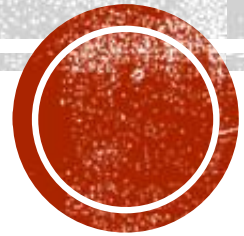
INTRODUCTION TO CLOUD COMPUTING



OUTLINE

- Cloud Computing
  - Definition
  - Characteristics
  - History
- Cloud vs Conventional Computing
- Cloud Benefits
- Cloud Computing Enablers
  - Virtualization

Cloud Computing – NIST Definition

A ***model*** for enabling convenient, on-demand network access to a ***shared*** pool of ***configurable computing*** and networking resources that can be ***rapidly provisioned*** and ***released*** with ***minimal management*** effort or service provider interaction

5 ESSENTIAL CLOUD CHARACTERISTIC

WHAT IS CLOUD COMPUTING IN THE REAL WORLD

- "Cloud" refers to large Internet services running on 10,000s of machines (Amazon, Google, Microsoft, etc)

- "Cloud computing" refers to services by these companies that let external customers rent cycles and storage
  - Amazon EC2: virtual machines at 8.5¢/hour
  - Amazon S3: storage at 15¢/GB/month
  - Google Cloud AppEngine
  - Windows Azure

WELL KNOWN CLOUD COMPUTING SERVICES

- Dropbox
- Google Drive
- Microsoft OneDrive
- Apple iCloud

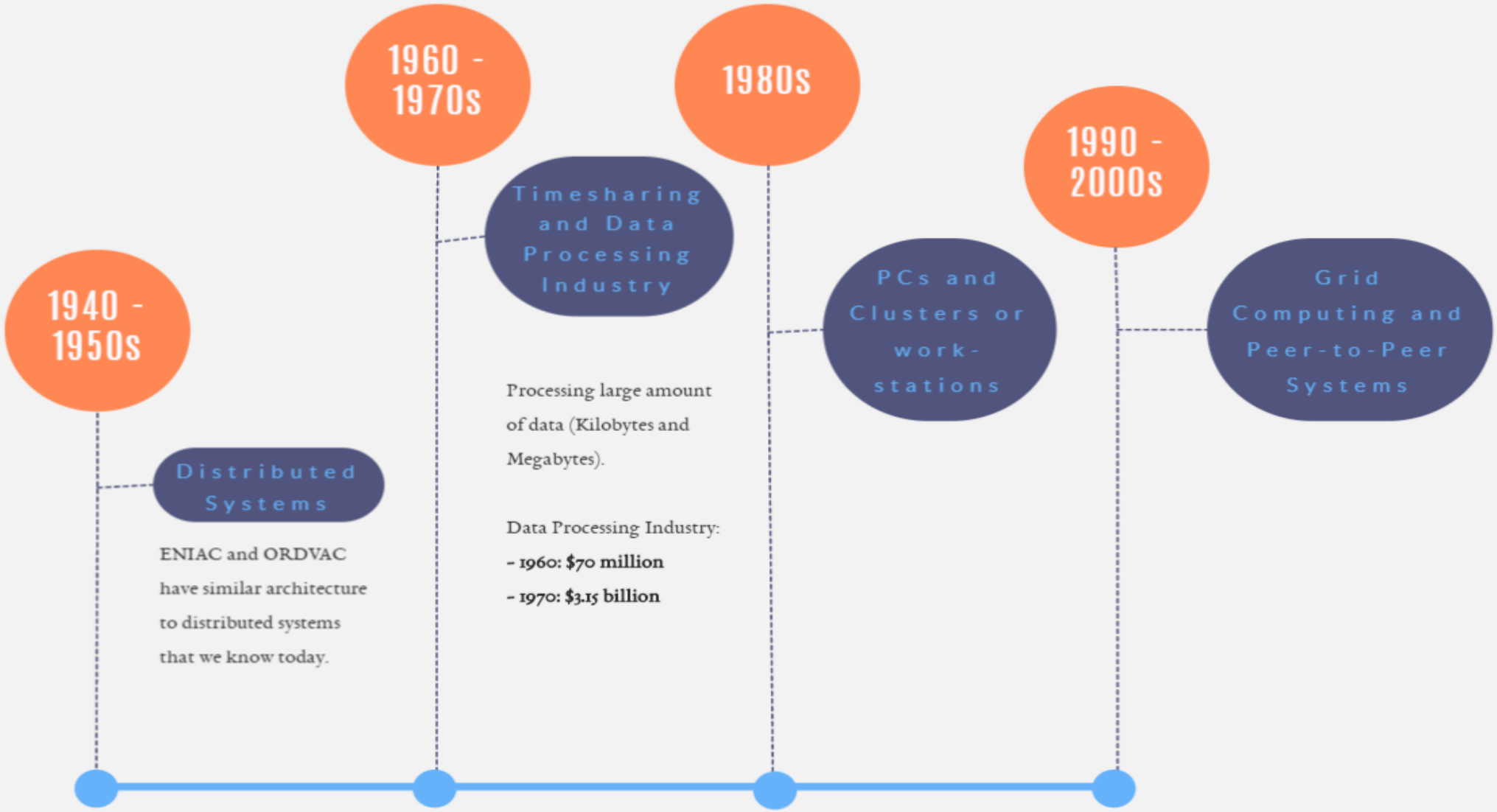
- Netflix - hosted on AWS
- Google search – Google Cloud
- Google Docs, Sheets, and Slides
- Facebook
- Skype
- Twitter





