Teaching Computer Science in the Cloud
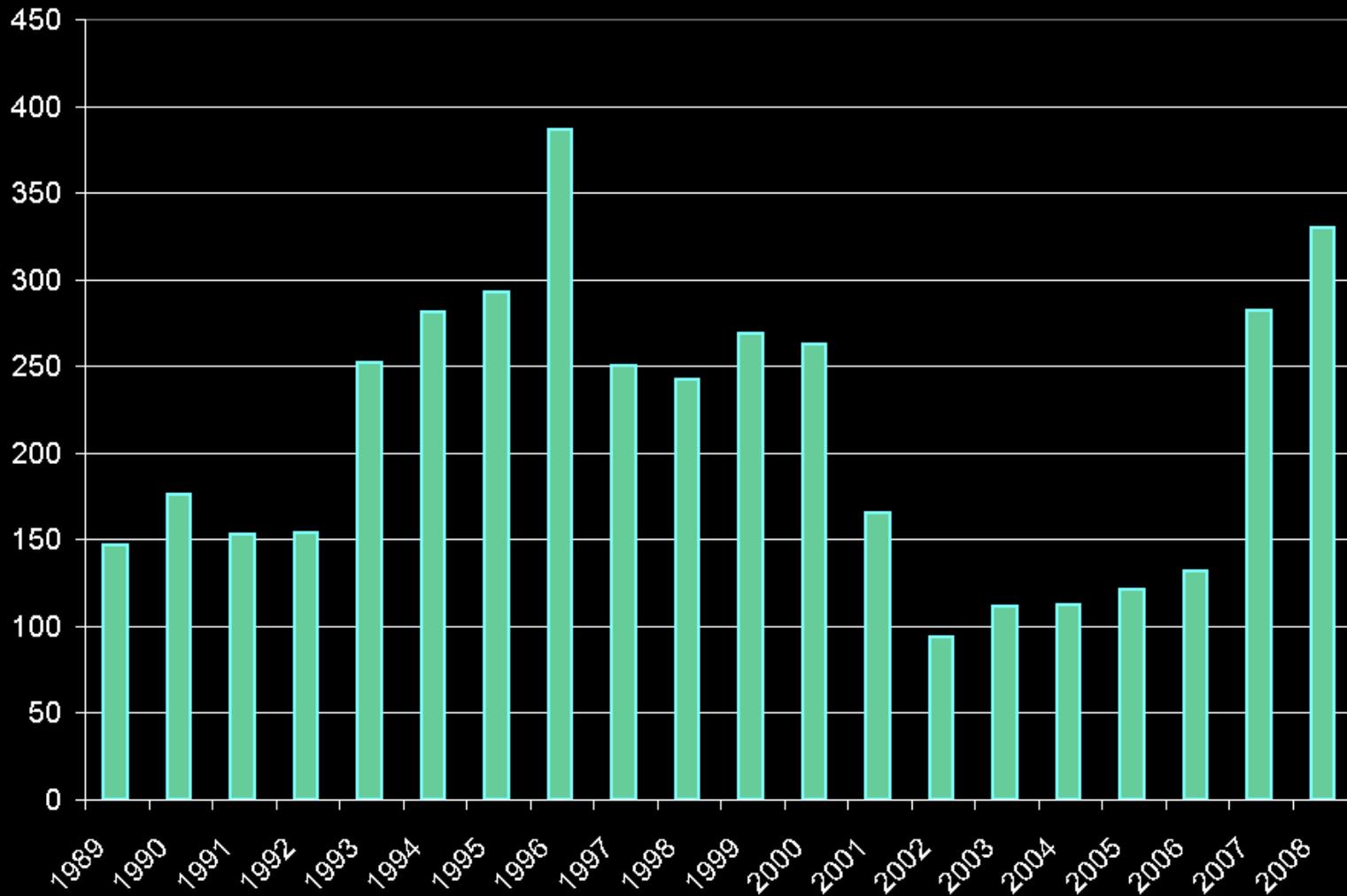
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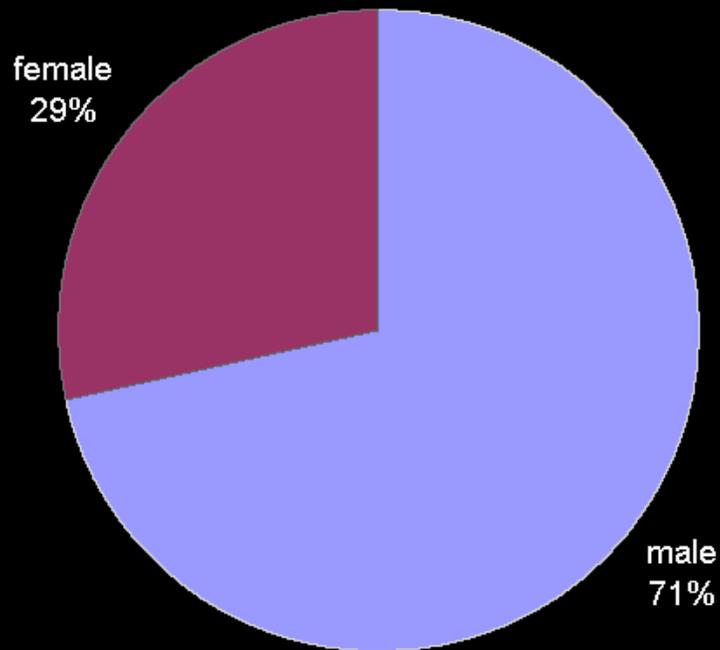
Enrollment's Increased 150%

