Welcome!

WWCode San Francisco - Backend Study Group

May 18, 2023

- We'll start in a moment :)
- We are **RECORDING** tonight's event
- We may plan to take screenshots for social media
- If you are comfortable, turn the video ON. If you want to be anonymous, then turn the video off
- We'll introduce the hosts & make some time for Q&A at the end of the presentation
- Feel free to take notes
- Online event best practices:
    - Don't multitask. Distractions reduce your ability to remember concepts
    - Mute yourself when you aren't talking
    - We want the session to be interactive
    - Use the 'Raise Hand' feature to ask questions
- **By attending our events, you agree to comply with our Code of Conduct**

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Introduction & Agenda

• Welcome from WWCode!
• Our mission: Empower diverse women to excel in technology careers
• Our vision: A tech industry where diverse women and historically excluded people thrive at any level
• About Backend Study Group

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Presentor
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Host
Senior Software Engineer, Unity
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- **Cloud Computing 101**
  - **What is Cloud?**
  - **Common Cloud Service Models**
  - **Types of Cloud Deployment**
  - **Why Cloud Computing?**
  - **Common Uses**
  - **Different Cloud Providers**
  - **Future of Cloud Computing**
  - **Q & A**

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What is Cloud?

What is Cloud?

- Network of servers
- Managed by some company
- Accessible over the internet
- Subscription model (You pay only for what you use)
- How's it different from traditional models?

