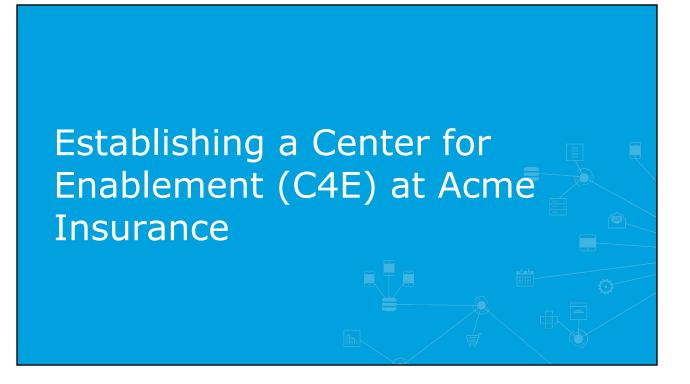


# Module 3 Establishing Organizational and Platform Foundations

### At the end of this module, you should be able to



- Advise on establishing a C4E and identify KPIs to measure its success
- Choose between options for hosting Anypoint Platform and provisioning Mule runtimes
- Describe the set-up of organizational structure on Anypoint Platform
- Compare and contrast Identity Management and Client
   Management on Anypoint Platform

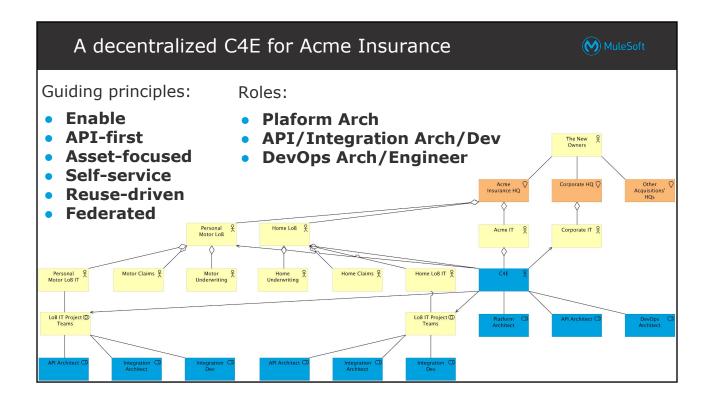


### Assessing Acme Insurance's integration capabilities



An assessment of Acme Insurance's IT capabilities is performed:

- LoBs have history of IT independence
  - o Strong IT skills, medium integration skills, no API-led connectivity know-how
- Acme IT is small but enthusiastic about application networks and API-led connectivity
- DevOps capabilities present in LoB IT and Acme IT
- Corporate IT lacks the capacity and desire to involve themselves directly in Acme Insurance's Enterprise Architecture
  - But corporate principles must be followed



### Exercise: Measuring success of the C4E



Thinking back on the application network vision on the one hand, and the principles of Acme Insurance's' C4E on the other hand:

- Compile a list of statements which, if largely true, allow the conclusion that the C4E is successful
- Compile a similar list that allows the conclusion that the application network vision is being realized
- 3. From these lists, extract a list of corresponding **metrics**

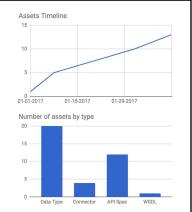
## KPIs measuring the success of Acme Insurance's C4E and the growth of its application network



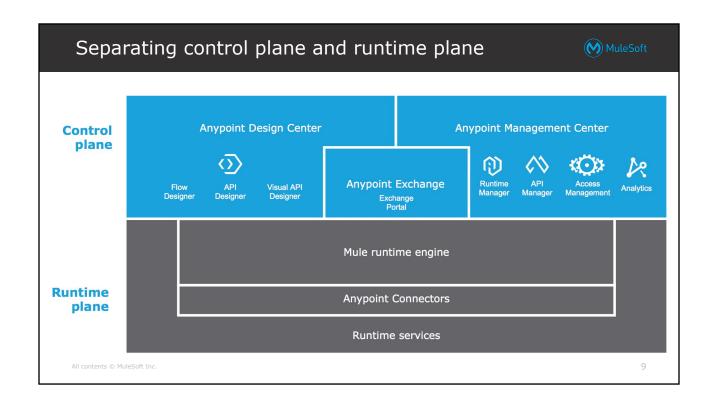
### Key Performance Indicators (KPIs):

