



# IBM Code Day 2018

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## Hybrid cloud application deployment and management

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# Creating value with cloud

- How create new value with cloud ?
  - Decide which IT and business functions to deliver through cloud
  - Identify and address challenges in adopting cloud
  - Realize operational, financial and innovation benefits.

*Growing business with cloud: Why organizations said they'll strategically adopt hybrid cloud solutions*

Lower total cost of ownership	54%
Enhance operational efficiencies	42%
Facilitate innovation	42%
Meet customer expectations more readily	40%

*Source: IBM Institute for Business Value analysis*



92% of surveyed executives said their most successful cloud initiative **enabled creation and support of new business models**



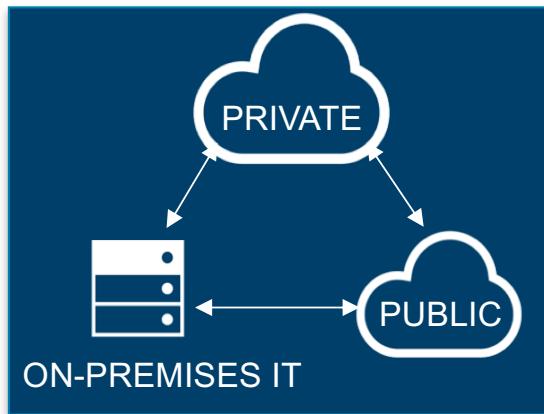
Executives said they expect **45% of workloads to stay on dedicated, on-premise servers**, even as cloud adoption expands



83% of high-performing organizations said their cloud initiatives **are coordinated or fully integrated within the organization**

*\*IBM Institute for Business Value study, "Tailoring Hybrid Cloud"*

# Hybrid Cloud



The connection of one or more clouds to on-premises systems and/or the connection of one or more clouds to other clouds.



# Why Hybrid Cloud ?

- Provides the ability for different personas to tap into data and analytics where it makes the most sense (localization wise)
- Allows the analytics to run where the data is stored (data gravity)
- Provides better management of legal and regulatory requirements in terms of privacy regulation associated with data sovereignty and regulatory requirements such as HIPAA, PCI, and SOX
- Provides an agile platform for developing/deploying new applications
- Allows workload portability and cost optimization

