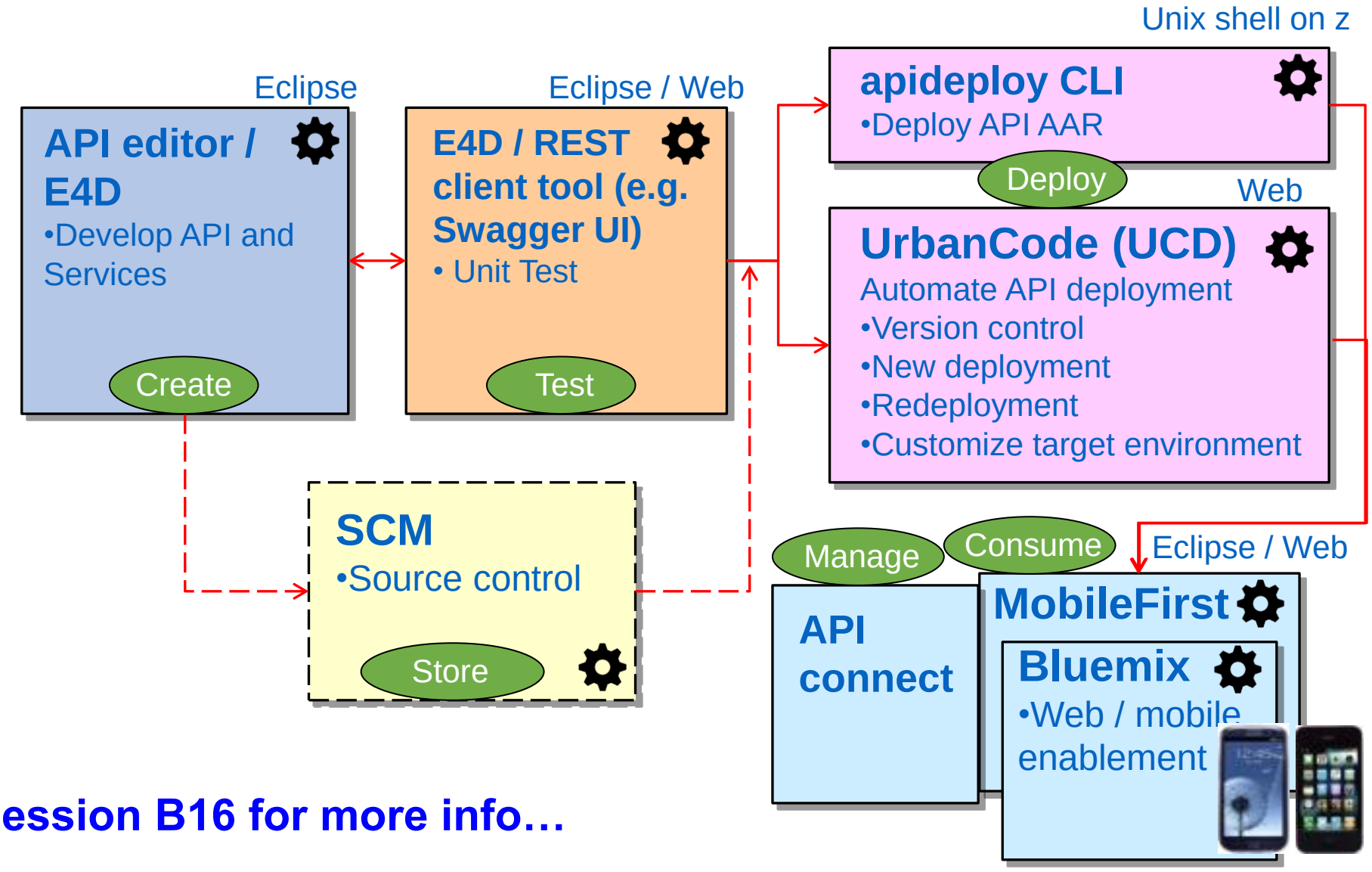
API Deployment and Promotion

Deployable Artifact and Automated Tools



Because the service definitions have been encapsulated into a deployable unit, it becomes eligible for deployment by automated tools. This further enhances productivity.

End-to-end DevOps flow for z/OS Connect APIs and Services



Session B16 for more info…

z/OS Connect EE Pricing, Performance and Open Beta offering

What about pricing?

