محاور الفصل الأول-

- ❖ مفاهيم وخصائص الحوسبة السحابية
- ❖ الإختراق الأخلاقي ومراحله في الحوسبة السحابية

تعريف وخصائص الحوسبة السحابية

National Institute of Standards and Technology (NIST)

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources

Cloud Services Essential Characteristics:

❖ On-demand self-service
❖ Broad Network Access
❖ Resource Pooling
❖ Rapid Elasticity
❖ Measured services

المعهد الأمريكي الوطني للمعايير والتقنية (NIST)

الحوسبة السحابية هي إطار يسمح بالوصول المناسب والسريع عبر الشبكة إلى مجموعة مشتركة من موارد الحوسبة عند الطلب لإستخدامها على أن تتوفر فيها الخصائص التالية:

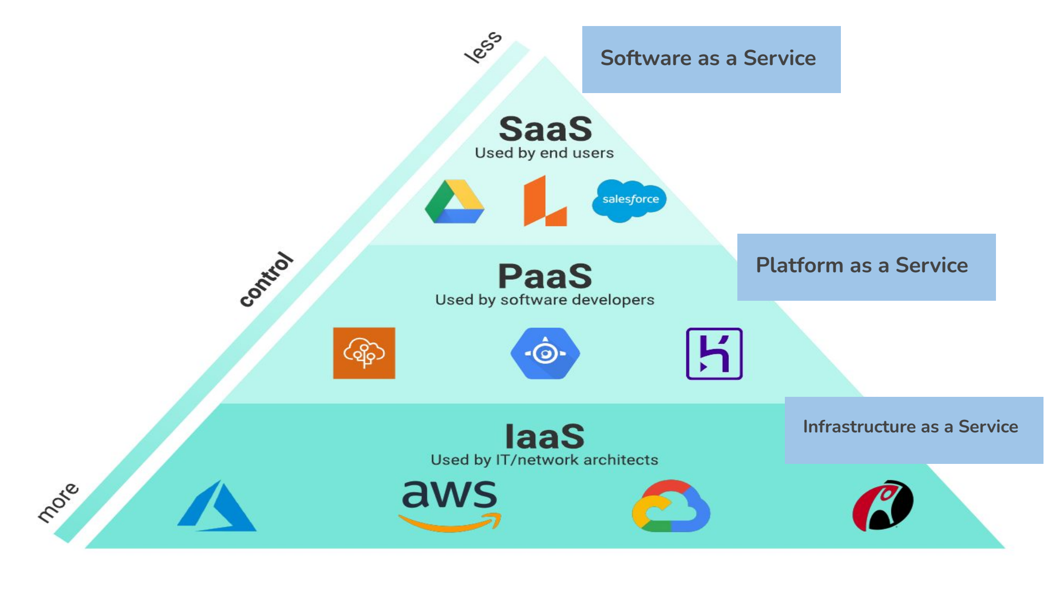
❖ طلب الموارد بناء على الخدمة الذاتية
❖ وصول واسع للشبكة (من أي مكان)
❖ تقديم موارد الحوسبة بكافة أنواعها وبشكل مرن ومتسارع

Cloud Service Models

SaaS: Software services through applications that are hosted, packaged, and delivered by third party cloud providers.

PaaS: Provides the facilities & platforms required to support the complete lifecycle of building, deploying and delivering web applications without worrying about storage and infrastructure capabilities

IaaS: Provides technology infrastructure (storage, networking, servers, and other computing resources via the cloud)



Cloud Deployment Models

Public Cloud: Provides computing services via shared IT infrastructure built in a multi-tenant architecture

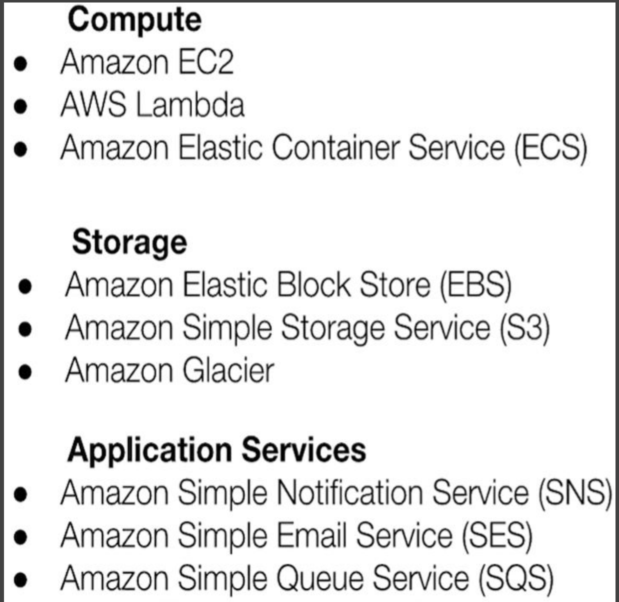
Private Cloud: Provides computing services via a proprietary architecture dedicated to a single subscriber or business entity

Hybrid Cloud: Orchestrate the integration of various IT infrastructures that are hosted in different environments (on-premises, private/cloud) into a single, unified, and agile computing infrastructure

