

Week 12: The Cloud; Freeconomics

CB2500 Information Management

Smart Banking (BI)
Smart e-Services (ISSN)

Smart IS Auditing (ISA)
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“How About \$10 Per Terabyte?”



What is cloud? How can you use it for your business?
Pros and Cons?

Study Questions / Intended Learning Outcomes

Q6-1: Why is the cloud the future for most organizations?

QCE8-1: What is a computer network?

Q6-4: How can organizations use cloud services securely?

QX1: What is freeconomics? How do companies use freeconomics strategy to compete?

Q6-1: Why Is the Cloud the Future for Most Organizations?

- The Cloud:
 - Elastic leasing of
 - pooled computer resources
 - over the Internet.

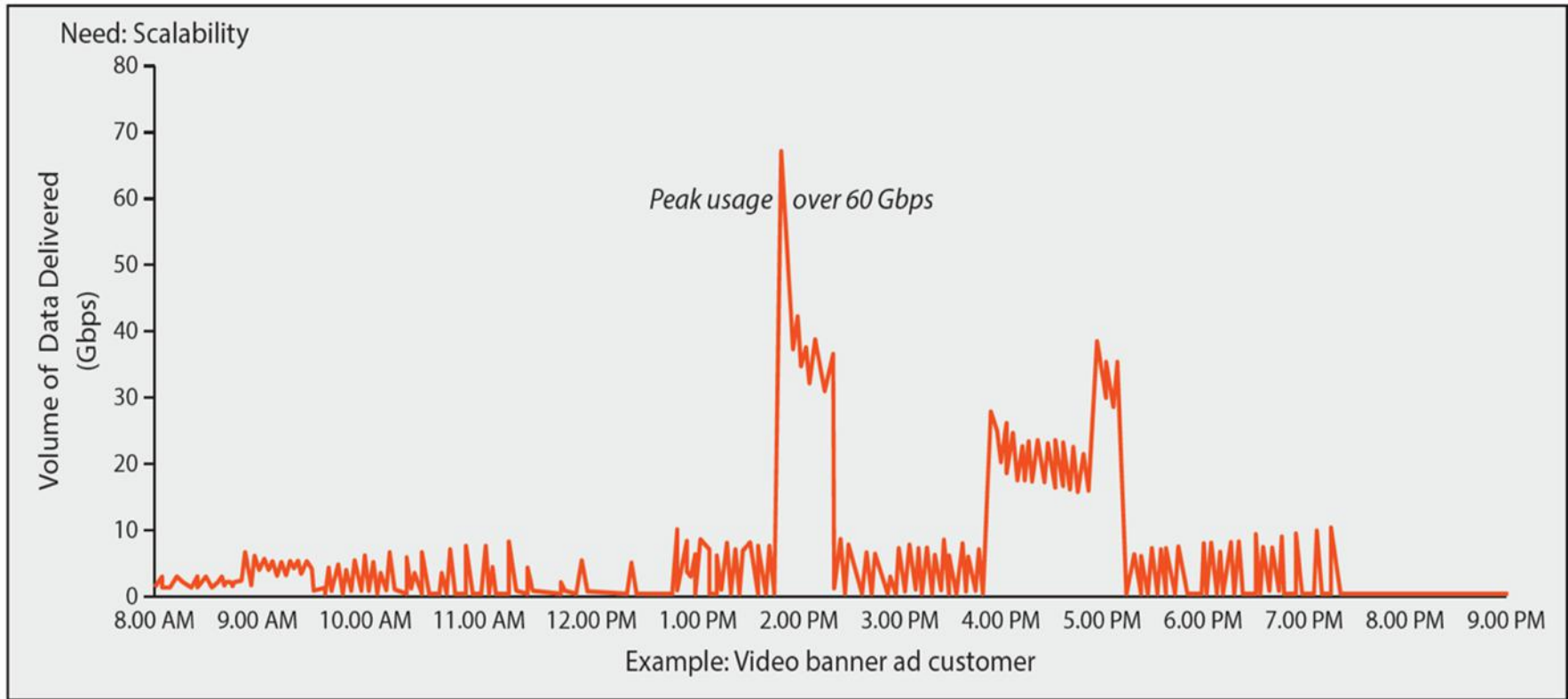
Q6-1: Why Is the Cloud the Future for Most Organizations?

- Elastic:
 - _____ computing resources
 - increased or decreased dynamically, programmatically, in a short span of time; and
 - organizations only _____.

A user can create, launch, and terminate server-instances as needed, paying by the second for active servers – hence the term "elastic"