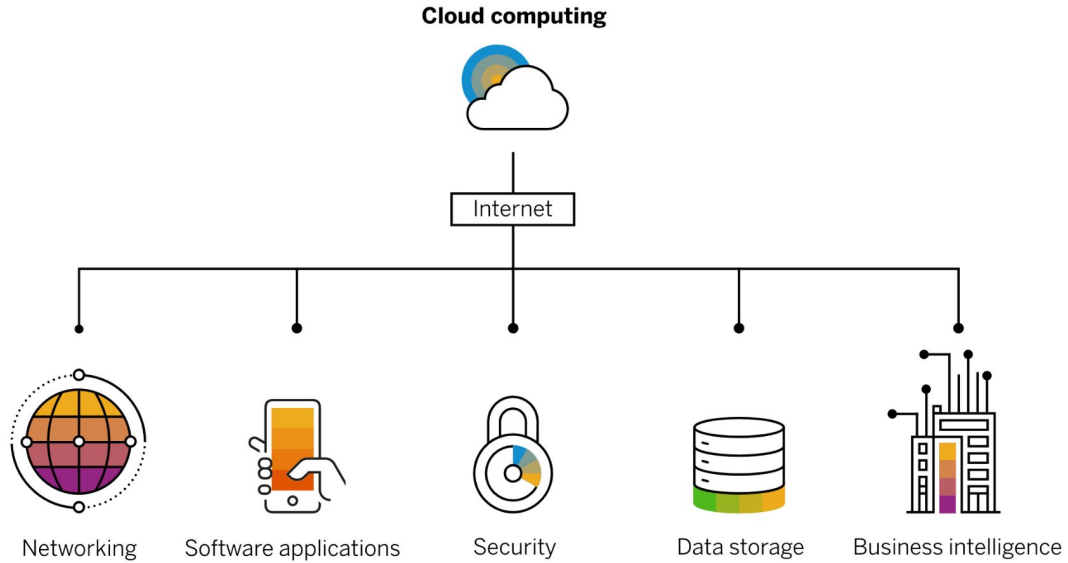
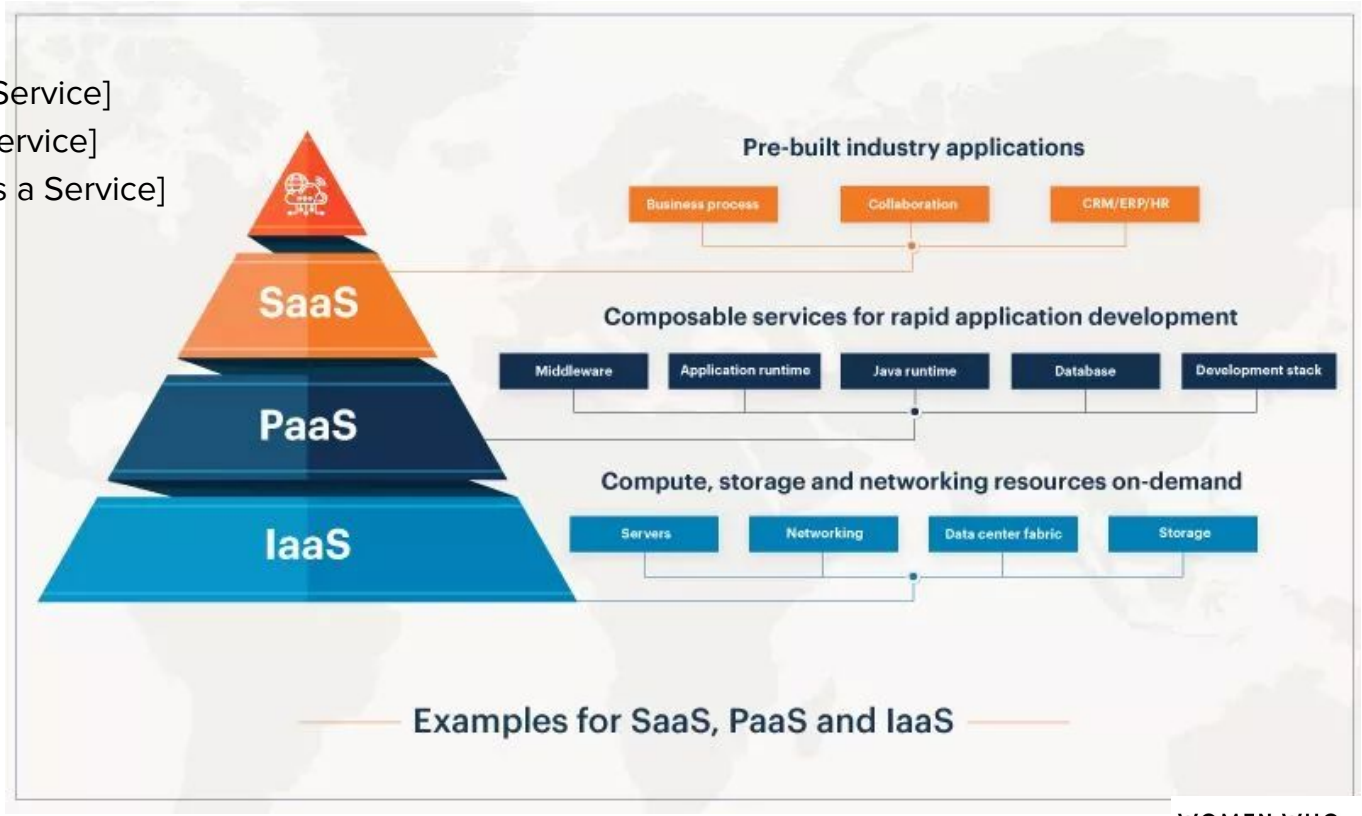


Image credit

Common Cloud Service Models

- SaaS [Software as a Service]
- Paas [Platform as a Service]
- IaaS [Infrastructure as a Service]



SaaS

- SaaS [Software as a Service]
  - Applications are offered as a service over the internet
  - Backup, maintenance, updates
  - Promised SLAs (Service Level Agreement)
  - Types of Software
    - Messaging software
    - Online collaboration software
    - HR software
    - Finance software
  - Examples
    - Dropbox
    - Slack
    - Docusign
    - Salesforce

PaaS

- PaaS [Platform as a Service]
  - Application development environment is offered as a service
  - Used by developers to build, deploy and manage apps
  - Sits in-between SaaS and IaaS
  - Faster time to market
  - Reduced time in managing infrastructure and more time to focus on building apps that adds value to business
  - Examples
    - AWS Elastic Beanstalk
    - Google App Engine
    - SAP Cloud

