MCPA-Level 1 Exam Readiness Workshop

September 2022

Course logistics

- Class is typically from **01:00 PM to 07:00 PM IST**

Certification Format

- Multiple-choice, closed book, proctored, online
- Length: 60 questions
- Duration: 120 minutes (2 hours)
- Pass score: 70%
- Language: English
- You can take the exam a maximum of 5 times, with a 24-hour wait between each attempt.
- https://training.mulesoft.com/certification/architect-platform-level1

Preparation

- You can best prepare for the exam by taking the instructor-led Anypoint Platform Architecture: Application Networks course.
  - https://training.mulesoft.com/course/architecture-application-networks

- Practice exam
  - https://training.mulesoft.com/certification/architect-platform-level1/practice-exam

Certification exam datasheets - Architect

- MuleSoft Certified Platform Architect - Level 1
- MuleSoft Certified Platform Architect - Level 1 MAINTENANCE
  - Format: Multiple-choice, closed book, proctored, online
  - Length: 25 questions
  - Duration: 45 minutes
  - Pass score: 70%
  - Language: English

Topics

Explaining application network basics

Explaining application network basics

- Identify and differentiate between **technologies typically used** to implement **API-led connectivity**.
- Describe the **role and characteristics of web APIs**.
- Correctly assign **APIs to tiers** according to **ownership, functional focus, and rate of change**.
- Describe the capabilities and **high-level components** of Anypoint Platform.

Reference

- https://blogs.mulesoft.com/learn-apis/api-led-connectivity/what-is-api-led-connectivity/
- https://www.mulesoft.com/resources/api/what-is-full-lifecycle-api-management
- https://docs.mulesoft.com/monitoring/
- https://status.mulesoft.com/

Reference

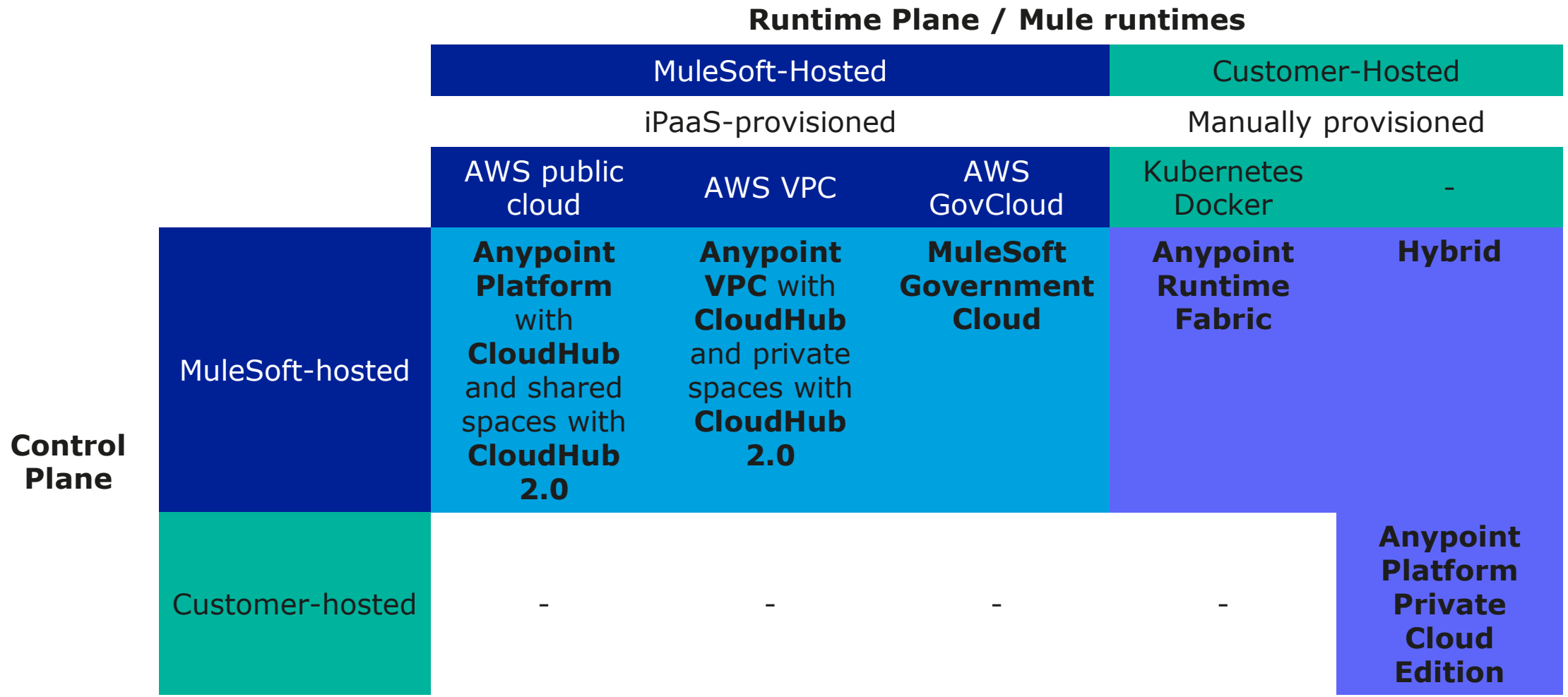
Component	Purpose
Design Center	https://docs.mulesoft.com/design-center/
API Manager	https://docs.mulesoft.com/api-manager/2.x/latest-overview-concept
Runtime Manager	https://docs.mulesoft.com/runtime-manager/
Access Management	https://docs.mulesoft.com/access-management/
Anypoint Monitoring	https://docs.mulesoft.com/monitoring/
API Analytics	https://docs.mulesoft.com/api-manager/1.x/analytics-concept
Anypoint Edge Security	https://docs.mulesoft.com/anypoint-security/
Object Store v2	https://docs.mulesoft.com/object-store/
Cloudhub Persistent Queue	CloudHub Persistent Queues Explained
Anypoint MQ	https://docs.mulesoft.com/mq/