A new approach

z/OS Connect EE introduces an innovative new pricing model on z Systems.

"*per instance*" pricing metric

- Based upon the maximum number of active concurrent address spaces

- Tiered usage bands
  - *provides increasing value as the size of an overall deployment rises; low cost of entry for small projects*

- Auditing is required through SMF89-2 records
  - *hourly snapshots of the number of concurrent instances, reports created with utility IFAURP*

What about pricing?

Value Unit exhibit VUE037 (see announcement letter ENUS215-493)

Number of Simultaneous Instances	VUs per Simultaneous Instance
1 to 4	1 VU per Simultaneous Instance
5 to 10	4 VUs + 0.6660 VUs per Simultaneous Instance > 4
11 to 20	8 VUs + 0.4000 VUs per Simultaneous Instance > 10
21 to 40	12 VUs + 0.2000 VUs per Simultaneous Instance > 20
41 to 100	16 VUs + 0.0660 VUs per Simultaneous Instance > 40
101 to 250	20 VUs + 0.0260 VUs per Simultaneous Instance > 100
251 to 500	24 VUs + 0.0160 VUs per Simultaneous Instance > 250
501 to 1000	28 VUs + 0.0080 VUs per Simultaneous Instance > 500
1001 to 3000	32 VUs + 0.0020 VUs per Simultaneous Instance > 1000
>3000	36 VUs + 0.0007 VUs per Simultaneous Instance > 3000

IFAURP usage reports

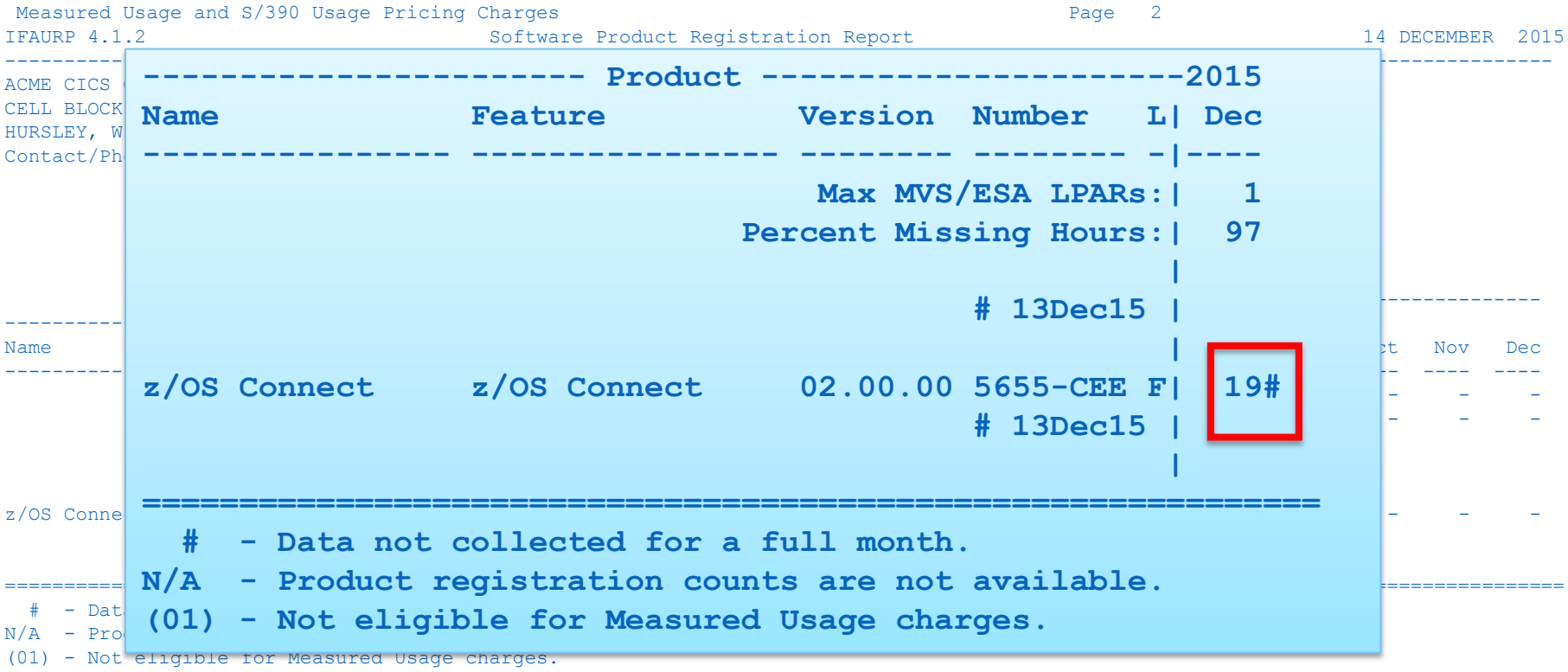
Maximum Concurrent Product Registrations – SMF 89 Type 2

```
//IFAURP EXEC PGM=IFAURP,REGION=0M,PARM='PRODUCT'
//STEPLIB  DD DSN=SYS1.SIFALIB,DISP=SHR
```

```
 Measured Usage and S/390 Usage Pricing Charges                                    Page   2
IFAURP 4.1.2                          Software Product Registration Report                          14 DECEMBER
2015
------------------- Customer No:          -------------------      -------------- Software Vendor: IBM CORP        ---------------
ACME CICS COMPANY
CELL BLOCK A
HURSLEY, WINCHESTER
Contact/Phone: MR WANNABE / +44 1962 815000
                        ---------------------------- Processor ----------------------------
                        Category    Type-Serial Model            Begin-End Dates
                        ----------  ----------  ---------------  -----------------
                        Machine     2964-8E8C7  NE1              13Dec15 - 14Dec15
                        2964 CEC    2964-8E8C7  7A5              13Dec15 - 14Dec15
                                                        ----------------- Maximum Concurrent Product Registrations -----------
------------------------ Product ------------------------2015  2016
Name             Feature          Version  Number   L| Dec   Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec
---------------- ---------------- -------- -------- -|----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----  ----
                                  Max MVS/ESA LPARs:|   1     -     -     -     -     -     -     -     -     -     -     -     -
                               Percent Missing Hours:|  97     -     -     -     -     -     -     -     -     -     -     -     -
                                                     |
                                          # 13Dec15  |
                                                     |
z/OS Connect     z/OS Connect     02.00.00 5655-CEE F|  19#    -     -     -     -     -     -     -     -     -     -     -     -
                                          # 13Dec15  |
                                                     |
=========================================================== Notes ==============================================================
  #  - Data not collected for a full month.
N/A  - Product registration counts are not available.
(01) - Not eligible for Measured Usage charges.
```