- # of assets published (to Exchange)
- # of interactions with (Exchange) assets
- # of APIs managed by Anypoint Platform
- # of System APIs managed
- # of API clients registered for access to APIs
- # of API implementations deployed
- # of API invocations
- # or fraction of LoCs covered by automated tests
- Ratio of info/warning/critical alerts to number of API invocations

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# Understanding Anypoint Platform deployment scenarios



### Anypoint Platform deployment option matrix MuleSoft **Runtime Plane / Mule runtimes** MuleSoft-hosted Customer-hosted iPaaS-provisioned Manually provisioned AWS **AWS Pivotal Cloud** Kubernetes **VPC** public cloud Foundry Docker MuleSoft-**Anypoint Anypoint** Control **Anypoint Hybrid** hosted **Platform** with **VPC** with **Runtime Plane** CloudHub CloudHub **Fabric** Customer-Anypoint **Anypoint** hosted Platform for **Platform Private PCF** Cloud **Edition**

### Deployment of control plane



- MuleSoft-hosted
  - Anypoint Platform
  - o AWS regions:
    - US East (N Virginia)
    - EU (Frankfurt)
- Customer-hosted
  - Anypoint Platform Private Cloud Edition

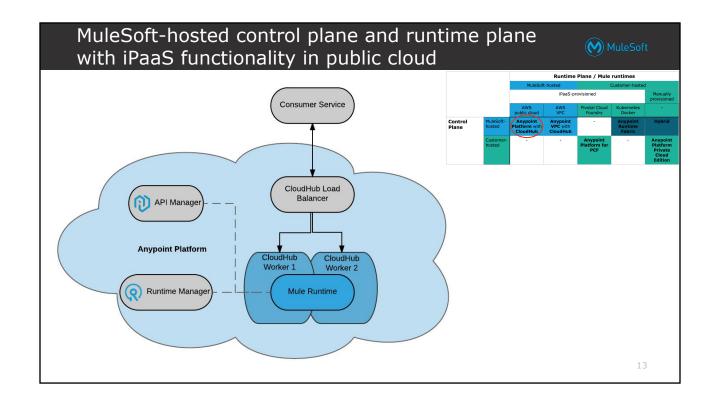
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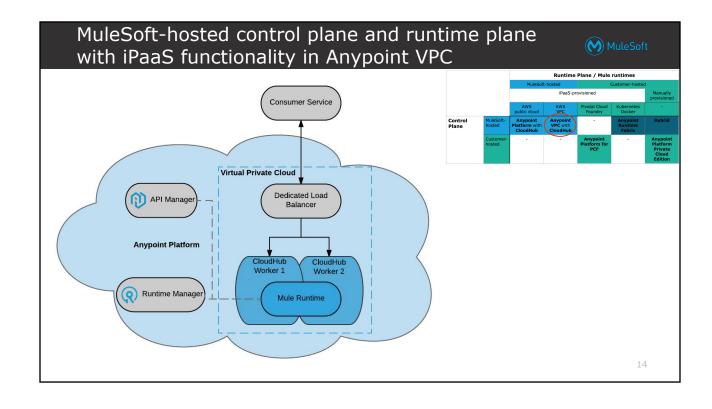
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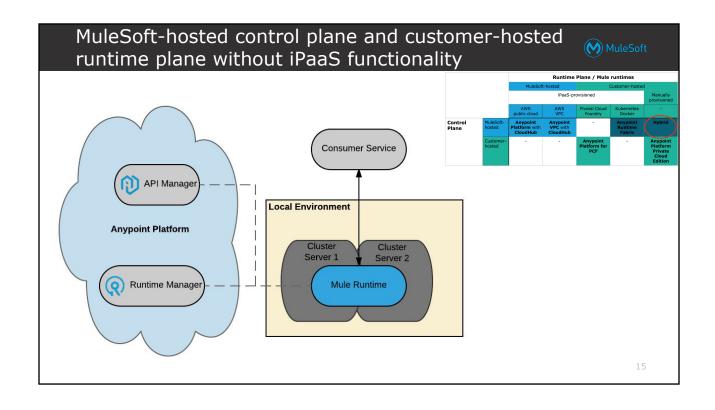
### Deployment of runtime plane and Mule runtimes