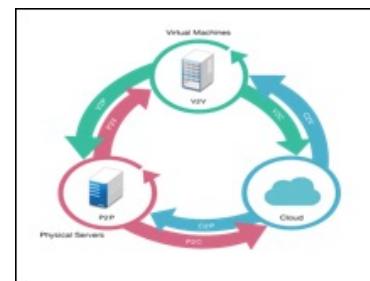
**Hybrid Integration**



**Workload / Resource Optimization**



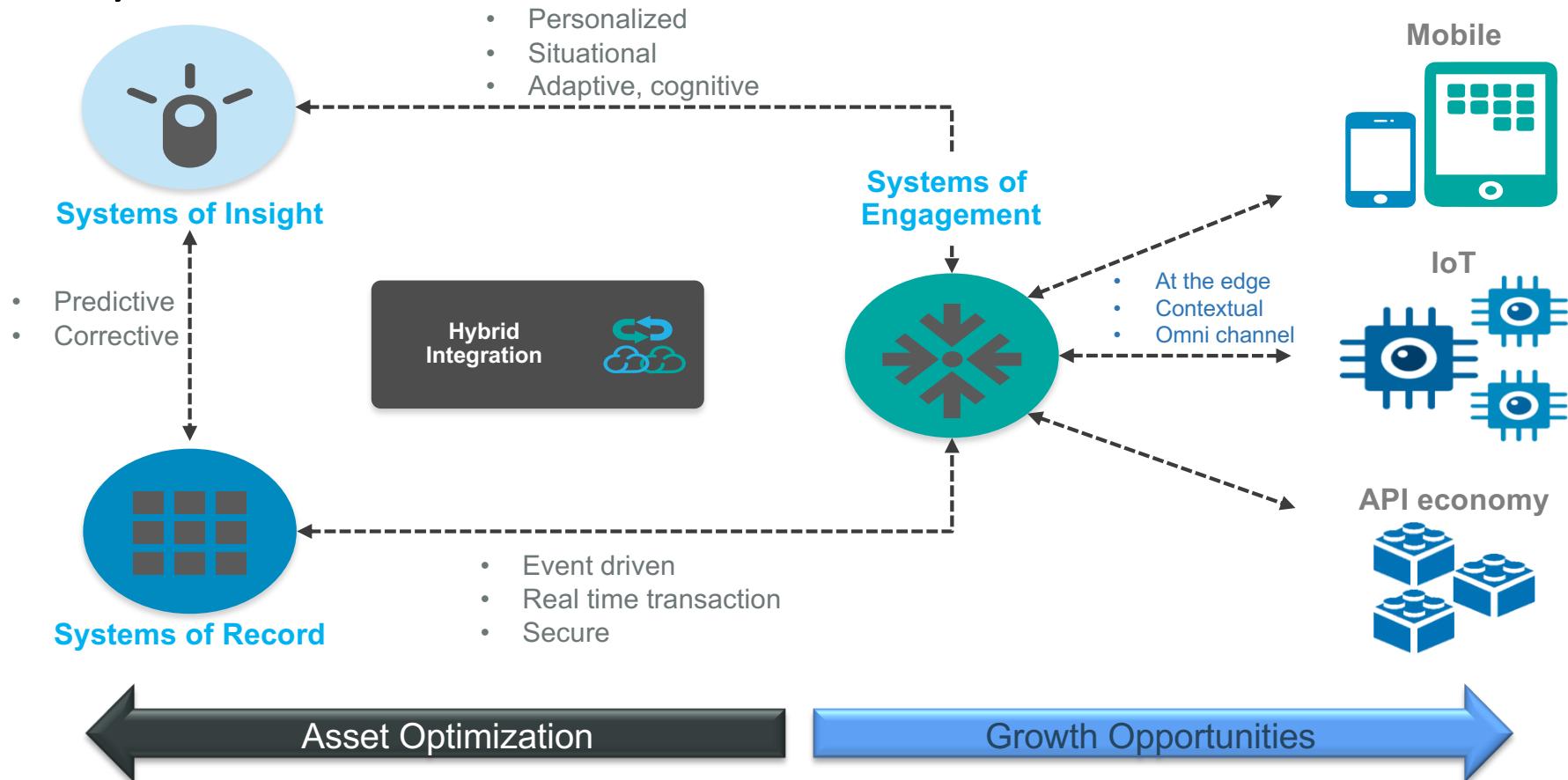
**Portability**



**Compliance**



# Hybrid cloud scenarios

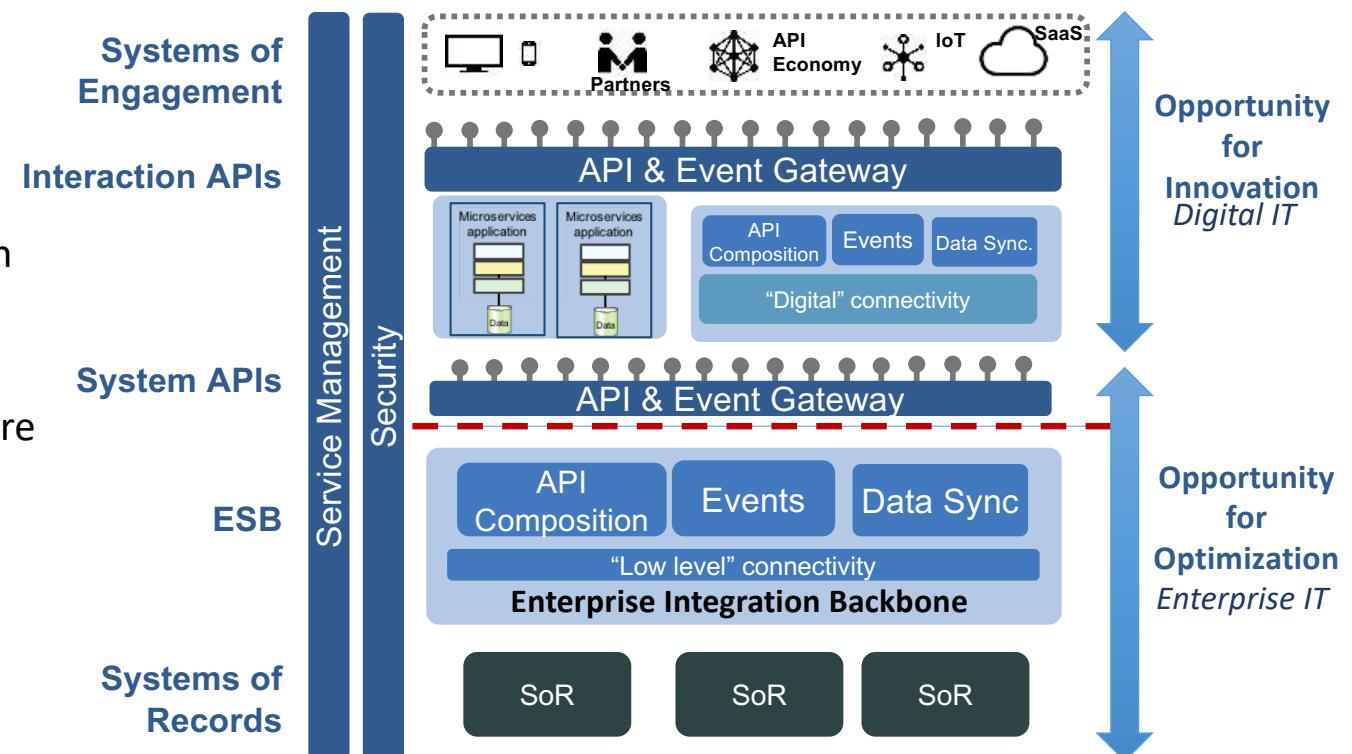


# Hybrid cloud integration scenarios

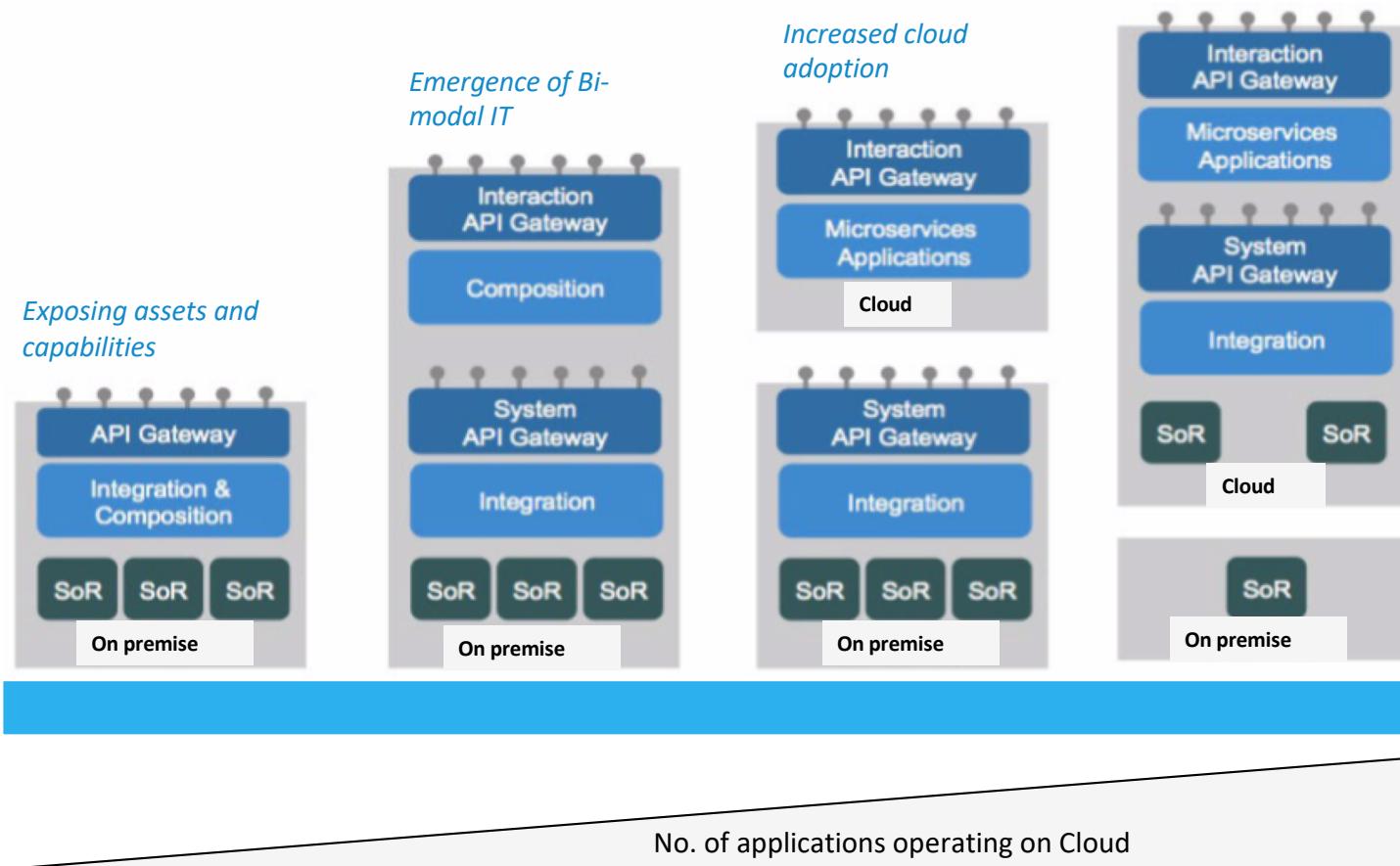
Next generation Hybrid Workloads			Hybrid Infrastructure Scale Out			Hybrid Cloud Brokerage & Management
Independent workload	SoE – SoI/SoR Integration	Portability & Optimization	Capacity	Backup & Archive	Disaster Recovery	
<p>On-Premises Production</p> <p>Private Production</p> <p>Public Dev / Test</p> <p>App</p>	<p>SOI</p> <p>SOE    SOAu</p> <p>Public</p> <p>SOI</p> <p>Private</p> <p>SOR</p> <p>On-Premises</p>	<p>On-Premises</p> <p>Private</p> <p>App</p>	<p>On-Premises</p> <p>Private</p> <p>Public</p> <p>App</p>	<p>Private</p> <p>Public</p> <p>App</p>	<p>App2</p> <p>Data2</p> <p>Public</p>	<p>On-Premises</p> <p>Private</p> <p>Public</p> <p>App</p> <p>Policy</p>
Choose on-prem, private or public cloud based on independent workload requirements	Systems of record on-prem, systems of insight, and systems of engagement on public cloud	Application and /or data are portable and can go from on-prem to public or private cloud for better optimization	Opportunistic use of public or private cloud as additional resources for large on-prem jobs / application	Leverage off-prem resources for backup & archive of on-prem resources	Setup and make available a parallel on-prem env using off-prem resources	Planned or policy based mgmt and sourcing across multiple env of the hybrid cloud