IFAURP usage reports

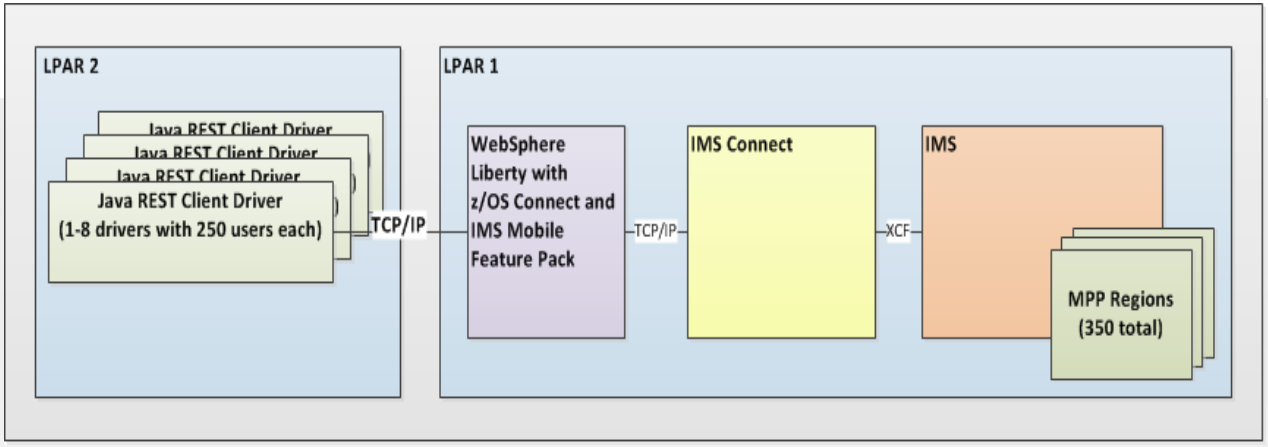
Maximum Concurrent Product Registrations – SMF 89 Type 2