Establishing organizational and platform foundations

Establishing organizational and platform foundations

- Advise on establishing a **Center for Enablement (C4E)** and identify **KPIs to measure its success**.
- Describe the **high-level structure** and benefits of **MuleSoft Catalyst**.
- Choose between **options for hosting and managing Anypoint Platform** control and runtime planes.
- Compare and contrast **Identity Management** and **Client Management** options on Anypoint Platform.
- Identify **data residency** of different kinds of data (e.g. payload, metrics, and others)

Reference



Reference

- https://blogs.mulesoft.com/digital-transformation/it-management/what-is-a-center-for-enablement-c4e/
- https://www.mulesoft.com/lp/whitepaper/soa/how-to-build-c4e
- https://github.com/mulesoft-catalyst/metrics-toolkit#available-metrics
- https://docs.mulesoft.com/access-management/external-identity
- https://docs.mulesoft.com/access-management/managing-api-clients
- https://blogs.mulesoft.com/dev-guides/how-to-tutorials/deployment-options-anypoint-platform/
- https://blogs.mulesoft.com/tag/catalyst/
- https://www.mulesoft.com/lp/whitepaper/soa/how-to-build-c4e
- https://share.vidyard.com/watch/iNV3tcyoDvQUAK2wQtc9BU
- https://share.vidyard.com/watch/n7DxctoBzuvtTyhhmysTec
- https://docs.mulesoft.com/anypoint-security/tokenization
- https://blogs.mulesoft.com/news/mulesoft-gdpr-compliance/

Designing and sharing APIs

Designing and sharing APIs

- Identify **dependencies** between an API, its API specification, its implementation, and its clients.
- Describe the **creation and publication of reusable API-related assets** using API specifications and Anypoint Platform components.
- Identify changes to an API that would require or not require changing the major/minor/patch component of its **semantic version**.
- Given a specific **power relationship** between two **Bounded Contexts**, choose the most appropriate strategy for mapping between the **API data models** of these Bounded Contexts.

Designing and sharing APIs

- Identify **idempotent HTTP methods** and HTTP-native support for **optimistic concurrency**.
- Recognize the important features and functionality of **API Designer** to design **API specifications**.

