IBM Application Integration Strategy and Roadmap

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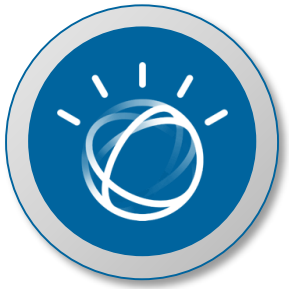
Four primary trends driving the **integration** market today

1. Increasing need to integrate across a **hybrid** environment

2. Increasing need to appeal to **Line of Business** users

3. Digital Transformation driving Increasing need to provide **API-led integration** across apps and data



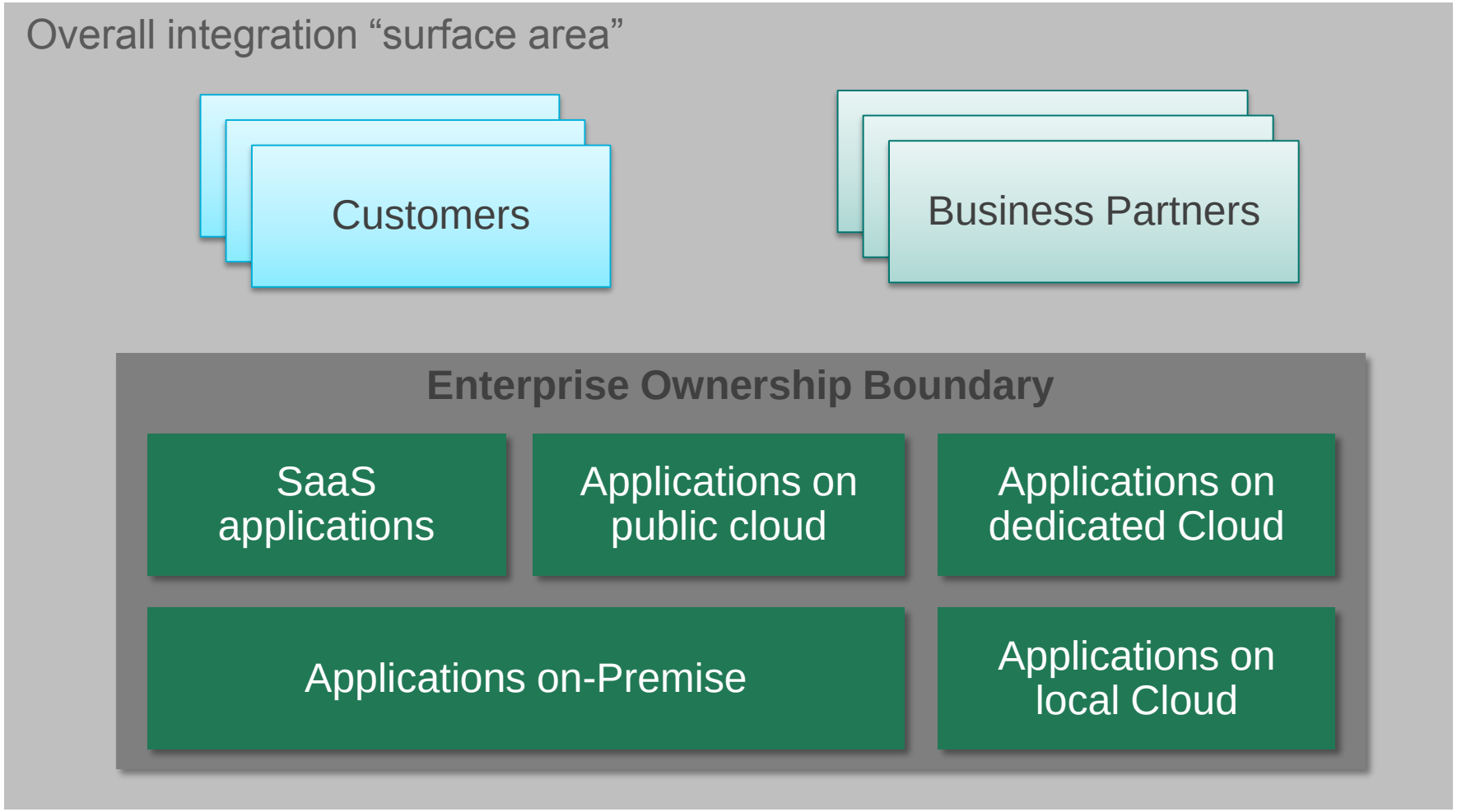
4. Changing **application deployment architectures** challenging traditional integration architectures

Enterprises' ownership boundaries are expanding…

An enterprises' Systems of record are now spread across a heterogeneous, hybrid "surface area"

This increasingly includes multiple cloud vendors, and varying levels of managed service from IaaS to PaaS to SaaS.

The boundary is no longer based on the physical edge of the enterprise, but on the reach of ownership.



23% of spending on cloud solutions happens outside of the IT department - with marketing, sales and human resources most often investing in solutions.

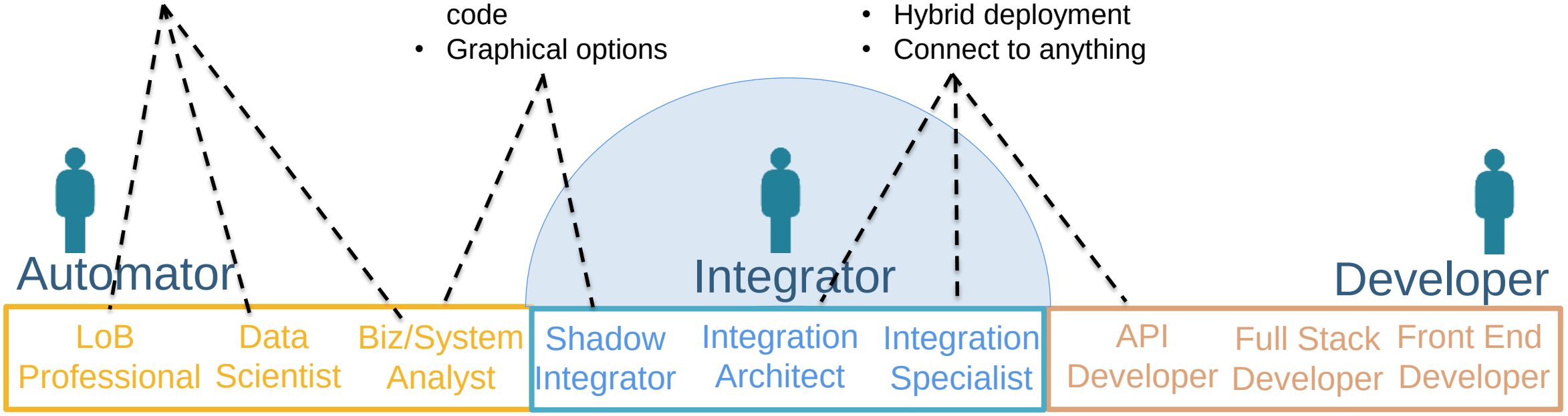
45% of the time, in instances where IT does not lead the project, IT is still called upon to take over the project.

How cloud adoption trends are driven by strategic imperatives

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

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

- **Skilled integration practitioners**
- Graphical assist, but full code environment.
- Hybrid deployment
- Connect to anything



Event-driven and Data-prep tooling

Graphical flow editors & configuration

API driven coding and orchestration

Different Users need a user experience that works for them

Business User

Uses integration tooling to automate work day

Citizen Integrator

Builds lightweight integration between SaaS apps and existing systems to support new systems of engagement and insight

API Developer

Creates and manages API's for use in micro-services based or other applications

Integration Specialist

Unlocks the systems of record for new business models

Business User

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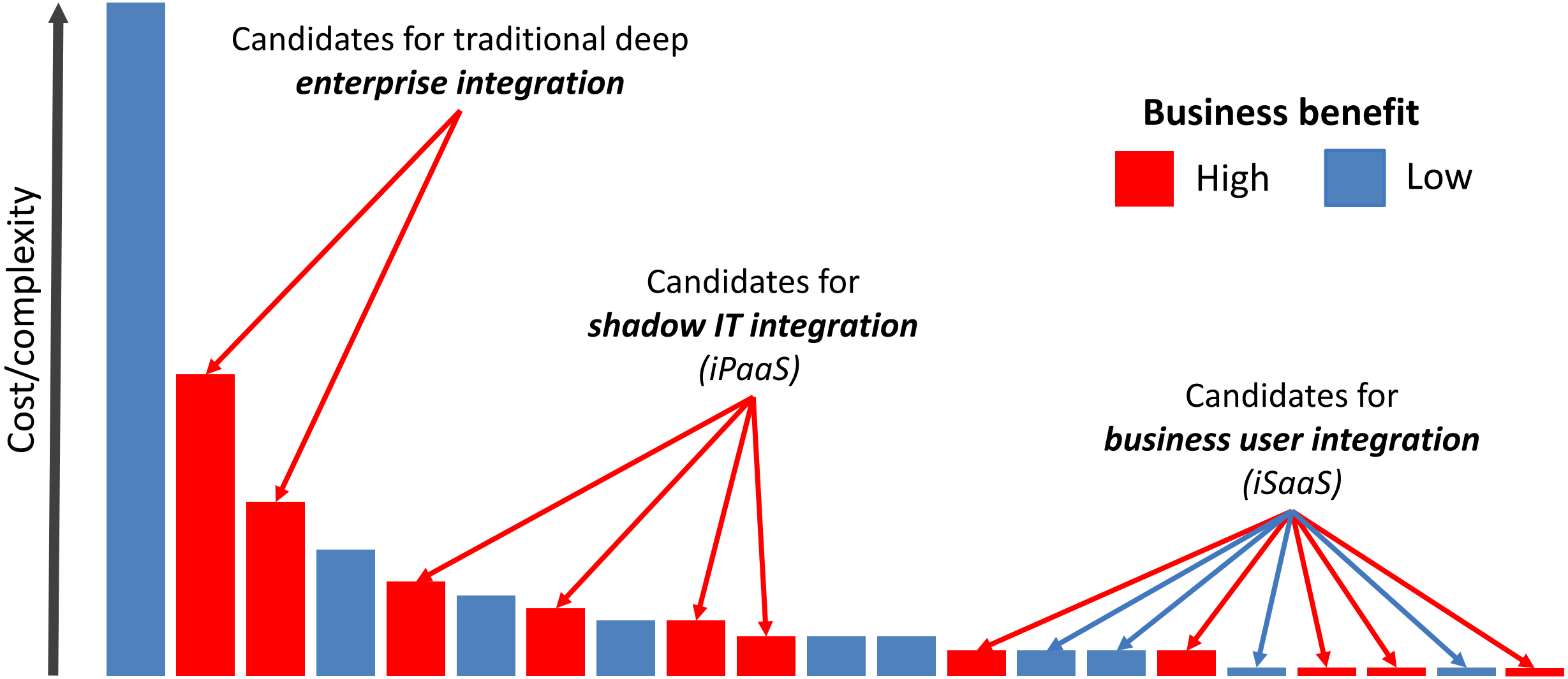
Integration Specialist

Unlocks the systems of record for new business models

In 2017, in large organizations, at least 65% of new integration flows will be developed outside the control of IT departments.

-Gartner

The long tail of integrations



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Engage the line of business

Radically simple integration tooling that connects cloud & on-premise apps

- ✓ Browser based UI for business professionals
- ✓ Automation of manual tasks – notifications, events & updates
- ✓ “App awareness” allows you to connect your apps in minutes
- ✓ Connect your applications wherever they are… cloud or local

Adopt new business applications quickly

Connectors understand the end point to manage scaling, fault recovery, limits, etc…

Pre-built connectors for a broad range of systems and applications (ERP, industry, legacy, etc…)

Basic protocol connectivity (RESTful/SOAP/file/msg/DB)

IBM App Connect

1

Simple

No-code and low-code approach to integration, accessible by users of all skill levels

2

Fast

Pre-built connectors and templates for 100s of SaaS and legacy applications

3

Flexible

Cloud and on-premises options to deploy where most convenient for you

4

Affordable

Pay only for the integration actions you run, with no extra costs for application connectors.

