

# A **First Principles** Approach to Mastering AWS

**AWS Community Day D.M.V.**  
**Date: Friday; September 30<sup>th</sup>, 2022**



# COMMUNITY DAY

DMV

SEPTEMBER 30<sup>th</sup>

## Yingquan Li (Linus)

*Data Engineer, Full-Time Graduate Student @  
Virginia Tech*

**Bio:** I'm an engineer who has worked in both private sector/public sector settings, as well as most recently in academia. I have been an AWS enthusiast since 2015 and I have extensive engineering experience with: 1) Data and DevOps engineering, 2) Data Analytics Engineering and 3) Data Science.

**Work:** University of Pennsylvania, Deloitte, PwC, Gartner, HPE

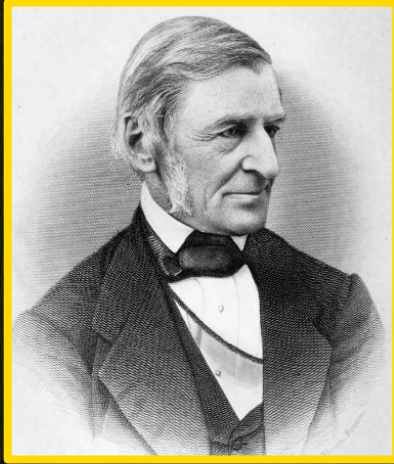
**Education:** Virginia Tech, University of Maryland



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## Starting Quote: Ralph Waldo Emerson

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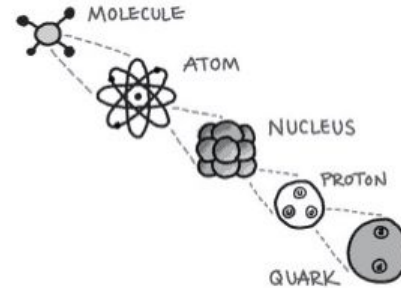
"As to methods, there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble."

# What is **First Principles** Reasoning?

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- ◆ My Definition: **First Principles** reasoning is a problem solving technique that has two parts:
  1. Boil a problem down to fundamental building blocks that lurk beneath the surface.
  2. Reason up from the fundamentals to form a new and novel solution to a particular problem.
- ◆ Common in fields such as: Mathematics, Physics, Philosophy, etc.

## First Principles Thinking



*"Boiling problems down to their most fundamental truths."*



*First Principles can be  
applied to almost  
anything in life!*



# Learning AWS through First Principles

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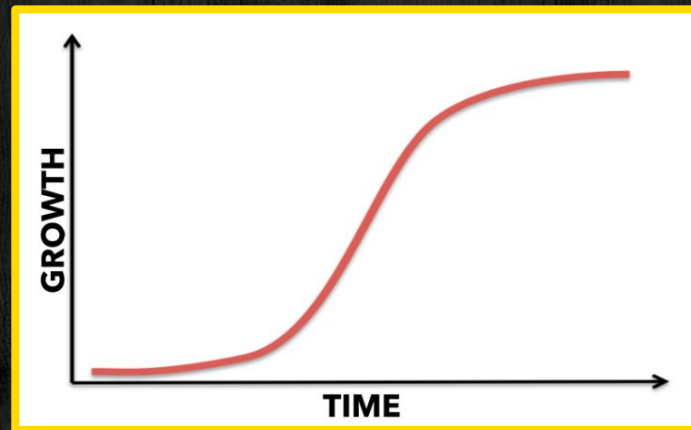
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2. The growth of the AWS cloud was a new “wave” that was going to follow an **S-Curve**.
3. There was a lack of professionals who understood the cloud **deeply**.



