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Application Integration - Introduction

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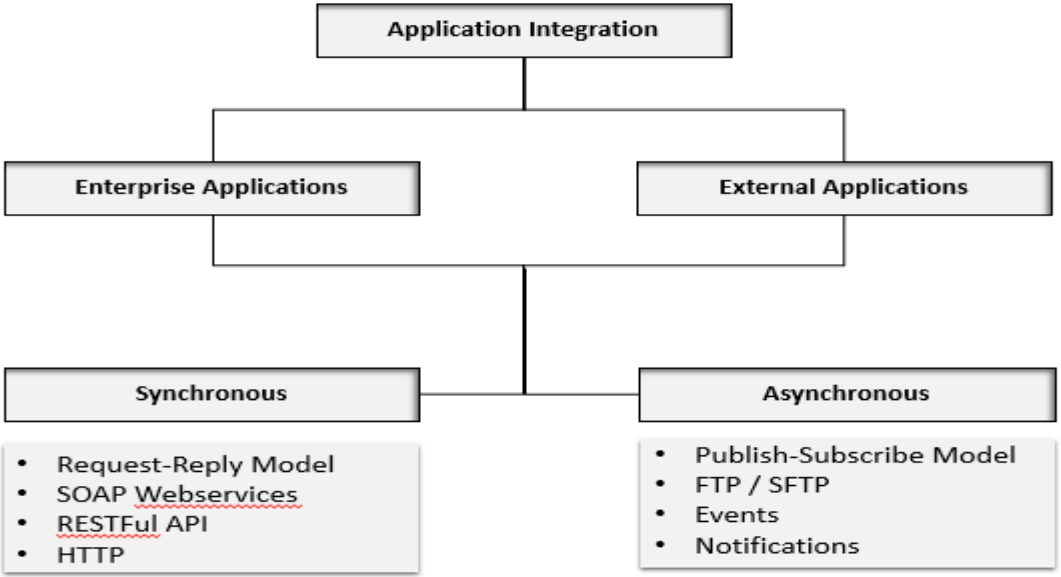
Application Integration - Introduction

Agenda

- What is Application Integration?
- Why do Enterprises need Application Integration?
- Technical Challenges
- Integration Products and Components
- Integration Patterns
- Use Cases
- API Management
- Integration on Cloud (iPaaS)
- Messaging Streaming

What is Application Integration?

- **Application integration** is alliance of Software Applications in an enterprise to share data , business processes and multiple other services to realize business transactions.
- Integrations are build to connect application within enterprise and business partner applications

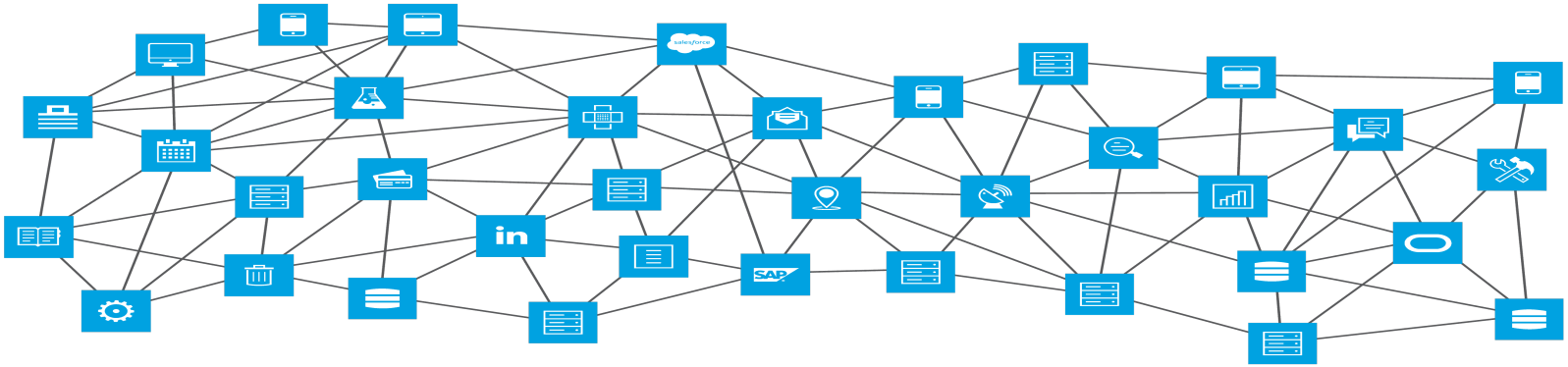


Why do Enterprises need Application Integration?

- A typical enterprise in a business domain owns multiple software applications that can be legacy application or a modern cloud application
- Business transaction lifecycle spans across multiple systems in an enterprise
- Applications are built using disparate technologies
- Both Legacy and Modern applications required to be integrated
- Without Integration Software , applications create point to point communication channels resulting in complex Architecture