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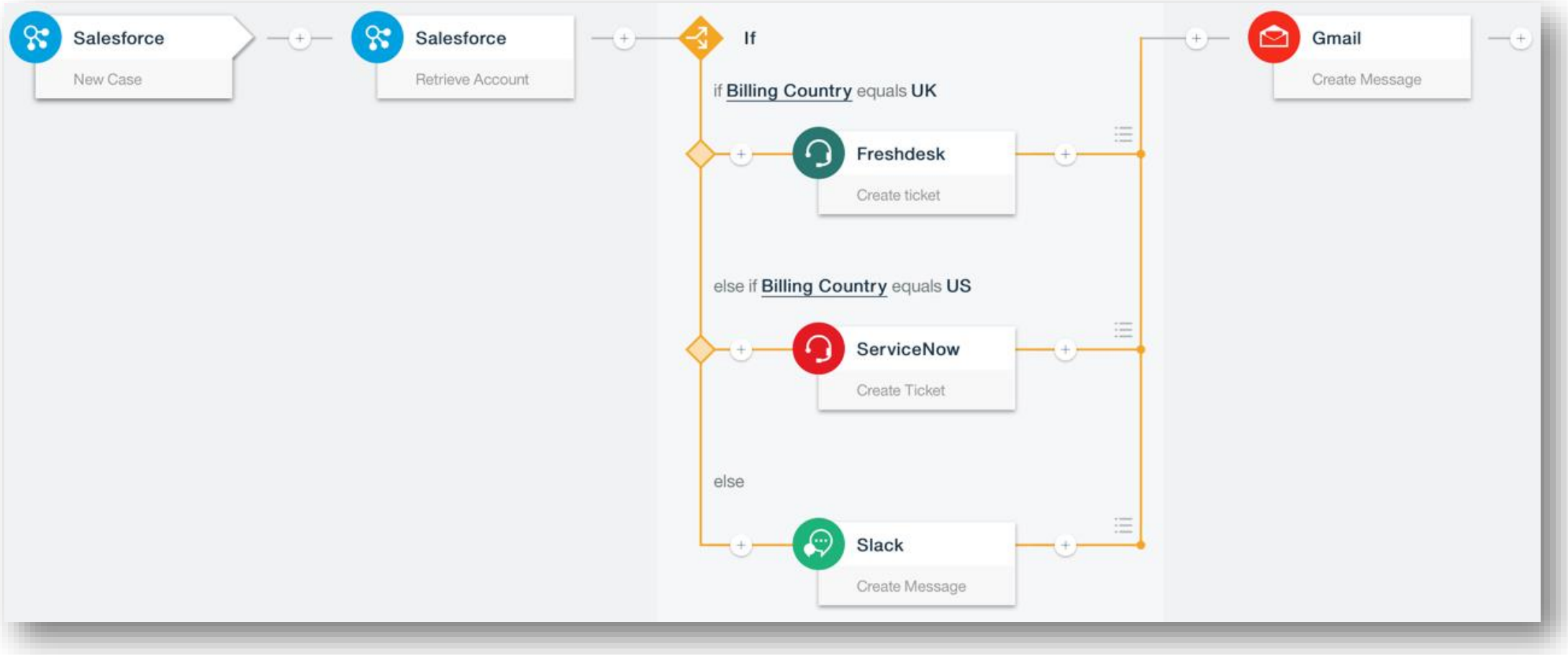
Simple. No-code and low-code approach to integration, accessible by users of all skill levels



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Fast. Pre-built connectors and templates for 100s of SaaS and legacy applications

- **Smart Connectors for Cloud and On-premise apps**
  - Business-friendly metadata for the business user
  - Trigger based on both create and update events
  - Capture events based on both webhooks and polling mechanisms
  - Addition of retrieve (lookup) and update actions
  - Dynamic discovery of custom objects

- **Connectivity with IBM solutions**
  - IBM Integration Bus
  - IBM Message Hub

Flexible. Cloud and on-premises options to deploy where most convenient for you

Public Cloud / SaaS

- A fully managed, multitenant iPaaS, which auto scales to handle variable workloads
- Flexible pricing models and option of a dedicated runtime environment on SaaS

Private Cloud / On-premises

- Buy your own license and deploy on-premises or in a private cloud environment
- Available as Docker image which offers complete deployment portability

Hybrid Deployment

- Combine the efficiencies of public cloud with the control of private deployment
- Flexibility of choosing between SaaS and on-premises deployments

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Affordable. Pay only for the integration actions you run, with no extra costs for application connectors.

- Flexible metrics based on capacity or run-time executions
- Unlimited endpoints at no extra charge
- Enterprise-grade 24x7 support included
- Available hybrid entitlement for SaaS and on-premises flexibility
- Free 30 day trial available

IBM App Connect is the most affordable iPaaS with the broadest set of capabilities.

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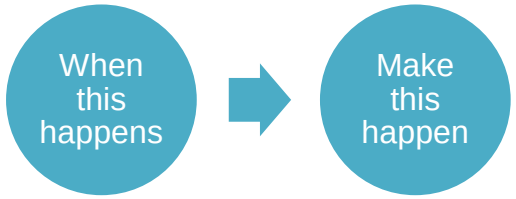
Integration Patterns we're focussed on