Example of a Video Banner Ad Customer



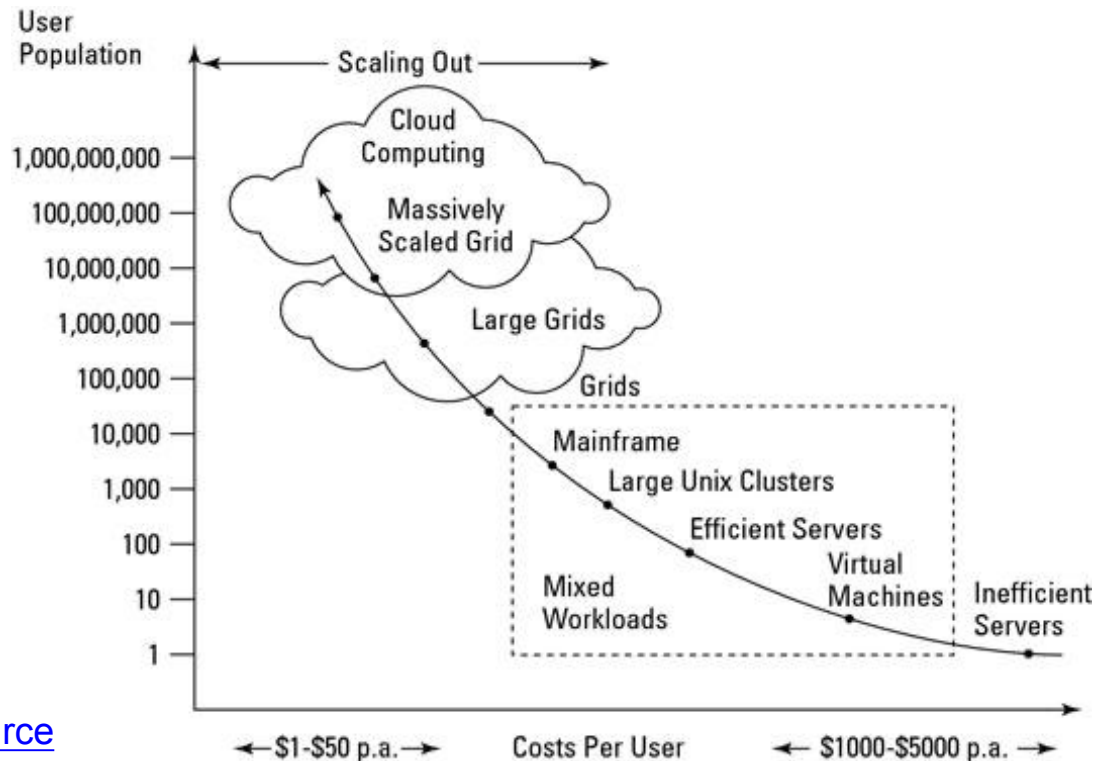
Pooled

- Cloud resources are pooled
- Many different organizations **share same physical hardware** through virtualization.



Pooled

- Benefit from _____
 - Average cost of production decreases as size of operation increases.



[Image Source](#)

Pooled

- Major cloud vendors operate enormous Web farms.

Alibaba →



← Google

What is The Cloud?



Video URL: <https://www.youtube.com/watch?v=i9x0UO8MY0g>

UReply Q1

You are the IT manager in a bank.

1. Based on the video, will you recommend using cloud to manage banking data?

2. Why would you make this decision?

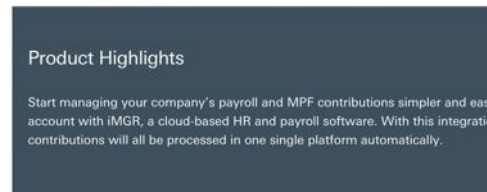


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Banking on The Cloud: A Case of HSBC



HSBC now has 169 petabytes of data on its servers. A year ago it only had about 100 petabytes.

"This is what made us go to the cloud," said David Knott, U.K.-based chief architect of the bank's I.T. "Managing that much data takes a lot of effort and computing power. We found we were spending more time managing the infrastructure for data than we were using the data to figure out what our customers wanted."

Darryl West, the bank's global chief information officer, now based in Hong Kong, is blunter: "We have a cloud-first strategy."

Fast calculation

For example, the bank has moved global liquidity reporting processes to vendor cloud. Daily reporting took up to 14 hours a day on its proprietary servers but now takes less than three hours on Google Cloud. The bank's consumer payments app, PayMe, took six hours to process certain usage analytics reports on-prem; now it takes two minutes.

Knott said: "We can now calculate our end-of-day liquidity position prior to start of business, meaning the business can respond to situations (both crisis and opportunity) much more quickly."

Other videos that may be of your interest:

- [HSBC: Using Serverless at Scale in Banking](#)
- [Why HSBC moved its more than 100 petabytes of data to Google Cloud](#)

Why Is the Cloud Preferred to In-House Hosting?

Cloud-Based Hosting	In-House Hosting
Positive:	
Small capital requirements	Control of data location
Speedy development	In-depth visibility of security and disaster preparedness
Superior flexibility and adaptability to growing or fluctuating demand	
Known cost structure	
Possibly best-of-breed security/disaster preparedness	
No obsolescence	
Industry-wide economies of scale, hence cheaper	

Why Is the Cloud Preferred to In-House Hosting? (cont'd)

Cloud-Based Hosting	In-House Hosting
Negative:	
Dependency on vendor	Significant capital required
Loss of control over data location	Significant development effort
Little visibility into true security and disaster preparedness capabilities	Annual maintenance costs
	Ongoing support costs
	Staff and train personnel
	Increased management requirements
	Difficult (impossible?) to accommodate fluctuating demand
	Cost uncertainties
	Obsolescence

When Does the Cloud NOT Make Sense?

- When, by law or by standard industry practice, a company is required to have physical control over its data.
- For example, a financial institution might be legally required to maintain physical control over its data.