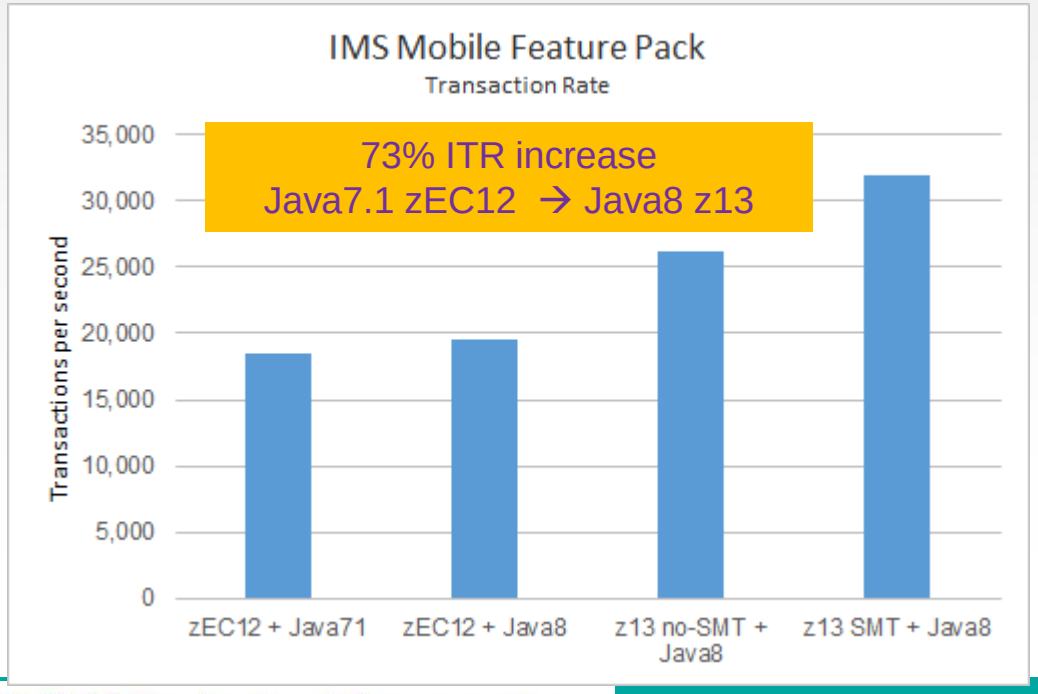


```
 Measured Usage and S/390 Usage Pricing Charges                                    Page   2
IFAURP 4.1.2                          Software Product Registration Report                    14 DECEMBER  2015
----------                                                                                    ---------------
ACME CICS
CELL BLOCK
HURSLEY, W
Contact/Ph

----------                                                                                    -------------
Name                                                                                      ct   Nov   Dec
----------                                                                                    ----  ----
                                                                                              -     -     -
                                                                                              -     -     -

z/OS Conne                                                                                    -     -     -

==========                                                                                    ===============
  #  - Dat
N/A  - Pro
(01) - Not eligible for Measured Usage charges.
```

```
---------------------- Product ----------------------2015
Name              Feature          Version  Number   L| Dec
---------------- ---------------- -------- -------- -|----
                                   Max MVS/ESA LPARs:|   1
                                Percent Missing Hours:|  97
                                                      |
                                            # 13Dec15 |
                                                      |
z/OS Connect     z/OS Connect     02.00.00 5655-CEE F|  19#
                                            # 13Dec15 |
                                                      |
==============================================================
  #  - Data not collected for a full month.
N/A  - Product registration counts are not available.
(01) - Not eligible for Measured Usage charges.
```

z/OS Connect with IMS (Mobile Feature Pack)





IMS Mobile Feature Pack **73%** aggregate improvement in throughput from z13 and IBM Java8

(Controlled measurement environment, results may vary)