Cloud History

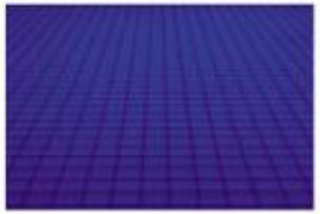
40s-Nowadays



EVOLUTION OF CLOUD COMPUTING – CONT'D

Grid Computing

- Solving large problems with parallel computing
- Made mainstream by Globus Alliance



Utility Computing

- Offering computing resources as a metered service
- Introduced in late 1990s

Software as a Service

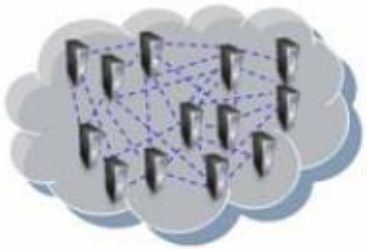
Network-based subscriptions to applications

Gained momentum in 2001

Cloud Computing

Next-Generation Internet computing

Next-Generation Data Centers



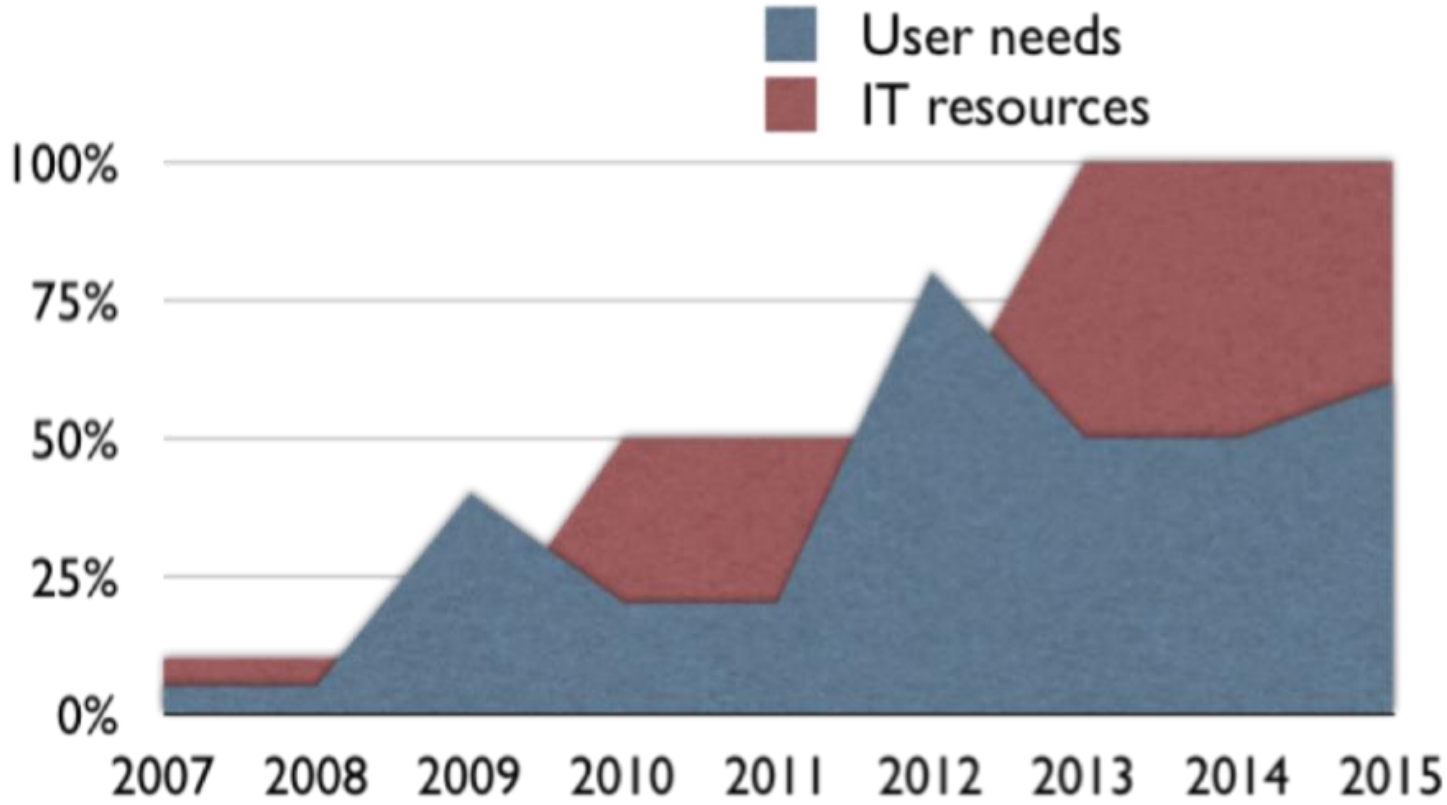
WHY CLOUD COMPUTING?

