Hybrid Integration Underpins Digital Transformation

Rob Nicholson,
IBM Distinguished Engineer & Master Inventor
rob_nicholson@uk.ibm.com
Linkedin: https://uk.linkedin.com/in/robertbnicholson
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Agenda

• Digital Transformation
• What is ‘Hybrid’ Integration & the trends that drive it?
• Digital Transformation enabled through Hybrid Integration
• IBM Integration Products (very briefly)
Uber, the world’s largest taxi company, owns no vehicles. Facebook, the world’s most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world’s largest accommodation provider, owns no real estate. Something interesting is happening.

http://techcrunch.com/2015/03/03/in-the-age-of-disintermediation-the-battle-is-all-for-the-customer-interface/#.pgfhdr:o98A
Organizations are seeking a Strategy to securely unlock value from existing IT assets.

Exposed as APIs

Existing IT Investments

Self Service Consumed by Developers

To Develop Innovative Apps


Where are these investments and what teams need to be involved?

Who are these users and what tools do they need?

What are the SLA characteristics needed to make this app a success?
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What is integration?…..
Patterns we commonly see.

<table>
<thead>
<tr>
<th>Event-action</th>
<th>One-way Data Replication</th>
<th>Two-way Data Synchronization</th>
<th>N-way Data Synchronization</th>
</tr>
</thead>
<tbody>
<tr>
<td>When this happens</td>
<td>Make this happen</td>
<td>System A Propagate all existing data and subsequent changes</td>
<td>System B E.g. Replicate my product catalogue to a NoSQL database for my Mobile App</td>
</tr>
<tr>
<td>E.g. Every time the stock level breaches a threshold -&gt; Order more stock</td>
<td>E.g. Make up to date master customer data visible in my SaaS CRM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>API composition</td>
<td>Invoke multiple backends in parallel.</td>
<td>Map and transform responses</td>
<td>E.g. Provide a cloud scale NoSQL DB to my Mobile App, sync’d with my SOR</td>
</tr>
<tr>
<td>API</td>
<td>Call backend 1</td>
<td>Hide protocol complexity in back-end systems</td>
<td>E.g. Keep my ERP system sync’d with my SaaS CRM</td>
</tr>
<tr>
<td>Call backend 2</td>
<td>Call backend 3</td>
<td>System A Dump data and changes</td>
<td>Primary</td>
</tr>
<tr>
<td>Reply</td>
<td>Data &amp; changes</td>
<td>System B Dump data &amp; changes</td>
<td>Secondary 1</td>
</tr>
<tr>
<td>Data Copy</td>
<td>E.g. Generate a new sales report every day at 7:30am, and send via e-mail</td>
<td>System A Dump data and changes</td>
<td>Secondary 2</td>
</tr>
<tr>
<td>API Trigger</td>
<td>Process all results from a query</td>
<td></td>
<td>E.g. Keep my ERP, CRM and Marketing systems in Sync</td>
</tr>
<tr>
<td>Generate a new dataset</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Trends driving the integration market

#1 Integration being adopted in the line of business (LOB)

#2 Increasing need to integrate across a hybrid environment

#3 Digital transformation, API Economy and the rise of Microservices
Hybrid User Roles

Cloud based

- Anyone can do it
- Zero code
- Cloud native
- Many pre-configured connectors

On Premises

- Technical person in a business environment
- Cloud native with on prem options
- Friendly modern style code
- Graphical options

- Skilled integration practitioners
- Graphical assist, but full code environment.
- Hybrid deployment
- Connect to anything
Integrating across a Hybrid Environment

**Hybrid Deployment**
- Integration Deployed into Infrastructure as a Service, Platform as a Service
- Integration as Software as a Service

**Hybrid Connectivity**
- Source and target systems
- On-prem, public IaaS, SaaS

**Hybrid Integration Styles**
- API Integration
- Data Centric Integration
- Event based integration
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Hybrid Integration
The foundation of digital transformation

Disrupting
- Take the company mobile
- Enter the API economy
- Refactor for innovation

Growing
- Modernize Applications
- Enable business users

Aligning
- Unlock systems of record
- Synchronize systems of record
- Embrace external sources
Common use cases for hybrid integration within digital transformation

A. API Monetization
   Enable new channels for revenue by monetizing existing data via the API economy

B. Productivity
   Enable line of business to automate their own work across SaaS and existing systems of record

C. Refactor for innovation
   Make a fundamental shift to a composable application architecture, and cloud-based partners, to enable innovation.
Digital Transformation Creates Multi-Modal IT