QCE8-1: What is a Computer Network:

Basic Concepts

- Computer Network
- Personal Area Network (PAN)
- Local Area Network (LAN)

QCE8-1: What is a Computer Network: Basic Concepts

- Internet: A _____ computer networks using _____ communication protocols



QCE8-1: What is a Computer Network: Basic Concepts

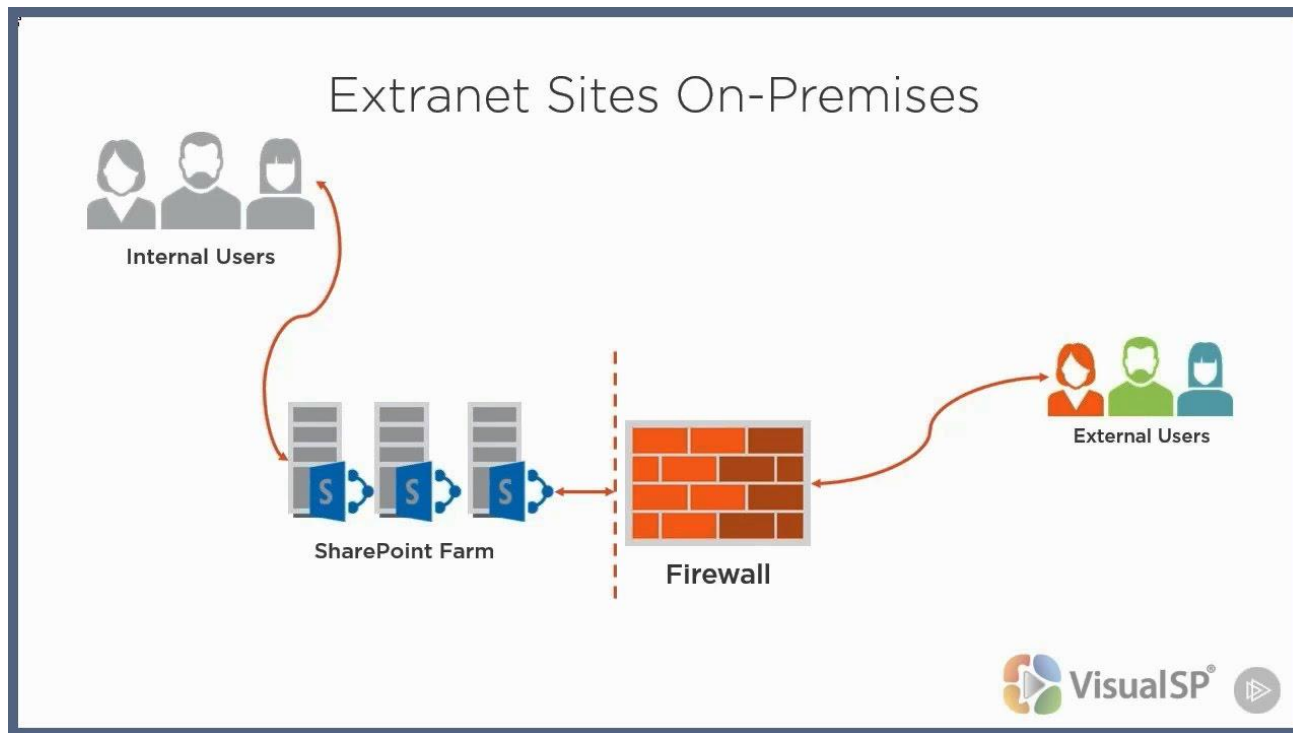
- Intranet: A _____ internet used within a corporation



QCE8-1: What is a Computer Network:

Basic Concepts

- Extranet: An _____ that can be _____ accessed by authorized outside users



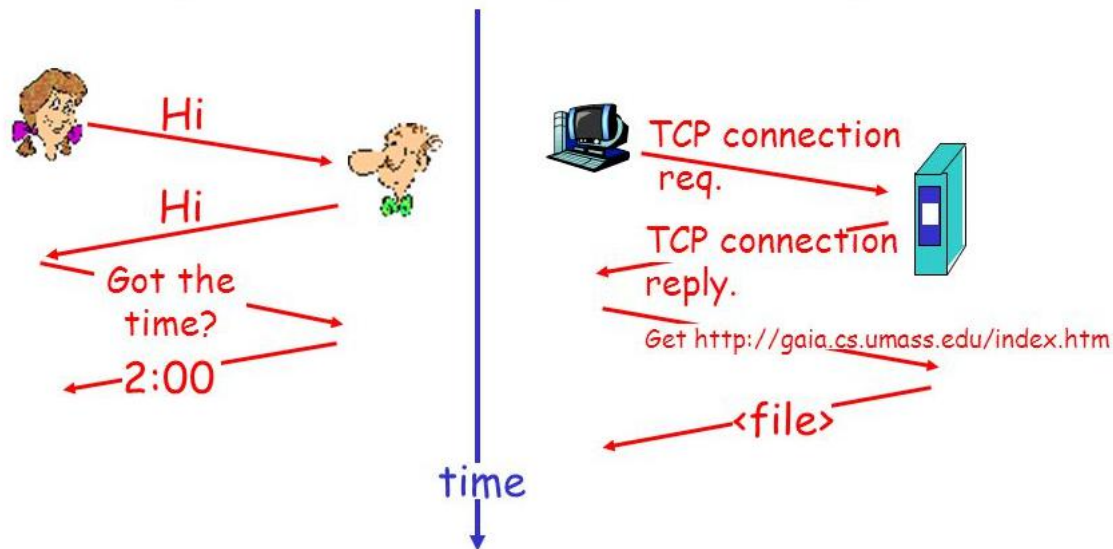
[Image Source](#)