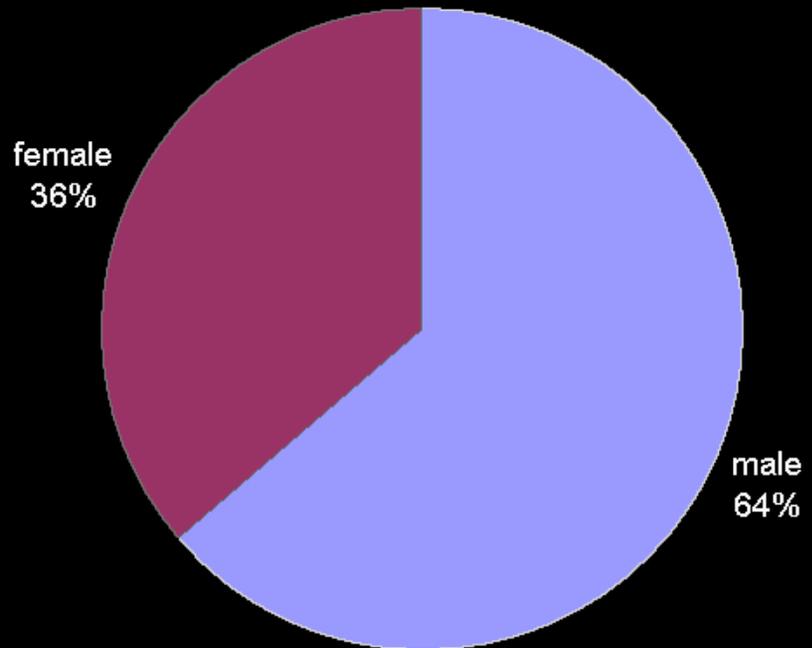# Female Enrollment's Increased 48%