- Expensive and wasteful IT infrastructure

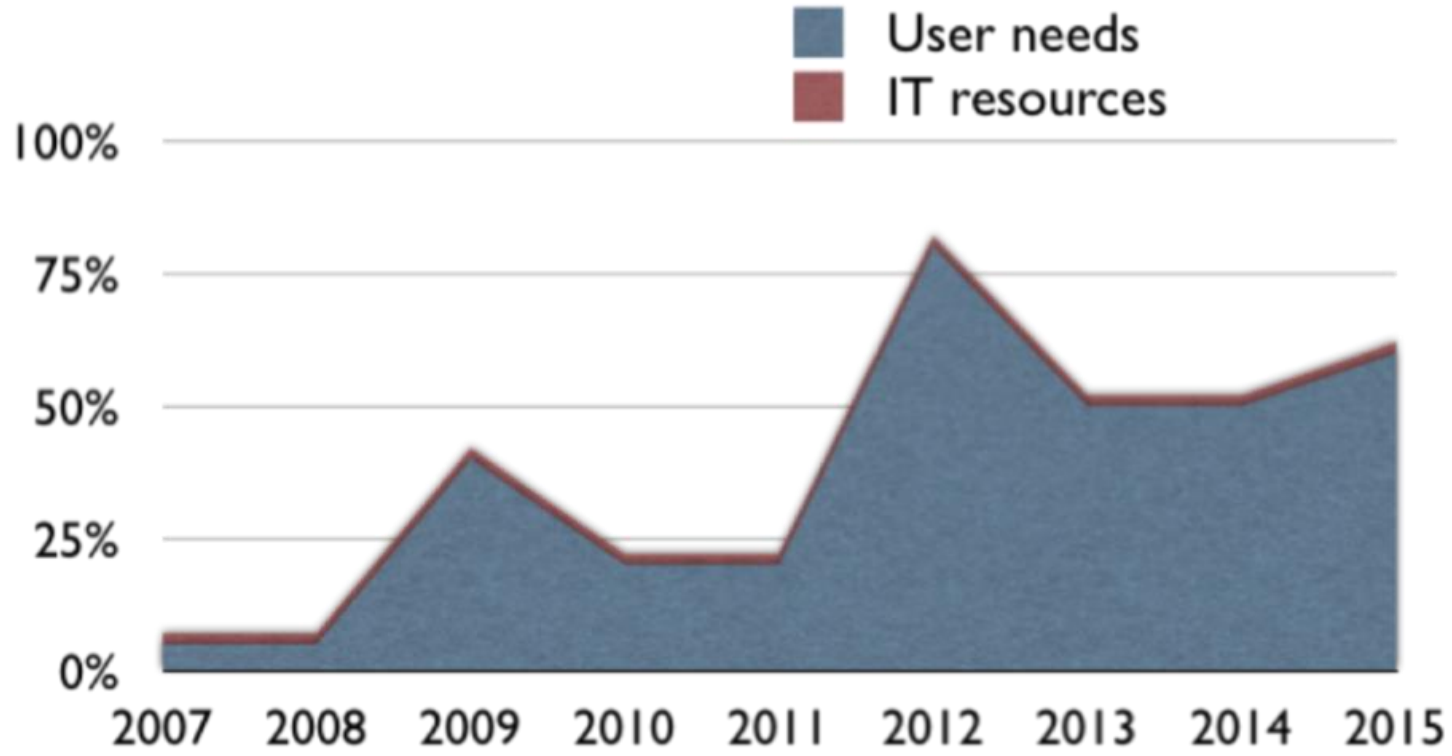
https://www.hpe.com/us/en/insights/articles/interested-in-consumption-based-it-here-are-5-questions-you-must-ask-1808.html

CONVENTIONAL COMPUTING INFRASTRUCTURE
"NEEDS VS IT RESOURCES"

- Moore's law
  - Storage Doubling Period: 12 months
  - Bandwidth Doubling Period: 9 months
  - CPU Computing Doubling Period: 18 months



CLOUD COMPUTING INFRASTRUCTURE
"NEEDS VS IT RESOURCES"



CONVENTIONAL VS CLOUD

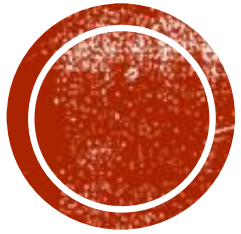
Conventional

- Manually Provisioned
- Dedicated Hardware
- Fixed Capacity
- Pay for Capacity
- Capital & Operational Expenses
- Managed via System administrators

Cloud

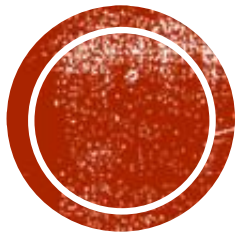
- Self-provisioned
- Shared Hardware
- Elastic Capacity
- Pay per Use
- Operational Expenses
- Managed via APIs

CLOUD BENEFITS



Cloud Computing Enablers

Cloud Computing = Data Center + Virtualization



Q&A