QCE8-1: What is a Computer Network: Basic Concepts

- Protocol: A set of rules that governs how network devices should communicate

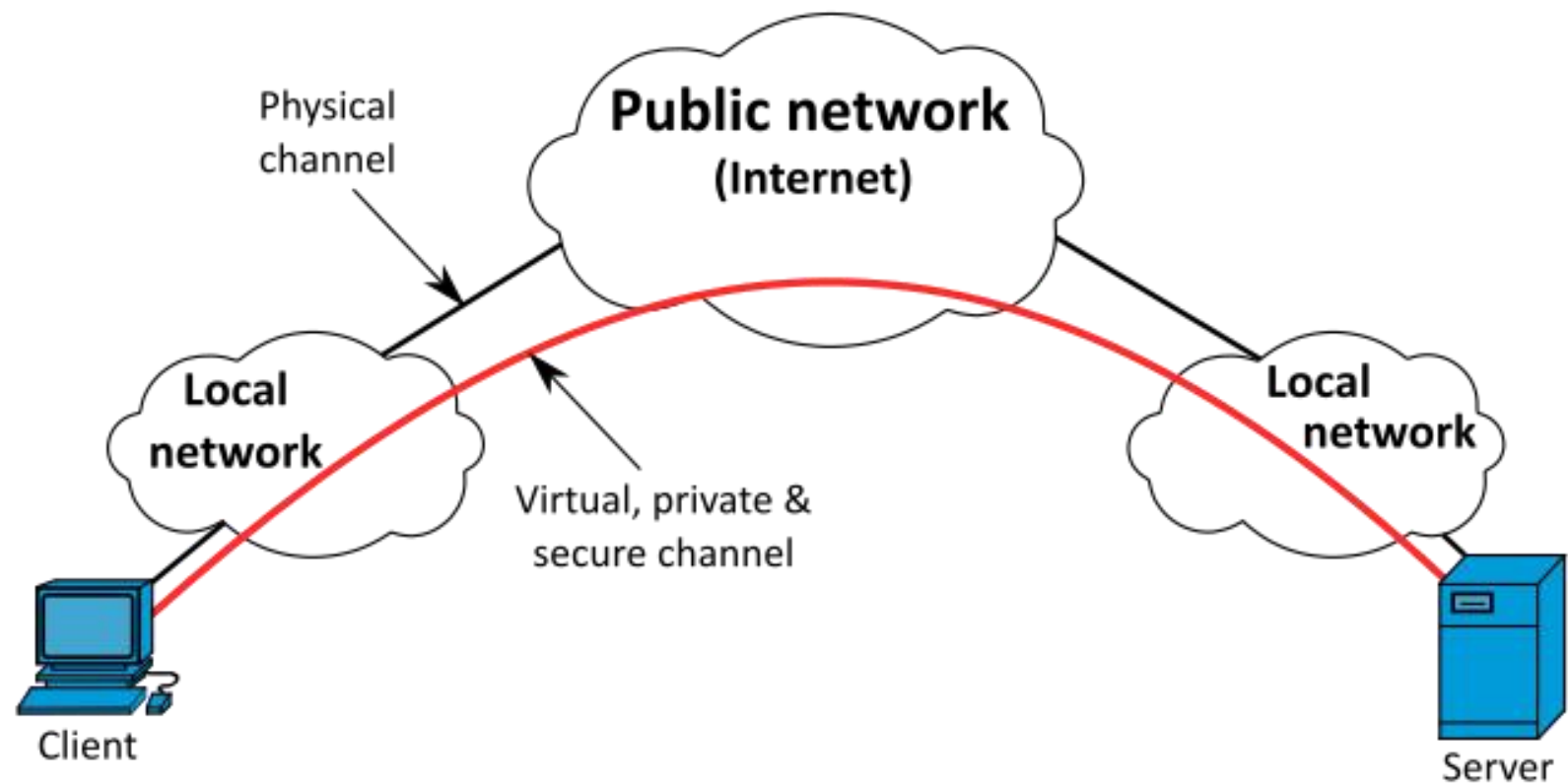
What's a protocol?

a human protocol and a computer network protocol:



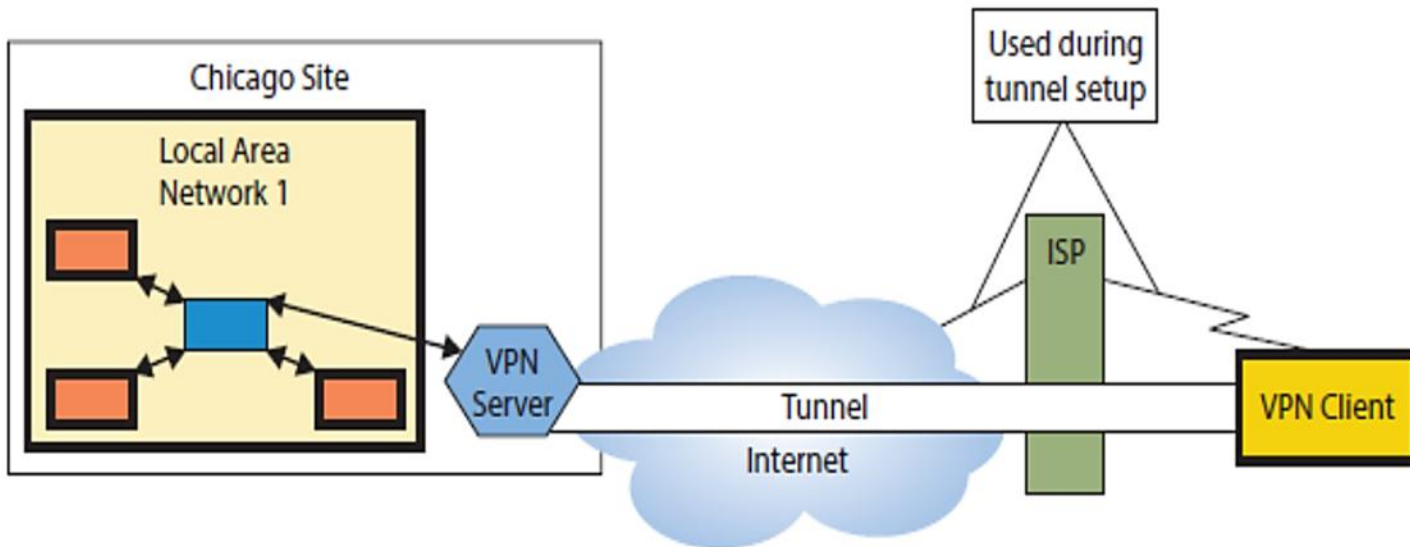
[Image Source](#)

Q6-4: How Can Organizations Use Cloud Services Securely?