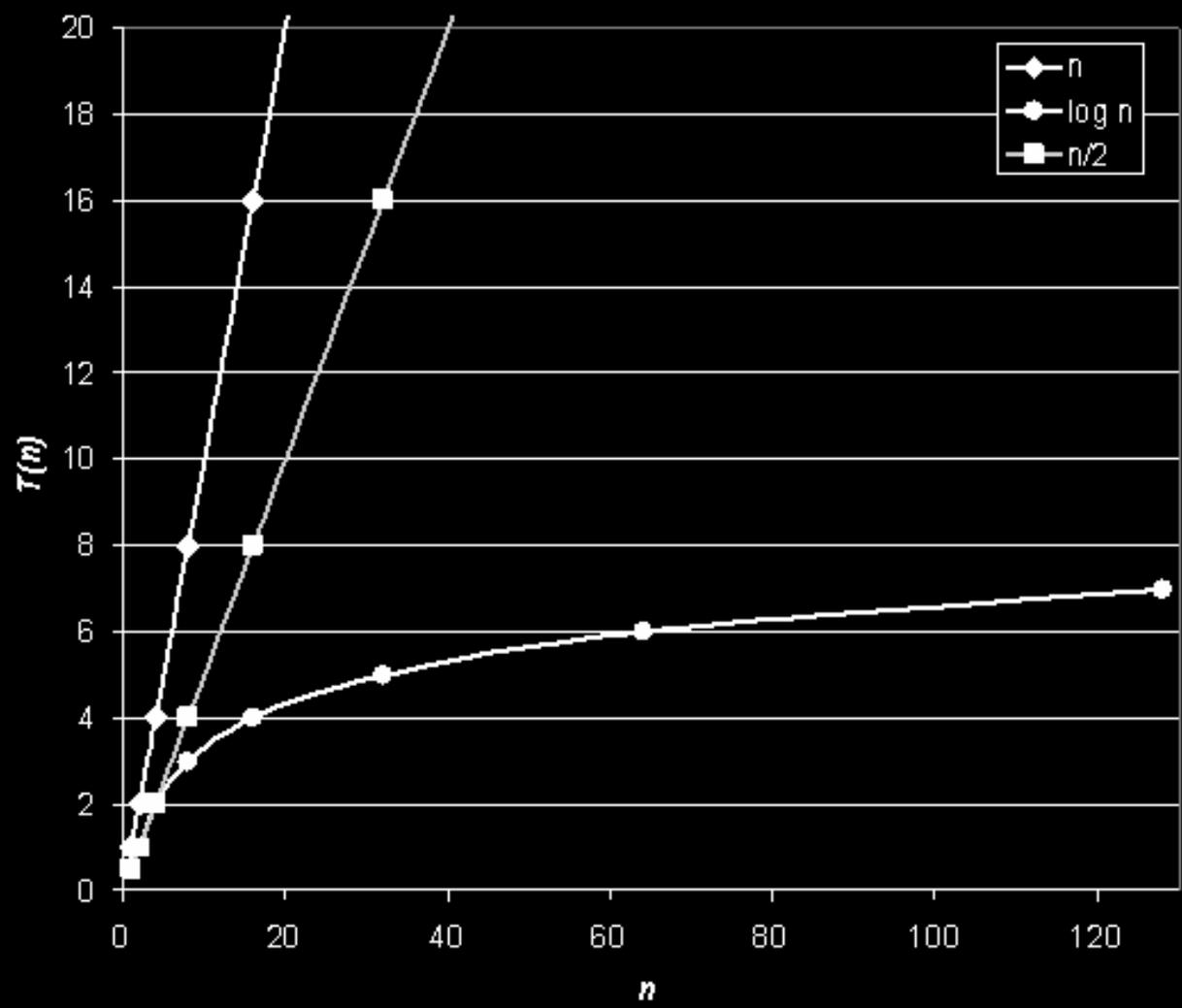
Fall 2007
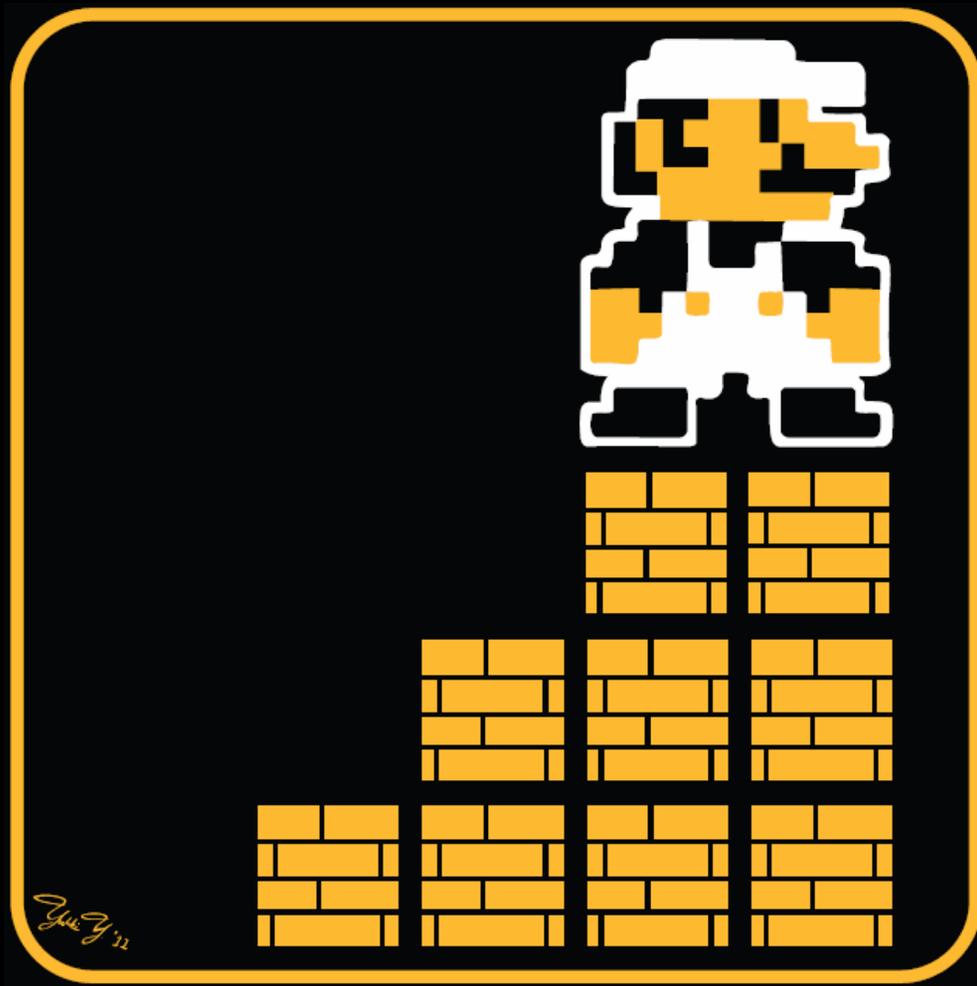
female
29%