Digital
- Timeframe: Days/Weeks
- Scope: Strategic
- Sponsor: CMO
- Budget: $
- Complexity: Low
- Buying behavior: Self service

Explore, adopt, adapt with rapid, iterative prototypes

Digital Teams

Enterprise
- Timeframe: Months/Years
- Scope: Strategic
- Sponsor: CIO
- Budget: $$$
- Complexity: High
- Buying behavior: Human engagement

Always on, always available
Security, control, and governance
The digital front door

API & Event Gateway

Mobile Partners API Economy IoT SaaS Offerings

http://ibm.biz/HybridIntRefArch
Digital Teams

Hybrid Integration

- Systems of Engagement
- Business logic

Empowering Digital teams

Core Business Operations

Cloud affinity

API & Event Gateway

- API Composition
- Events
- Data Synchronisation

“Digital” connectivity

On-Premise

http://ibm.biz/HybridIntRefArch
Typically a Micro Service Architecture
What is microservices architecture?

Simplistically, microservices architecture is about breaking down large silo applications into more manageable fully decoupled pieces.

A microservice is a granular decoupled component within a broader application.
Why Microservices?

Small scoped, independent, scalable components

Scaling
  Elastic scalability
  Workload orchestration

Agility
  Faster iteration cycles
  Bounded context (code and data)

Resilience
  Reduced dependencies
  Fail fast
What that might look like in IBM technology?
(simplistic representation – NOT a reference architecture!)
Microservices inter-communication

Aim is decoupling for robustness

Messaging where possible
- Lightweight messaging (e.g. AMQP, Apache Kafka)
- Publish/subscribe
- Eventual consistency

Direct calls where necessary
Lightweight protocols (e.g. JSON/HTTP)
- Load balancing/scaling via service discovery
- Circuit breaker
- Caching
An Evolving Architecture for Digital Business

Hybrid Integration

- Systems of Engagement
- Business logic

Empowering Digital teams

Core Business Operations

API Composition
Events
Data Synchronisation

“Low level” connectivity

System Of Record
System Of Record
System Of Record

API & Event Gateway

“Digital” connectivity

Cloud affinity

SaaS SoR(s)

On-Premise

XaaS

http://ibm.biz/HybridIntRefArch
Enterprises of different shapes

**Mature large enterprise**

Microservices are just one style of application
Exposing services is an *integration and data* challenge

**Green field online start-up**

Much of landscape could be microservice based
The landscape is as (micro)service oriented architecture
A glimpse into the complexities of a real integration architecture
The long tail of integrations

Candidates for traditional deep enterprise integration

Candidates for shadow IT integration (iPaaS)

Candidates for business user integration (iSaaS)

Business benefit
- High
- Low
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IBM Hybrid Integration Platform

Fit-for-User Experiences
- Tooling optimized for key uses so simple stays simple
- Automator, Integrator, Developer

Centralized Ops, Distributed Runtimes
- Administer from single hub
- Run hosted on IBM cloud or BYO compute
- Push runtimes to other clouds or on-prem

Shared Assets, Common Tooling
- Consume any asset (apis, data, flows, …) across experiences
- Emphasize “Golden Thread” scenarios

Hybrid Enabled
- Run integrations near your apps and data
- Make secure, managed connections across boundaries
- Control and Enforce policies to secure your APIs
Mapping to IBM Products - Platform

- Bluemix

API & Event Gateway

- API Composition
- Events
- Data Synchronisation

“Low level” connectivity

- System Of Record
- System Of Record
- System Of Record

“NoSQL” connectivity

Cloud affinity

SaaS SoR(s)

XaaS

On-Premise

API & Event Gateway

- Mobile
- Partners
- API Economy
- IoT
- SaaS Offerings
Mapping to IBM Products – API & runtime

API Connect
Manage/secure

API Connect
Create/Run

WAS
Liberty

API Connect
Manage/secure

API & Event Gateway

API Composition

Events

Data Synchronisation

System Of Record

System Of Record

System Of Record

“Low level” connectivity

“Digital” connectivity

SaaS SoR(s)
Mapping to IBM Products - Integration

MQ/MQ Light
Message Hub
Cast Iron/ App Connect Application Integration Suite
IIB
Z/OS Connect
MQ

API & Event Gateway

API Composition
Events
Data Synchronisation

“Digital” connectivity

“Low level” connectivity

System Of Record
System Of Record
System Of Record

SaaS Offerings
API Economy
IoT
Mobile
Partners

NoSQL
NoSQL

System Of Record

SoR(s)

Low level connectivity
IBM’s Integration Bus (IIB) in the Hybrid Cloud

- **Cloud Bursting**
  - IIB on Cloud
    - Callable Flow
- **Callable Flows**
  - IIB on Cloud
    - Flow Invoke
- **Port Forwarding**
  - IIB on Cloud
    - IIB Agent
  - IIB On Cloud
    - only

- **Ground**
  - IIB
    - only
  - IIB
    - Flow Invoke
  - IIB
    - Callable Flow
  - IIB
    - Agent only
IBM API Connect: Simplified & Comprehensive API foundation

What is API Connect?