Q6-4: How Can Organizations Use Cloud Services Securely?

Remote Access Using VPN: Actual Connections



Remote client connects to LAN/cloud resources through secure channel over public Internet; it is logically acting as a local computer in the LAN/cloud.

QX1: Freeeconomics

- The leveraging of digital technologies
- to provide free goods and services to customers as a business strategy
- for gaining competitive advantage.



The Rise of "Freeeconomics"

It's a big day for Moore's Law. I'm not sure anyone else has noticed this, but by my calculations we have in the past few months reached the penny-per-MIPS* milestone. Intel's Core Duo running at 2.13 GHz now costs around \$200 at retail (it's around \$180 at volume), but can do about 20,000 MIPS. I remember my first 6 MHz 286 PC in 1982 that did 0.9 MIPS. I have no idea what the CPU cost then, but the PC it came in cost nearly \$3,000 so it couldn't have been cheap. Say it was around \$1,000/MIPS back then. Now it's \$0.01/MIPS. I



http://www.longtail.com/the_long_tail/2006/11/the_rise_of_fre.html

How Does Freeeconomics Work

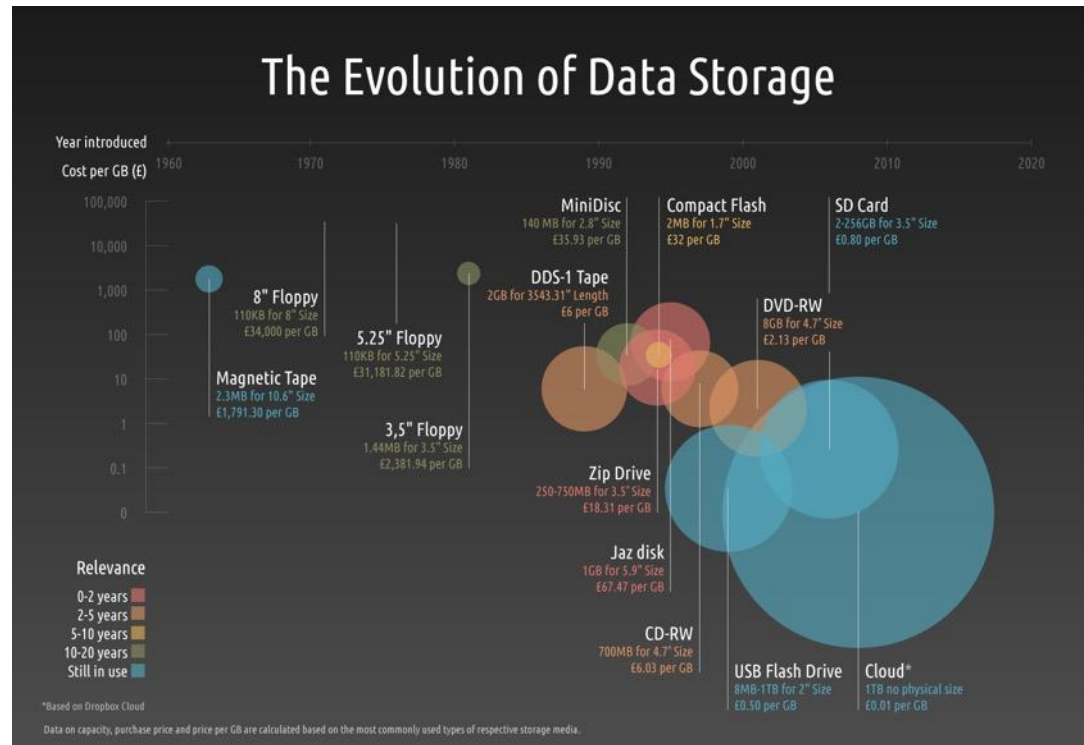
- Marginal cost



- It influences price setting

How Does Freeeconomics Work