# Hybrid cloud integration

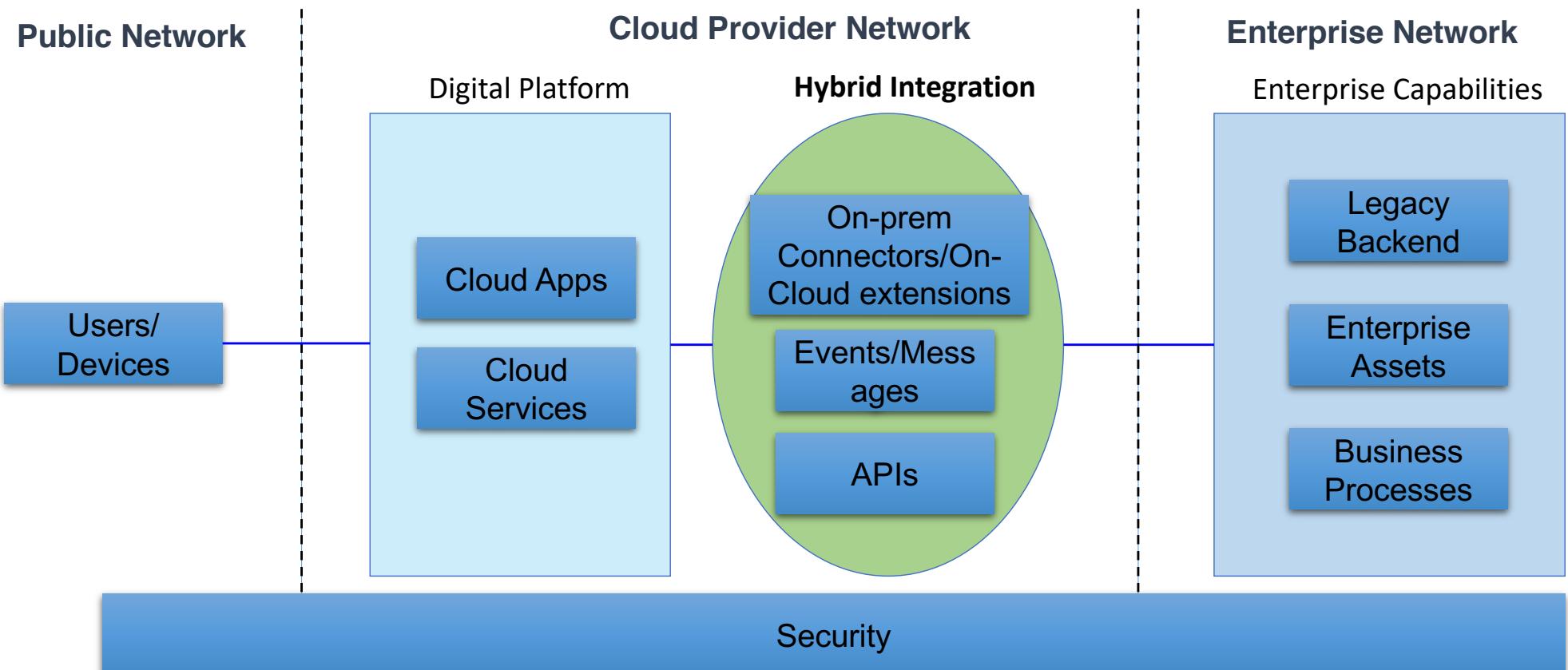
- Infrastructure Integration
- Application, Services and Data Integration
  - Application-layer integration
  - API-driven Integration
  - Event-based integration
  - Integration to legacy software & middleware
  - Data sync & integration
  - Integrated DevOps
  - Integrated Security Services
- Operational Integration



