**AWS Identity and Access Management (IAM) Roles**

**Introduction**

AWS IAM Roles are a secure way to grant permissions to AWS services and applications without using long-term access keys. They allow AWS resources to interact with other AWS services in a controlled manner, following the principle of least privilege.

**Key Features**

**1. Temporary Credentials**

* IAM roles provide **temporary security credentials** instead of static access keys.
* These credentials automatically rotate and expire, enhancing security.

**2. Fine-Grained Access Control**

* Define **permissions using IAM policies** to restrict actions.
* Attach **managed policies** or custom JSON policies to IAM roles.

**3. Cross-Account Access**

* Grant access to AWS resources across different AWS accounts securely.
* Useful for **multi-account architectures** and AWS Organizations.

**4. Service-Linked Roles**

* Automatically created and managed roles by AWS for specific services (e.g., AWS Lambda execution roles).
* Reduces manual role management.

**5. Use with AWS Services**

IAM roles can be used with:

* **EC2 Instances** – Grant instances permissions to interact with AWS services.
* **AWS Lambda** – Allow functions to access databases, S3, etc.
* **Amazon RDS** – Enable database authentication via IAM.
* **AWS Glue, Redshift, and EMR** – Manage permissions for analytics workloads.

**Applications**

1. **Secure Application Authentication** – Grant AWS services controlled access to other resources.
2. **Cross-Account Access** – Manage resources securely across AWS accounts.
3. **Automated Security Management** – Eliminate the need for static IAM credentials.
4. **AWS Service Integration** – Allow AWS services like Lambda and EC2 to interact with databases, storage, etc.

**Business Model**

IAM Roles are part of AWS IAM, which is a **free** service. However, charges apply for AWS services that use IAM roles (e.g., EC2, Lambda, RDS).

**Conclusion**

AWS IAM Roles enhance security, simplify permission management, and integrate seamlessly with AWS services. They enable secure, temporary access while following best practices for cloud security.