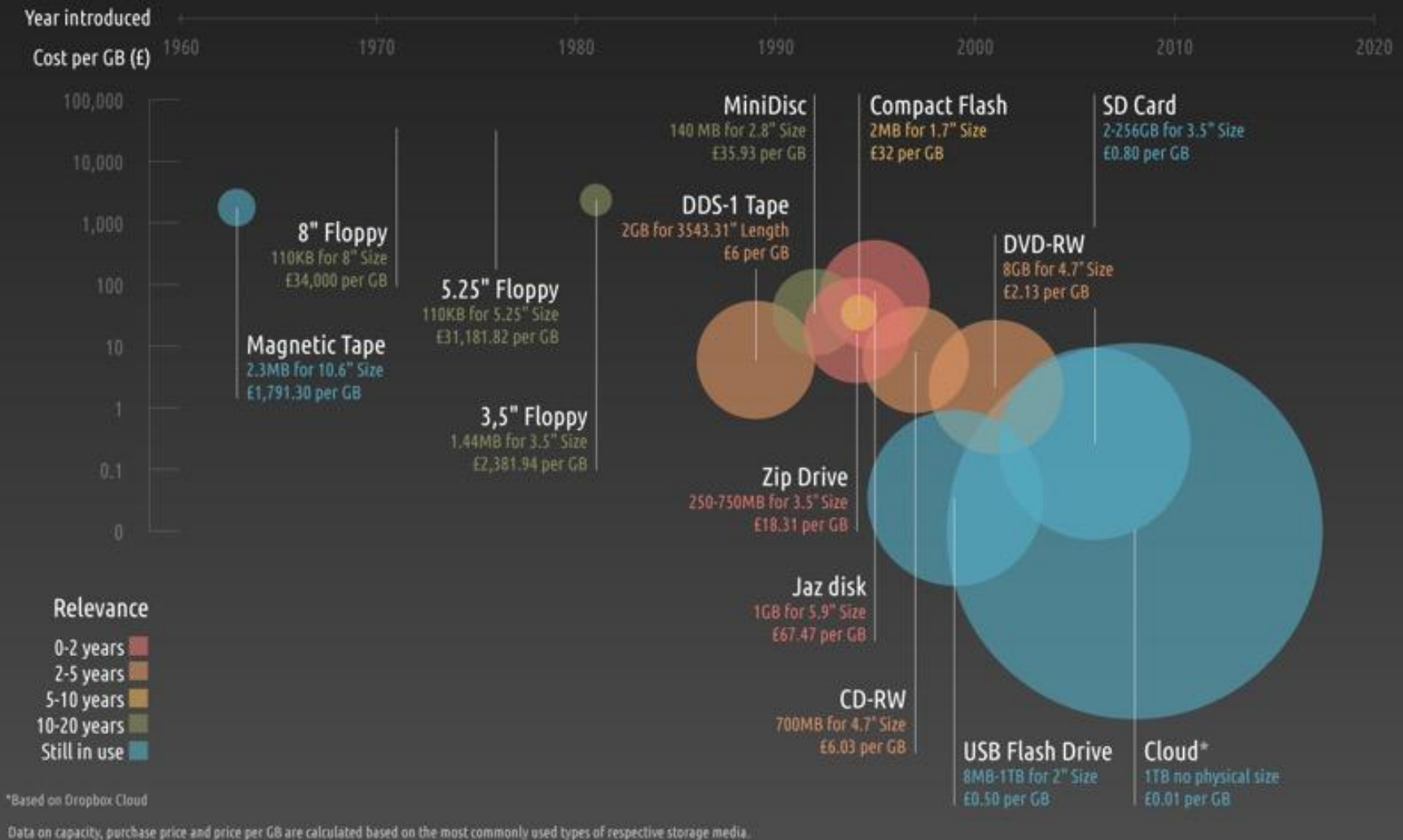
- Marginal cost is getting lower
 - Especially for businesses leveraging digital technologies



<https://www.nimbushosting.co.uk/the-evolution-of-data-storage/>

Nimbushosting Sources: <https://www.cs.auckland.ac.nz/historydisplays/FifthFloor/MagneticDataStorage/MagneticTapes.php> - <http://www.radioshackcatalogs.com/html/1985/hr177.html> - <https://en.wikipedia.org/wiki/CD-RW> - <http://royal.pingdom.com/2008/04/06/the-history-of-computer-data-storage-in-pictures/> - <http://www.coolinfographics.com/blog/2012/11/14/the-lifespan-of-storage-media.html> - https://en.wikipedia.org/wiki/Floppy_disk - <http://www.jmilit.com/flashprice.htm> - <http://www.pcmag.com/article2/0,2817,965379,00.asp> - <http://www.jmilit.com/flashprice.htm> - <http://www.frommountain.com/Knowledge-Center/Reference-Library/View-by-Documents/General-Articles/The-History-of-Magnetic-Tape-and-Computing-A-65-Year-Old-Marriage-Continues-to-Evolve.aspx> - https://books.google.co.uk/books?id=ctgEAAAAMBAJpg&pg=PA438dq=compact+flash+4mb+original+cost+msrp&source=bl&ots=05y_49KRbB&sig=eylQaKHQ516KpCvdTfB-ODnewbhl=en&sa=X&ved=0ahUKEwJpuDqyMDMANUJCAXHBUA,QQ6AEIVZAJv=onepage&q=compact%20flash%204mb%20original%20cost%20msrp&f=false