male
71%

Fall 2008

female
36%

male
64%

"You will also become addicted to useless internet-memes, but that is expected, as with great power comes even more creative ways to procrastinate."

1: C
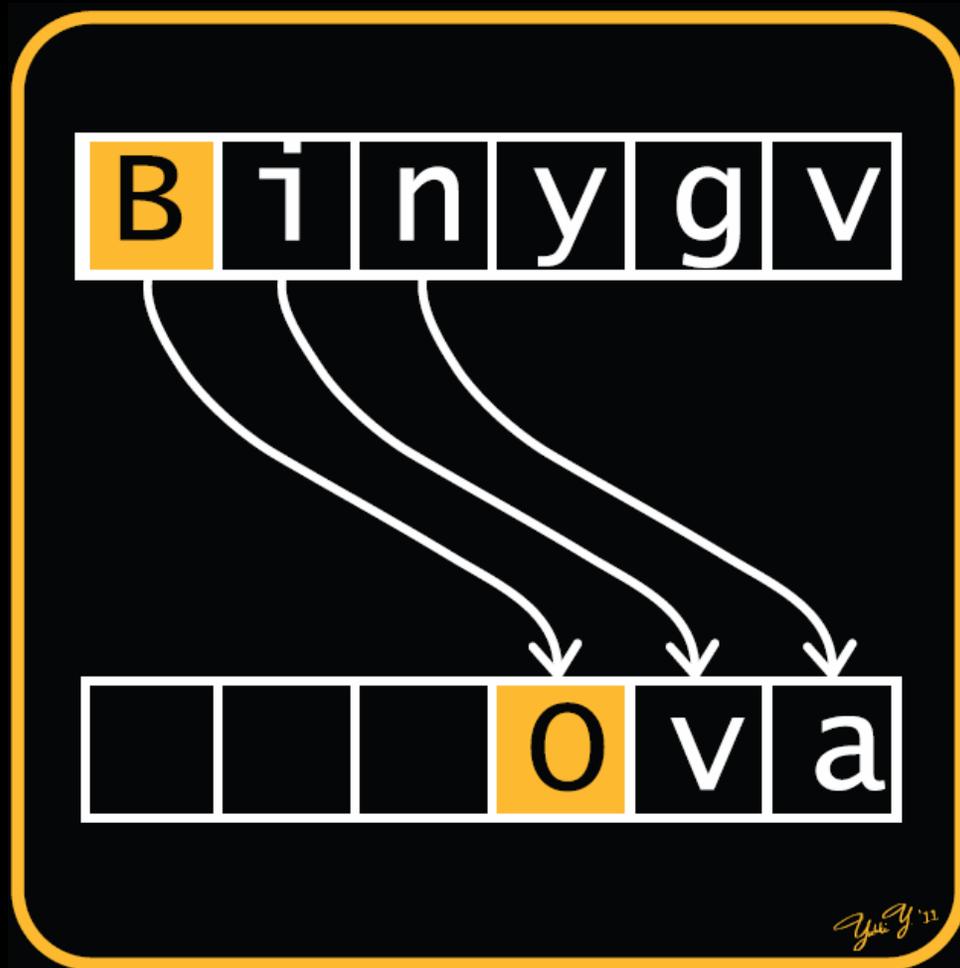
2: Crypto

3: Game of Fifteen

4: Sudoku

im in ur crime scenz

5: Forensics

CS50 ⇧ 120

