2-1-1: Implementing Cloud Deployment Strategies

After completing this episode, you should be able to:

- Identify and explain cloud deployment strategies, given a scenario

Description: In this episode, the learner will examine various deployment strategies. We will explore the process and considerations for Blue-Green, Rolling, In-Place, Canary deployments, and more.

- Describe the importance of using a deployment strategy
    - A methodology applied during the software release process to deploy new versions of an application with minimal downtime and risk
    - Understanding these strategies is crucial for ensuring smooth transitions between application versions
    - Can enhance the user experience
    - Helps in maintaining system reliability
- Describe common deployment strategies
    - Blue-Green deployment
        - A method involving two identical environments, with one hosting the current application version (blue) and the other the new version (green)
        - Process
            - The new version is deployed to the green environment for testing
            - Upon successful validation, traffic is shifted from blue to green
        - Considerations
            - Can reduce downtime
            - Allows for quick rollback if needed
        - Cloud deployments
            - Can simplify the creation of identical environments and provide integrated traffic routing services
            - Implement automation to create exact replicas of each environment
            - Implement Infrastructure-as-Code, Configuration-as-Code, and version control solutions for rapid
    - Canary deployment
        - A strategy that releases the new application version to a small subset of users initially, followed by a gradual rollout to the entire user base.
        - Process
            - The new version is incrementally released to a larger group of users
            - Continuous monitoring is implemented to ensure stability and performance
        - Considerations
            - Limits the impact of potential issues to small or incremental user groups
        - Cloud deployments
            - Supports dynamic scaling and segmentation
            - Implement traffic management and monitoring solutions are critical for tracking, controlling, monitoring, and logging the deployments
    - Rolling deployment
        - Gradually replaces the old version of an application with the new one across servers or containers without taking the system offline.
        - Process
            - Servers are updated one by one
            - Ensures that some part of the application remains available at all times
        - Considerations
            - Maintains operational continuity
            - Can be complex if issues occur.
        - Cloud deployments

            - Cloud services facilitate Rolling deployments by automating the update process across distributed resources
            - Minimizes manual effort
            - Increases system stability, reducing the risk of downtime
    - In-Place Deployment
        - Directly updates the application on the existing infrastructure, typically resulting in some downtime.
        - Process
            - The current environment is directly updated to the new version
            - Commonly leads to temporary unavailability
        - Considerations
            - Simplicity and suitability for smaller or less critical applications
        - Cloud deployments
            - Can minimize downtime through rapid deployment capabilities
        - Implement automation and monitoring solutions
- Scenario 1: Blue-Green Deployment
    - Objective
        - Implement a low-latency, non-disruptive deployment for a critical cloud-hosted application
        - Ensure the new version is fully operational before switching traffic
        - Provide a seamless user experience
    - Cloud considerations
        - Fast, automated switching between environments
        - Utilize cloud-based load balancers to minimize downtime and risk
- Scenario 2: Canary Deployment
    - Objective
        - Gradually release a new feature in a cloud application to a segmented group of users
        - Closely monitoring performance and user feedback to adjust the rollout.
    - Cloud considerations
        - Dynamic resource allocation in response to real-time feedback and performance data
        - Ensure that the infrastructure can adapt to user demand and application needs efficiently
- Scenario 3: Rolling Deployment
    - Objective
        - Update a cloud-based e-commerce platform with minimal impact on user experience
        - Use a rolling update to ensure continuous operation
    - Cloud considerations
        - Automated scaling and management of instances across different geographic locations
        - Ensure that updates are seamlessly applied without impacting the global user experience
        - Maintaining service quality and availability
- Scenario 4: In-Place Deployment
    - Objective
        - Conduct an update on a proprietary on-premise system
        - Plan for a short downtime window
    - Cloud considerations
        - Implement accelerated provisioning, automated deployment and monitoring capabilities
- Describe some considerations when choosing a deployment strategy
    - Ensure application requirements can be meet
    - The organization's tolerance for risk and downtime
    - Available resources for managing the deployment process