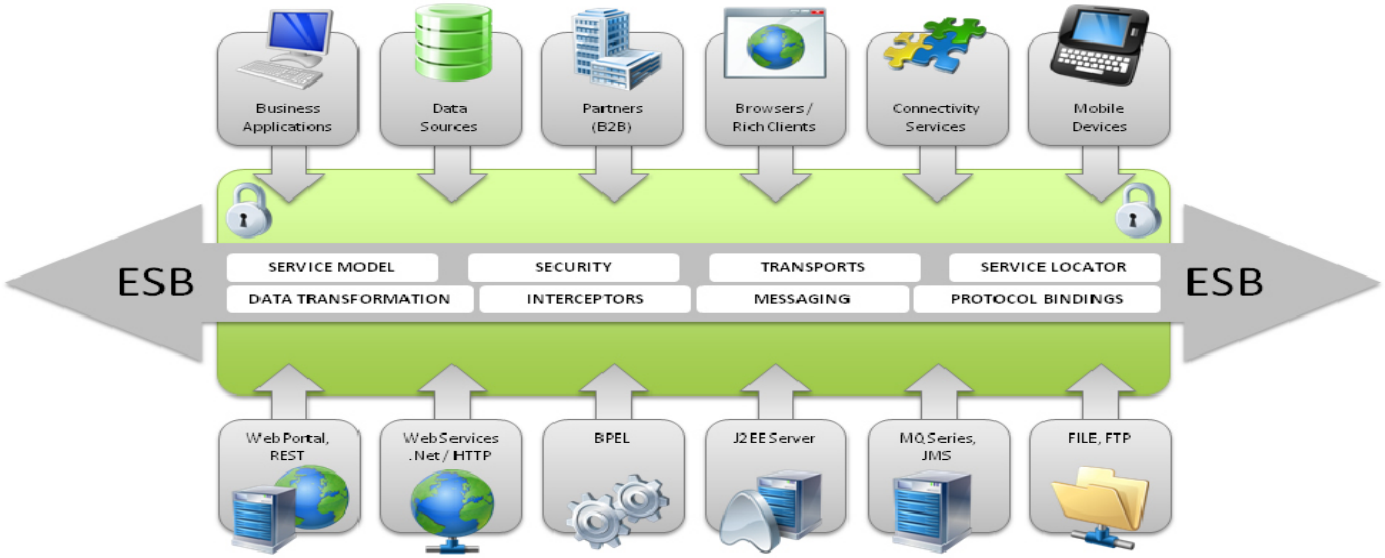
Technical Challenges

- Incompatible due to lack of standardized data formats , transport and messaging protocol support
- Data requires transformation and enrichment before it can be consumed by other applications
- Broadcasting to multiple applications
- Maintenance is expensive as integrations are custom built
- Point to Point Integrations



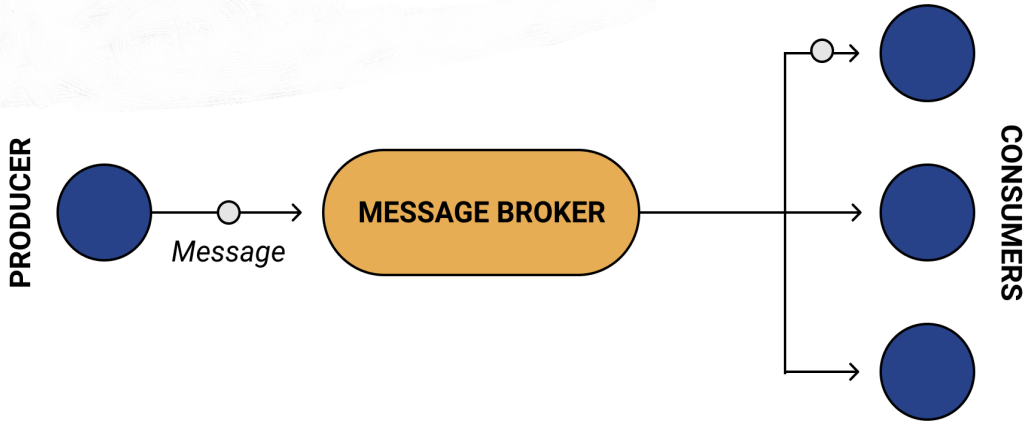
Integration Products and Components

- **Enterprise Service Bus** : An ESB, or enterprise service bus, is a pattern whereby a centralized software component performs integrations to backend systems (and translations of data models, deep connectivity, routing, and requests) and makes those integrations and translations available as service interfaces for reuse by new applications



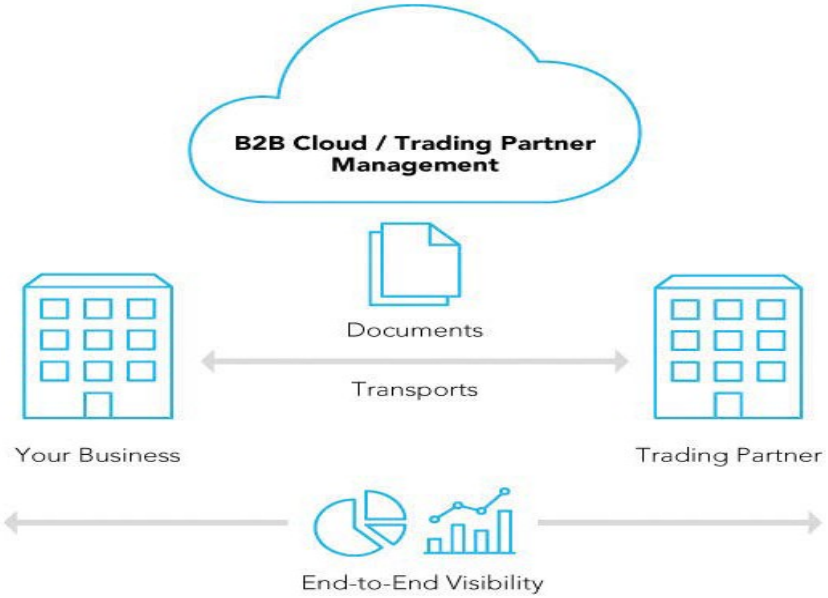
Integration Products and Components

- **Message Broker :**A message broker is software that enables applications, systems, and services to communicate with each other and exchange information. The message broker does this by translating messages between formal messaging protocols