Dependencies between an API, API specification, implementation, and clients.

- API Datatype, Contract (API Specification)
- API Policies (Client ID Enforcement, OAuth Policies, CORS)
- API Fragments / Traits
  - Technology Interface (HTTP / Rest / SOAP)
  - Anypoint Exchange
    - SOA Service Discovery
    - Reusability
  - State Management (Stateful / Stateless)
    - Objectstore v2
    - Persistent VM Queue
    - Anypoint MQ

Semantic Version

- Semantic Version
  - Major
  - Minor
  - Patch

- Major Version Changes
  - Datatype / Datamodel changes
  - Header changes
  - Status code changes
  - Deletion of resources

Domain Driven Design

- Domain Data Models
  - Common Data Model
  - Bounded Context Data Model
  - No Data Model

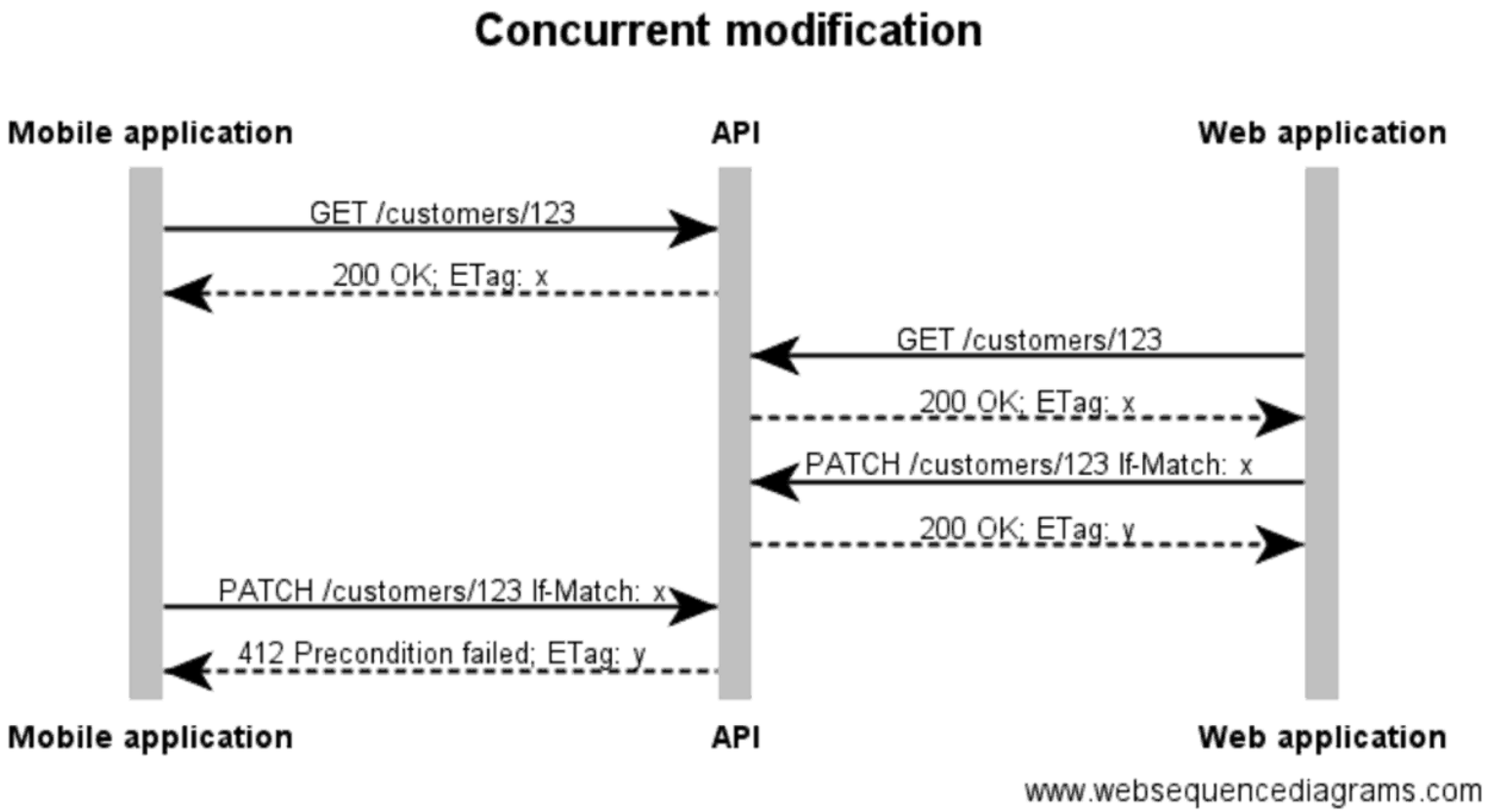
- Power Relationship
  - Partnership
  - Customer / Supplier
  - Conformist
  - https://www.oreilly.com/library/view/what-is-domain-driven/9781492057802/ch04.html
  - https://pubs.opengroup.org/architecture/o-aa-standard/DDD-strategic-patterns.html