Community Cloud: Provides computing services via a proprietary architecture dedicated to a single subscriber or business entity

Multi-Cloud Model: Provides the facilities & platforms required to support the complete lifecycle of building, deploying and delivering web applications without worrying about storage and infrastructure capabilities

Example- AWS Cloud Services



Compute

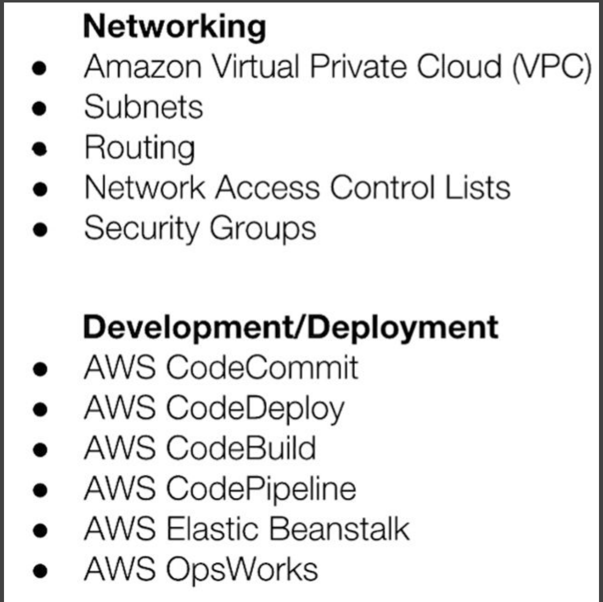
- Amazon EC2
- AWS Lambda
- Amazon Elastic Container Service (ECS)

Storage

- Amazon Elastic Block Store (EBS)
- Amazon Simple Storage Service (S3)
- Amazon Glacier

Application Services

- Amazon Simple Notification Service (SNS)
- Amazon Simple Email Service (SES)
- Amazon Simple Queue Service (SQS)

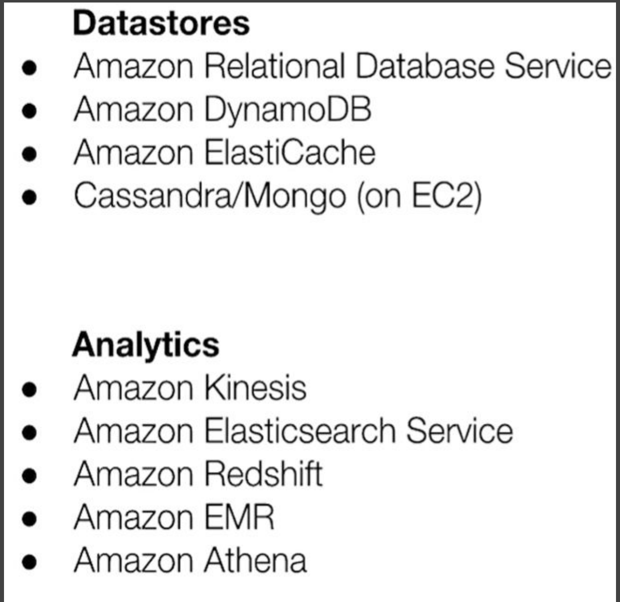


Networking

- Amazon Virtual Private Cloud (VPC)
- Subnets
- Routing
- Network Access Control Lists
- Security Groups

Development/Deployment

- AWS CodeCommit
- AWS CodeDeploy
- AWS CodeBuild
- AWS CodePipeline
- AWS Elastic Beanstalk
- AWS OpsWorks



Datastores

- Amazon Relational Database Service
- Amazon DynamoDB
- Amazon ElastiCache
- Cassandra/Mongo (on EC2)

Analytics

- Amazon Kinesis
- Amazon Elasticsearch Service
- Amazon Redshift
- Amazon EMR
- Amazon Athena

amazon
web services

الجزء الثاني

الإختراق الأخلاقي ومراحله في الحوسبة السحابية

Pen-Testing Definition

“Penetration testing is security testing in which assessors mimic real-world attacks to identify methods for circumventing the security features of an application, system, or network.” (NIST 800-115)

- It Involves launching real attacks to look for or identify more than one vulnerability on one or more systems to assess the effectiveness of existing controls

Common Methodologies

- **Penetration Testing Execution Standard**
  - http://www.pentest-standard.org
- **OWASP Testing Guide**
  - https://www.owasp.org/index.php/OWASP_Testing_Project
- **NIST 800-115: Technical Guide to Information Security Testing and Assessment**
  - http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-115.pdf
- **Open-Source Security Testing Methodology Manual (OSSTMM)**
  - http://www.isecom.org/research/