Event-action



Designer today

E.g. Every time the stock level breaches a threshold -> Order more stock

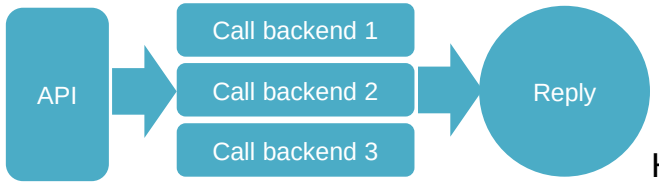
One-way Data Replication

E.g. Replicate my product catalogue to a NoSQL database for my Mobile App

E.g. Make up to date master customer data visible in my SaaS CRM

Studio today

API composition



Designer today

Invoke multiple backends

Map and transform responses

Hide protocol complexity in back-end systems

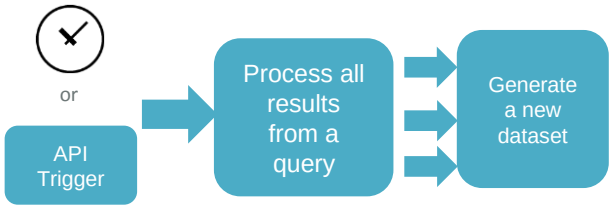
Two-way Data Synchronization

E.g. Provide a cloud scale NoSQL DB to my Mobile App, sync'd with my SOR

E.g. Keep my ERP system sync'd with my SaaS CRM

Studio today

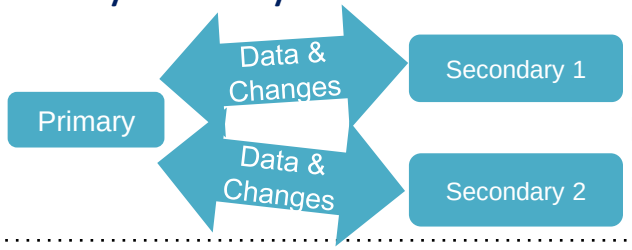
Data Copy



E.g. Generate a new sales report every day at 7:30am, and send via e-mail

Studio today

N-way Data Synchronization

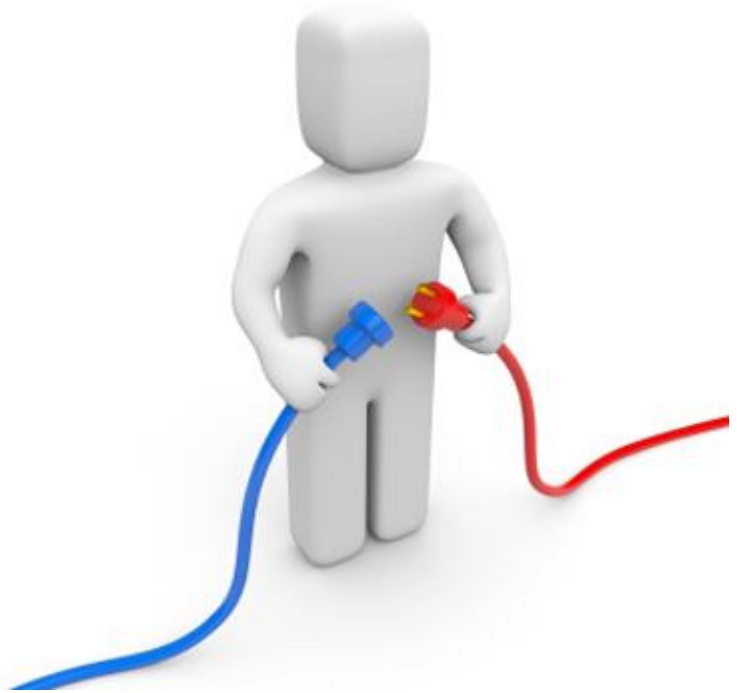


E.g. Keep my ERP, CRM and Marketing systems in Sync

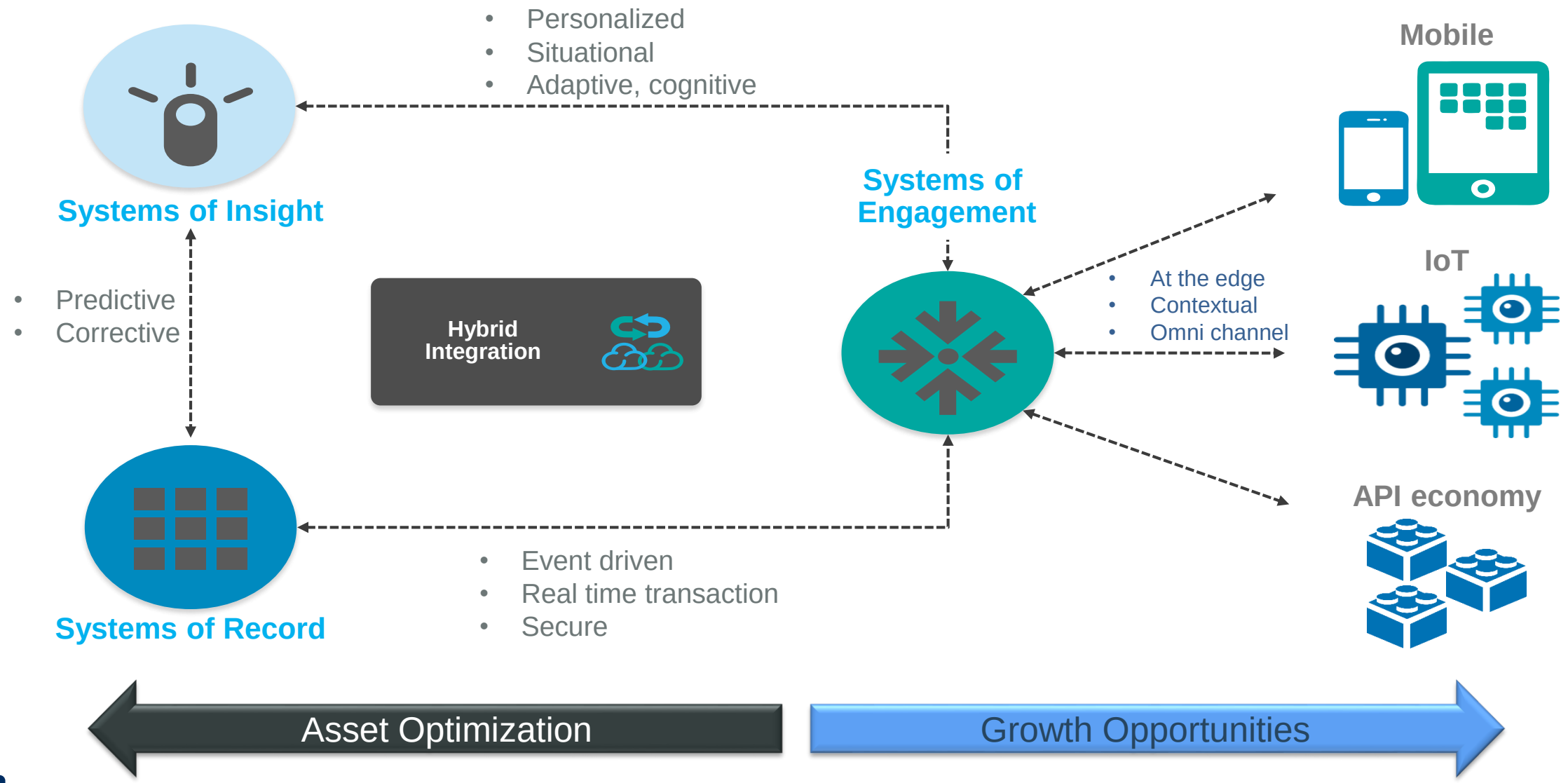
Studio today

App Connect

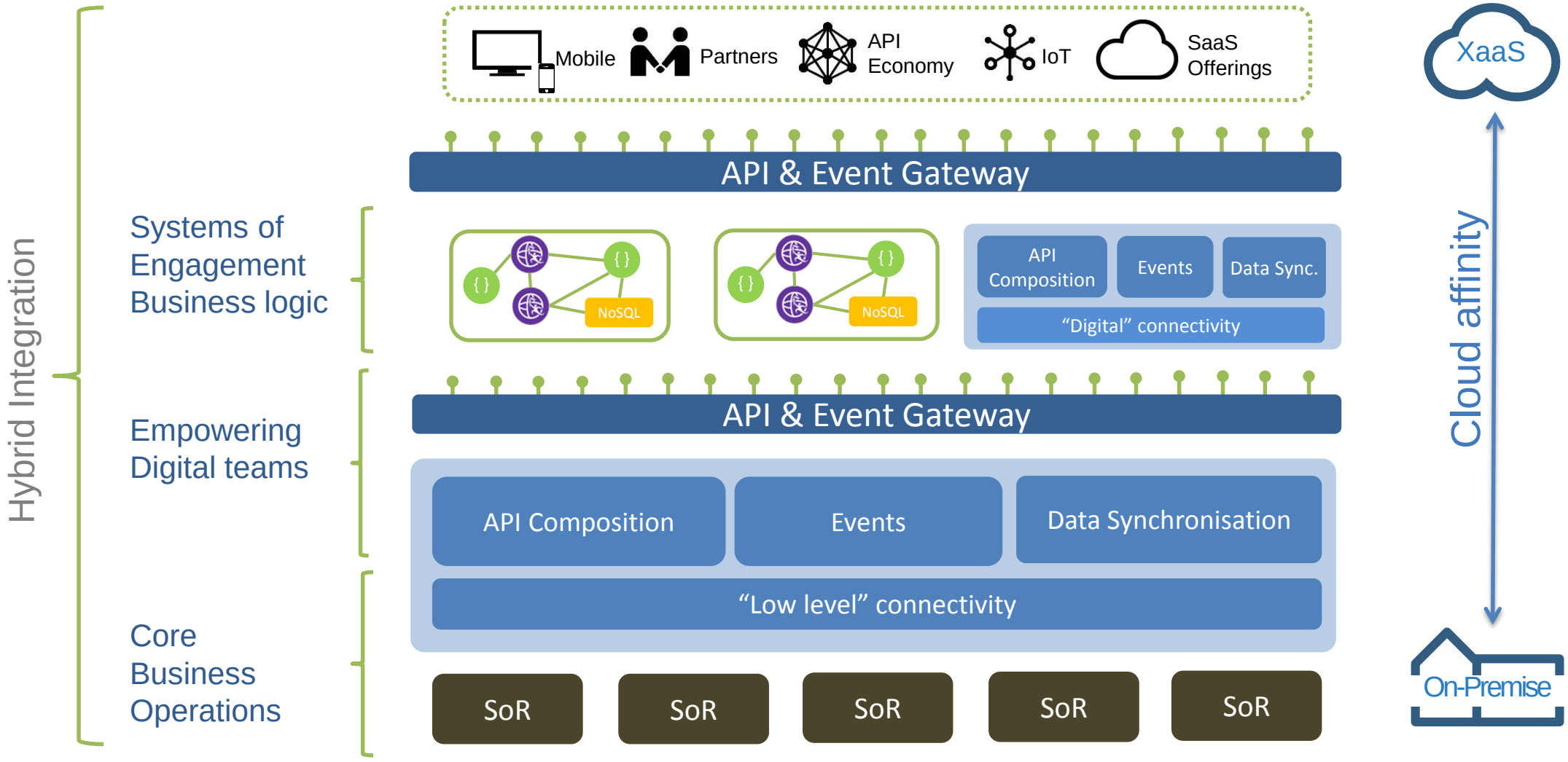
- **More Connectors, events and actions**
  - 100s of new connectors supporting new integration patterns
  - Target new application ecosystems and use cases
    - HR, CRM, Microsoft, etc.
- **More capabilities for Integration Developer (iPaaS)**
  - Technology connectors, OpenAPI, REST, SOAP, MessageHub etc.
  - OpenWhisk integration…call custom code
  - Enhance testing and monitoring
- **More Integration Patterns**
  - Extend to data integration use cases
    - Data copy, sync, replication
  - Full iPaaS features available in Designer UI
- **Portfolio Convergence**
  - Ability to extend to IIB, IIS etc. for more complex integration



Hybrid Integration Platform: What is it and Why



Hybrid Integration Reference Architecture



developerWorks article
http://ibm.biz/HybridIntRefArch

Integration blog
https://developer.ibm.com/integration/blog

IBM **Integration Bus**

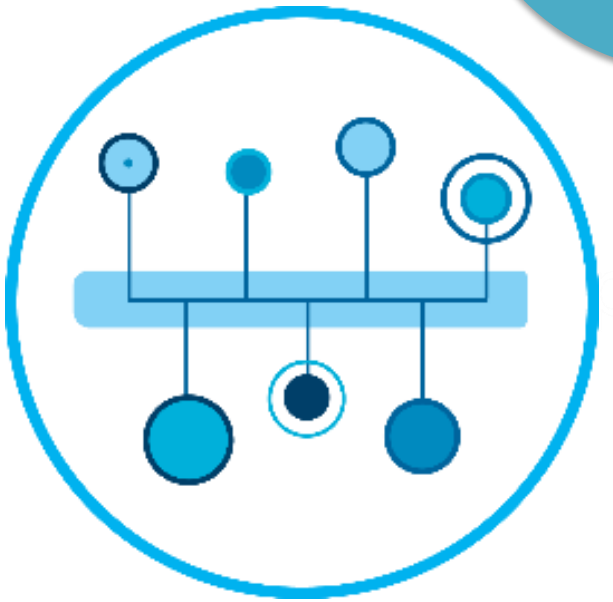
ENTERPRISE INTEGRATION

What is Integration Bus?

A proven, scalable and secure integration platform that delivers rapid, secure, scalable and reliable connectivity.

What does Integration Bus provide?

- ✓ Largest breadth, platforms and protocols supported.
- ✓ Industry relevant connectivity to solve domain specific problems. Industry specific nodes, solution-oriented patterns & user-oriented tooling.
- ✓ Adds Flexibility introducing anonymity between producers and consumers of data
- ✓ Provides insight into applications and business value they bring



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IBM **API Connect**

API MANAGEMENT

An integrated creation, runtime, management, and security foundation for enterprise grade APIs to power modern digital applications

What does API Connect provide?

- ✓ Automated, visual and coding options for creating APIs
- ✓ Access control over APIs, API Products and API Plans
- ✓ Advanced API usage analytics and Developer Portal
- ✓ Policy enforcement, security and control
- ✓ Enterprise grade API creation and management in Node.js and Java

IBM **API** Connect

IBM **App Connect**

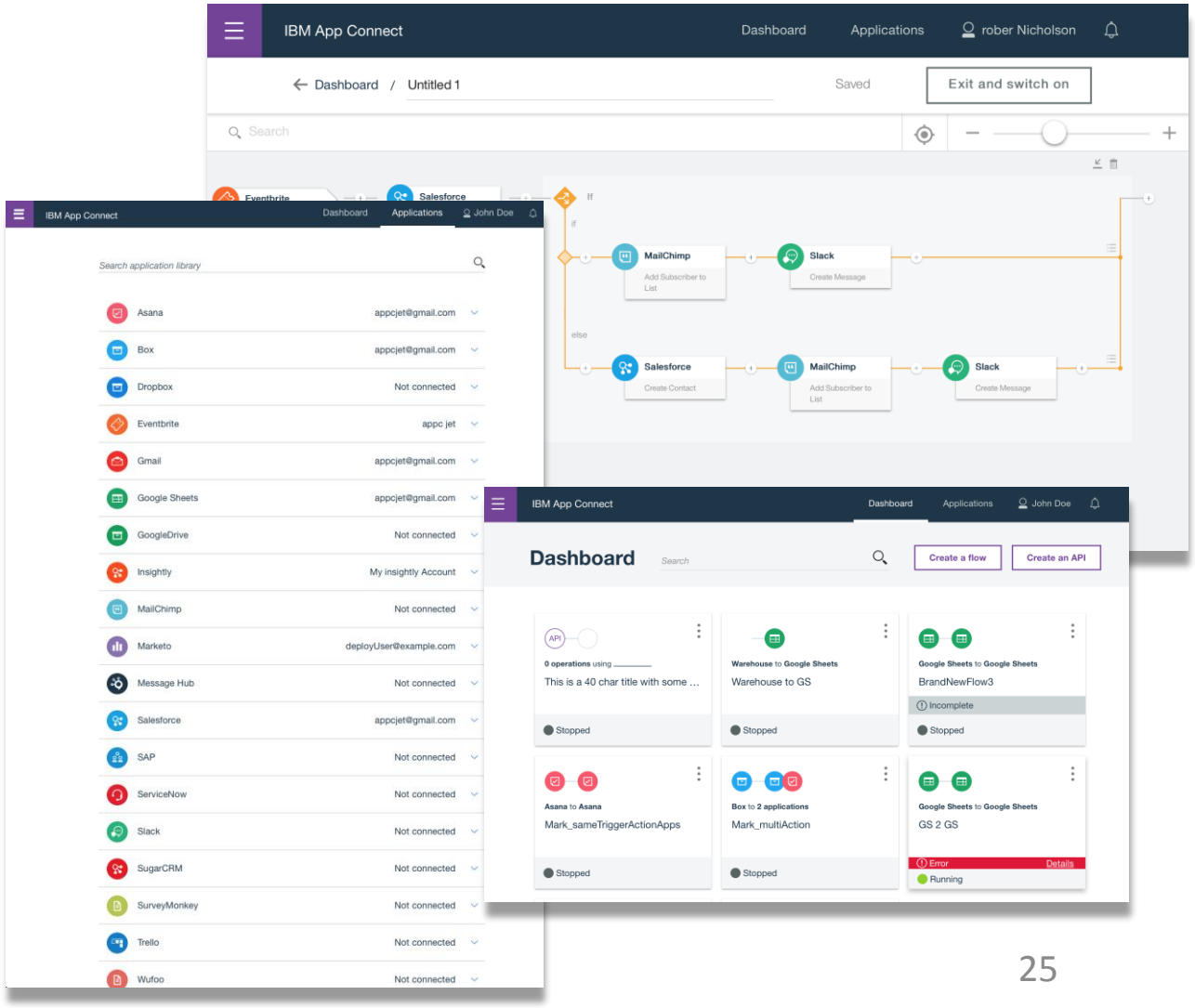
CLOUD INTEGRATION

What is App Connect?

