Infrastructure as a Service (IaaS)

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“The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications.

The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).”

Source: https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Data Center

PWS are deployed to the Amazon EC2, a central part of Amazon AWS.

- Perimeter Layer
- Infrastructure Layer
- Data Layer
- Environmental Layer

IaaS Provider Services

- Billing
- Scaling
- Monitoring
- Log access
- Security
- Load balancing
- Data partitioning
- Backup
- etc.

IaaS Examples

- Amazon Web Services (AWS)
- Cisco Metapod
- Microsoft Azure
- Google Compute Engine (GCE)

IaaS Pros and Cons

Pros

- Cost-efficient (cost based on consumption)
- Highly scalable
- Most flexible model (when compared to PaaS and SaaS)

Cons

- Costs may be higher than expected since they are more granular
- Lack of details of infrastructure configuration and performance

Software as a Service (SaaS)

Software as a Service (SaaS)

- SaaS is a distribution model for software
- Users access web-based applications over the internet
- Aka web-based software
- Typically uses a subscription model for payment

SaaS Examples

- Google Apps
- Slack
- Microsoft Office 365
- DropBox
- etc.

SaaS Characteristics

- Managed from a central location
- User not responsible for hardware and software updates
- Configuration and customization
  - Customers can typically set configuration options
- Accelerated feature delivery
  - Can be updated frequently
- Open integration protocols
- Collaborative functionality

SaaS Adoption Drivers

- Broadband access has made it easier
- HTTPS security
- Standardization of web technologies

SaaS Pros

- No need to install software on local machines
- Vertical scalability
- Automatic updates
- Access from multiple devices

SaaS Cons

- Security may be an issue
- Cloud-based may cause latency
- User may be forced into adopting new versions
- Relies on internet connection
- What happens if the vendor goes out of business?

Platform as a Service (PaaS)

What is a Platform?

“a platform serves as the basic foundation for the development and support of hardware and software”

Source: https://www.lifewire.com/what-is-a-platform-4155653

What does a PaaS provider provide?

“A PaaS provider builds and supplies a resilient and optimized environment on which users can install applications and data sets.”

Source: https://searchcloudcomputing.techtarget.com/definition/Platform-as-a-Service-PaaS

PaaS Examples

- AWS Elastic Beanstalk
- Windows Azure
- Heroku
- Google App Engine

PaaS Pros and Cons

Pros

- Developers can focus on creating apps, not building infrastructure
- Simplifies the code-writing process
- Cost is per-use
- Scalability

Cons

- Service outages
- Provider lock-in
- Reduced control