Integration Products and Components

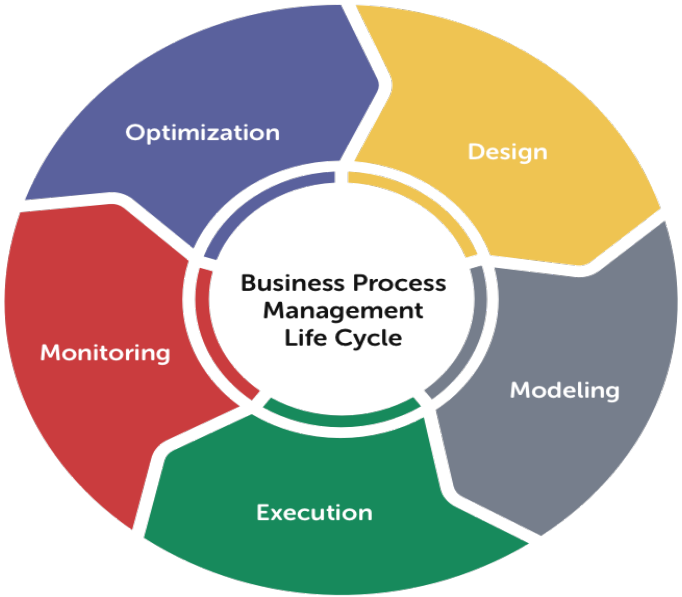
- Business-to-business (**B2B**) **integration** is the automation of business processes and communication between two or more organizations. It allows them to work and trade more effectively with their customers, suppliers and business partners

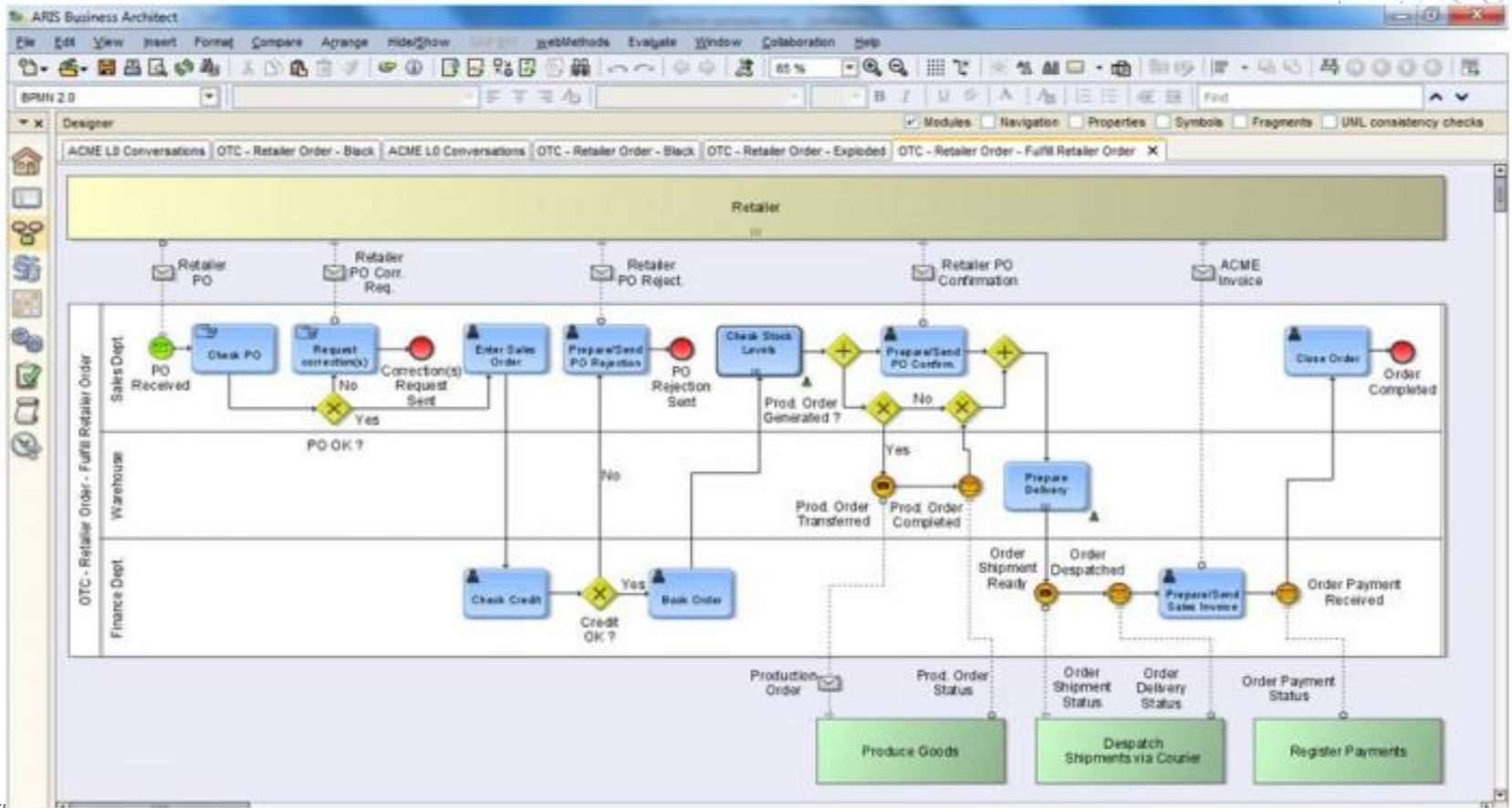


- Trading Partner Management
- Request-Response Processing Rules
- EDI Standards Support – EDIFACT , ANSI X12 , XML
- Batch and Realtime transaction delivery
- Transaction Monitoring
- Reprocessing of Failed transaction

Integration Products and Components

- Business Process Management: BPM is a discipline involving any combination of modeling, automation, execution, control, measurement and optimization of business activity flow.