HTTP Methods

- Safe
  - GET HEAD OPTIONS
  - Cacheable: GET, HEAD
- Unsafe
  - POST
  - PATCH
- Idempotent
  - GET, HEAD, OPTIONS, TRACE, DELETE, PUT

https://blogs.mulesoft.com/dev/api-dev/application-network-fault-tolerance/

HTTP-native support for optimistic concurrency



https://blogs.mulesoft.com/api-integration/patterns/advanced-api-patterns-with-raml/

Features and Functionality of API designer

- You can use the API Designer web UI to design API specifications in:
  - RESTful API Modeling Language (RAML) version 0.8 or 1.0
  - OpenAPI Specification (OAS) version 2.0 or 3.0
  - AsyncAPI 2.0
  - API fragments in RESTful API Modeling Language (RAML) version 0.8 or 1.0.
  - Mocking Service
  - Publish API Specification to Anypoint Exchange

Reference

- https://docs.mulesoft.com/exchange/to-deploy-using-rest-connect
- https://blogs.mulesoft.com/dev-guides/common-api-mistakes/
- https://restcookbook.com/HTTP%20Methods/idempotency/
- https://semver.org/

Designing APIs using system, process, and experience layers

Designing APIs using system, process, and experience layers

- **Identify appropriate APIs** to implement a business process and assign them to **layers of API-led connectivity**.
- Assign APIs to layers according to **ownership, functional focus, and rate of change**.
- Recommend the most appropriate approach relating the **API data model of System APIs** to that of their backend system based on specific requirements and organizational characteristics.

Reference

- https://www.mulesoft.com/sites/default/files/resource-assets/API-led-connectivity-new-soa-updated.pdf
- https://martinfowler.com/articles/products-over-projects.html
- https://www.oreilly.com/library/view/what-is-domain-driven/9781492057802/ch04.html
- https://blogs.mulesoft.com/dev-guides/microservices/from-monolith-to-microservices-an-architects-first-hand-account/
- https://blogs.mulesoft.com/dev-guides/microservices/from-monolith-to-microservices-an-architects-first-hand-account-part-2/
- https://www.youtube.com/watch?v=8qCuJFmpvIc

Governing web APIs on Anypoint Platform

Governing web APIs on Anypoint Platform

- Make appropriate use of **API instances and environments** in API manager taking into account the **nature of the API** and the **underlying data and system**.
- Select **appropriate API policies** and other **components of the AP** to support specific **non-functional requirements (NFRs**).
- Identify any **change(s) required to an API specification** to reflect the **application of an API policy** with specific characteristics.
- Select an approach to **API policy enforcement** based on **specific preferences and constraints**, including, but not limited to, **API proxies/API gateways and Anypoint Service Mesh**.