Business friendly integration that connects cloud & enterprise apps as flows and APIs

What does App Connect provide today?

- ✓ "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 data in sync between multiple apps
- ✓ Build new connections quickly – tooling for IT to connect to the apps you care about in hours
- ✓ Model driven approach for exposing integration flow as APIs



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General characteristics	
manually built	Built only once in the initial “infrastructure” stage. Scripts help with consistency across environments but are mostly run manually.
managed	Components are directly and individually monitored during operation with a role-based access control to allow different groups of users administrative access.
hand fed	Nurtured over time, for example introducing new integration applications. As part of that process, new options and parameters are applied, changing the overall configuration of the hub. Gradually the running instance becomes more bespoke with each change.
server pairs	Typically pairs of nodes provide high availability. Great care is taken to keep these pairs up and running and to back up the evolving configuration. Scalability is very coarse grained and achieved by essentially creating more pairs or adding resources so that existing pairs can support more workload.

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Characteristics	
Individual policy based management	Resilience and scalability is managed at the level of the integration, not at the level of the infrastructure.
Elastic scalability	Integrations are scaled horizontally and allocated on-demand in a cloud-like infrastructure.
Disposable/re-creatable	Using lightweight container technology encourages changes to be made by re-deploying amended images rather than by nurturing a running server.
Starts/stops in seconds	Integrations are run and deployed as more fine-grained entities and therefore take less time to start.
Minimal interdependencies	Unrelated integration are not grouped together. Co-location and grouping are driven by functional and operational characteristics.
Infrastructure as code	Resources and code are declared and deployed together.

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Inter-microservice vs. inter-application communication

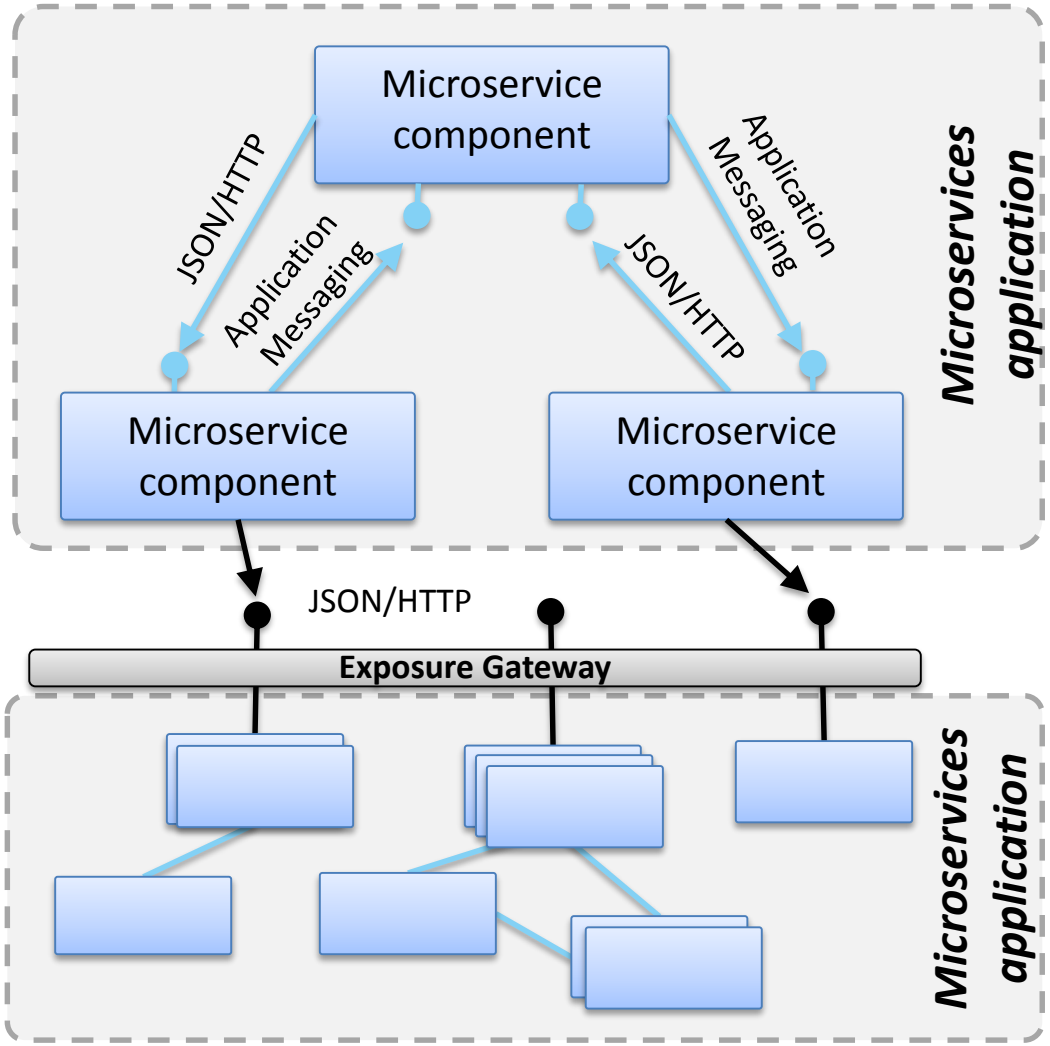
Inter-**microservice** communication

- Lightweight protocols: HTTP, application messaging
- Runtime component registry
- Client-side load balancing and circuit breaker patterns

Inter-**application** communication

- Enterprise protocols: Managed API gateways, enterprise messaging
- Design time developer portals
- Gateway load balancing and throttling

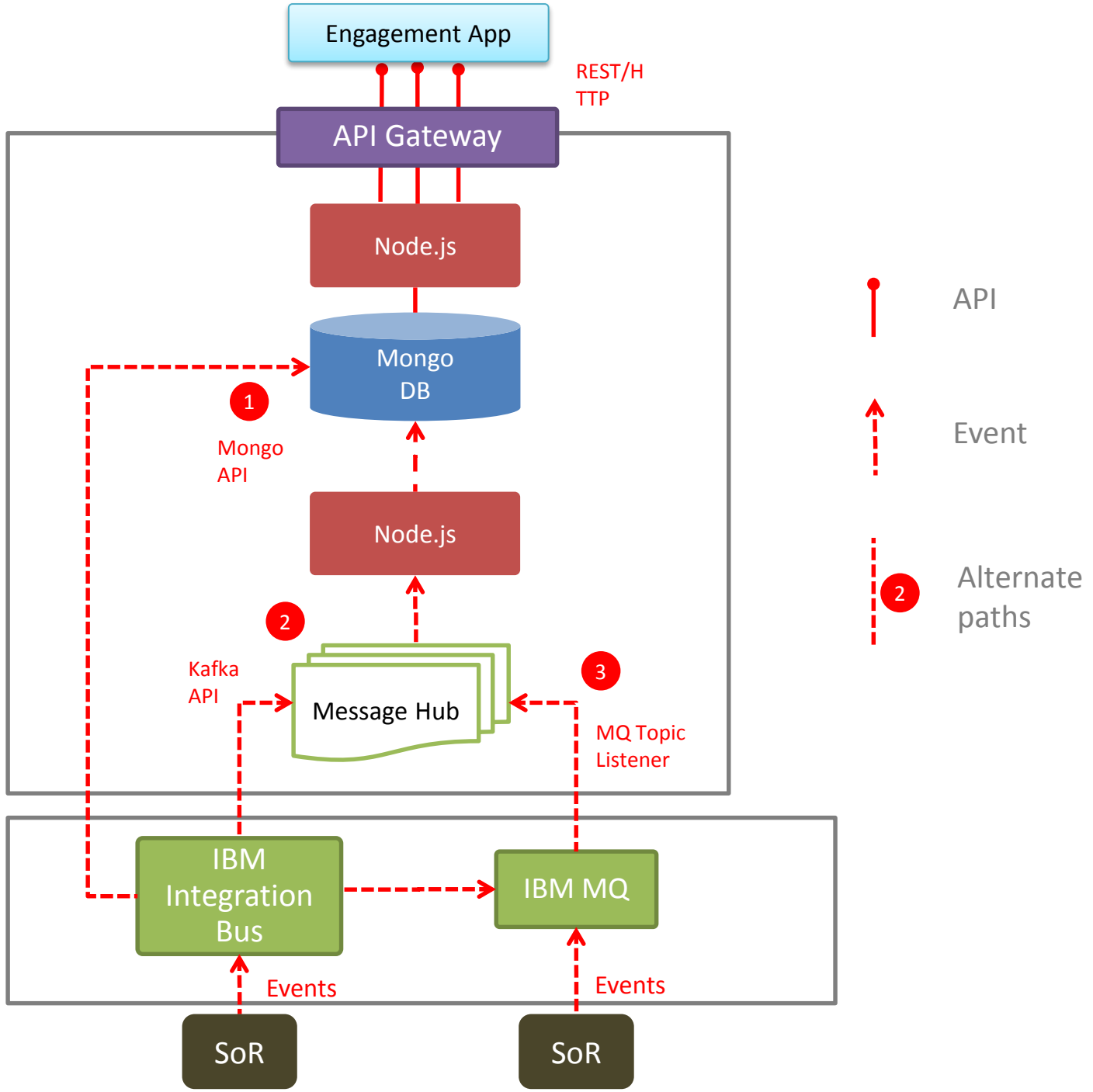
JSON/HTTP RESTful communication styles may be present in both types of communication, but their implementation may be radically different.



APIs implemented using microservices with local data stores.

Consolidate enterprise events into event streams

Multiple options for how to populate microservices data stores.



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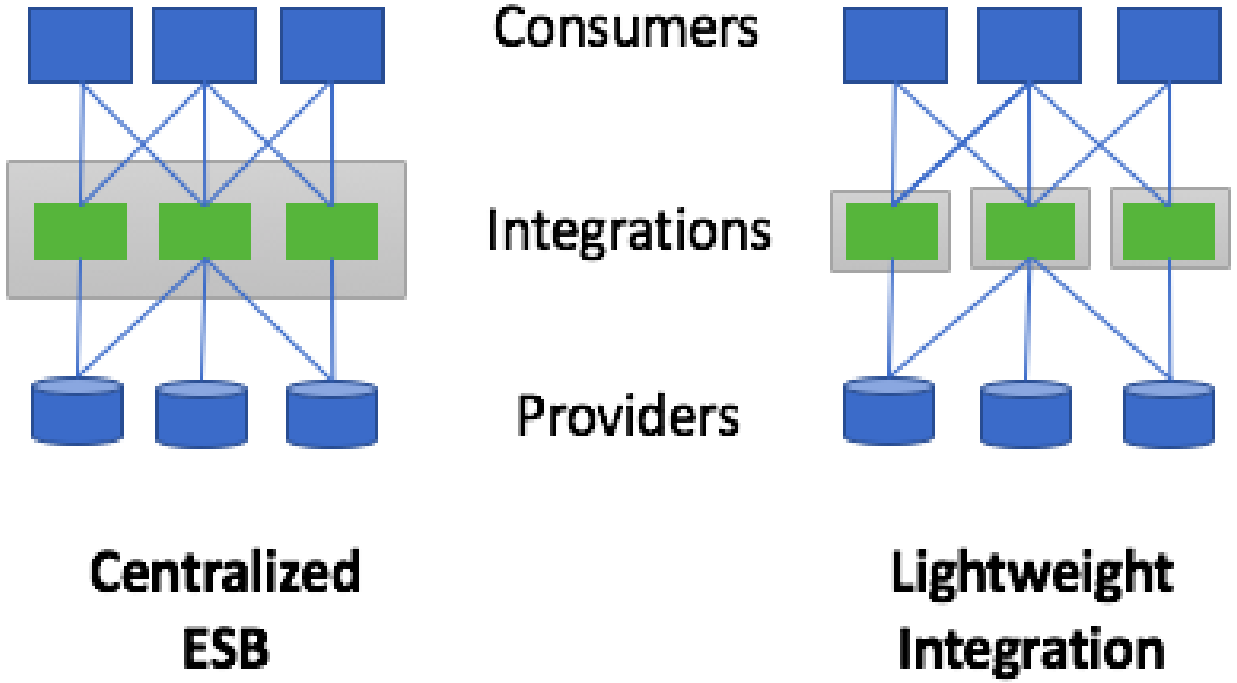
Can integration topologies draw on the benefits of microservices architecture?



