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Digital Transformation is Driving API Evolution

Emerging API Needs:
- Microservices
- Event-Driven
- Serverless/FaaS
- Edge Machine Learning
- Conversational Experiences
- Streaming Realtime Data
Gateways Need to Evolve Too

Existing gateways not built for:

- Developer Tooling
- Microservices Choreography
- Complex Message Patterns
- True “micro” Footprint
- Service Meshes
So, What Changes?

“By 2020, 50% of organizations managing APIs will Incorporate event-driven APIs into their architecture” * 

<table>
<thead>
<tr>
<th>RESTful APIs</th>
<th>Event-Driven APIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client Driven</td>
<td>Client or Server Driven</td>
</tr>
<tr>
<td>Inherently Synchronous</td>
<td>Inherently Asynchronous</td>
</tr>
<tr>
<td>Must be Available</td>
<td>Can be Buffered</td>
</tr>
<tr>
<td>One to One</td>
<td>Can be Many to Many</td>
</tr>
<tr>
<td>Service Mediation</td>
<td>Event Mediation</td>
</tr>
</tbody>
</table>

* Source: Gartner; The Impact of Event-Driven IT on API Management (April 2017)
Good: Request/Response API Today

- Request/response pattern; fixed inputs & outputs
- Streaming data or server-side pushes not supported
- Works best with well defined, repeatable use cases
Better: Microservices Request/Response API

- Fine-grained APIs improve scalability & response
- Supports serverless and FaaS consumption
- Isolated services easier & faster to change
- Request/response pattern limits API use cases
“Among development managers who said that changing their business model was likely to be a critical or high business priority, 62% already have microservices or plan to have them by early 2018.”

“...among those having implemented REST APIs, only 25% say that all or nearly all of them are designed as entirely CRUD APIs, which shows that many organizations feel the need to go against the religion.”

“...among development managers with internal APIs, 23% said they have important use cases, where one call to an API must update multiple applications.”
Best: Event-Driven Microservices & APIs

- Event based, behavior is flexible
- Mixed MEPs supported
- Events can come from anywhere
- Best approach for realtime applications
The Evented Microservices Developer Gap

**Tooling**
- Event handlers
- Loosely coupled events
- Pub/sub & other MEPs
- Codeless tooling

**Lightweight Runtime**
- Minimal overhead
- Distributed & federated
- Easy to modify

**Multi-Architecture**
- Support for Edge Computing
- Serverless & FaaS
- Service mesh interop
Current Marketplace Options

API Gateways
- Traditional API Gateways
- Commercial Products
- Sophisticated Security & API Mgt Policies

However…
- Lack Eventing Capabilities
- Are Heavyweight

Service Meshes
- Microservices-Oriented
- Open Source
- Layer for Service Interaction, Reliability & Monitoring

However…
- Lack Eventing Capabilities
- Lack API-Led Development

Microgateways
- Lighter Weight Than API Gateways
- Open Source
- Simple Proxy for Request/Response

However…
- Lack Eventing Capabilities
- Light on Operational Functions
Project Mashling
The Only Open Source Event-driven Microgateway

- Ultralight & Embeddable
- Event-driven by design
- Complements service meshes
- Publish APIs to Mashery
How Project Mashling Adds Value

**Speeds Up Microservices Development**
Mashling accelerates developer productivity for microservices with visual tooling and sharable, flow-based recipes.

**Foundation for Evented APIs and Applications**
Composable, event-driven microservices and APIs that interoperate with service mesh open source, can be developed using the Mashling framework.

**Extreme Flexibility in Gateway Deployment**
Small 5MB footprint runs anywhere and can be embedded in edge devices or deployed as a federated microgateway co-located with applications.
Embracing Open Source, Sharing Our Innovations

Leverage open source projects or partner with TIBCO for commercial enterprise-ready versions, with support services

Project Flogo
Ultralight Edge Microservices Framework

Project Mashling
Open Source Event-Driven Microgateway
Open Source, TIBCO’s Foundation For Innovation

TIBCO Mashery
- Commercial support with Mashery Local
- Available Q4 2017

Open Source
Project Flogo
Develop Ultralight Microservices
- Developer-Centric Focus
- GoLang based & visual flow designer
- Edge Device & IoT Optimized
- FaaS & Serverless Support
- 100% OSS + Community Support

Open Source
Project Mashling
Event-Driven Microgateway
- Developer-Centric Focus
- Available Now
- Re-usable Recipes
- Service Mesh Compatibility
- 100% OSS + Community Support
Sample Customer Scenarios

**Telco Example**
- Existing TIBCO customer
- Large scale BW Engines
- Multiple legacy gateways
- New landscape = BWCE + SpringBoot + Pivotal CF

Key requirement is a developer friendly microgateway

**Retailer Example**
- New TIBCO customer
- Landscape is BW Container Edition + Flogo + Docker

Key requirement is an embeddable gateway framework that works with service meshes

**Manufacturing Example**
- Large OEM TIBCO customer
- Landscape = Thingworx + Spotfire + Custom apps

Key requirement is an embeddable gateway for IOT devices and edge
Federated Gateways and Microservices

- **Serverless / FaaS**
  - $F(x)$
  - $F(y)$

- **Docker Swarm**
  - Bounded Microservices
  - Kafka / MQTT

- **Kubernetes**
  - Bounded Microservices
  - TIBCO Messaging

- **SOA/ESB Domain**
  - Svc A
  - Svc B

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**Federated Gateway Architecture**

<table>
<thead>
<tr>
<th>Embedded Gateway</th>
<th>Cloud Gateway</th>
<th>On-Prem Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer Portal</td>
<td>API Creation</td>
<td>API Policies</td>
</tr>
<tr>
<td>API Packager</td>
<td></td>
<td>Analytics</td>
</tr>
</tbody>
</table>
User Persona - Aaron Ramos, the Microservices Dev

- Developer building microservices
- Preferred toolchain: Node.js, Go, Kafka, Docker, Envoy
- Typically part of a 2-pizza team with end-to-end DevOps responsibility for the microservice
- Interested in event-driven patterns

*NOT your typical API Product Manager persona nor an API Gateway Operator*
Project Mashling Demo
How can I get started?

• [http://mashling.io](http://mashling.io) to browse, download and customize microgateway recipes

• [github.com/tibcosoftware/mashling](https://github.com/tibcosoftware/mashling) for access to CLI, library and extensions
Illustrative Customer Landscape - Federated Gateways & Microservices

API Platform

- Dev Portal
- Analytics
- API Packager
- API Policies
- Federated API Gateway
- On Prem
- Cloud
- IoT

Serverless & FaaS

Microservices
- Bounded Context A
  - Docker Swarm
- Bounded Context B
  - Kubernetes

Kafka/MQTT

Microservices

TIBCO Messaging

SOA/ESB Domain

Serverless & FaaS

Federated Gateways & Microservices

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