Governing web APIs on Anypoint Platform

- **Secure web APIs** using **API policies** appropriately chosen for the API's tier (System, Process, Experience).
- Describe in what circumstances and how to pass **client ID and secret to a web API**.
- Explain how to **request access to an API version for an API client**, and how that access is approved and revoked.
- Select appropriate **API policies to enforce non-functional security constraints** on web API invocations.
- Explain the relationships of **Anypoint Platform, external Identity Providers, AP Business Groups, and API clients** in the context of **OAuth 2.0**.

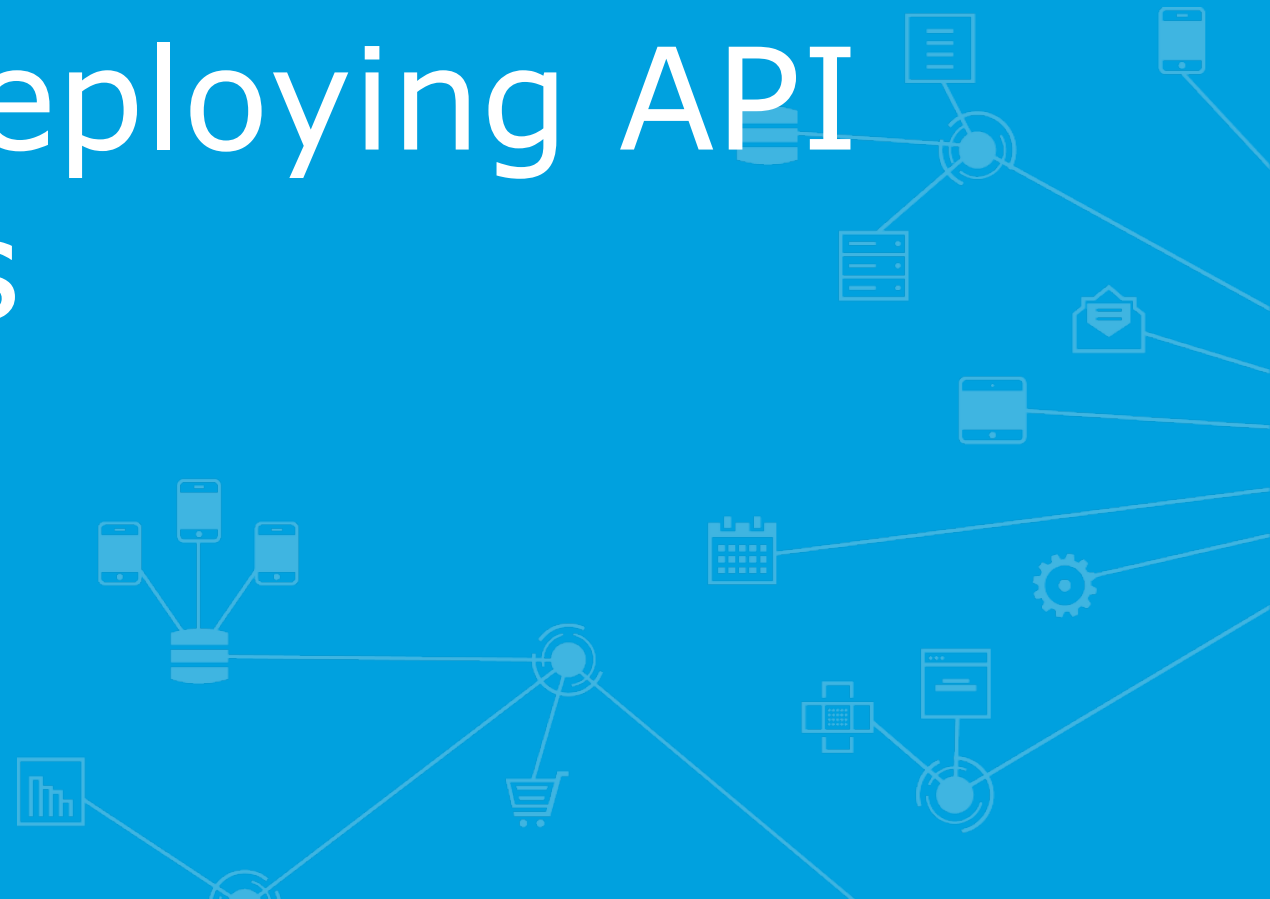
Governing web APIs on Anypoint Platform

- Identify scenarios needing **custom API policies**.