Agility: Different teams can work on integrations completely independently without deferring to a centralized group or infrastructure that can quickly become a bottleneck. Individual integration flows can be changed, rebuilt and deployed completely independently of other flows, enabling safer application of changes, and maximizing the speed to production.

Scalability: Individual flows can be scaled on their own allowing us to take advantage of the efficient elastic scaling of cloud infrastructures.

Resilience: Isolated integration flows deployed in separate containers cannot affect one another by stealing shared resources such as memory, connections, or CPU.

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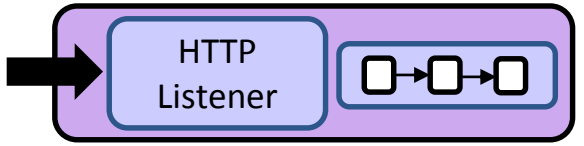
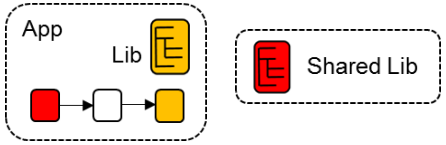
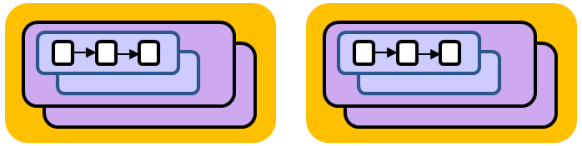
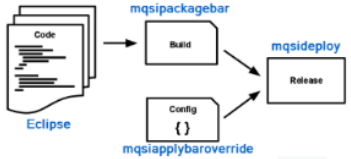
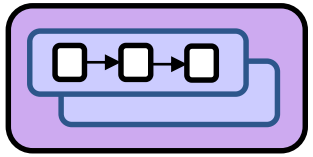
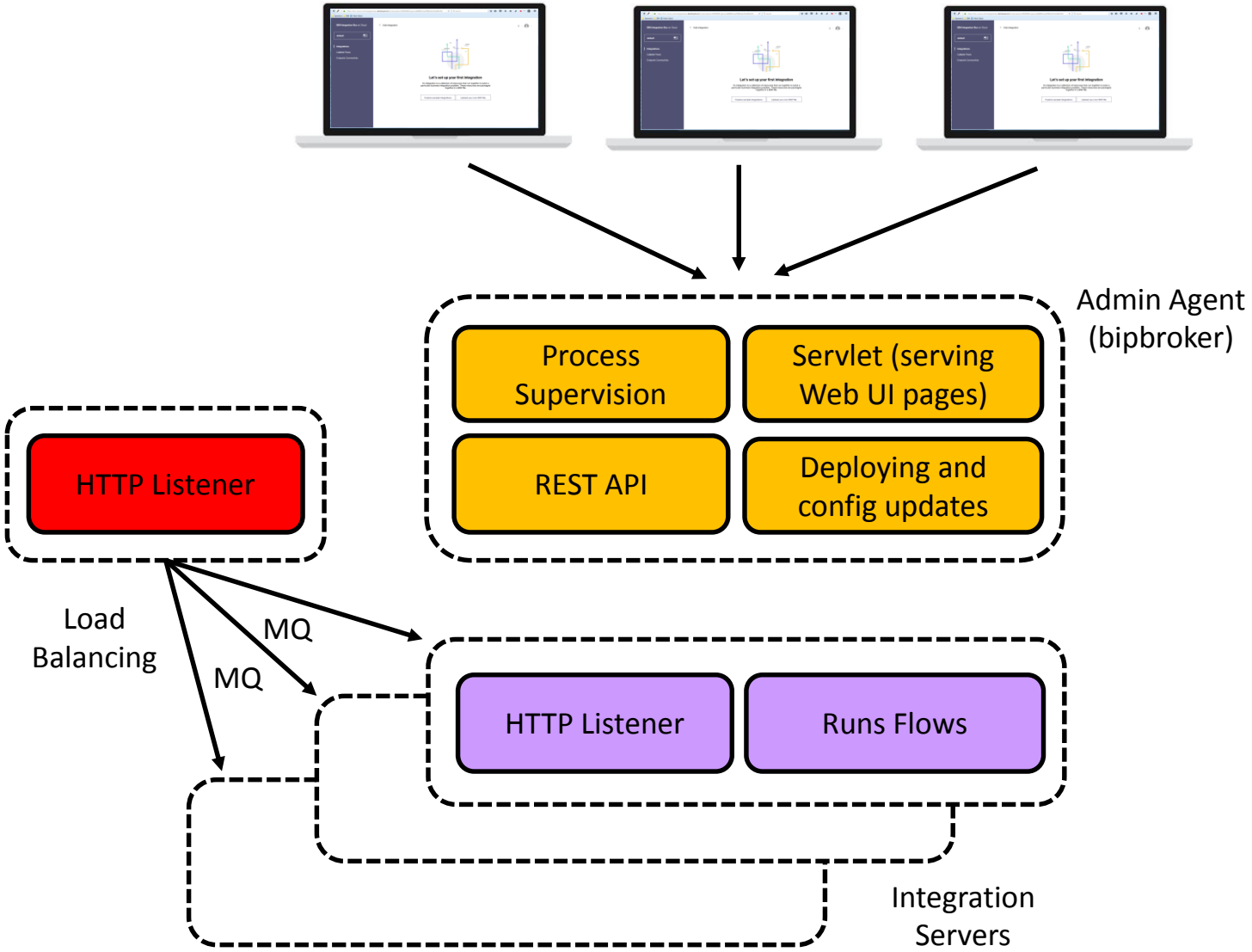
IIB is a 12-Factor App!

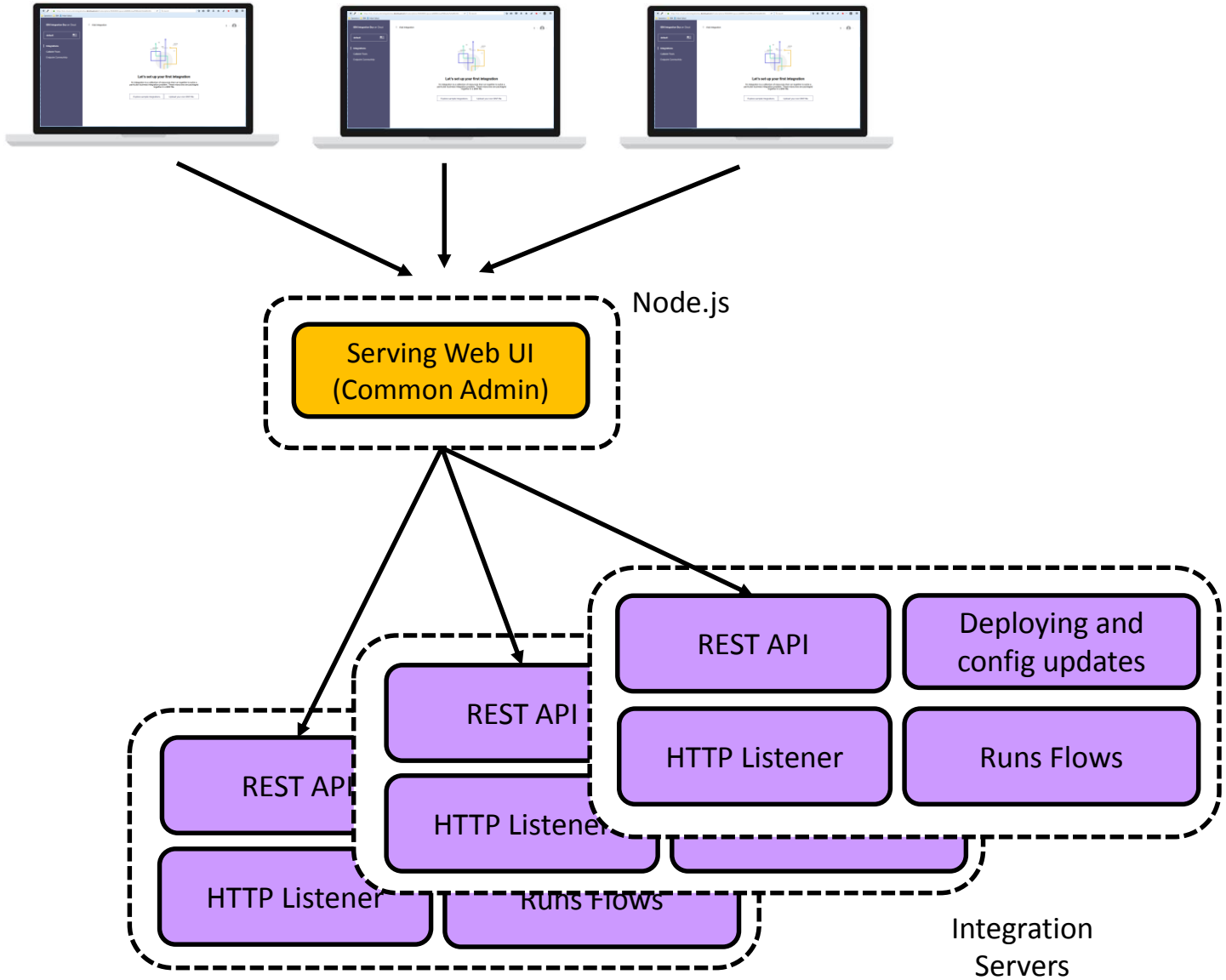
1. Codebase 	**7. Port binding** 
2. Dependencies 	**8. Concurrency** 
3. Configuration 	**9. Disposability** 
4. Backing Services 	**10. Dev / prod parity** 
5. Build, Release, Run 	**11. Logs**
6. Stateless Processes 	**12. Admin Processes** `mqsicreatebar` **Integration API** `mqsiapplybaroverride` `mqsideploy`

https://developer.ibm.com/integration/blog/2017/04/16/12-factor-integration/

IIB Evolution



IIB Evolution



Standalone Integration Servers (SIS)

- Run direct from the command line
  - Similar to StrongLoop, Mongo, etc
  - No create step.
  - No deploy step necessary
  - Process is not owned by any other process (or Integration Node)
    - Can be managed by container-based admin (Kubernetes, etc)

- Basic parameters for frequently used settings:
  - Can be given a name under which it runs (should be unique)
  - Default MQ queue manager name
  - http port for HTTP nodes
  - Named event log file rather than logging to syslog/Event Viewer
  - JVM options so that min/max heap size can be specified etc..