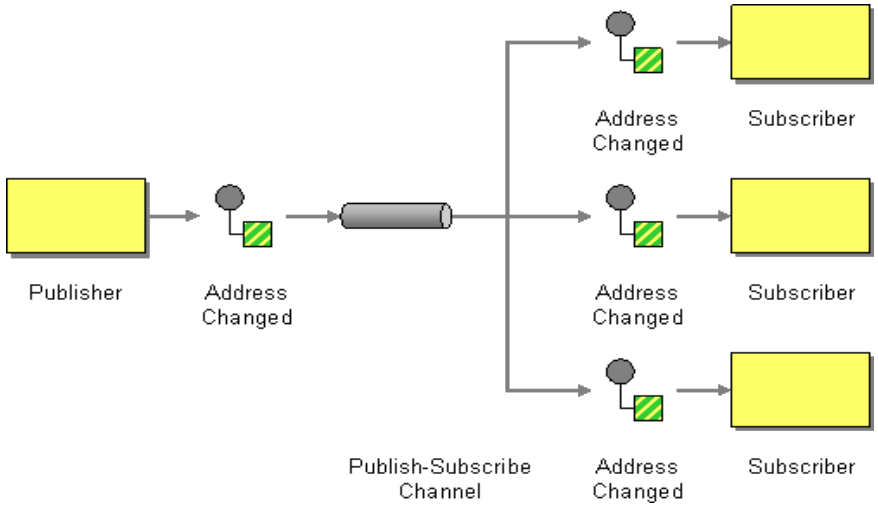



ARIS Business Architect
Designer
Retailer
Retailer PO
Retailer PO Corr. Req.
Retailer PO Reject
Retailer PO Confirmation
ACME Invoice
OTC - Retailer Order - Fulfil Retailer Order
Sales Dept.
Warehouse
Finance Dept.
PO Received
Check PO
Request correction(s)
No
Yes
PO OK ?
Correction(s) Request Sent
Enter Sales Order
Prepare/Send PO Rejection
PO Rejection Sent
Check Stock Levels
Prod. Order Generated ?
Prepare/Send PO Confirm.
No
Yes
Close Order
Order Completed
Prod. Order Transferred
Prod. Order Completed
Prepare Delivery
Check Credit
Credit OK ?
Yes
No
Book Order
Order Shipment Ready
Order Despatched
Prepare/Send Sales Invoice
Order Payment Received
Production Order
Prod. Order Status
Order Shipment Status
Order Delivery Status
Order Payment Status
Produce Goods
Despatch Shipments via Courier
Register Payments

Integration Patterns

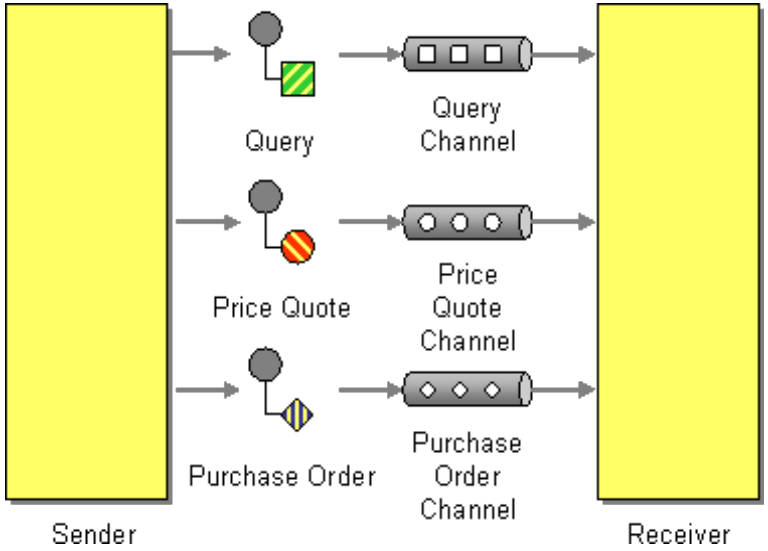
- Design Patterns: Design patterns are formalized best practices that the programmer can use to solve common problems when designing an application or system
- Proven best practices and frameworks for Integrating applications
- Almost all Product vendors provide these patterns out of the box
- Set of criteria decide which pattern to follow for Integration based on customer requirements

Integration Patterns



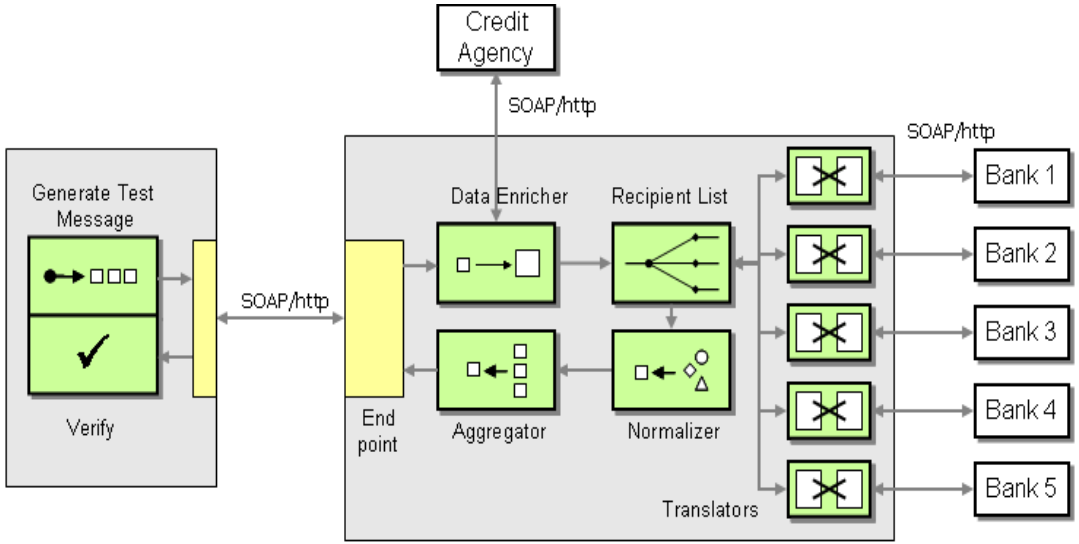
- It has one input channel that splits into multiple output channels, one for each subscriber
- When an event is published into the channel, the Publish-Subscribe Channel delivers a copy of the message to each of the output channels
- Each output channel has only one subscriber, which is only allowed to consume a message once