$

7: C$50 Finance

THE
CS 50
FAIR

What languages were used for the projects?

Language	Count
ActionScript	7
C	28
C++	5
C#	4
CSS	104
Java	27
JavaScript	152
Objective-C	12
Perl	1
PHP	206
Python	14
Ruby	7
SQL	156
XHTML	198
LOLcode	1
Other	21
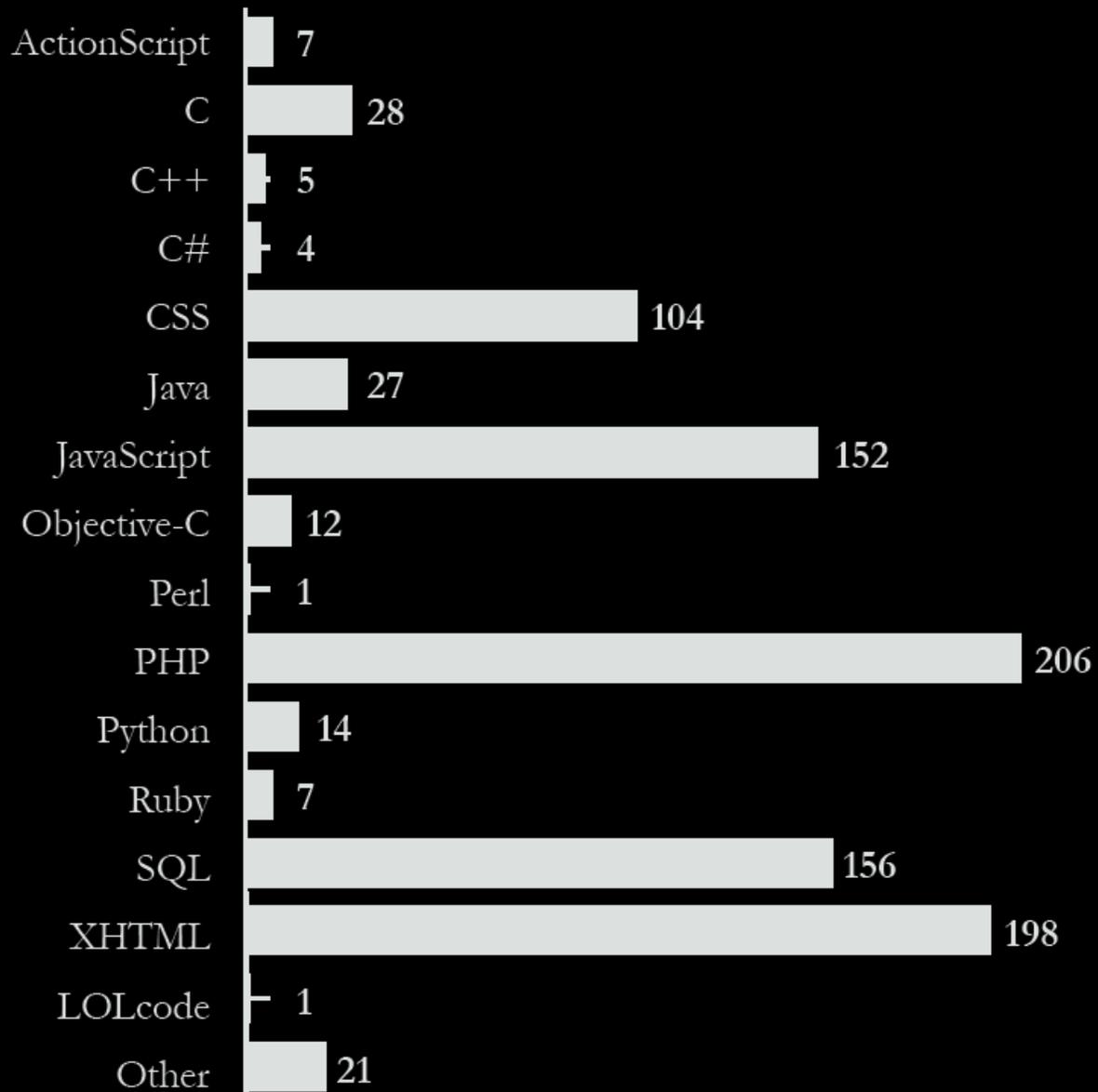
Self-service, Prorated Super Computing Fun!