References

- https://docs.mulesoft.com/api-manager/2.x/create-instance-task
- https://docs.mulesoft.com/api-manager/2.x/apply-configure-json-threat-task
- https://docs.mulesoft.com/api-manager/2.x/client-id-based-policies
- https://docs.mulesoft.com/api-manager/2.x/client-id-based-policies#configuring-api-specifications
- https://docs.mulesoft.com/api-manager/2.x/message-logging-policy
- https://docs.mulesoft.com/api-manager/2.x/policies-landing-page
- https://docs.mulesoft.com/access-management/external-identity

Architecting & deploying API implementations



Architecting & deploying API implementations

- Explain how to use **auto-discovery** to link a web API implementation to an API instance managed with **API Manager**.
- Identify **requirements** that call for the use of an **Anypoint VPC**.
- Compare and contrast options for **hosting and managing Anypoint Platform runtime planes**.
- Compare **unit and integration tests** and specify where **Munit** is best employed.
- Explain options for **automated build, test, and deploy** of API implementations and **related artifacts in a DevOps** setting.

Reference

- https://docs.mulesoft.com/runtime-manager/lb-architecture
- https://help.mulesoft.com/s/article/Configuring-Public-and-Private-Mule-Applications-Behind-DLB
- https://docs.mulesoft.com/mule-runtime/4.4/build-an-https-service
- https://docs.mulesoft.com/runtime-manager/vpc-firewall-rules-concept
- https://docs.mulesoft.com/runtime-manager/command-line-tools
- https://docs.mulesoft.com/mule-runtime/4.4/deploy-on-premises
- https://blogs.mulesoft.com/dev-guides/how-to-tutorials/get-started-with-platform-apis-and-postman-automation/

- https://docs.mulesoft.com/mule-runtime/4.3/deploying
- https://docs.mulesoft.com/mule-runtime/4.1/mmp-concept

Deploying API implementations to CloudHub

Deploying API implementations to CloudHub

- Describe the scenarios for which **Object Store** should be used with CloudHub.
- Select **CloudHub worker sizes** and configuration as appropriate.
- Given an app deployed to the **CloudHub shared worker cloud** in **one or more regions**, describe and predict its **reliability and performance characteristics**.
- Identify the defining differences between the **CloudHub Shared and Dedicated Load Balancers**.
- Compare and contrast the options for **CloudHub networking** in the presence of **customer-owned Amazon VPCs** and **on-premises data centers**.
- Identify and avoid **single points of failure in CloudHub** deployments of API implementations.

Reference

- https://docs.mulesoft.com/object-store
- https://docs.mulesoft.com/object-store/osv2-faq
- https://docs.mulesoft.com/runtime-manager/autoscaling-in-cloudhub
- https://docs.mulesoft.com/runtime-manager/cloudhub-hadr
- https://docs.mulesoft.com/runtime-manager/tgw-about
- https://docs.mulesoft.com/runtime-manager/vpc-provisioning-concept
- https://blogs.mulesoft.com/api-integration/security/how-to-choose-the-cidr-block-for-your-vpc/

Meeting API quality goals

Meeting API quality goals

- Design, describe, and differentiate between scenarios that use the **Object Store or caching**.
- Select **resilience strategies** that help web API clients guard against failures when invoking APIs.
- Describe when **horizontal scaling of an API implementation** is or is not likely to benefit response time and throughput as seen by API clients.