# Hybrid Integration Journey

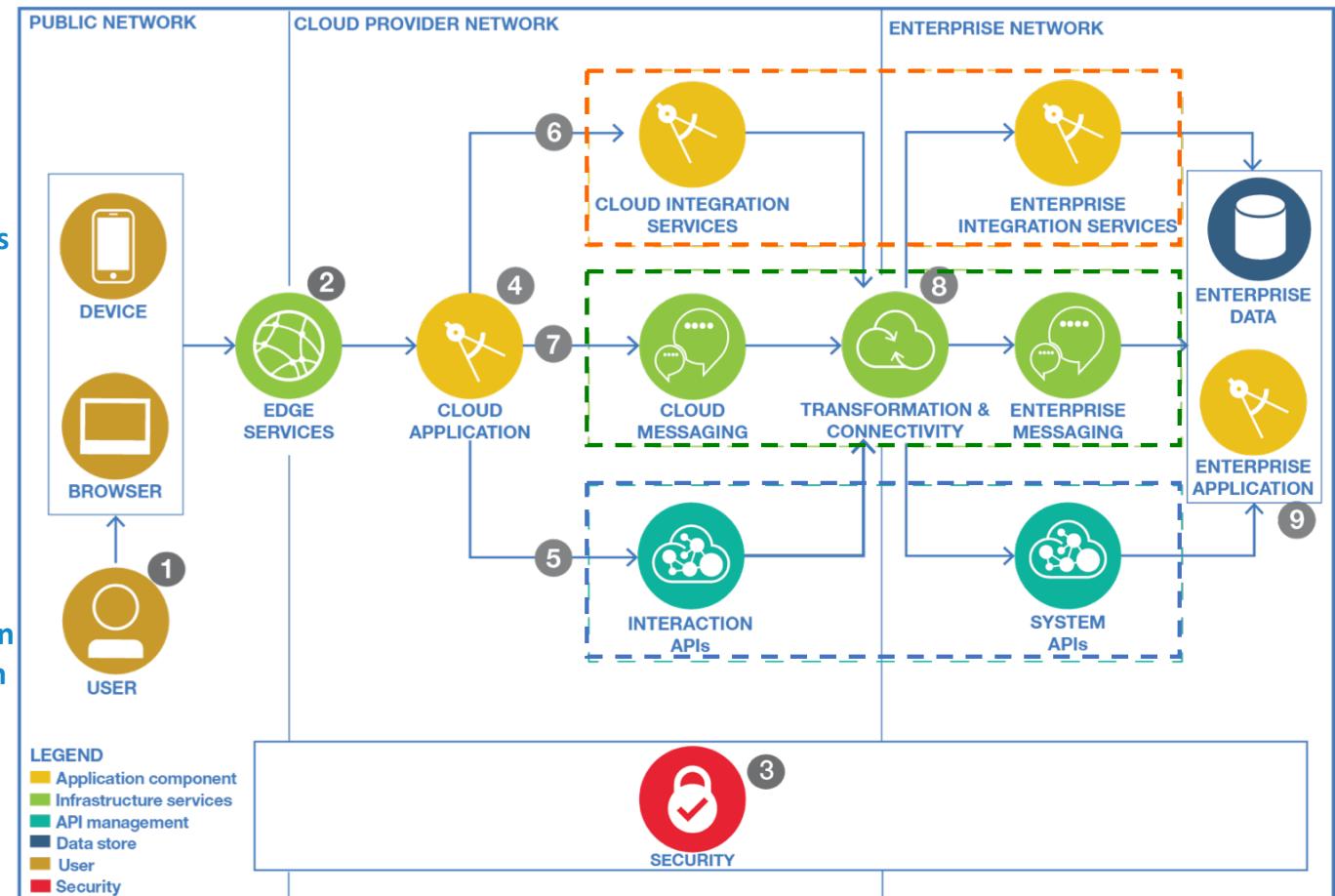


# Hybrid Integration topology

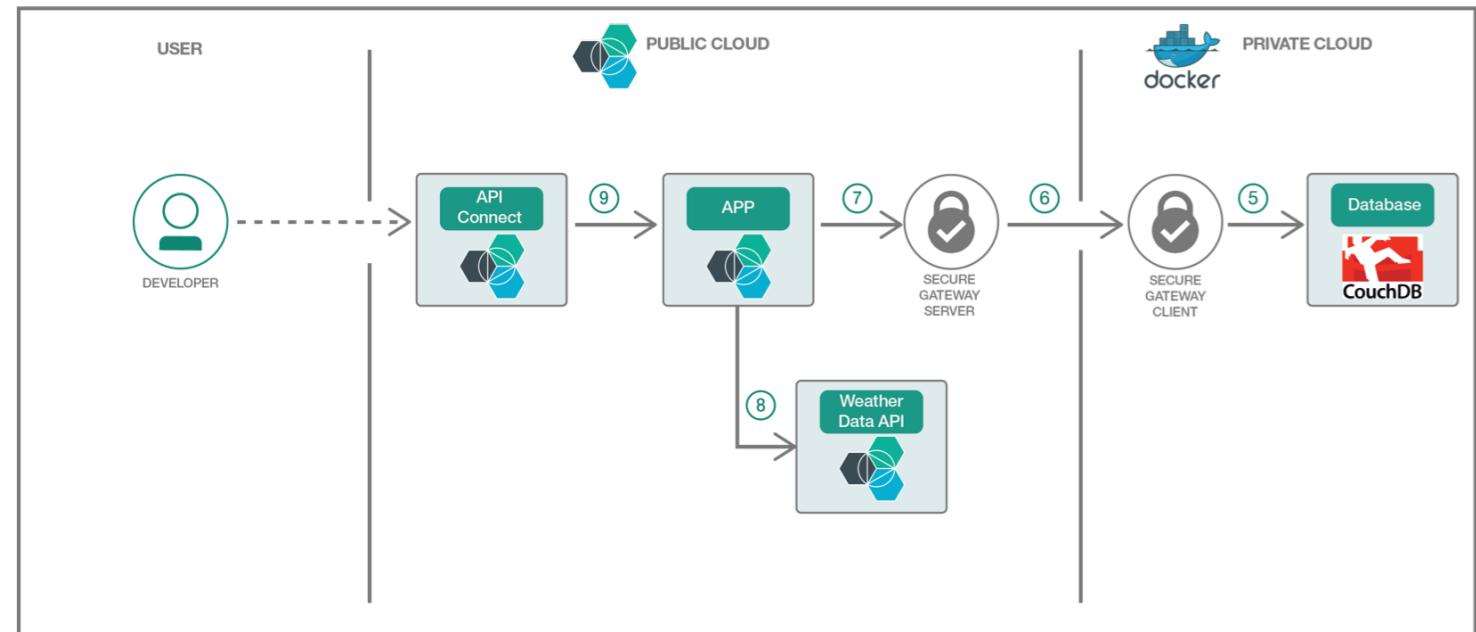


# Hybrid Integration – Reference Architecture

1. User accesses device app
2. Device app invokes cloud app
3. User is authenticated.
- 4. User interacts with Cloud App to select and purchase a product. Cloud app needs to invoke on-prem enterprise services to execute the purchase**
- 5. Cloud app calls a managed API to get the customer enterprise account ID**
- 6. Cloud app submit the purchase transaction via a connector against the customer account in the billing system**
- 7. Cloud app publishes an event to a topic queue to report the purchase information which will be updated in the CRM system**
- 8. Secure gateway funnels those requests to the on-prem data source**
- 9. Enterprise app retrieves/updates data accordingly**



## Demo: Create a hybrid cloud with API Connect and Secure Gateway



- Journey
  - Create a tunnel to connect your on-prem environment to the public cloud.
  - Build and run a sample application by using either *WebSphere Liberty* for on-premises or *Cloud Foundry* for the public cloud.
  - Have the application connect to an on-premises database by using *CouchDB* and *Docker*.
  - Expose application APIs for public consumption by using an *API gateway* framework.

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### Code & instructions

<https://github.com/IBMDevConnect>  
<https://github.com/IBM>  
<https://github.com/IBM-Cloud>  
<https://ibm-cloud.github.io/#/>  
<http://ibm.github.io>  
<https://github.com/watson-developer-cloud>  
<https://github.com/ibm-bluemix-mobile-services>



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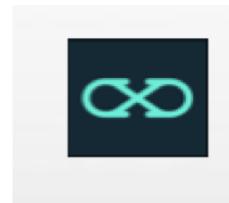


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```
if operation == "MIRROR_X":  
    mirror_mod.use_x = True  
    mirror_mod.use_y = False  
    mirror_mod.use_z = False  
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elif operation == "MIRROR_Z":  
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    mirror_mod.use_y = False  
    mirror_mod.use_z = True
```