An integrated creation, runtime, management, and security foundation for enterprise grade API’s and Microservices to power modern digital applications

What does API Connect provide?

- Automated, visual and coding options for creating APIs
- Enterprise grade Microservices creation and management in Node.js and Java
- Access control over API’s, API Products and API Plans
- Advanced API usage analytics and Developer Portal
- Policy enforcement, security and control
What is App Connect?
Integration tooling optimized to make Cloud Integration simple. Business friendly ‘citizen integration’ — but connected to IT tools

What does App Connect provide?
- “App awareness” allows you to connect your apps 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 apps
- Build new connections quickly – your tech team can make connecting to legacy apps as easy as modern ones
IBM App Connect

As easy as choosing your apps...

Preliminary designs shown – final product experience and capability may differ
IBM App Connect – Triggers and Actions

And the events you care about …

Select from preconfigured events and actions in your application.
“App Aware” - The hard work is already done

Shows the triggers and actions for YOUR system

<table>
<thead>
<tr>
<th>Triggers</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Worksheet</td>
<td>Convert Lead</td>
</tr>
<tr>
<td>This is an example</td>
<td>This is an example action</td>
</tr>
<tr>
<td>you can do.</td>
<td>you can do.</td>
</tr>
<tr>
<td>Worksheet Removed</td>
<td>Create Object</td>
</tr>
<tr>
<td>This is an example</td>
<td>This is an example action</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>you can do.</td>
</tr>
<tr>
<td>New Sheet</td>
<td>Delete Object</td>
</tr>
<tr>
<td>This is an example</td>
<td>This is an example action</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>you can do.</td>
</tr>
<tr>
<td>Sheet Removed</td>
<td>Retrieve Contact</td>
</tr>
<tr>
<td>This is an example</td>
<td>This is an example action</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>you can do.</td>
</tr>
<tr>
<td>New Row</td>
<td>Update Contact</td>
</tr>
<tr>
<td>This is an example</td>
<td>This is an example action</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>you can do.</td>
</tr>
<tr>
<td>Row Removed</td>
<td>New Campaign</td>
</tr>
<tr>
<td>This is an example</td>
<td>Triggers when a new Campaign</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>is created</td>
</tr>
<tr>
<td>New Column</td>
<td>New Lead</td>
</tr>
<tr>
<td>This is an example</td>
<td>Triggers when a new Lead is</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>created</td>
</tr>
<tr>
<td>Column Removed</td>
<td>New Account</td>
</tr>
<tr>
<td>This is an example</td>
<td>Triggers when a new Account</td>
</tr>
<tr>
<td>trigger you can do.</td>
<td>is created</td>
</tr>
<tr>
<td></td>
<td>New Contact</td>
</tr>
<tr>
<td></td>
<td>Triggers when a new Contact</td>
</tr>
<tr>
<td></td>
<td>is created</td>
</tr>
<tr>
<td></td>
<td>New Opportunity</td>
</tr>
<tr>
<td></td>
<td>Triggers when a new Opportunity is created</td>
</tr>
<tr>
<td></td>
<td>New Contract</td>
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<td></td>
<td>Triggers when a new Contract is created</td>
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<td></td>
<td>New Order</td>
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<td></td>
<td>Triggers when a new Order is created</td>
</tr>
<tr>
<td></td>
<td>New Case</td>
</tr>
<tr>
<td></td>
<td>Triggers when a new Case is created</td>
</tr>
</tbody>
</table>

Preliminary designs shown – final product experience and capability may differ
IBM App Connect - Map your data

We automatically map everything we can

Add/change any fields that need to be modified

Preliminary designs shown – final product experience and capability may differ
IBM App Connect – Add simple transforms

Add any transforms you need

Uppercase, concatenate, trim blanks, reformat date, currency etc

Preliminary designs shown – final product experience and capability may differ
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Rob Nicholson,
Distinguished Engineer & Master Inventor
rob_nicholson@uk.ibm.com
Linkedin: https://uk.linkedin.com/in/robertbnicholson