Integration Patterns



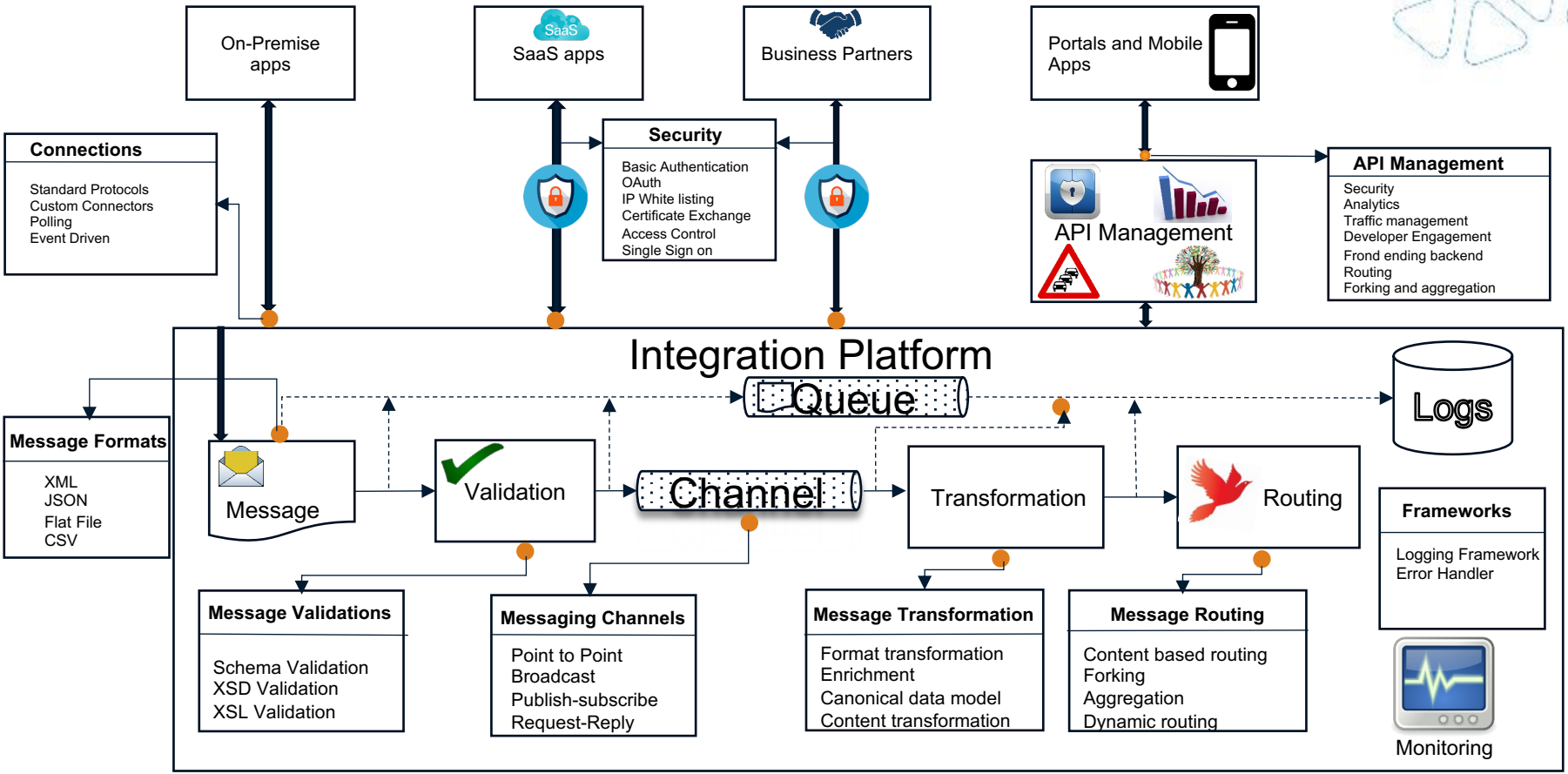
- Use a separate Datatype Channel for each data type
- The sender, knowing what type the data is, will need to select the appropriate channel to send it on
- The receiver, knowing what channel the data was received on, will know what its type is

Integration Patterns



- Request-Reply - Synchronous model
- SOAP / RESTful webservices can be utilized
- Data Enrichment , Routing , Normalizer and Aggregator are used to enable communication with end applications