Get ahead of the game! *Register your interest today*

Preview potential capabilities plus the chance to give direct feedback

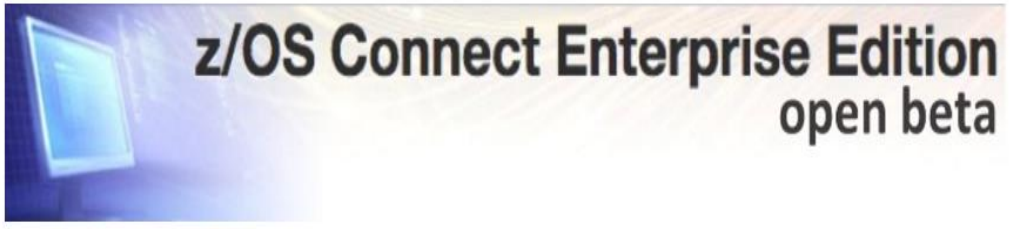
IBM z/OS Connect Enterprise Edition open beta

Downloadable files

Abstract

The z/OS Connect Enterprise Edition open beta offering is to be made available, unsupported by IBM, to enable you to evaluate its features at no charge, for a limited period.

Download Description



IBM z/OS Connect Enterprise Edition (EE) extends the value of applications that run on z/OS by allowing efficient and scalable APIs for contemporary mobile and cloud applications to be easily created.

ibm.biz/zosconnectopenbeta

Summary

IBM z/OS Connect Enterprise Edition

Product summary review

Announcement letter ENUS215-493

ibm.biz/zosconnect20_announce

IBM z/OS Connect Enterprise Edition (EE) V2.0 is the latest evolution of z/OS Connect! z/OS Connect EE V2.0 is a priced offering, orderable via Shopz as PID **5655-CEE**.

z/OS Connect EE V2.0 includes

- A dedicated Liberty profile for z/OS
  - *GA release includes Liberty V8.5.5.7*
- New Eclipse-based tooling for API composition with SWAGGER
  - *Delivered through IBM Explorer for z/OS V3.0 Aqua*
- The WOLA service provider for access to CICS and BATCH
  - *Including the WOLA Liberty feature*
- Utilities to generate service archives for use with CICS programs
  - *Creates JSON schemas as input for API composition*
- The REST client for access to "3rd party" REST services
  - *e.g. JAX-RS applications hosted on WAS for z/OS*

Available now!

IBM IMS Enterprise Suite V3.2.1

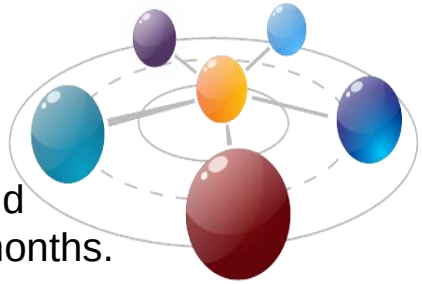
Delivers day-one support for z/OS Connect EE V2.0

- IBM IMS Enterprise Suite V3.2.1 is the latest release of components that support open integration technologies to enable new application development and extend access to IMS transactions and data.

- IMS Enterprise Suite V3.2.1 includes
  - IMS Mobile Feature Pack for z/OS Connect Enterprise Edition
    - The IMS mobile feature (service provider) for z/OS Connect EE, enabling integration of IMS Transactions with z/OS Connect EE
  - IMS Explorer for Development
    - Support for generating service archives for use with IMS transactions

Statements of general direction

ENUS215-493, December 1st, 2015



IBM intends to deliver IBM z/OS Connect Enterprise Edition (EE) components and technologies through **continuous delivery of new features** in the coming months.

IBM intends that a future release of IBM **CICS Transaction Server** for z/OS (CICS TS) will provide support for z/OS Connect EE to enable it to execute **embedded within CICS TS**. *(zCEE V2.0 APAR PI56615 / CICS TS V5.2 PI54207 / CICS TS V5.3 PI54208)*

IBM intends that a future release of IBM **MQ** for z/OS will provide support for **both** z/OS Connect and z/OS Connect EE.

IBM intends to update IBM **System Automation** for z/OS V3.5.0 to deliver a new sample policy to allow automated operations and restart of z/OS Connect and z/OS Connect EE.

IBM intends that a future release of IBM **IMS Enterprise Suite** will provide support for z/OS Connect EE. *(Delivered ! IMS ES V3.2.1)*

IBM intends to offer IBM **DB2** for z/OS Version 11, or later, with support for the external interface delivered in z/OS Connect EE V2.0, and DB2 RESTful API support that is fully integrated into the DB2 for z/OS Distributed Data Facility.