# Taking Action ⚡

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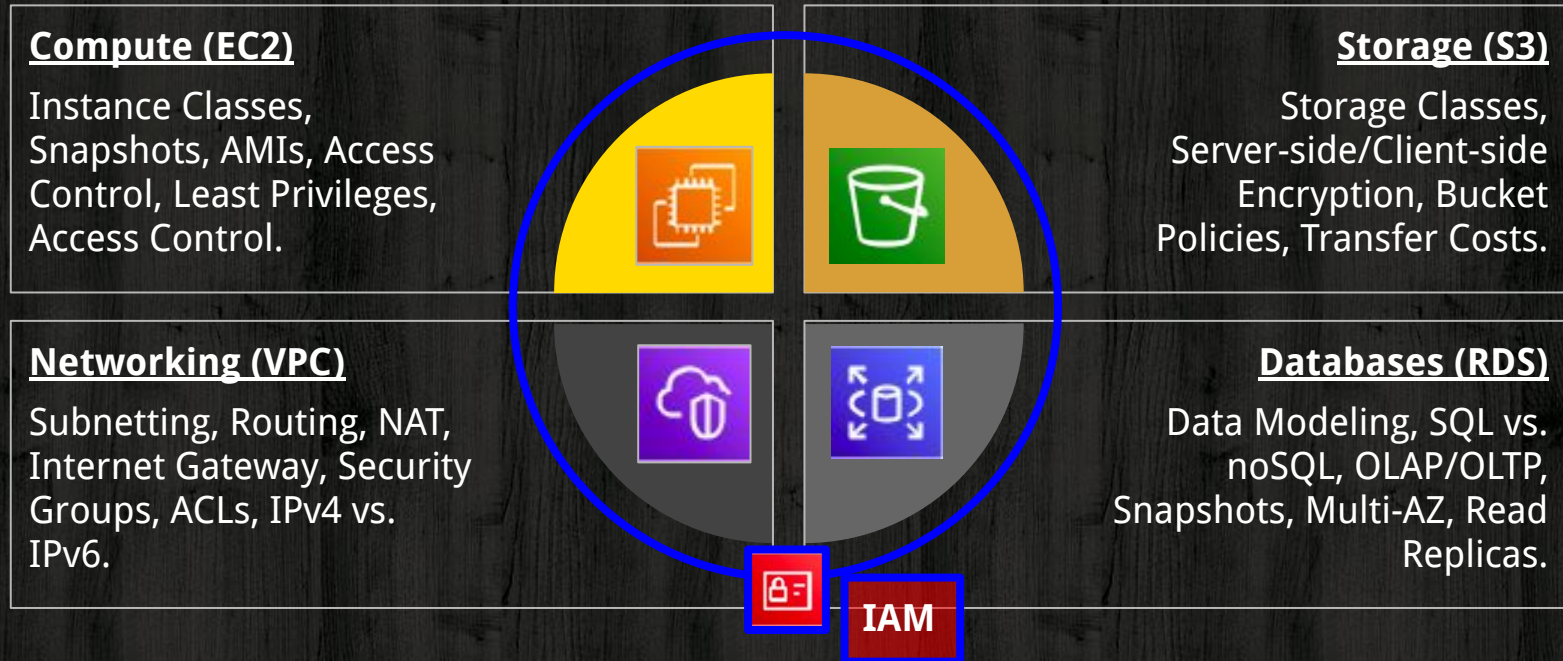
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- ◆ I identified two big action items:
  - 1) If I wanted to understand cloud technology deeply, I would have to stay patient and keep working. It might take years.
  - 2) I realized that to get really good at AWS involved both learning the theory + applying the learning in the real-world.

# I Realized the Following from My Studies (2015–2019)

**Punchline:** All AWS services are built on 5 key services: **IAM, EC2, S3, VPC, RDS**. But to truly understand a service, you have to learn *all the concepts behind each service + the IT concepts*.

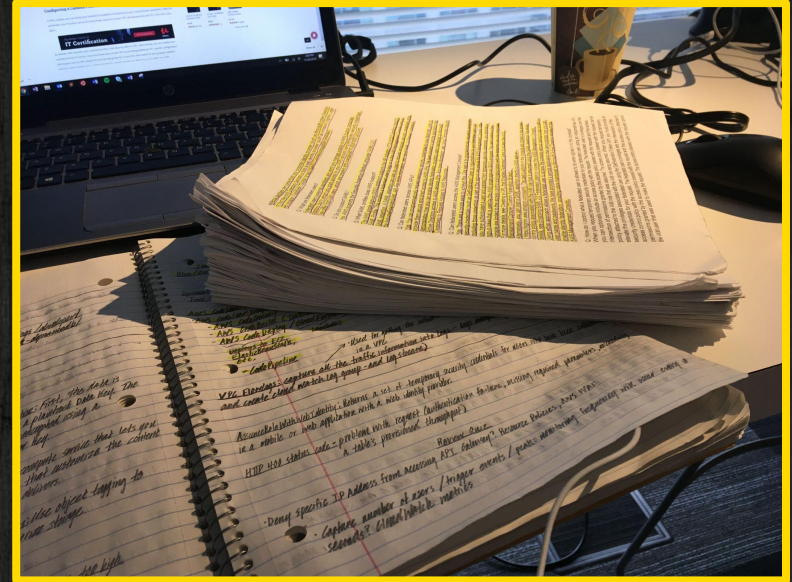




# True Magic: When First Principles Meets Application



My team and I at the AWS Small Business Adm. Hackathon. (Dec. 2018).



The day after Thanksgiving; in the office studying for my AWS Developers - Assoc. test the next day (Nov. 2019).

# Conclusion

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- ◆ It took years, but my study + building projects underpinned by AWS **first principles** is finally paying off.
- ◆ A solid foundation pay dividends years down the line. To be intimately familiar with first principles gives you so much confidence that:
  1. You can solve any cloud/IT problem.
  2. You can pick up any new cloud technology/service extremely quickly.
- ◆ In summary: no shortcuts!

## Ending Quote: Elon Musk

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"Always go beyond memorizing formulas, passing tests. Always go deep into the underlying principles of any subject; to track any problem down to the root cause, buried in the dirt and the dark."



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Any questions? Thank you!

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