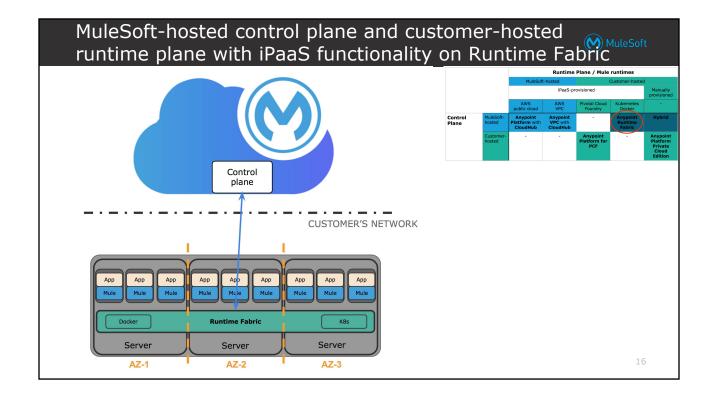


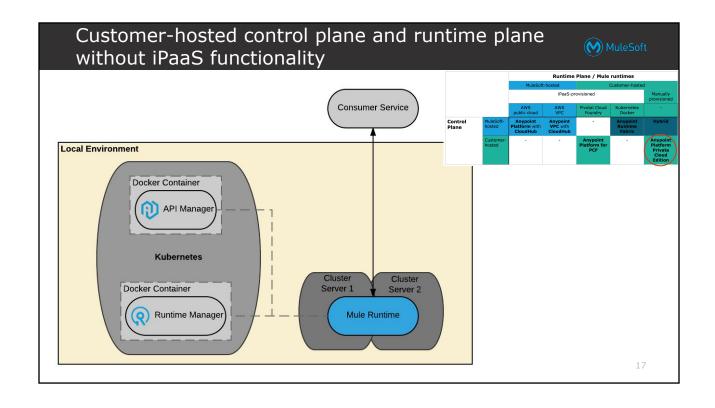
- MuleSoft-hosted
  - In public AWS cloud: CloudHub
  - In AWS VPC: CloudHub with Anypoint VPC
  - AWS regions:
    - US control plane: US East/West, Canada, APac, EU (incl. London), S America
    - **EU control plane**: EU (Frankfurt, Ireland)
- Customer-hosted
  - Manually provisioned Mule runtimes: metal, VMs, on-premises, cloud, ...
  - **iPaaS-provisioned** Mule runtimes:
    - MuleSoft appliance: Anypoint Runtime Fabric
    - Customer-managed: Anypoint Platform for Pivotal Cloud Foundry