- "The New York Times has decided to make all the public domain articles from 1851–1922 available free of charge. These articles are all in the form of images scanned from the original paper. In fact from 1851–1980, all 11 million articles are available as images in PDF format. To generate a PDF version of the article takes quite a bit of work — each article is actually composed of numerous smaller TIFF images that need to be scaled and glued together in a coherent fashion. . . . I then began some rough calculations and determined that if I used only four machines, it could take some time to generate all 11 m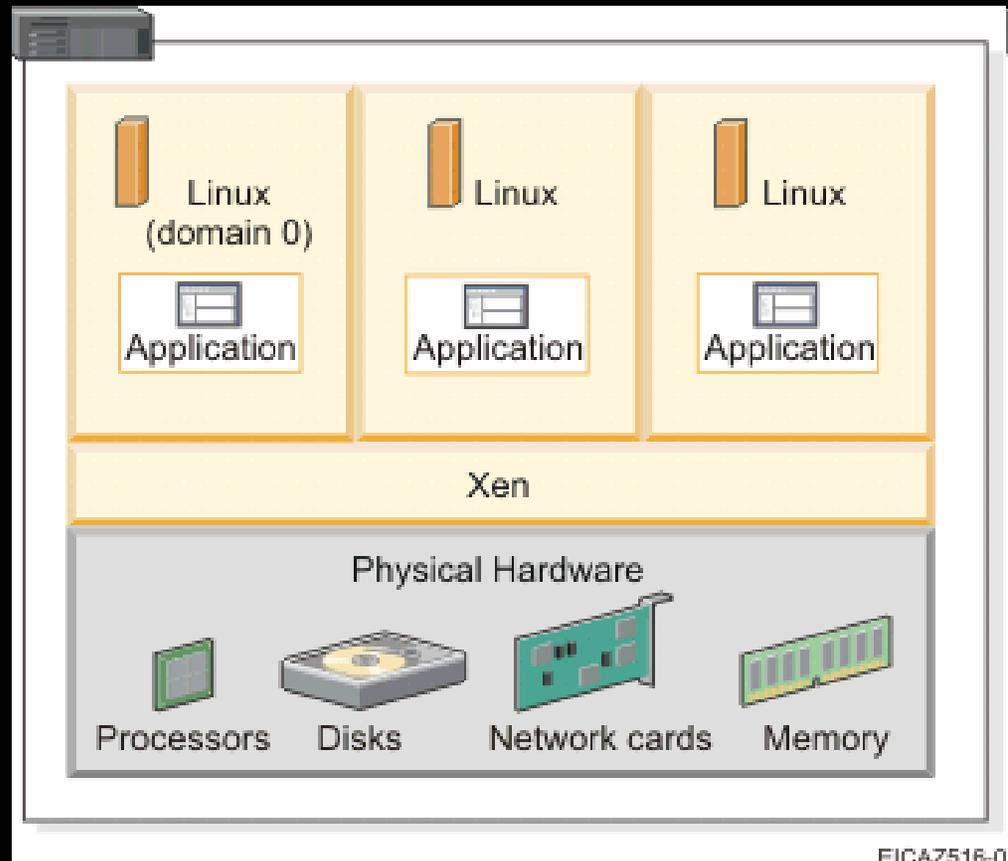illion article PDFs. But thanks to the swell people at Amazon, I got access to a few more machines and churned through all 11 million articles in just under 24 hours using 100 EC2 instances . . . . (In fact, it work so well that we ran it twice, since after we were done we noticed an error in the PDFs.)"