IaaS

- IaaS [Infrastructure as a Service]
  - Providing the whole infrastructure as a service
    - Imagine using someones computer, storage, hardware, etc
  - Can buy on demand
  - No upfront huge hardware investment cost
  - Scale up/down as needed
  - Accessible by multiple users
  - Examples
    - AWS
    - Microsoft Azure
    - Google Cloud Engine
    - Oracle Cloud

Common Cloud Services

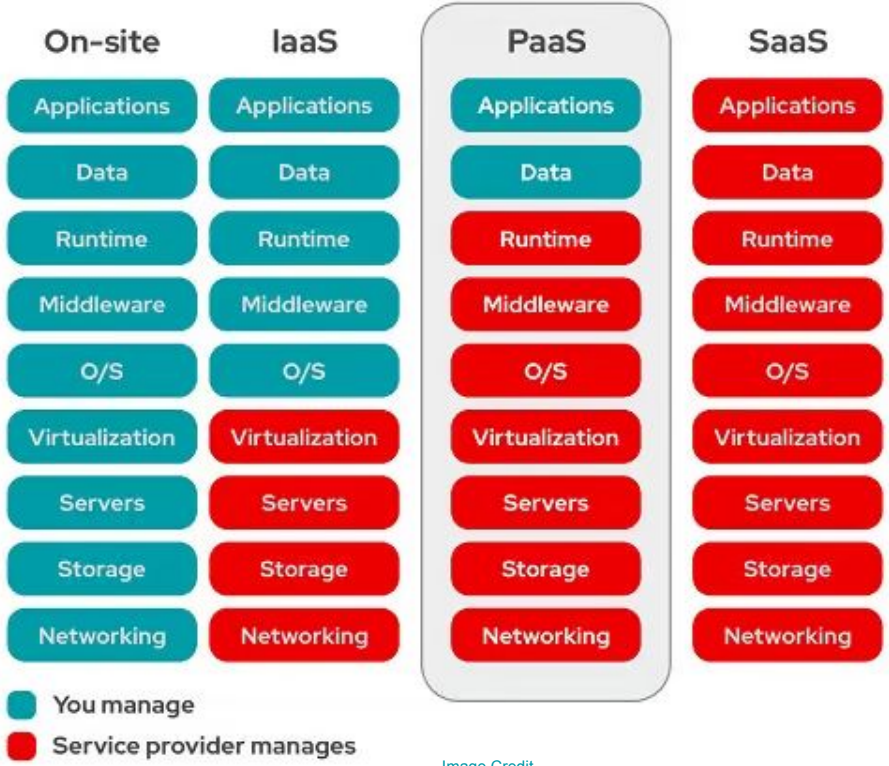


Image Credit

FaaS

- FaaS [Function as a Service]
  - Serverless
  - Build, deploy and manage functions which does a specific job
  - Execute code in response to an event
    - IoT
    - Edge services
  - No hassle of even managing the application
  - You have all the time to focus purely on the core business logic
  - Keep the function simple. Don’t call one function within another
  - Examples
    - AWS Lambda
    - Google Cloud Functions
    - Microsoft Azure Functions

Types of Cloud Deployment

- Public Cloud
  - Service is offered over internet
  - Accessible by anyone on the internet
  - Most common type of deployment
  - Highest level of efficiency because of resource sharing
  - Cheapest, yet customizable
  - Considered least secure of all deployment models
- Private Cloud
  - Service is offered to a single organization in a private network
  - Not accessible via internet
  - Most expensive deployment model
  - Considered very secure
  - Not practical for small orgs due to cost

Types of Cloud Deployment

- Hybrid Cloud
  - Combination of public, private cloud and on-premise services
  - Run critical applications and store sensitive information in private network or onprem
  - Use public cloud for rest of the applications and data
  - Combines best of both worlds
  - Provides more agility
  - Portability of workloads
  - Cost is moderate because private cloud is used only for the most critical parts of the architeture

