**Step 1: Launch an EC2 Instance**

1. **Log in to the AWS Management Console**:
   * Navigate to the EC2 Dashboard.
2. **Launch an Instance**:
   * Click **Launch Instances**.
   * Choose an Amazon Machine Image (AMI) (e.g., Amazon Linux 2).
   * Select an Instance Type (e.g., t2.micro for free tier).
   * Configure Instance Details:
     + Use default settings.
     + Enable a public IP if you need external access.
   * Add Storage:
     + Keep default or modify as needed.
   * Add Tags:
     + Add a tag like Key=Name, Value=EC2LambdaDemo.
   * Configure Security Group:
     + Allow SSH (port 22) for your IP address.
     + Allow HTTP/HTTPS if a web server is planned.
3. **Review and Launch**:
   * Create or use an existing key pair for SSH access.
   * Launch the instance and note down the instance ID and public IP.

**Step 2: Set Up IAM Role for Lambda and EC2**

1. **Create an IAM Role for EC2**:
   * Go to the IAM Management Console.
   * Create a role with the following permissions:
     + AmazonSSMManagedInstanceCore for SSM Session Manager access.
     + Attach this role to the EC2 instance.
2. **Create an IAM Role for Lambda**:
   * Create another role with permissions:
     + AWSLambdaBasicExecutionRole.
     + Additional permissions as needed (e.g., AmazonEC2FullAccess for demo purposes).
   * Attach this role to the Lambda function.

**Step 3: Write and Deploy the Lambda Function**

1. **Write the Lambda Code**: Example Python code to start, stop, or describe EC2 instances:
2. import boto3
3. def lambda\_handler(event, context):
4. ec2 = boto3.client('ec2')
6. action = event.get('action', 'describe')
7. instance\_id = event.get('instance\_id')
9. if action == 'start':
10. ec2.start\_instances(InstanceIds=[instance\_id])
11. return f"Started instance {instance\_id}"
12. elif action == 'stop':
13. ec2.stop\_instances(InstanceIds=[instance\_id])
14. return f"Stopped instance {instance\_id}"
15. else:
16. instances = ec2.describe\_instances()

return instances

1. **Create the Lambda Function**:
   * Navigate to the Lambda Console.
   * Click **Create Function**.
   * Choose **Author from scratch**.
   * Provide a name like EC2ControlFunction.
   * Select the runtime (e.g., Python 3.9).
   * Attach the IAM role created for Lambda.
2. **Deploy the Function**:
   * Copy the code into the inline editor or upload a zip file.
   * Configure an environment variable if needed (e.g., INSTANCE\_ID).
   * Save and deploy the function.

**Step 4: Test the Lambda Function**

1. **Prepare a Test Event**: Example event payload to start an EC2 instance:
2. {
3. "action": "start",
4. "instance\_id": "<your-instance-id>"

}

1. **Run the Test**:
   * Use the test feature in the Lambda Console.
   * Verify the EC2 instance state changes (use the EC2 Console or CLI).
2. **Experiment with Other Actions**:
   * Modify the payload for stop or describe actions and test again.