IBM Cloud Integration

IBM **App Connect** is part of a portfolio

- **App Connect**
- **API Connect**
- **Integration Bus**
- **MQ**

Application Integration Suite

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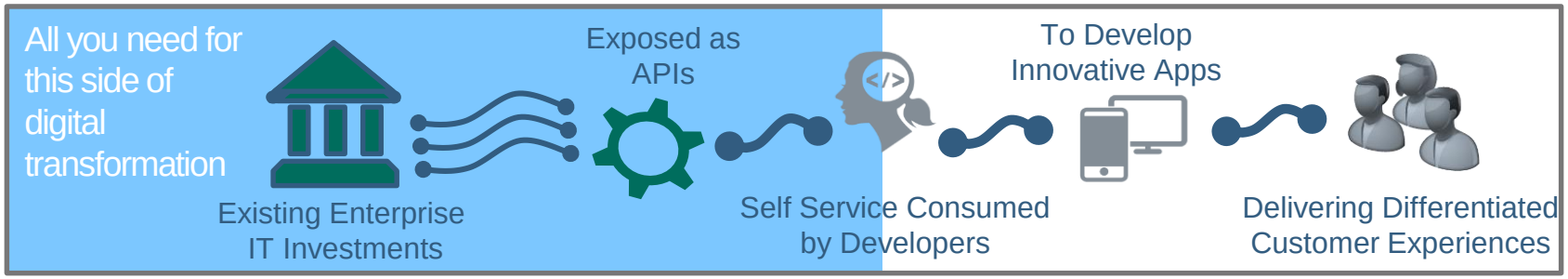
IBM Application Integration Suite

Combines Application Integration, Cloud Integration and API Management into one offering

- ✓ Deploy on-premise or in the cloud
- ✓ Build business logic with the highest levels of productivity via application & cloud integration features
- ✓ Integrated tooling to easily publish new integration flows as APIs
- ✓ Secure connectivity to hundreds of cloud and on-premise applications and endpoints



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A cohesive & modular offering for any integration need

Connect Seamlessly

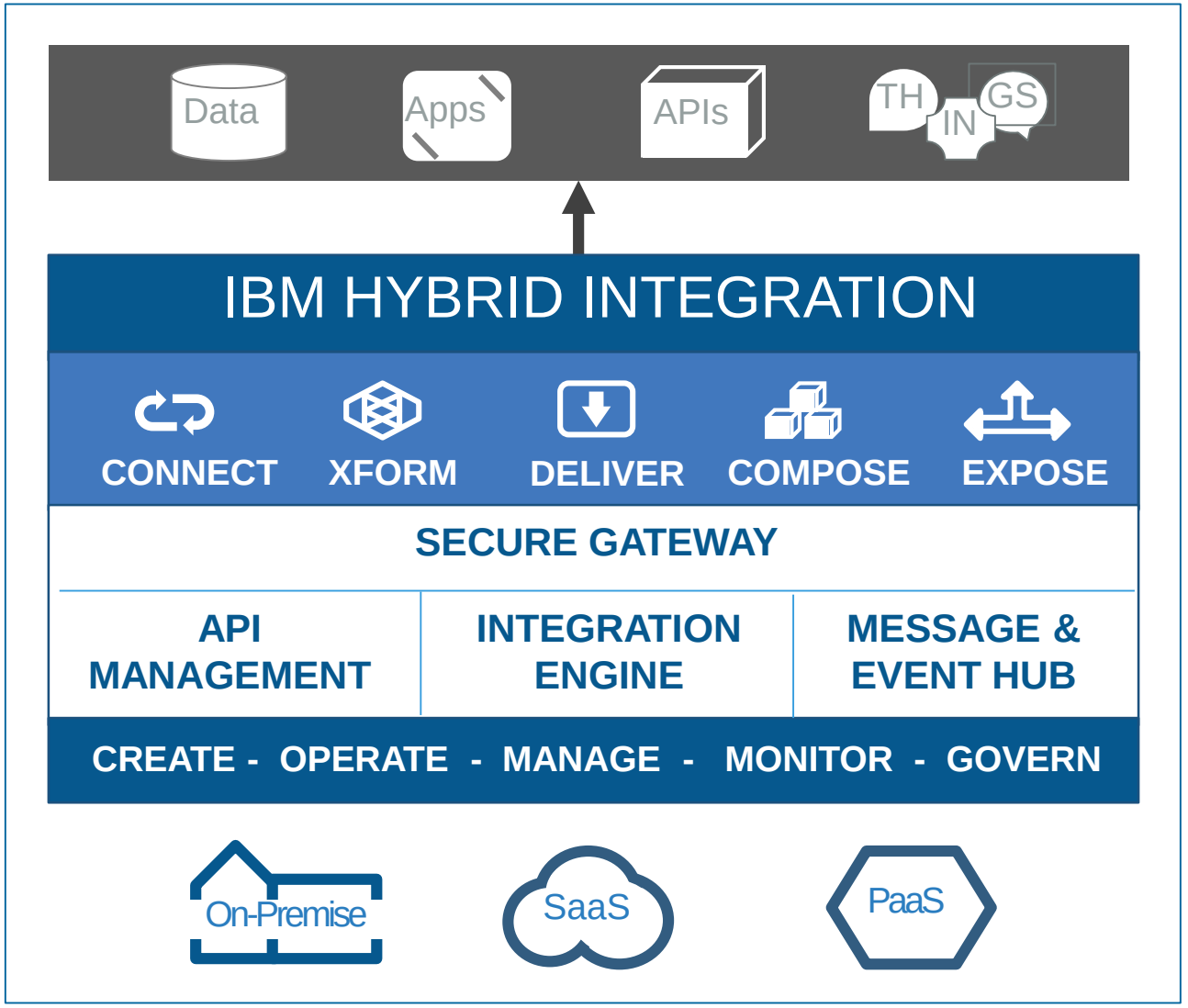
Hundreds of end points to apps and data in the cloud and on premise

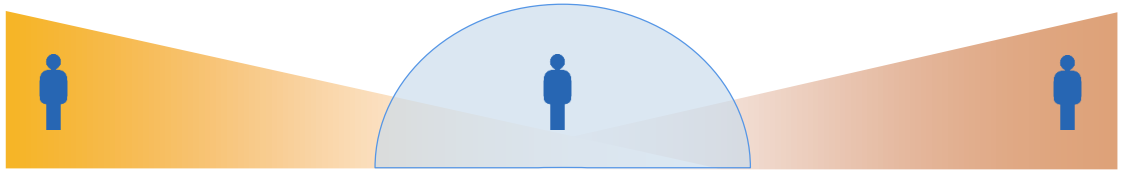
Develop Rapidly

Intuitive & robust tooling to transform data to meet business needs

Scale Efficiently

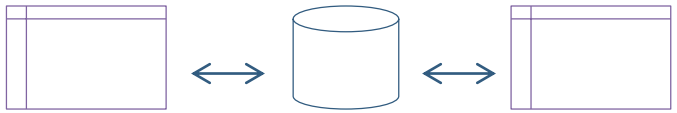
Performance and scalability to meet the SLAs of your business apps





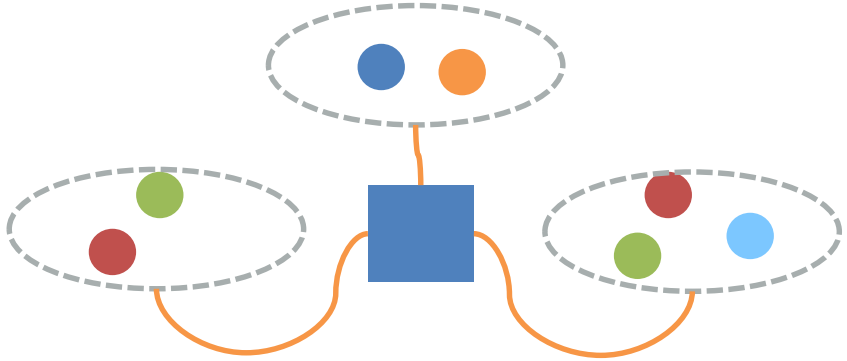
Fit-for-User Experiences

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



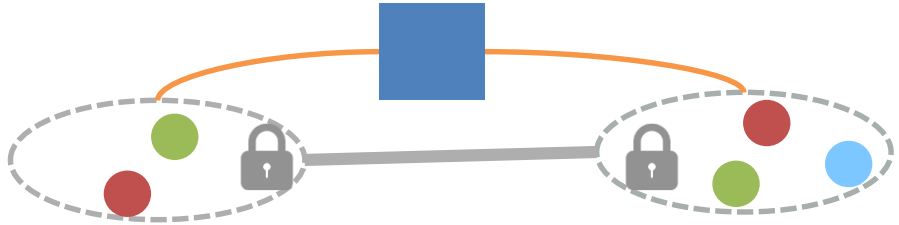
Shared Assets, Common Tooling

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



Centralized Ops, Distributed Runtimes

- Administer from single hub
- Run hosted on IBM cloud or BYO compute
- Push runtimes to other clouds or on-prem

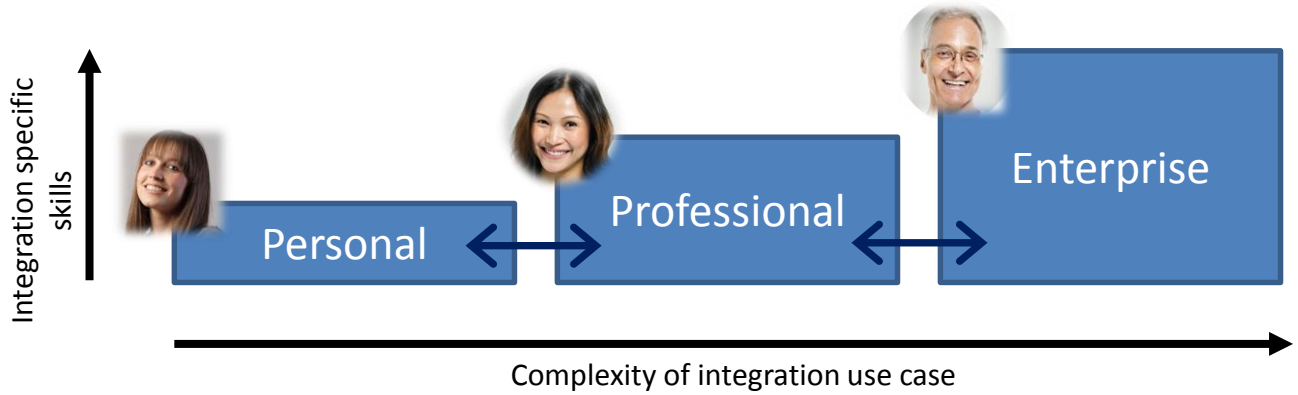


Hybrid Enabled

- Run integrations near your apps and data
- Make secure, managed connections across boundaries
- Control and Enforce policies to secure your APIs

Hybrid Integration Platform Convergence

- **Friction Free** experience when personas collaborate
- **Progressive disclosure** of advanced features - Blur the boundaries between personas



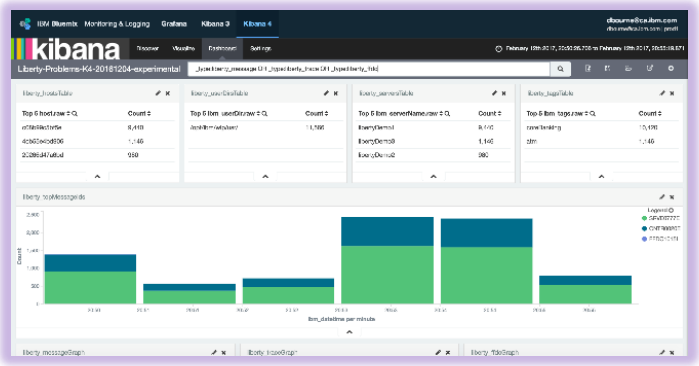
- **Consistent capability** across managed service and software
- **Straightforward pricing structure** with free, PAYG, and annual subscription plans
- **Simple and efficient** for customers to acquire and manage