Types of Cloud Deployment

	Public Cloud	Private Cloud	Hybrid Cloud
Environment	Publicly-shared computing resources	Private computing resources	Mix of public and private resources
Auto-Scaling	High	Can be limited	High
Security	Good – but depends on security of the vendor	Most secure – all data stored in private data center	Very secure – sensitive data stored in private data center
Reliability	Medium – depends on Internet connectivity and service provider availability	High – all equipment on premise or hosted by dedicated private cloud provider	Medium to high – some dependency on service provider
Cost	Low – pay-for-what-you-need model and no need for on-premise storage and infrastructure	Moderate to high – can require on-premise resources such as a data center, electricity, and IT staff	Moderate – mix of pay-for-what-you-need model and on-premise resources
Who Is It for?	Companies that want to take advantage of the latest SaaS apps and elastic IaaS while keeping costs low	Government agencies, healthcare providers, banks, and any business that handles a lot of sensitive data	Companies that want to keep critical apps and data private – and still use public cloud services

Why Cloud Computing

- **Cost effective**: Pooling of resources reduces cost and increases the utilization
- **Reliable**: Promised SLAs
- **Scalable**: Scale up and down as needed
- **Flexible**: Access from anywhere. Quick and convenient access to the services
- **Up to date**: Software, platform, infra is maintained by other companies. So, they care of updates, maintenance, etc
- **Secure and Privacy**: Companies offering these services take security very seriously so that their clients would have the trust to use these services
- **Time saving**: No need to upgrade, maintain, etc. No need to spend time to set up, tear down, etc
- **Tech support**: No need for in house expertise. Cloud provides offer you technical support by connecting you with Subject Matter experts. You can focus on the actual core business logic

Common Uses

Who uses?

- Small businesses with a few members to large organizations with 1000s of employees
- Educational sectors like schools, research institutes, universities
- Government
- Individuals
- 50% of businesses in US uses cloud in some capacity

Common use cases

- Database management
- Email servers
- eCommerce
- Website hosting
- File storage and sharing
- Global collaboration
- Product and service hosting
- Customer Relationship Management (CRM)
- Advertising
- Disaster Recovery

Different Cloud Providers

- Top 5 Cloud Providers globally with market share
  - Amazon Web Services (AWS) - 34%
  - Microsoft Azure - 22%
  - Google Cloud Platform (GCP) - 9.5%
  - Alibaba Cloud - 6%
  - Oracle Cloud - 2%

- Top 3 services from AWS
  - AWS EC2 (Elastic Cloud Compute)
  - AWS RDS (Relational Database Services)
  - Amazon S3 (Simple Storage Service)

Future of Cloud Computing

- Multi-cloud are on the rise
  - Prevents single vendor lock-in
  - Helps reduce the enormous switching costs from one vendor to the other
  - Provides failover option if one cloud provider's service goes down or ceases operations
  - Key to this is using containers and orchestration tools
- More growth in serverless computing
  - Only the modules, functions or application is scheduled when needed
  - No need to spin up VM, containers, etc every time
  - Better resource sharing
  - Cost saving and load management benefits
- Edge computing will be more prevalent
  - Edge devices will become more powerful and more spread producing large volumes of data
  - With 5G(which handles intermittent connections better), they will be used in areas of extreme weather or environmental conditions

Future of Cloud Computing

- Growth in IoT
  - Smart homes
  - Smart vehicles
  - Smart industries, etc
- Enhanced storage capacities. 200 ZettaByte (1 ZB = 1 billion TB) of data globally in 2025. 50% of it will be in cloud
- Growth of Cloud based AI systems
- More focus on Data privacy and cloud mitigation
- More adoption of Kubernetes
- Increased adoption of cloud in education and health care industries
- Increased economic influence on business

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References:

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- https://www.zdnet.com/article/the-future-of-cloud-computing-from-hybrid-to-edge-to-ai-powered/

Backend Study Group:

- Presentations on GitHub and session recordings available on WWCode YouTube channel
- Upcoming sessions:
  - June 22nd 2023 - SQL Queries 101
  - June 29th, 2023 - Big Data Pipelines 101
  - July 6th, 2023 - Ruby On Rails 101

Women Who Code:

- Technical Tracks and Digital Events for more events
- Join the Digital mailing list for updates about WWCode
- Contacts us at: contact@womenwhocode.com
- Join our Slack workspace and join *#backend-study-group*!

You can unmute and talk or use the chat

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