Notices and Disclaimers

Copyright © 2016 by International Business Machines Corporation (IBM). No part of this document may be reproduced or transmitted in any form without written permission from IBM.

U.S. Government Users Restricted Rights - Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IN NO EVENT SHALL IBM BE LIABLE FOR ANY DAMAGE ARISING FROM THE USE OF THIS INFORMATION, INCLUDING BUT NOT LIMITED TO, LOSS OF DATA, BUSINESS INTERRUPTION, LOSS OF PROFIT OR LOSS OF OPPORTUNITY. IBM products and services are warranted according to the terms and conditions of the agreements under which they are provided.

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law

Notices and Disclaimers Con't.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. IBM EXPRESSLY DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The provision of the information contained h erein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

IBM, the IBM logo, ibm.com, Aspera®, Bluemix, Blueworks Live, CICS, Clearcase, Cognos®, DOORS®, Emptoris®, Enterprise Document Management System™, FASP®, FileNet®, Global Business Services ®, Global Technology Services ®, IBM ExperienceOne™, IBM SmartCloud®, IBM Social Business®, Information on Demand, ILOG, Maximo®, MQIntegrator®, MQSeries®, Netcool®, OMEGAMON, OpenPower, PureAnalytics™, PureApplication®, pureCluster™, PureCoverage®, PureData®, PureExperience®, PureFlex®, pureQuery®, pureScale®, PureSystems®, QRadar®, Rational®, Rhapsody®, Smarter Commerce®, SoDA, SPSS, Sterling Commerce®, StoredIQ, Tealeaf®, Tivoli®, Trusteer®, Unica®, urban{code}®, Watson, WebSphere®, Worklight®, X-Force® and System z® Z/OS, are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.