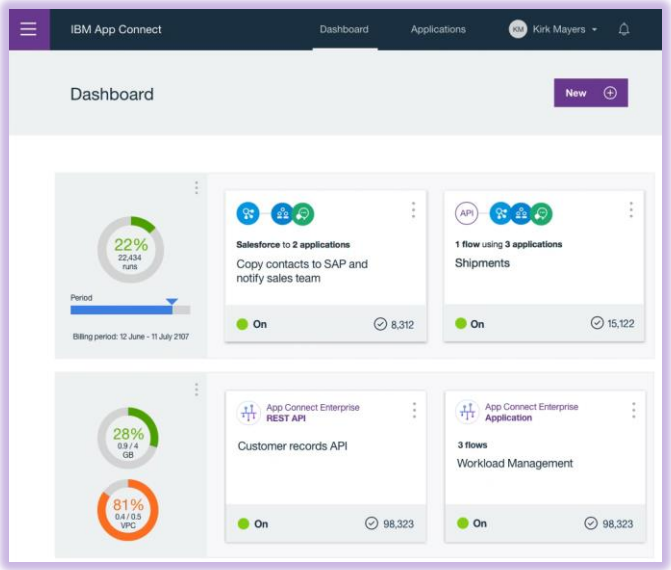
Hybrid Integration Platform Convergence

- Converge IBM Integration Bus on Cloud and App Connect offerings into a single cloud service
- Converge and reuse connector architectures
- Converge integration flow
  - IIB message flows can take advantage of App Connect connectors
  - App Connect flows can take advantage of advanced integration capabilities in IIB
- Converge our Cloud Foundry service and Container service implementations on to Kubernetes clusters in Bluemix

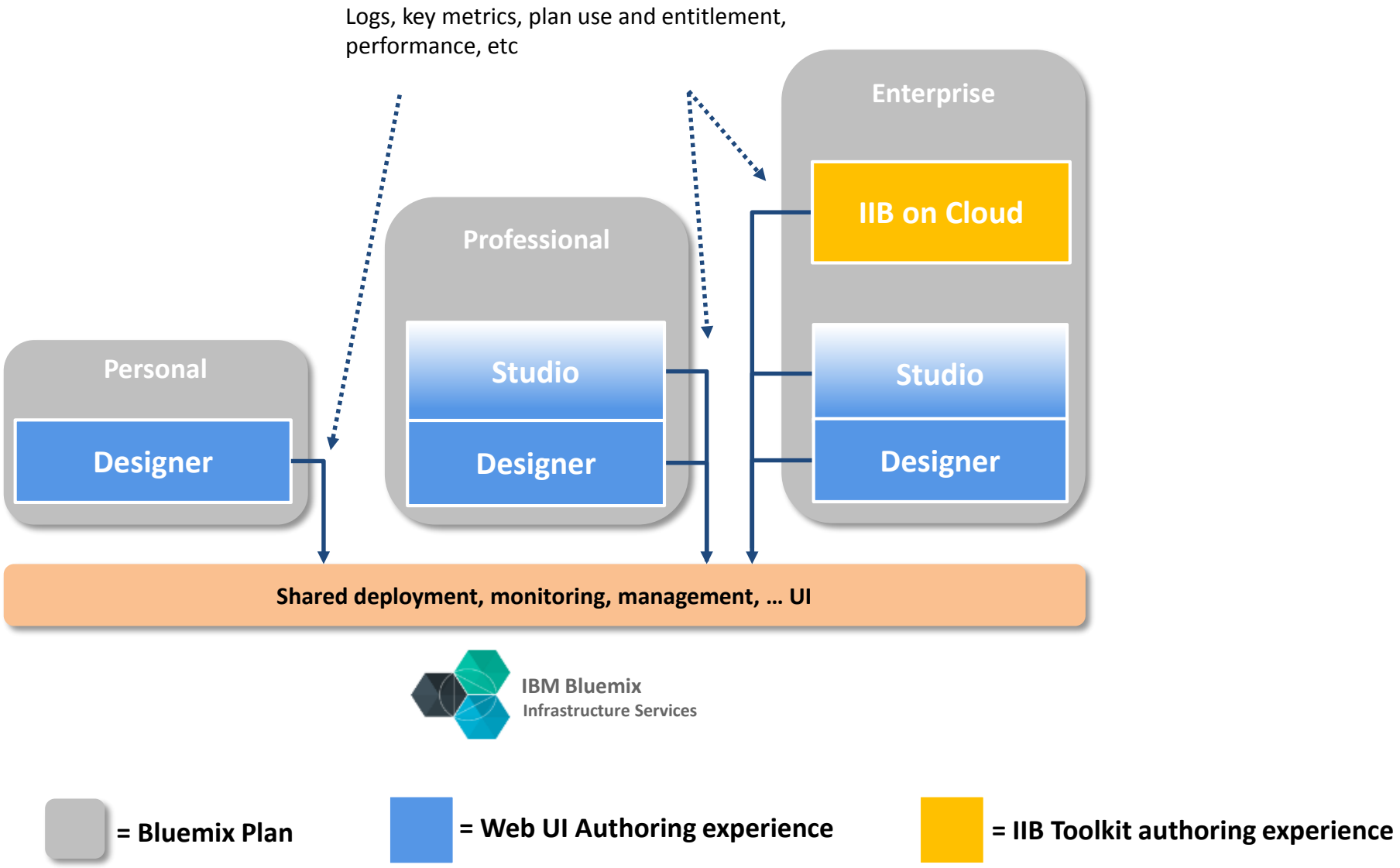
IBM App Connect Enterprise (managed service on Bluemix)

- IIB on Cloud Dashboard and App Connect Professional Designer will merge to become the App Connect Enterprise plan underneath the App Connect Bluemix tile
- From the Bluemix catalog you will create a Service instance for the App Connect Enterprise plan which will allow you to run (side by side):
  - IIB artifacts (deployed as IIB BAR files) containing Apps, Libs, REST APIs, Flows etc.
  - App Connect artifacts (Flows and REST APIs)
- A single monitoring dashboard (Bluemix logging and metrics)
- A single administration dashboard to start and stop
- A common management CLI and API
- At initial launch, development experience is likely to be a mixture of Eclipse based Toolkit and App Connect Designer
- Licensing and charging paths are still to be decided
  - Likely to include both PAYG and Subscription options



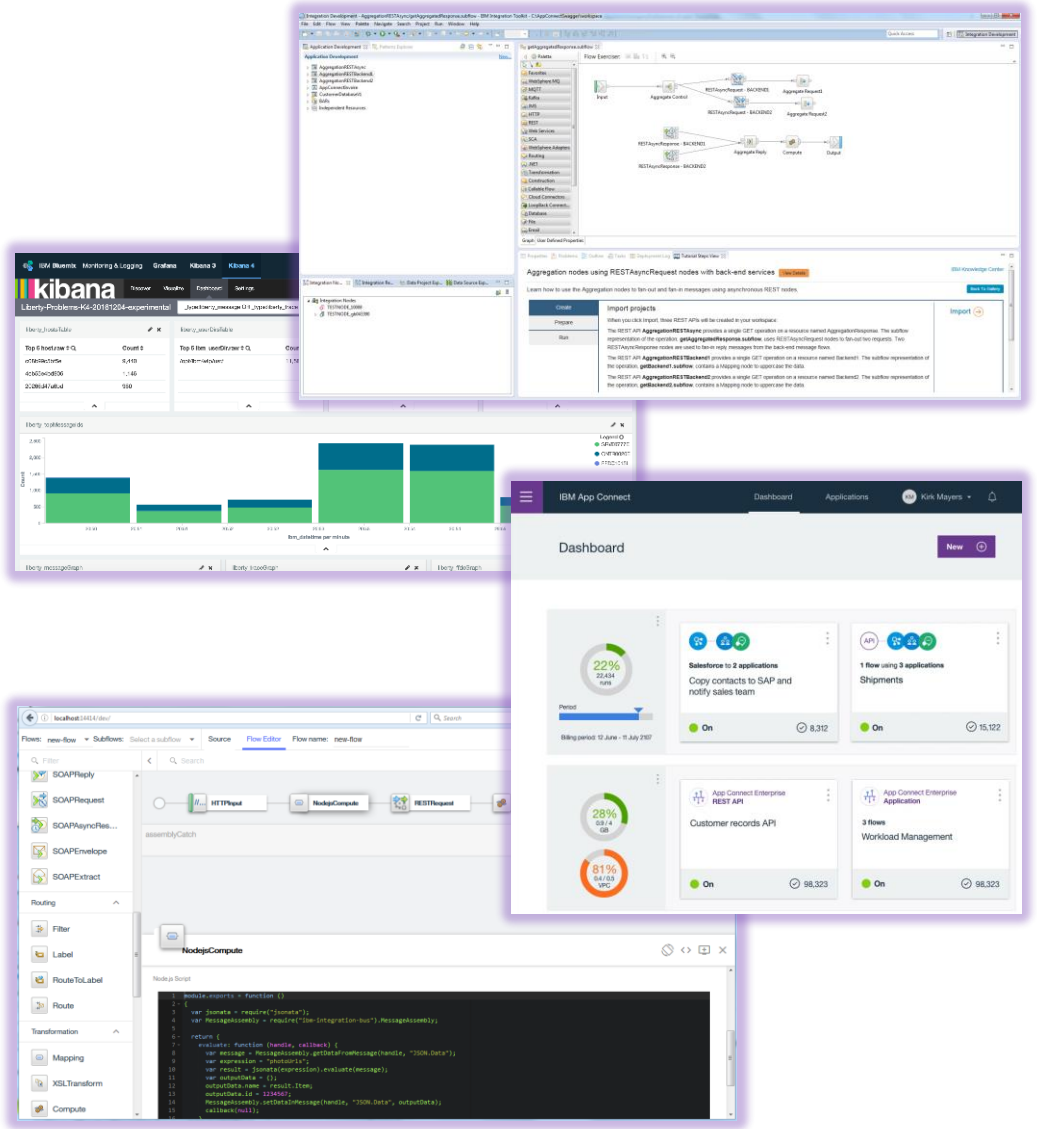


IBM App Connect Enterprise (managed service on Bluemix)