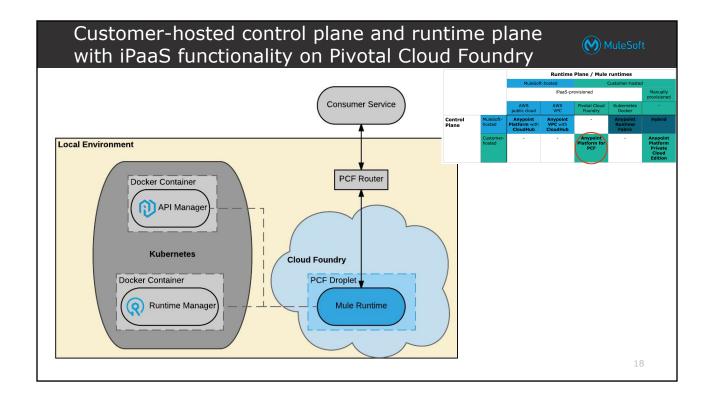












# Availability of Anypoint Platform components in different Anypoint Platform deployment scenarios



Component	CloudHub	Hybrid	Runtime Fabric	Anypoint Platform Private Cloud Edition	Anypoint Platform for Pivotal Cloud Foundry
API designer	yes	yes	yes	yes	yes
Flow designer	yes	yes	yes	no	no
Access Management	yes	yes	yes	yes	yes
Runtime Manager	yes	yes	yes	yes	yes
API Manager	yes	yes	yes	yes	yes
Analytics	yes	yes	yes	no	no
Exchange	yes	yes	yes	yes	yes
Anypoint MQ	yes	no	no	no	no
PaaS	yes	no	yes	no	yes

### Exercise: Choosing between deployment scenarios



Reflecting on the various deployment scenarios supported by Anypoint Platform:

- 1. Discuss the characteristics of each scenario
- 2. For each deployment scenario, identify requirements that would clearly require that scenario

  Runtime Plane / Mule runtimes

MuleSoft-hosted Customer-hosted iPaaS-provisioned Manually provisioned AWS public cloud AWS VPC **Pivotal Cloud** Kubernetes Docker Foundry Anypoint Runtime Fabric Control MuleSoft-**Anypoint Anypoint** Hybrid Platform with CloudHub VPC with CloudHub hosted **Plane** Customer **Anypoint** Anypoint Platform for **PCF** Private Cloud

### Solution: Choosing between deployment scenarios



Evaluate scenarios along the following dimensions:

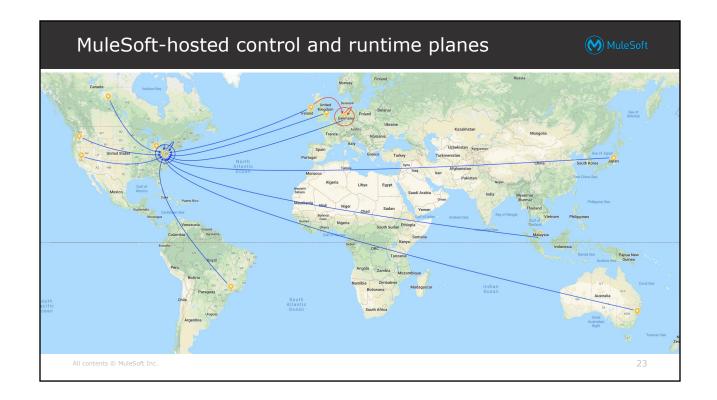
- Regulatory requirements of on-premises processing
  - Including meta-data about API invocations and messages
- Time-to-market
- IT operations effort
- Accessing on-premises data sources
- **Isolation** between Mule apps
- Mule runtime tuning
- Scalability of runtime plane
  - horizontal and vertical; static and dynamic
- Roll-out of new releases

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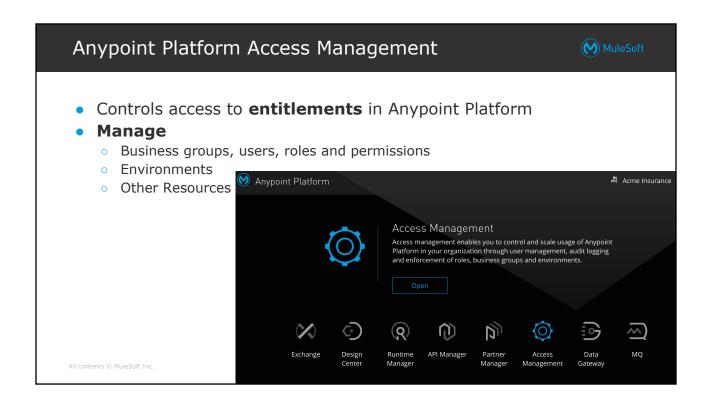
### Anypoint Platform data residency