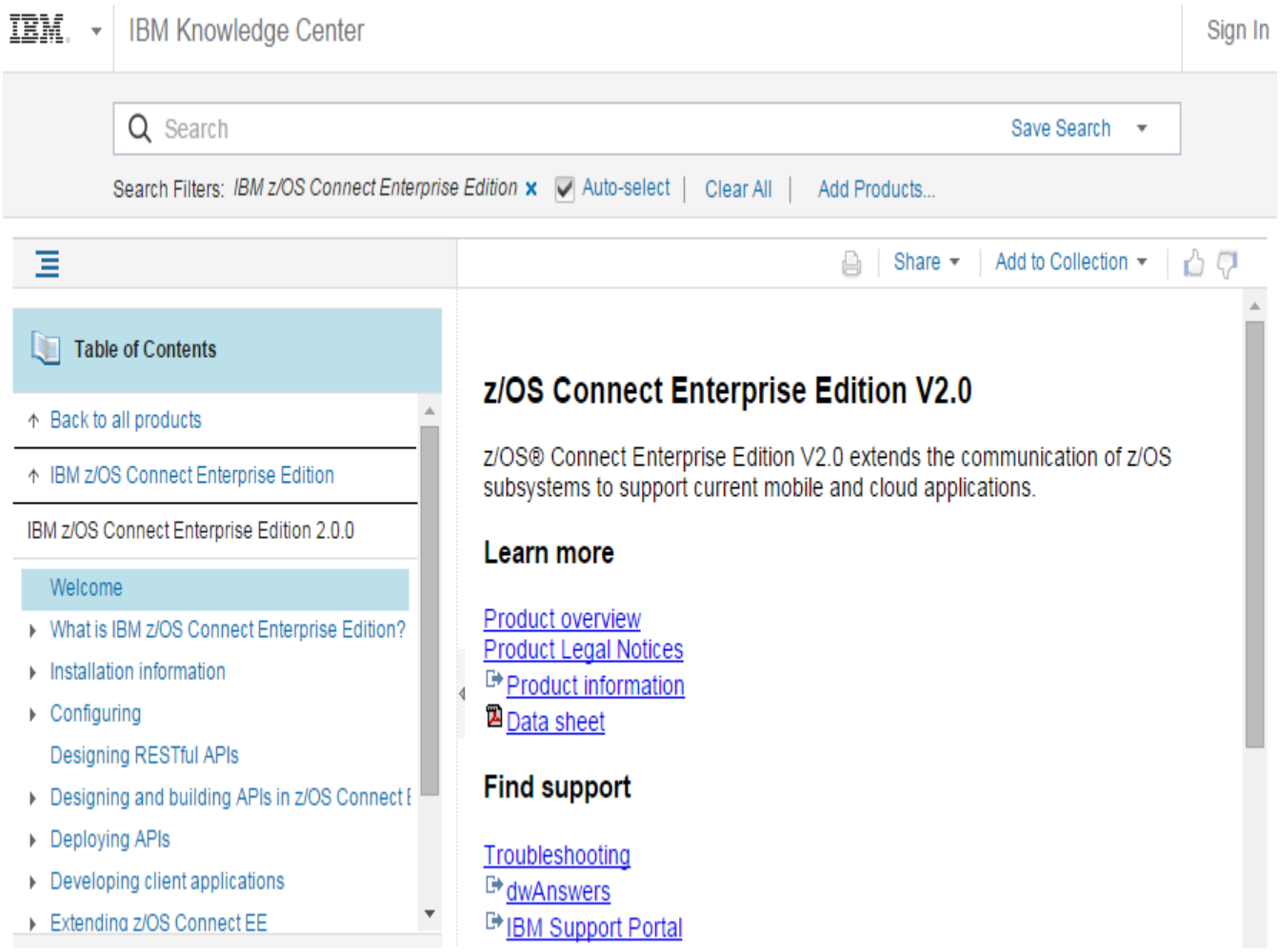
Thank You

IBM z/OS Connect EE

Further information

Want to know more?