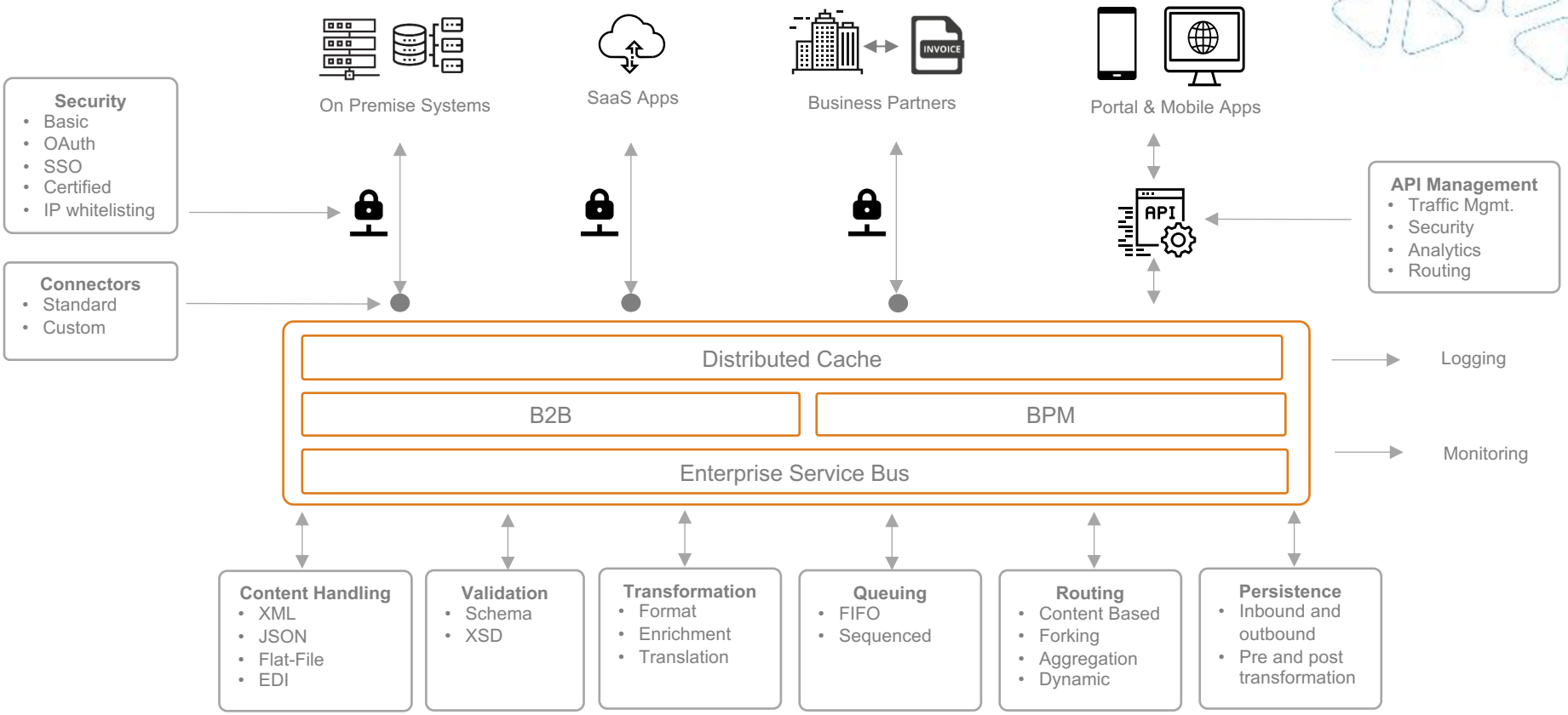
Integration Landscape



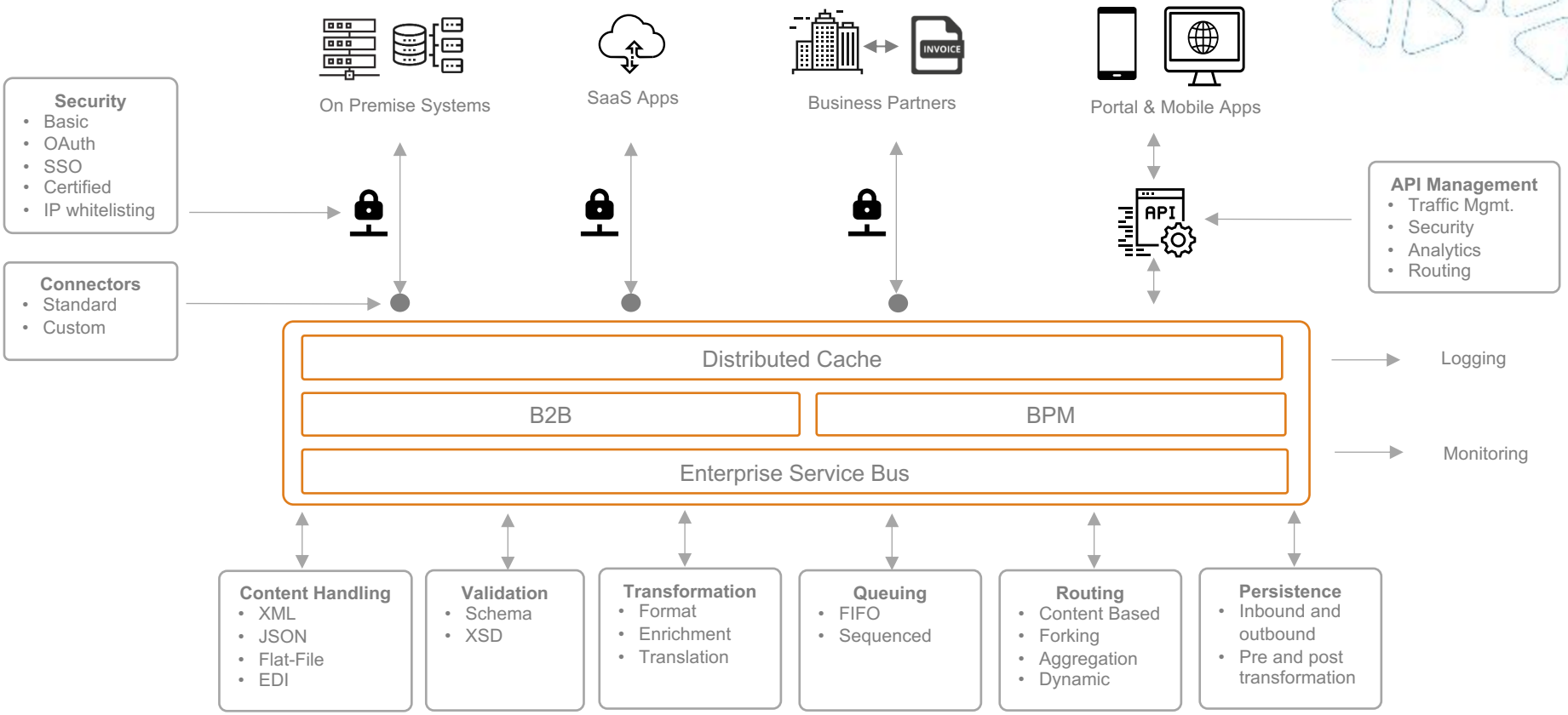
Integration Product Vendors

- SoftwareAG
- Mulesoft
- Tibco
- Oracle
- Snaplogic
- DellBoomi
- IICS
- WSO2

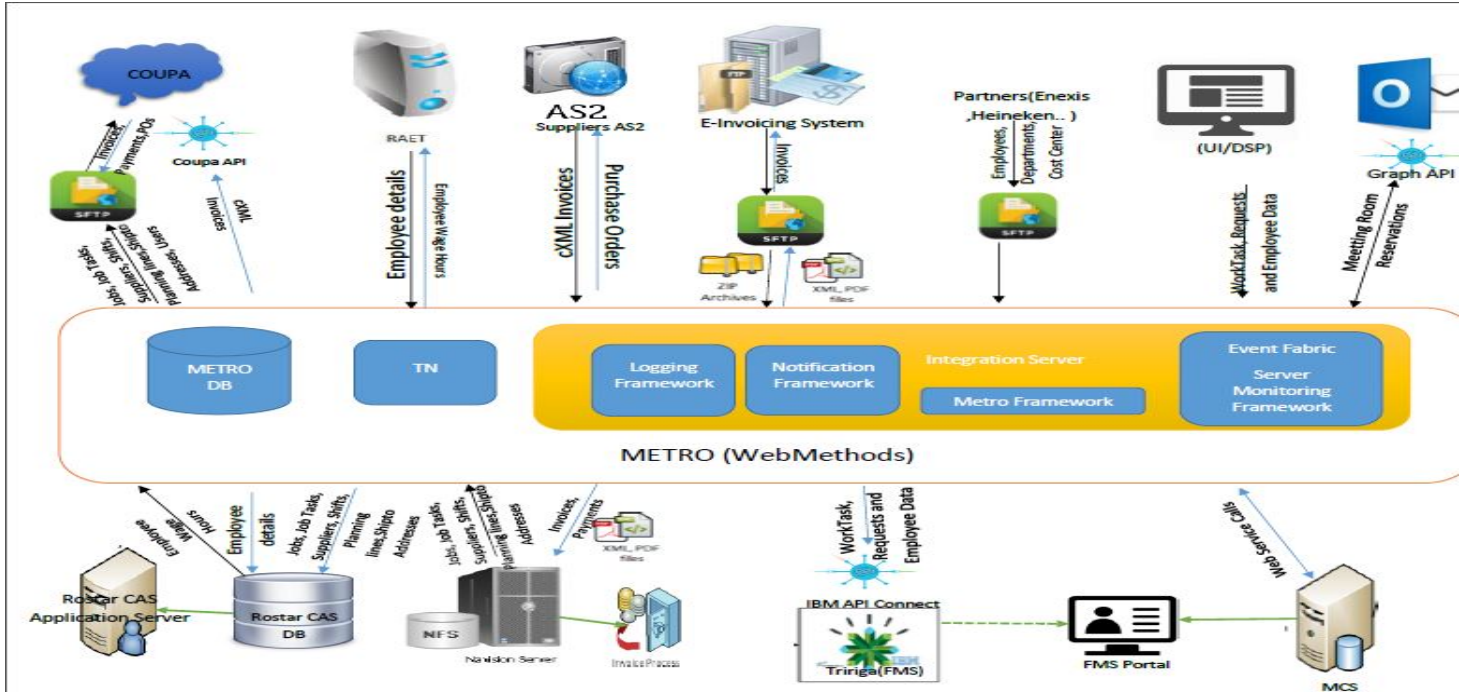
Use-Case – Telecom Domain



Use-Case – Telecom Domain

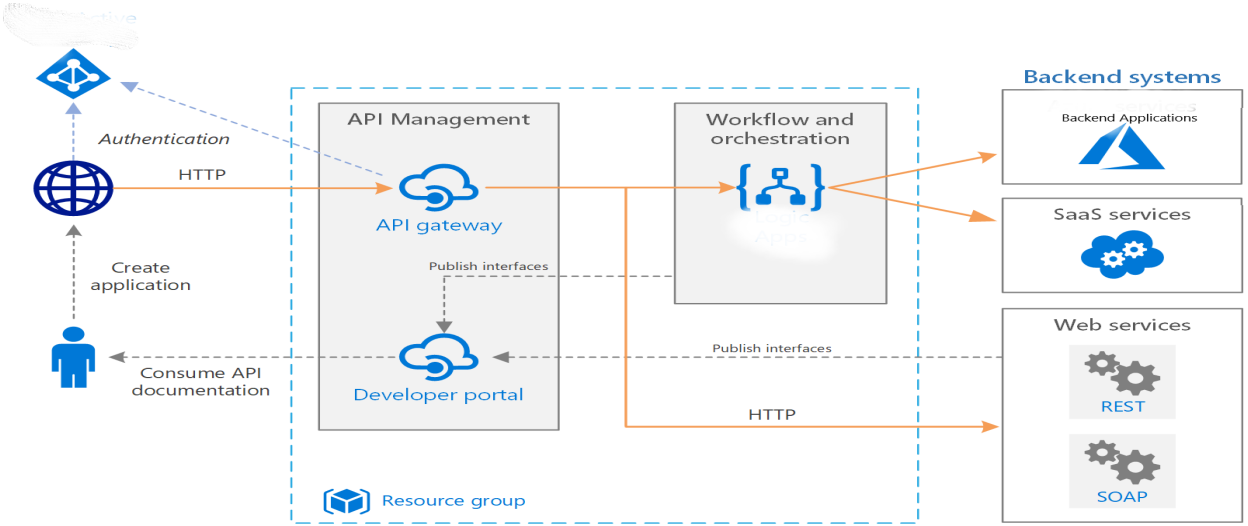


Use-Case – Facility Management Solution



API Management

- API – Application Programming Interface allows two application communicate with each other to work with backend systems and resources
- API management refers to the processes for distributing, controlling, and analyzing the APIs that connect applications and data across the enterprise and across clouds.