The Evolution of Data Storage



<https://www.nimbushosting.co.uk/the-evolution-of-data-storage/>

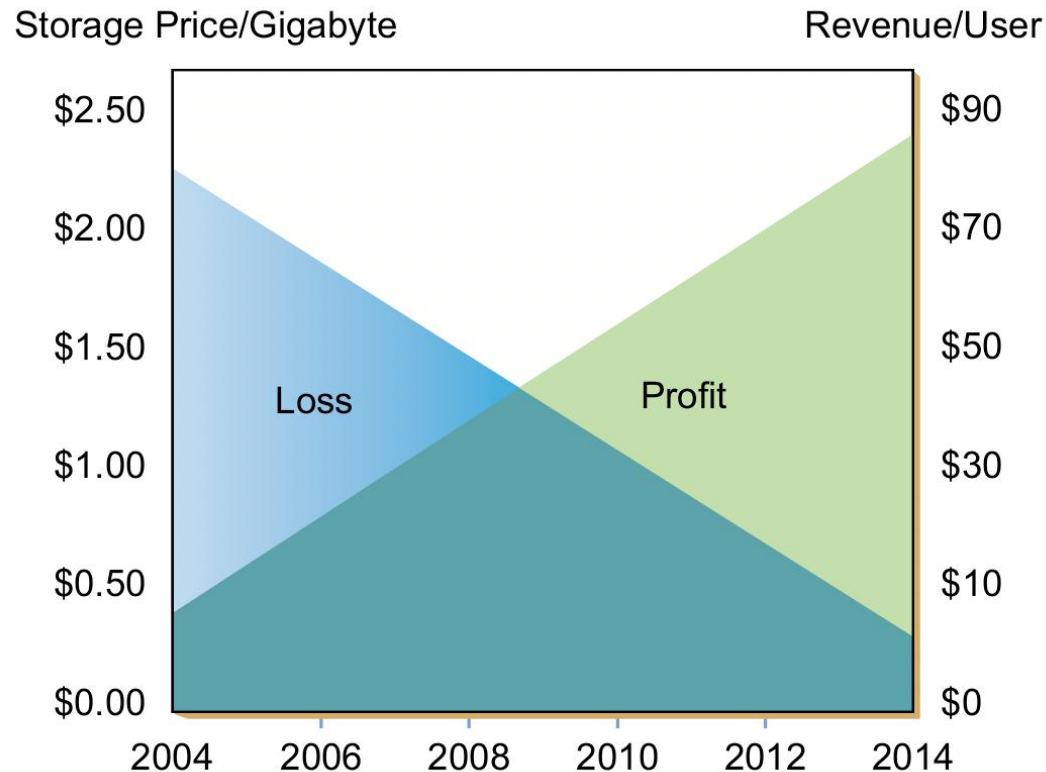
How Does Freeeconomics Work

- Marginal cost is getting lower
 - How much does it cost Yahoo/Google to accommodate a new email service user?



How Does Freeconomics Work

- Marginal cost is getting lower



How Yahoo! makes millions of dollars from its free web-based e-mail service—as the cost of storage has dropped, revenue per user has increased.

The Freeeconomic Value Proposition

- “Free”?
- Someone, somewhere is paying for the service.
- Value proposition includes more than just buyers and sellers.

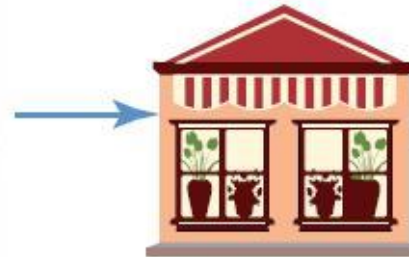
The Freeeconomic Value Proposition: A Case of Google Search Engine



Consumer
Uses
Google's
Free
Service to
Search for
Flowers



Consumer
Clicks a
Sponsored
Link



Consumer is
Redirected
to
Advertiser's
Web Page

Advertiser Fulfills
Order



Advertiser pays
Google

Approaches for Applying Freeeconomics

- Advertising

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Approaches for Applying Freeeconomics

- Freemium (Remember?)