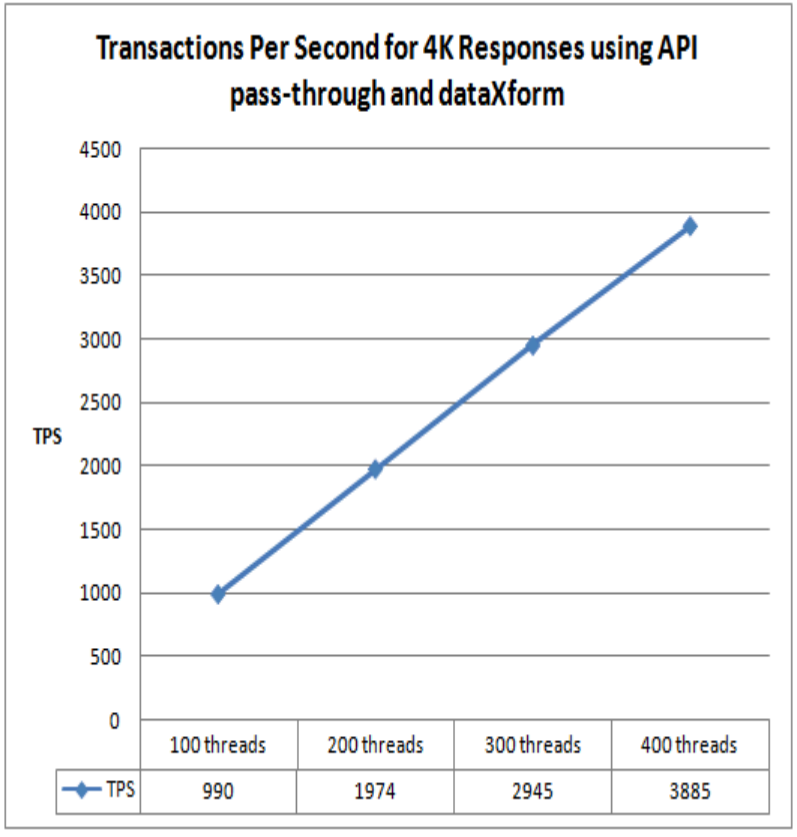
z/OS Connect EE Knowledge Center

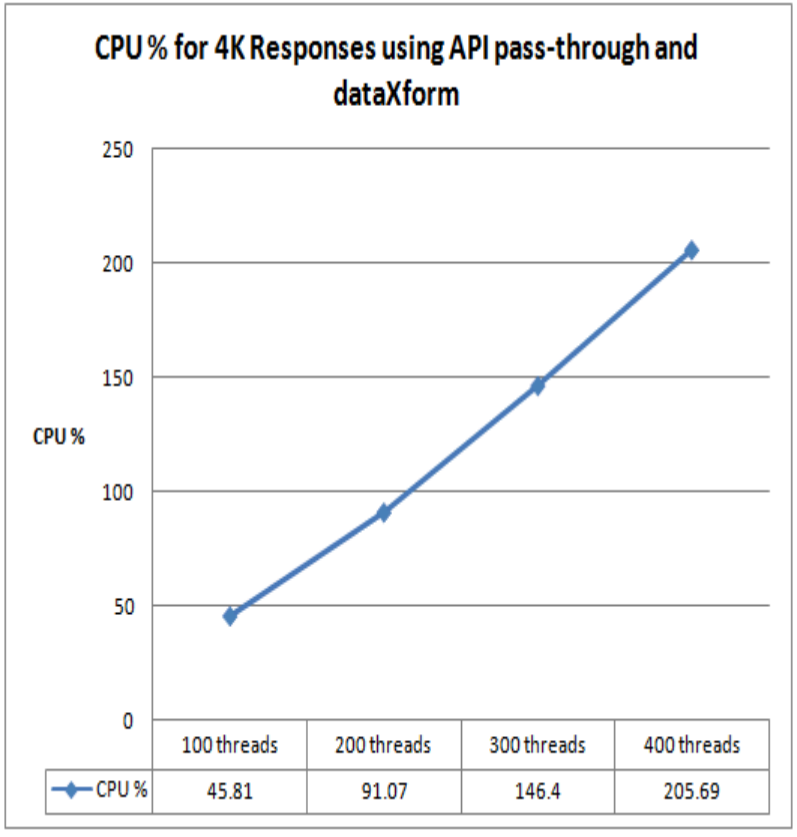


ibm.biz/zosconnect20_kc

z/OS Connect EE V2.0 Performance

SupportPac CP02: *IBM z/OS Connect Enterprise Edition Performance Reports*



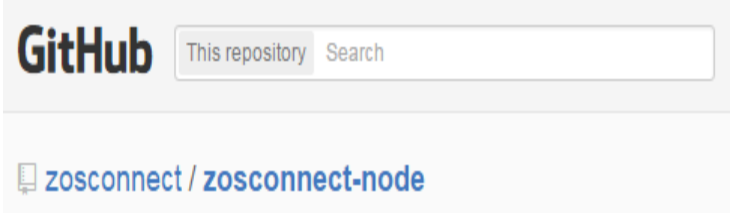


Lab-based performance summaries for z/OS Connect EE V2.0, with regular updates aligned with the product continuous delivery lifecycle

z/OS Connect support for node.js developers

Introducing the **z/OS Connect for node.js** project. Want to contribute to it's evolution? *It's happening in the open…*

JavaScript programmers eat and breathe JSON & REST; node.js is now the de-facto runtime framework used on the server. **Today**, node.js is available on many platforms,



A wrapper service for z/OS® Connect, enabling node applications to discover and access IBM z Systems resources that are service-enabled by z/OS® Connect.

github.com/zosconnect/zosconnect-node

www.npmjs.com/package/zosconnect-node

IBM Redbooks guide

Mobile and API Economy

IBM z Systems Integration Guide for the Mobile and API Economy

Redbooks®

Richard Gamblin

Rob Jones

Nigel Williams

Abstract

Today, organizations engage with customers, business partners, and employees who are increasingly using mobile technology as their primary general-purpose computing platform. They have an opportunity to fully embrace this new mobile technology for many types of transactions, including everything from exchanging information to exchanging goods and services, from employee self-service to customer service. This mobile engagement allows organizations to build new insight into the behavior of their customers to better anticipate customer needs and gain a competitive advantage by offering new services.

By extending existing enterprise applications onto a mobile platform you can capitalize on existing investments without the need to develop completely new solutions to support mobile services. Because nearly 70% of all enterprise transactions touch a mainframe, IBM z SystemsTM has an important role in enabling existing and new mainframes to be easily consumed by mobile applications, for example, through REST APIs. These same APIs can be consumed through other channels and applications, both on-premises and in the cloud.

Profile

Last Update
01 December 2015

Rating: ☆☆☆☆☆
(based on 1 review)

→ Rate this Draft

Author(s)

- Richard Gamblin
- Rob Jones
- Nigel Williams

ISBN-10
0738454788

ISBN-13
9780738454788

IBM Form Number
REDP-5319-00