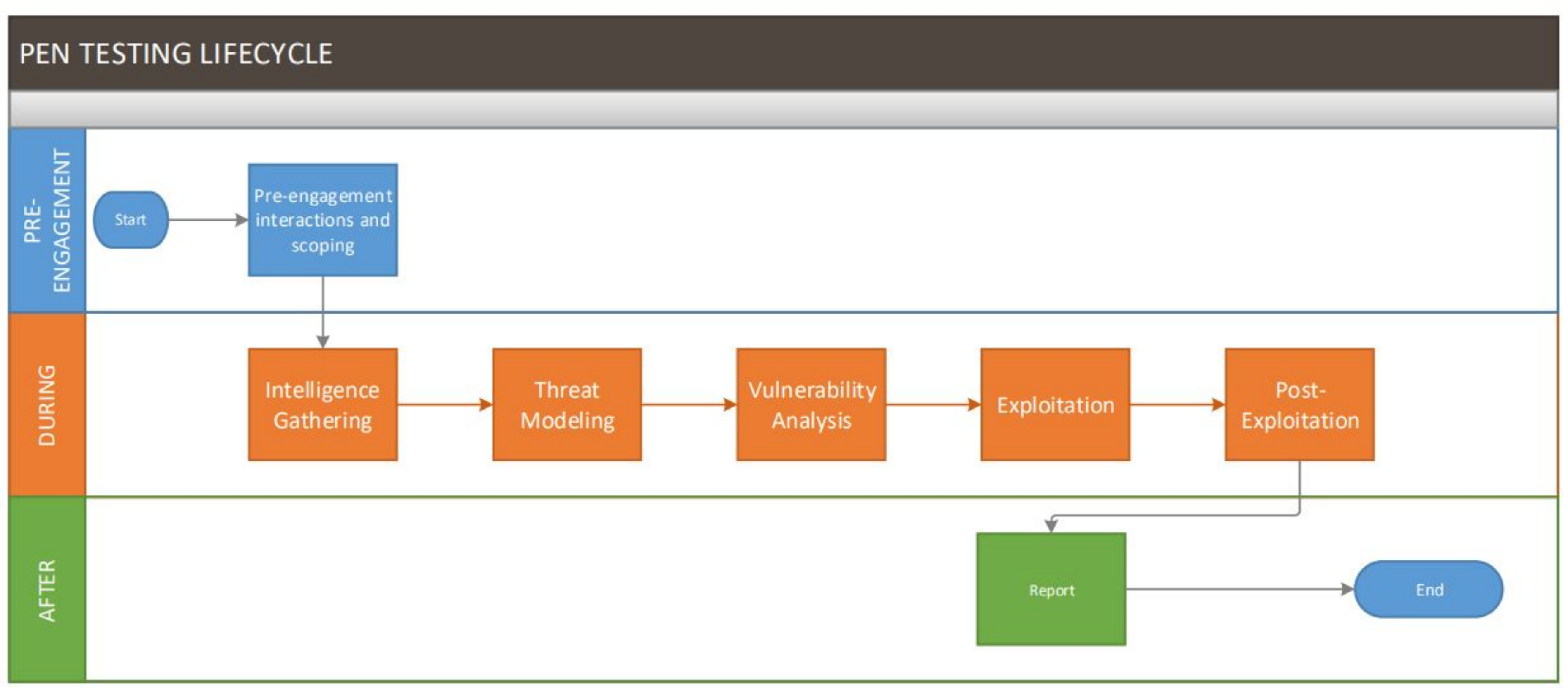
Types

White-Box: All info is provided to the individual conducting the pen-testing. This test type is normally used to test new applications before they are put into production and are routinely conducted as part of the SDLC to identify vulnerabilities before rolling out to production.

Black-Box: Only public info is provided mimicking hackers activities in real world. This test could miss some weaknesses that were not identified by the tester. Also, it can have an impact on production services as things might break down!

Gray-Box: This types sits in the middle of the two types above.

PEN TESTING LIFECYCLE



Aligned with: http://www.pentest-standard.org/

Pen Testing in the Cloud

SaaS

- Attempt to gain unauthorized access for a user or admin to obtain data
- Attempt to add/modify user accounts or create additional tokens on the system

Examples- gain email access to office 365 | gather customer info from Salesforce

In this scenario, you test the software itself through the appropriate channels, but generally SaaS is out of scope for applications pen testing

PaaS

- Attack the application at the container level
- Needs to be careful during the attack attempts and avoid exploiting the host or other non-client containers

In PaaS, there will be restrictions on escaping the VM/segments environments when conducting apps pen testings due to cloud nature of shared resources

IaaS

- Testing policies vary between service providers
- AWS provides a specific method for testing infrastructure including a list of permitted services
- Azure provides a specific testing lab for findings bug

This cloud architecture provides the least amount of restrictions since providers are limited in forcing security controls and let their clients decide how they construct their infrastructures

Attackers View of SaaS | PaaS | IaaS

Passive Reconnaisse

Open-source intelligence (OSINT) is a data collection framework that gather information from open sources

Passive Recon Tools:

- Censys & Crt.sh
- AMass
- Exiftool
- ExtractMetadata
- Findsubdomains
- FOCA
- IntelTechniques

- Scrapy
- Screaming Frog
- theHarvester
- Visual SEO Studio
- Web Data Extractor
- Xenu
- ParamSpider

- Google Hacking DB
- Shodan
- Recon-NG
- Maltego
- SpiderFoot
- Sublist3r
- Buscador

HD Moore - A repo for several enumeration sources