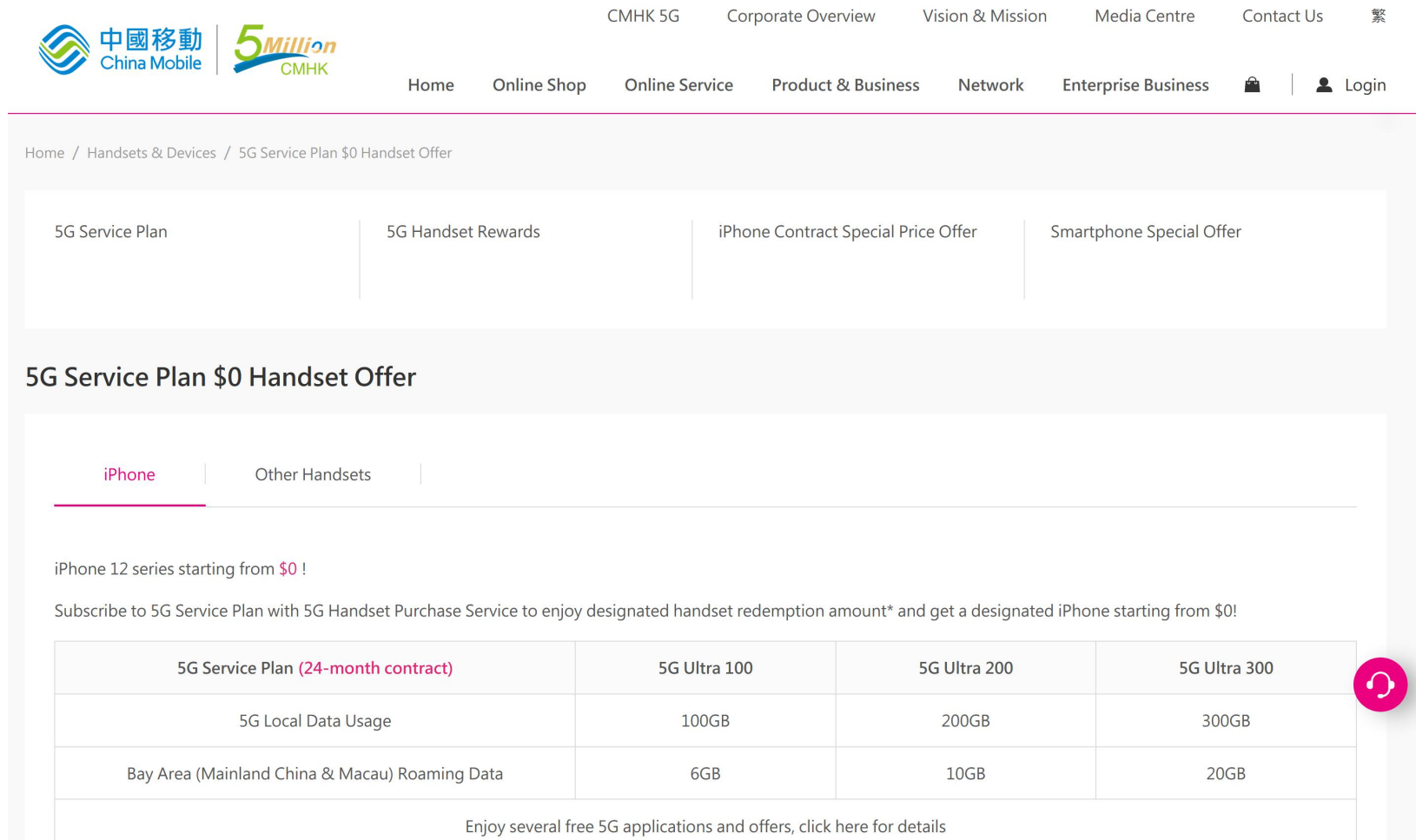
Zoom Meeting Plans for Your Business

[Zoom for Education](#) | [Zoom for Telehealth](#) | [Zoom for Developers](#)

Basic	Pro	Business	Enterprise
Personal Meeting	Great for Small Teams	Small & Med Businesses	Large Enterprise-Ready
Free	\$14.99 /mo/host	\$19.99 /mo/host	\$19.99 /mo/host
		<small>* Starting at 10 hosts for \$199.90/mo</small>	<small>* Starting at 100 hosts for \$1,999/mo</small>
Sign up, It's Free	Buy Now	Buy Now	Contact Sales
Host up to 100 participants Unlimited 1 to 1 meetings 40 mins limit on group meetings Unlimited number of meetings Ticket Support + Video Conferencing Features + Web Conferencing Features + Group Collaboration Features + Security	All Basic features + Includes 100 participants Need more participants? Meeting duration limit is 24 hrs User management Admin feature controls Reporting Custom Personal Meeting ID Assign scheduler 1GB of MP4 or M4A cloud recording REST API Skype for Business (Lync) interoperability + Optional Add-on Plans	All Pro features + Includes 300 participants Need more participants? Dedicated phone support Admin dashboard Vanity URL Option for on-premise deployment Managed domains Single sign-on Company branding Custom emails LTI integration Cloud Recording Transcripts + Optional Add-on Plans	All Business features + Enterprise includes 500 participants Enterprise Plus includes 1,000 participants Unlimited Cloud Storage Dedicated Customer Success Manager Executive Business Reviews Bundle discounts on Webinars and Zoom Rooms

Approaches for Applying Freeeconomics

- Cross-subsidies



The screenshot displays the China Mobile website's promotional page for a 5G Service Plan. The header includes the China Mobile logo, a '5 Million CMHK' badge, and navigation links such as 'CMHK 5G', 'Corporate Overview', 'Vision & Mission', 'Media Centre', 'Contact Us', 'Home', 'Online Shop', 'Online Service', 'Product & Business', 'Network', 'Enterprise Business', and a 'Login' button. The main content area features a breadcrumb trail 'Home / Handsets & Devices / 5G Service Plan \$0 Handset Offer' and a grid of four promotional tiles: '5G Service Plan', '5G Handset Rewards', 'iPhone Contract Special Price Offer', and 'Smartphone Special Offer'. Below this, the '5G Service Plan \$0 Handset Offer' section is highlighted, with tabs for 'iPhone' (selected) and 'Other Handsets'. The text states 'iPhone 12 series starting from \$0!' and 'Subscribe to 5G Service Plan with 5G Handset Purchase Service to enjoy designated handset redemption amount* and get a designated iPhone starting from \$0!'. A table compares the 5G Service Plan (24-month contract) with three handset options: 5G Ultra 100, 5G Ultra 200, and 5G Ultra 300. The table details local data usage and roaming data for the Bay Area (Mainland China & Macau). A footer note mentions 'Enjoy several free 5G applications and offers, click here for details'.

5G Service Plan (24-month contract)	5G Ultra 100	5G Ultra 200	5G Ultra 300
5G Local Data Usage	100GB	200GB	300GB
Bay Area (Mainland China & Macau) Roaming Data	6GB	10GB	20GB

Approaches for Applying Freeeconomics: A Summary

Approach	What It Means	Examples
Advertising	Free services are provided to customers and paid for by a third party.	<ul style="list-style-type: none">■ Yahoo!'s banner ads■ Google's pay-per-click■ Amazon's pay-per-transaction "affiliate ads"
Freemium	Basic services are offered for free, but a premium is charged for special features.	<ul style="list-style-type: none">■ Flickr■ Skype■ Dropbox.com■ Trillian
Cross subsidies	Sale price of one item is reduced in order to sell something else of value.	<ul style="list-style-type: none">■ Comcast DVR■ Free theater ticket for those willing to buy a large popcorn and beverage■ Free Wii to those willing to buy five new games■ Free cell phone with two-year contract

Why is this lecture valuable to you?

- This lecture prepares you for your career as a business consultant
- You may advise your clients to use the Cloud to realize the benefits of economies of scale
- You may use the concept of marginal cost of digital service to evaluate Freeeconomics business models

Week 12 Recap

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QCE8-1: What is a computer network?

Q6-4: How can organizations use cloud services securely?

QX1: What is freeconomics? How do companies use freeconomics strategy to compete?

References and Disclaimer

- Ch. 6
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