- https://blogs.mulesoft.com/dev/api-dev/application-network-fault-tolerance/

Reference

- https://apisero.com/cache-scope-and-object-store-in-mule-4/
- https://www.appnovation.com/blog/effectively-using-caching-while-developing-apis-mule-part-1
- https://docs.mulesoft.com/mule-runtime/4.3/cache-scope
- https://help.mulesoft.com/s/question/0D52T00004mXYC6/horizontal-scaling-vs-vertical-scaling-of-mule-workers
- https://docs.mulesoft.com/runtime-manager/cloudhub-fabric
- https://docs.mulesoft.com/runtime-manager/cloudhub-architecture
- https://dzone.com/articles/reasons-to-scale-horizontally
- https://www.mulesoft.com/lp/whitepaper/api/reactive-programming

Monitoring and analyzing application networks

Monitoring and analyzing application networks

- Identify the **components of Anypoint Platform** that generate **data for monitoring and alerting**.
- Describe the **metrics collected by Anypoint Platform** for **API invocations.**
- Specify **alerts to define for key metrics of API invocations** for all layers of API-led connectivity.
- Specify **alerts to define for Mule applications**.

Reference

- https://docs.mulesoft.com/monitoring/configure-monitoring-cloudhub
- https://docs.mulesoft.com/monitoring/log-tokenization
- https://docs.mulesoft.com/api-functional-monitoring/afm-in-anypoint-platform
- https://docs.mulesoft.com/runtime-manager/custom-application-alerts

Exploring additional resources

Take additional MuleSoft training courses

- Anypoint Platform:
  - API Design
- Anypoint Platform Development:
  - DataWeave
  - Production-Ready Development Practices
  - Production-Ready Integrations
- Anypoint Platform Operations:
  - CloudHub
  - Runtime Fabric
  - Customer-Hosted Runtimes
  - API Management
- Anypoint Platform Architecture:
  - Integration Solutions
  - Mulesoft Accelerator for Healthcare

training.mulesoft.com

Learn and build on your own

- Read more
  - Documentation: developer.mulesoft.com/docs
  - Support knowledge base: help.mulesoft.com/s/support
  - Blog: blogs.mulesoft.com

- See more code
  - Templates: www.mulesoft.com/exchange

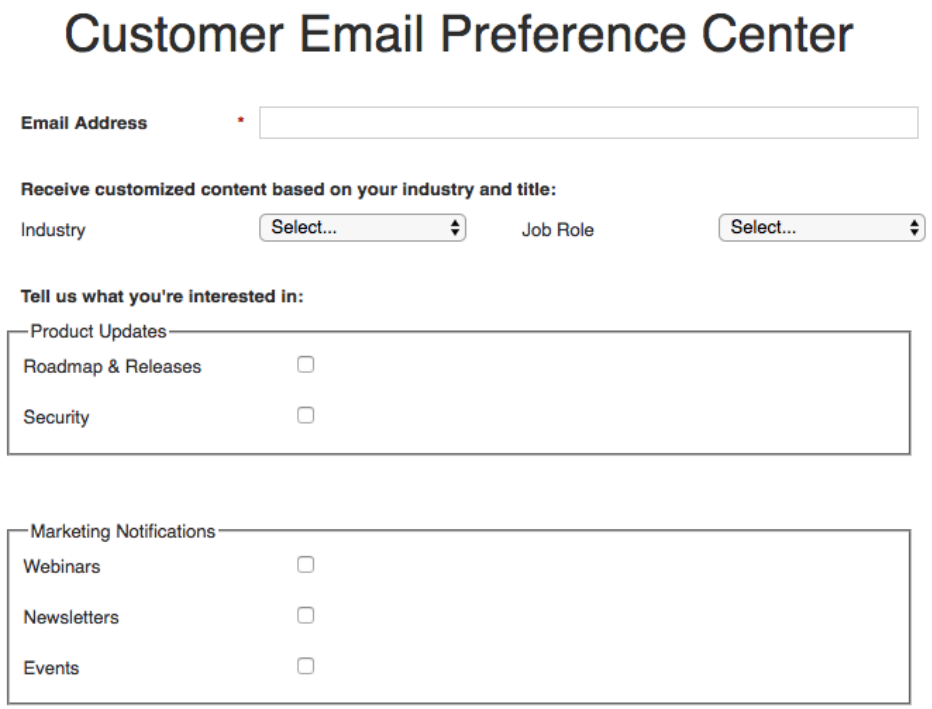
- Report and track issues
  - Mule kernel JIRA: www.mulesoft.org/jira/browse/MULE
  - Mule: Submit through the support portal