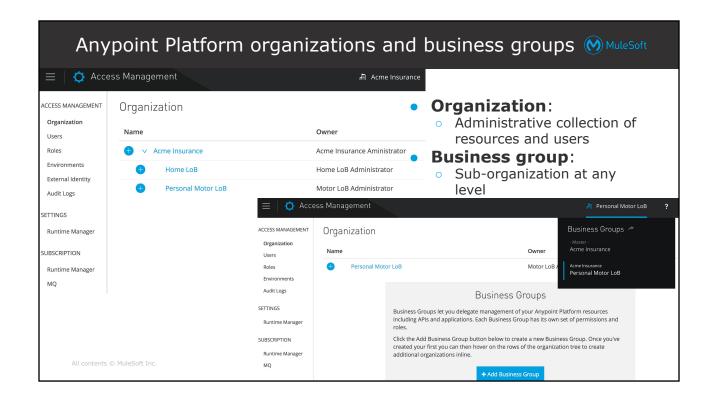


- Location of Mule runtime + integration logic in Mule apps determine location and residency of all data
  - Message payload stays in Mule runtime
    - Possible exception (not by default): business events and Insight
  - Persistent data (ObjectStore, persistent VM queues, Anypoint MQ queues)
     in AWS region of runtime plane
- Metadata incl. metrics exchanged with Management Center
  - CPU/memory usage, message/error count, API name and version, geodata about the API client, HTTP method, violated API policy name, etc.
- Mule apps stored in Runtime Manager
- Typical jurisdiction-local deployments:
  - (EU/US control plane) + (EU/US or customer-hosted runtime plane)
  - Fully customer-hosted (Private Cloud Edition or for PCF)









### Identity Management vs Client Management



- Identity Management concerns users of Anypoint Platform
  - Human users of the Anypoint Platform web UI
  - Programmatic clients of Anypoint Platform APIs
  - Enables Single Sign-On (SSO)
  - Default: Anypoint Platform itself
- Client Management concerns API clients using OAuth 2.0
  - No default
- Anypoint Platform allows one external Identity Provider each
  - For Identity Management
  - For Client Management

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### Supported Identity Provider standards and products



- For Identity Management:
  - Mapping of Anypoint Platform roles to groups in IdP
  - OpenID Connect (OIDC)
    - Implemented by Salesforce Identity, PingFederate, OpenAM, Okta, ...
  - SAML 2.0
    - Implemented by PingFederate, OpenAM, Okta, Shibboleth, Active Directory Federation Services (AD FS), onelogin, CA Single Sign-On, ...
  - LDAP
    - Only on Anypoint Platform Private Cloud Edition
- For Client Management as OAuth 2.0 servers:
  - OpenAM
  - PingFederate
  - OpenID Connect Dynamic Client Registration (OIDC DCR)
    - Implemented by Identity Providers such as Okta and OpenAM

### Selecting an Identity Provider for Acme Insurance



- Currently Microsoft Active Directory (AD)
- Choose PingFederate as an Identity Provider ontop of AD
- Configure organization in MuleSoft-hosted Anypoint Platform to access on-premises PingFederate instance for Identity
   Management
- If OAuth 2.0 needed use same PingFederate instance also for Client Management



### Summary



- Federated C4E is established
  - **KPIs** to measure the C4E's success are defined and monitored
- Anypoint Platform can be hosted by MuleSoft or customers
  - Control plane and runtime plane
- Mule runtimes can be provisioned manually or through iPaaS
- Not all Anypoint Platform components are available in all deployment scenarios
- Organization is onboarded onto Anypoint Platform using an external Identity Provider
- Identity Management and Client Management are clearly distinct functional areas supported by Identity Providers

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