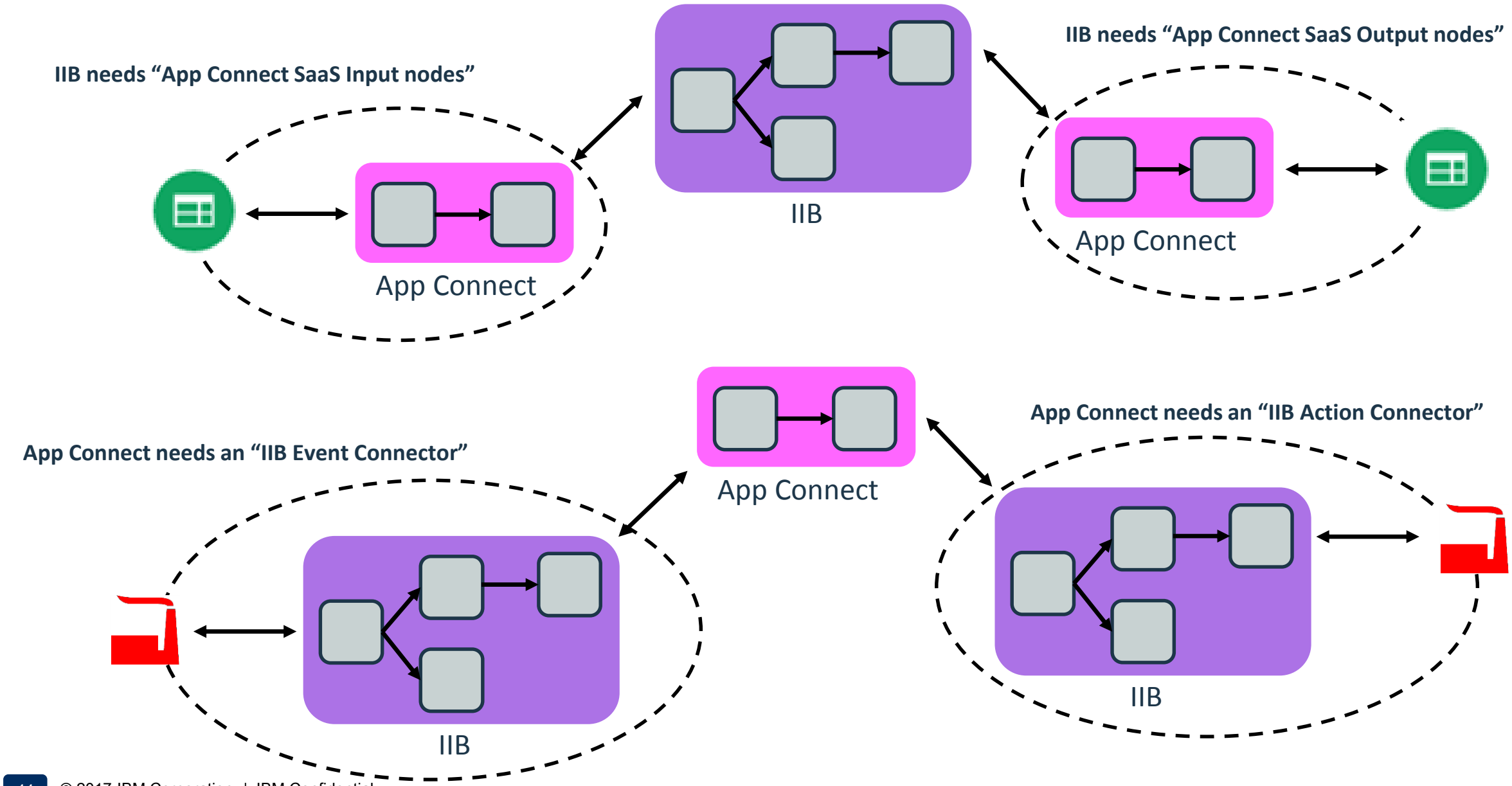


IBM App Connect Enterprise (software)

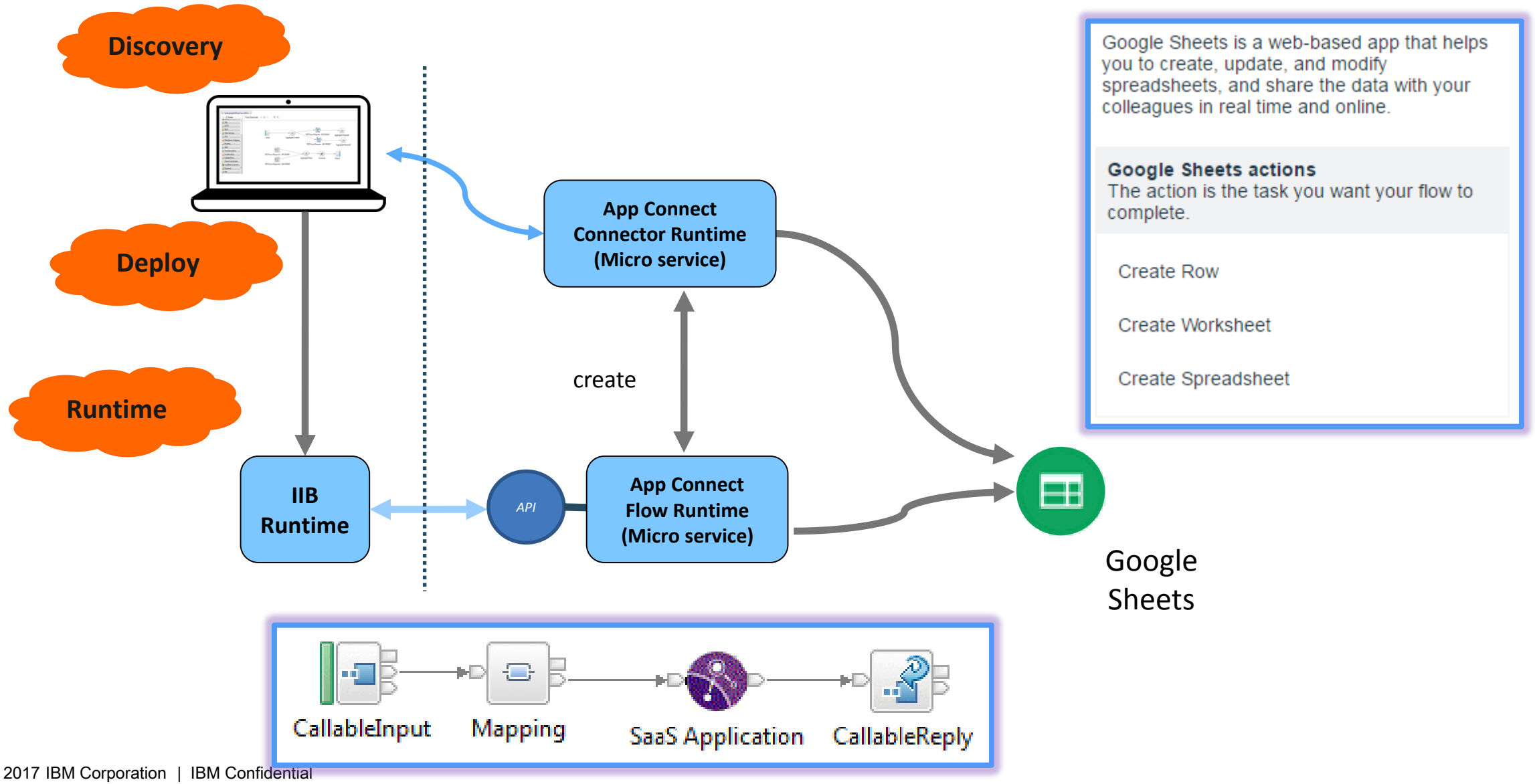
- The next generation of IIB software will evolve to also allow the running of App Connect integration flows and REST APIs in addition to IIB artifacts
- This software product will be based upon the IIB runtime
  - The App Connect flow engine could be run using node.js embedded in the IIB integration server
  - Potentially, App Connect flows could be converted into something that IIB could run natively
- App Connect flows running in this software will make use of the cloud service connectors using the same architecture as IIB flows
- Monitoring and Administration tools likely to be provided as alternatives to be run in the cloud or on premise
- Licensing and charging paths are still to be decided:
  - Metric likely to be based on Cores (capacity)
  - Freedom entitlement



Converged integration flows



First steps: IIB, App Connect, and SaaS Connectors



Which connectors are being planned?

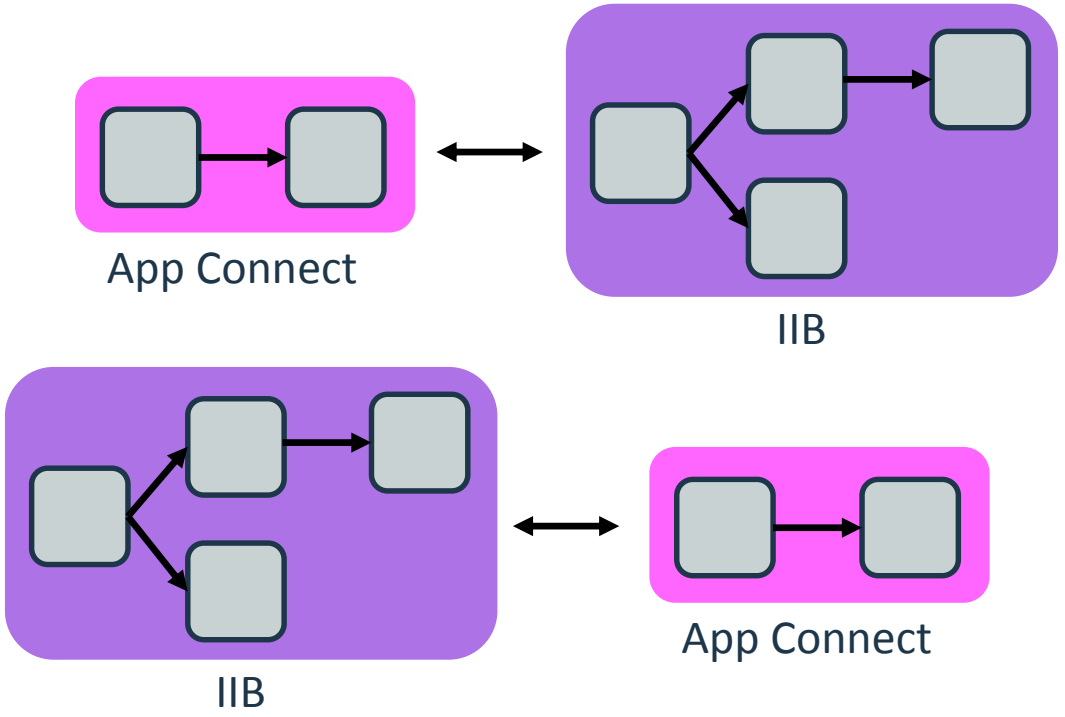
- Equals 3 Lucy
- Coupa
- Silverpop
- Insideview
- Twitter
- Yammer
- MS Office 365
- Watson Retrieve and Rank
- Watson Tone Analyzer
- Watson Language Translator
- Watson Natural Language Classifier
- Watson Personality Insights
- HubSpot Marketing
- Atlasian Jira
- Big Commerce
- Stripe
- Twilio
- FreshDesk

- Xactly
- Oracle Eloqua
- Oracle Taleo Applicant Tracking
- Microsoft Dynamics CRM /AX / GP / NAV / SL
- MS Office 365 One Drive
- Wordpress
- Drupal
- Google Analytics
- Workday Application Tracking
- Workday Human Capital Mgmt
- SoftLayer S3 (Object Store)
- SAP SuccessFactors Employee Central
- SuccessFactors Talent Management
- SuccessFactors Recruiting
- Google Adwords
- Adobe Marketing Cloud
- Unica Campaign
- IBM Commerce
- IBM Verse
- Cloudant
- Netsuite CRM

- Infusionsoft Marketing
- Cisco Spark
- Facebook
- Facebook Lead Ads
- Oracle Netsuite ERP
- SAP Concur
- NetSuite HR
- NetSuite Finance
- Salesforce Pardot
- Salesforce Marketing Cloud
- Oracle Sales Cloud Beta
- Salesforce Service Cloud
- Oracle Service Cloud Beta (RightNow)
- QuickBooks Online
- Intacct
- Sharepoint 2013
- Salesforce Libraries
- Salesforce Files
- Shopify
- Google Forms
- RingCentral

Longer term, what about flow authoring convergence?

- Flow authoring convergence is about having an authoring experience that is capable of creating more than one type of integration asset
- The IIB Toolkit is very feature rich and we have no plans to replace it.
- However, a web based flow editor experience extending that of App Connect can begin focused on authoring simple enterprise level flows
- A basic prototype exists – to be discussed in the next session.



IBM Integration 2017/18 Objectives

- Continue to support core connectivity and traditional user investments with investment in core integration patterns and capabilities

- Deliver world class iPaaS incorporating application integration investments and leveraging data integration, OpenWhisk, Digital Business Insights, Bluemix, Product Insights

- Converge to build genuine Hybrid Integration Platform
    - Multiple users, integration patterns support in cohesive modular products

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