Interact with the community

- Ask questions
  - Forums
    - help.mulesoft.com/s/forum – general forum
    - training.mulesoft.com/help/apdev-fundamentals4 – course-specific forum
  - StackOverflow: stackoverflow.com/search?q=mule
- The MuleSoft Help Center: help.mulesoft.com
  - Forum – ask questions
  - Discussion Groups – browse topics
  - Resources – get technical resources
  - Training – expand your expertise
  - Support – support and subscriptions
  - Community – network with your peers

Keep current with Mulesoft

- Conferences and events: www.mulesoft.com/events
- Blog: blogs.mulesoft.com
- Webinars: www.mulesoft.com/webinars
- Roadmap webinar
  - Get invited by selecting roadmap in email preferences resources.mulesoft.com/preference-customers.html
- Facebook: www.facebook.com/mulesoft
- Twitter: twitter.com/mulesoft



Influence MuleSoft's roadmap

- Attend quarterly customer roadmap webinars
- Fill out customer surveys
- Leave feedback (ratings and comments) on documentation pages
- Open customer support that can result in enhancement requests

MuleSoft's product team wants to hear from you!

Join the **Anypoint Platform Insiders Community** to:

- Connect directly with the product team
- Share your experience with Anypoint Platform
- Provide feedback on new features
- Influence product decisions
- No minimum time commitment required

JOIN TODAY!

training.mulesoft.com/product-insider

Getting certified

MuleSoft certification program

- Offers multiple types of **professional accreditation** for developers and architects

- **Why get certified?**
  - To confirm you have mastery of the knowledge and skills required to perform your job role and tasks
  - To obtain recognized industry certification
  - To differentiate yourself in the marketplace

- **With each certification, you get**
  - A digital badge for your communications
  - The ability to add the certification to your LinkedIn profile

MuleSoft Certified Architect exams

- **MuleSoft Certified Platform Architect - Level 1**
  - Should be able to define and be responsible for an organization's Anypoint Platform strategy
  - The exam validates that an architect has the required knowledge and skills to direct the emergence of an effective application network out of individual integration solutions following API-led connectivity across an organization using Anypoint Platform

- **MuleSoft Certified Integration Architect - Level 1**
  - Should be able to drive and be responsible for an organization's Anypoint Platform implementation and the technical quality, governance (ensuring compliance), and operationalization of the integration solutions
  - The exam validates that an architect has the required knowledge and skills to work with technical and non-technical stakeholders to translate functional and non-functional requirements into integration interfaces and implementations

MuleSoft Certified Platform Architect - Level 1 exam

- **Proctored, closed book,**
  60 multiple-choice questions,
  120 minutes
  - You can take the exam online using your laptop camera
- This class includes two attempts at the exam
  - You will be auto-enrolled in the MCPA – Level 1 exam at the end of class

Preparing for the MCPA - Level 1 exam

- Make sure you have mastered the content in this course before taking the exam
  - Review the **student manual** on your own

- Review the **exam topics**
  - training.mulesoft.com/exam/mcpa-level1

- Take the **practice exam**
  - training.mulesoft.com/certification/architect-platform-level1/practice-exam

MuleSoft Certified Developer exams

- **MuleSoft Certified Developer - Level 1**
  - Should be able to successfully work on basic Mule 4 projects with guidance and supervision.
  - The exam validates that a developer has the required knowledge and skills to design, build, test and debug, deploy, and manage basic APIs and integrations—moving from Anypoint Platform to Anypoint Studio and back.

- **MuleSoft Certified Developer - Level 2**
  - Should be able to independently work on production-ready Mule applications on professional software development projects, as well as address and balance critical non-functional requirements including monitoring, performance, maintainability, reliability, and security.
  - The exam validates that a developer has the required knowledge and skills to expose production-ready Anypoint Platform-managed APIs from Mule applications and implement performant, reliable, maintainable, monitorable, and modular Mule applications and their Maven builds, while maintaining data security at rest and in transit.

Q & A

Thank you!