Extending z/TPF using IBM API Management (APIM)

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What is TPF, Who Uses It, and Why
What is TPF

• **z/Transaction Processing Facility** (z/TPF) is the market-segment dominant transaction processor... but it is much more than just a transaction processor.

• z/TPF is an operating system, transaction processor and a unique database, all designed to work together as one system.

• The transaction processor and operating system are specifically designed for high-volume transactions in a real-time environment.
Important Industries Powered by z/TPF

Travel & Transportation
- American Airlines
- U.S. Airways
- Singapore Airlines
- Marriott
- Thai Airways
- Air Canada
- InterContinental Hotels Group
- KLM
- ANA
- SNCF
- Trenitalia

Banking
- American Express
- Visa
- Citi
- Wells Fargo

Other
- FedEx
- Internal Revenue Service
TPF’s Claim to Fame

• z/TPF is optimized to support:
  • Fast, consistent access (less than one millisecond on current systems) to write intensive data in a large, single image database providing one consistent view of your critical data
  • Millions of moderate to complex transactions/second
  • Billions of end users

...all while providing superior reliability, availability and serviceability (RAS)

• If you have ever booked an airline or train ticket, stayed in a hotel, or swiped your credit card, odds are you have used TPF

Minimizing the total cost per transaction in a highly available environment
IBM API Management (APIM)
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
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

1. Develop Services (Web or REST)

2. Develop Enterprise APIs

3. Mobile/Cloud App Enablement

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

Cloud-based Services

Access to systems of records and enterprise data via APIs

Mobile Applications

Cloud APIs

Enterprise Services

z/TPF

CICS

IMS

WAS
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
API Management Roles – Who Does What

1. Develop Services (Web or REST)
2. Develop Enterprise APIs
3. Mobile/Cloud App Enablement

Mobile Applications

Cloud APIs

Access to systems of records and enterprise data via APIs

Cloud-based Services

- Enterprise API Management
- Security & Integration API Gateway
- APIM Communication with GW

Mobile/Cloud Portfolio API

Cloud-based Services

- Integrated Databases, SDK/APIs, and Marketplace
- API Development Tools

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

Enterprise APIs

Develop services on z/TPF
APIM Roles – Who Does What

1. Develop Services (Web or REST)
   - Create APIs from z Systems services
   - Entitlement management
   - Usage monitoring and analytics

2. Develop Enterprise APIs

3. Mobile/Cloud App Enablement

On-Premise API Management
- Create, Publish, Manage & Socialize APIs (IBM API Management)
- Security & Integration API Gateway (IBM DataPower Appliance)
- APIM Communication with GW

Cloud APIs
- Access to systems of records and enterprise data via APIs
- Cloud-based Services
- Mobile/Cloud Applications

Mobile Applications

Develop services on z/TPF
APIM Roles – Who Does What

1. Develop Services (Web or REST)
   - Create APIs from z Systems services
   - Entitlement management
   - Usage monitoring and analytics

2. Develop Enterprise APIs
   - On-Premise API Management
   - Create, Publish, Manage & Socialize APIs (IBM API Management)
   - Security & Integration API Gateway (IBM DataPower Appliance)

3. Mobile/Cloud App Enablement
   - Create applications that invoke APIs to access back-end services

Develop services on z/TPF
IBM Demo Overview
z/TPF APIM Demo Environment
Web Services Exist on your z/TPF System
z/TPF APIM Demo Environment
Use IBM APIM to Define/Deploy APIs that Map to z/TPF Web Services
z/TPF APIM Demo Environment
Use IBM MobileFirst to Develop Mobile App Using Published APIs
z/TPF APIM Demo Environment
Use IBM MobileFirst to Deploy Mobile App
z/TPF APIM Demo Environment Transactional Flows Mobile App Issues API
z/TPF APIM Demo Environment Transactional Flows
API is Converted to a Web Services Call to z/TPF

IBM MobileFirst → REST (JSON) → DataPower

IBM APIM

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

IBM MobileFirst

IBM APIM

DataPower

z/TPF

REST (JSON)

SOAP (XML)

SOAP (XML)
z/TPF APIM Demo Environment Transactional Flows
Web Services Response is Converted to API Response
Sample IBM APIM Screen Shots
Using APIM to Create Booking API based on the Booking Web Service

<table>
<thead>
<tr>
<th>Available values</th>
<th>Transformation</th>
<th>Input variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
<td>Sample</td>
<td>Field</td>
</tr>
<tr>
<td>Request</td>
<td></td>
<td>Request</td>
</tr>
<tr>
<td>Parameters</td>
<td></td>
<td>body</td>
</tr>
<tr>
<td>* xy flight</td>
<td>fnum</td>
<td>* Booking</td>
</tr>
<tr>
<td>* xy date</td>
<td>fdate</td>
<td>xy flightNum</td>
</tr>
<tr>
<td>* xy orig</td>
<td>forig</td>
<td>xy flightDate</td>
</tr>
<tr>
<td>* xy dest</td>
<td>fdest</td>
<td>xy originCity</td>
</tr>
<tr>
<td>* xy name</td>
<td>pname</td>
<td>xy destinationCity</td>
</tr>
</tbody>
</table>

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Use APIM Test Wizard to Verify the New Booking API

**Resource**

<table>
<thead>
<tr>
<th>Method</th>
<th>Path</th>
<th>Display name (optional)</th>
<th>Description (optional)</th>
<th>Identification</th>
<th>Authentication</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/bookit?flight={fmu}</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>×</td>
</tr>
</tbody>
</table>

**Parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Required</th>
<th>Value</th>
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</thead>
<tbody>
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<td>JO100</td>
</tr>
<tr>
<td>data</td>
<td></td>
<td>✓</td>
<td>DEC02</td>
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<tr>
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<td></td>
<td>✓</td>
<td>JFK</td>
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<tr>
<td>dest</td>
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<td>✓</td>
<td>ODR</td>
</tr>
<tr>
<td>name</td>
<td></td>
<td>✓</td>
<td>JIMBO</td>
</tr>
</tbody>
</table>
Test Wizard Booking API Response Screen

HTTP Reply Status Code

Confirmation code in Booking API response
Use APIM to Set Limits for Availability API within a Given Plan
APIM Developer Portal View of APIs Available to this Application Developer

Welcome to the zTPF_APIM_Demo Developer Center

- facebookAgent (REST)
  - Feb 16, 2015
- availability (SOAP)
  - Mar 9, 2015
- rAvailability (REST)
  - Mar 9, 2015
- booking (REST)
  - Mar 9, 2015
- rCancel (REST)
  - Mar 9, 2015
- rQuery (REST)
  - Mar 9, 2015
- booking (SOAP)
  - Mar 11, 2015
Sample Screen Shots from the Demo
Mobile App Check Flight Availability Screen

- Origin City: Chicago O'Hare, IL
- Destination City: Fort Lauderdale, FL
- Date: Sept. 3

Check Availability
Mobile App Check Flight Availability Response

Various Flight Options Displayed
Mobile App Booking Response

FLIGHT CONFIRMATION

Trip Successfully Booked. Confirmation Code: WAPZNW

Click 'MY Trips' to view booked flights.
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
- APIM can be used to access back-end services on z Systems and other platforms
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Notes

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