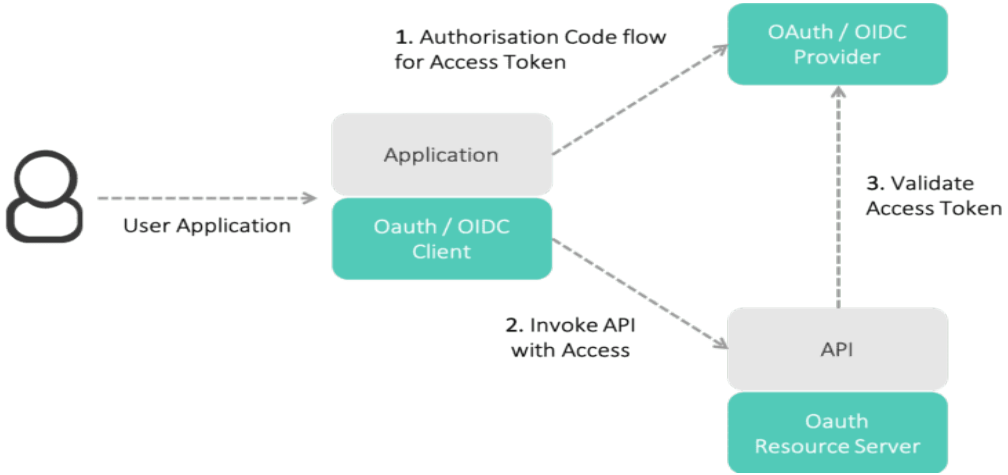


API Gateway Features

- **API Definitions :**– REST / SOAP based Web services. Created using RAML / OpenAPI specification
- **Security** : Define Authentication and Authorization mechanism
- **Request and Response Processing** : Data Transformation using XSLT.
- **Policy enforcement:** API providers can enforce security, traffic management, monitoring, and SLA management policies
- **Discovery and Testing API**: API Gateway provides filter capabilities to quickly find APIs of interest. Developers can use the provided samples and expected error and return codes to see how the API works.
- **Built-in usage analytics :** API Gateway provides information about Gateway-specific events and API-specific events by the way of dashboard.

API Security

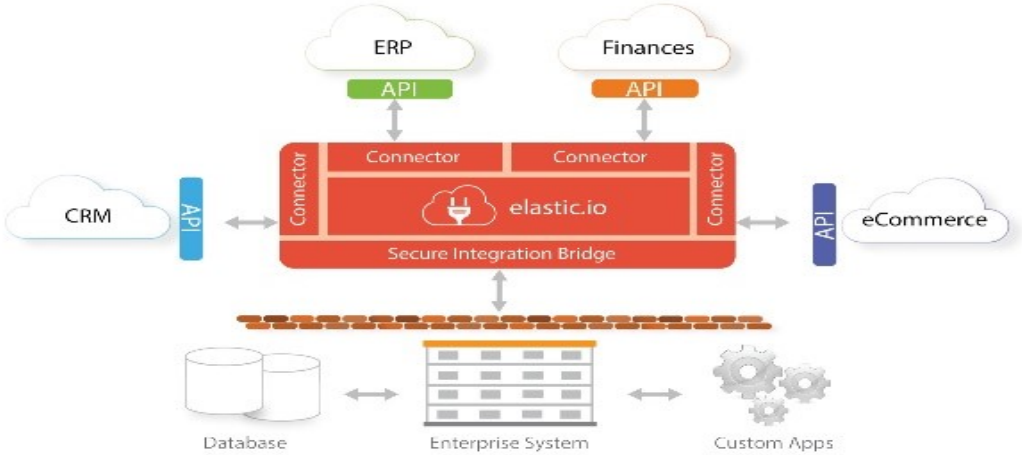
- **Authentication** : Mechanism to validate user identity who they claim to be. Username /Password , One-time pins , authentication apps are some of ways to establish user identity
- **Authorization** : Authorization in system security is the process of giving the user permission to access a specific resource or function



- HTTP Basic Authentication
- API Key – Generated and shared with API consumers
- OAuth 2.0 in combination of Openid Connect

Integration on Cloud – iPaaS

- Integration platform as a service (iPaaS) is a hosted service offering in which a third-party provider delivers infrastructure and middleware software
- Suite of Cloud services enabling development , execution and governance of integration flows
- Integration between cloud to cloud , cloud to on premise application is possible



iPaaS Features Overview

- **Easy-to-use interface :**

  Integration features an intuitive, drag-and-drop user interface to design, assemble, and deploy workflows for cloud and on-premise apps.

- **Application connectors**

  Connect to anything. iPaaS provides out-of-the-box connectivity to SaaS applications such as Salesforce®, ServiceNow® and StrikeIron™ as well as industry standard protocols, such as REST, SOAP and Odata.

- **Multi-tenant architecture**

  Many tenants can share a single development execution environment while each has its own production environment. And all users interact with the system using a common, web-based user interface.

- **On-premises connectivity**

  Integration to create reliable and secure cloud-to-on-premises integrations. All connections are initiated from the on-premises Integration Server, so you don’t need to open up firewall ports for your data center.

- **Develop on-premises, deploy in the cloud**

  Cloud Deployment enables professional developers to build integration projects in a full-featured Eclipse-based environment and deploy them into iPaaS Platform. Create sophisticated integrations using powerful developer tooling.

- **End-to-end monitoring**

  Allows you to have clear visibility into all of your webMethods.io systems with a dynamic view of your service calls as they move through various runtimes in API, B2B and Integration

Message Streaming - Kafka

- Message / Event streaming is the practice of capturing large volume of data in real-time from event sources like databases, sensors, mobile devices, cloud services, and software applications in the form of streams of events
- Based on the Publish-Subscribe model and often used in real-time streaming data to provide real-time analytics
- Message feed is stored as topics on Kafka Servers
- Producers publishes messages to Topics , Consumers subscribe to Topics and processes the message
- Kafka ensures Message-Ordering while processing , guaranteed delivery and anomaly detection
- Doesn’t perform data transformation

Kafka – Use cases

- Real-Time Stream Processing
- General Purpose Message Bus
- Collecting User activity data
- Operational metrics from applications ,servers and devices
- Log Aggregation

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