**Preparation Phase for AMI Refresh.**

**Preparation Phase**

1. **Define the Purpose of Refresh:**
   * Is it for patching, adding software, configuration updates, or standardization?
2. **Identify the Existing AMI:**
   * Note the AMI ID of the current base image being used.
3. **Plan the Refresh:**
   * Decide if you will update a running instance or create a new instance based on the current AMI.
4. **Backup Data:**
   * If refreshing a running instance, create a backup snapshot of the attached volumes to prevent data loss.

**Execution Phase**

**Step 1: Launch an Instance from the Existing AMI**

* Go to the **EC2 Console**.
* Select the existing AMI and click **Launch Instance**.
* Configure instance details (e.g., instance type, networking, and storage).
* Launch the instance and connect to it.

**Step 2: Update the Instance**

* SSH into the instance or use AWS Systems Manager if configured.
* Perform the necessary updates:

**OS Updates**:

* sudo yum update -y       # For Amazon Linux
* sudo apt update && sudo apt upgrade -y  # For Ubuntu/Debian
  + **Software Updates**: Update your installed applications (e.g., by downloading the latest versions or using package managers).
  + **Configuration Changes**: Apply any configuration changes needed, such as new environment variables or updated configurations.

**Step 3: Test the Updated Instance**

* Verify the instance functions as expected:
* Test all services, software, and configurations.
* Ensure compatibility with your existing workloads.
* Confirm security measures, such as firewall rules and patched vulnerabilities.

**AMI Creation Phase**

**Step 4: Create a New AMI**

* Stop services or terminate unnecessary processes on the instance.
* Go to the **EC2 Console**:
* Select the updated instance.
* Click **Actions** > **Image and Templates** > **Create Image**.
* Provide a descriptive name and details for the new AMI.
* Click **Create Image**.

**Step 5: Verify the New AMI**

* Launch a new instance using the newly created AMI.
* Test its functionality, ensuring all updates and configurations work as expected.

**Deployment Phase**

**Step 6: Update Auto Scaling Groups or Instances**

* Update your **Auto Scaling Group** or manual instances to use the new AMI.
* Terminate old instances (ensure zero downtime by staggering deployments if necessary).

**Step 7: Decommission Old AMIs**

* After verifying the new AMI, deregister and delete older AMIs and associated snapshots to save costs (if not needed).

**Post-Refresh Maintenance**

1. **Documentation:**
   * Document the refresh process, including changes made to the instance and AMI.
2. **Monitoring:**
   * Monitor the new instances for any anomalies or errors.
3. **Schedule Regular Refreshes:**
   * Automate AMI updates using AWS tools like **EC2 Image Builder** or scripts in **AWS Lambda** for consistent refresh cycles.