Amazon EC2 (Elastic Compute Cloud) Setup Notes

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1. Introduction to Amazon EC2

Amazon Elastic Compute Cloud (EC2) is a web service that provides resizable compute capacity in the cloud. It allows users to quickly scale capacity up or down depending on their needs.

Key Features:

- Virtual servers in the cloud (called EC2 Instances).
- Flexible instance types (CPU, memory, storage, networking).
- On-demand, Reserved, Spot, and Dedicated pricing models.
- Supports multiple operating systems (Linux, Windows, etc.).
- Integration with other AWS services (S3, RDS, IAM, CloudWatch, etc.).

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2. Steps to Create an AWS Account

1. Visit https://aws.amazon.com.
2. Click **Create an AWS Account**.
3. Enter your email address, password, and account name.
4. Provide billing details (credit/debit card required).
5. Verify your phone number.
6. Choose **Basic (Free) Plan** to start with free-tier services.
7. Access **AWS Management Console** with root account.
8. Create **IAM users** for day-to-day activities (best practice: don't use root).

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3. Steps to Launch an EC2 Instance (Linux)

1. Login to **AWS Console**.
2. Navigate to **EC2 Service**.
3. Click **Launch Instance**.
4. Configure the following:
    - **Name**: e.g., `Linux-Server`.
    - **AMI (Amazon Machine Image)**: Choose **Amazon Linux 2** or **Ubuntu**.
    - **Instance Type**: `t2.micro` (Free-tier eligible).
    - **Key Pair**: Create/download a `.pem` file for SSH access.

- **Network Settings**:
  - VPC + Subnet (default VPC is fine).
  - Security Group → allow **SSH (port 22)**.
- **Storage**: EBS volume (default 8GB is fine).

5. Review & Launch instance.
6. Connect via SSH:

```
chmod 400 mykey.pem
ssh -i mykey.pem ec2-user@<Public-IP>
```

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4. Steps to Launch an EC2 Instance (Windows)

1. Login to **AWS Console**.
2. Go to **EC2 → Launch Instance**.
3. Configure:
   - **Name**: `Windows-Server`.
   - **AMI**: Choose **Microsoft Windows Server 2019 Base**.
   - **Instance Type**: `t2.micro` (Free-tier eligible).
   - **Key Pair**: Create/download `.pem` file (used to get RDP password).
   - **Security Group**: Allow **RDP (port 3389)**.
   - **Storage**: Default is fine (30GB EBS for Windows).
4. Review & Launch.
5. Connect via RDP:
   - Download **Remote Desktop Client** (Windows has it by default).
   - In EC2 Console, select your instance → **Get Windows Password**.
   - Upload your `.pem` file → decrypt password.
   - Use **Public IP + username + decrypted password** in RDP.

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5. EC2 Key Components

- **AMI (Amazon Machine Image)** → Template for OS.
- **Instance Type** → Defines CPU, Memory, Network capacity.
- **EBS (Elastic Block Store)** → Persistent storage for EC2.
- **Security Groups** → Virtual firewall rules.
- **Key Pair (.pem)** → Secure login credentials.
- **Elastic IP** → Static IP for EC2.

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6. EC2 Linux vs Windows

Feature	Linux EC2	Windows EC2
Login Method	SSH (Port 22, using Key Pair)	RDP (Port 3389, Key + Password)
Default User	ec2-user (Amazon Linux) or ubuntu (Ubuntu AMI)	Administrator
Default Storage	8 GB EBS (Root Volume)	30 GB EBS (Root Volume)
Common Use Cases	Web Servers, Application Hosting, DevOps workloads	.NET Applications, Windows-based Enterprise Workloads

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7. Best Practices

- Always use IAM users, not root account.
- Restrict Security Group rules (don’t open 0.0.0.0/0 unless needed).
- Regularly patch/update your EC2 instances.
- Use Elastic IP for production servers.
- Use CloudWatch for monitoring CPU, memory, and network.
- Take AMI backups for recovery.