Virtualization

Virtualization

- **Xen**
- VMware
  - Workstation, Fusion, Server, ESXi, vSphere
- Parallels
  - Workstation, Server for Mac, Virtuozzo
- Microsoft
  - Hyper-V, Virtual PC
- Sun
  - VirtualBox
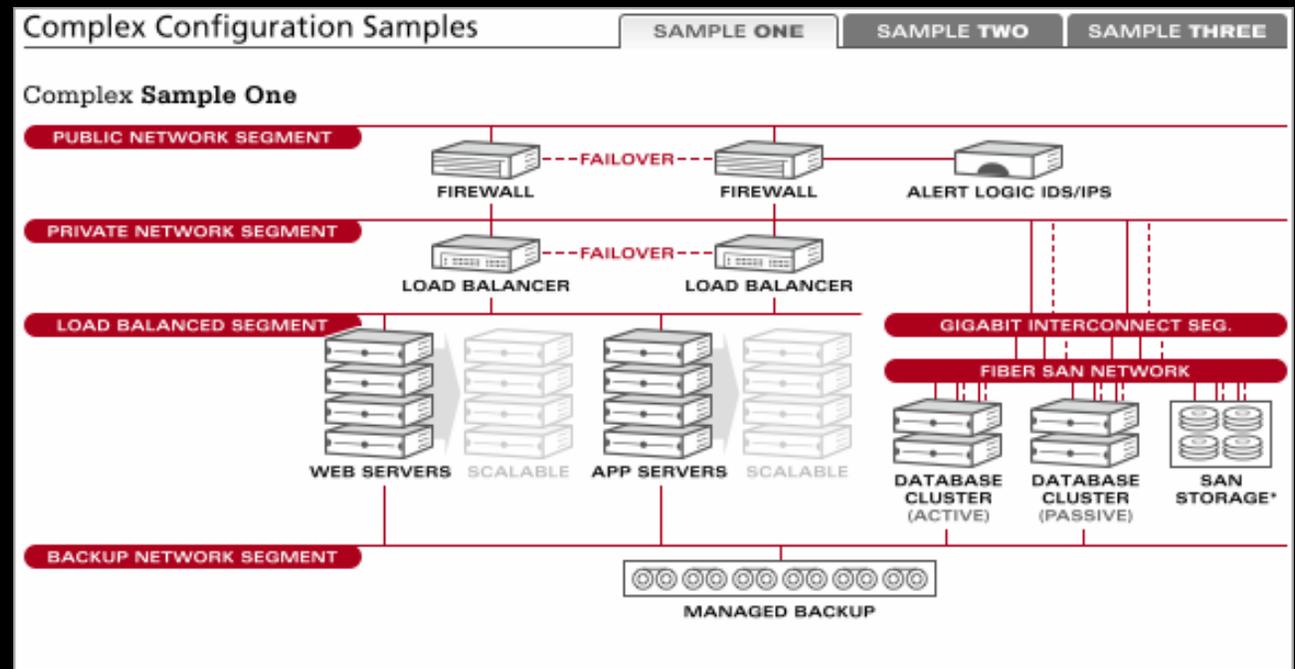- QEMU
- FreeVPS
- Virtual Iron
- . . .

Virtual Private Servers (VPSes)

- **Linode**
- **ServInt**
- **TekTonic**
- **VPSLAND**
- **. . .**

SuperVPS	SuperVPS 125	SuperVPS 2x
75 GB Disk Space **3 TB Monthly Transfer** **4 GB Guaranteed (8 GB Burst RAM)**	**125 GB Disk Space** **3.5 TB Monthly Transfer** **4 GB Guaranteed (8 GB Burst RAM)**	**150 GB Disk Space** **6 TB Monthly Transfer** **8 GB Guaranteed (16 GB Burst RAM)**
1 CPU Core Guaranteed (Burst to 4 Cores) Hardware RAID 10 CentOS 5 Operating System 4 IP Addresses Unlimited Domains and User Accounts FREE Virtuozzo Power Panel FREE nightly backups FREE cPanel or Plesk 9 Available [details] No set-up fee	1 CPU Core Guaranteed (Burst to 4 Cores) Hardware RAID 10 CentOS 5 Operating System 4 IP Addresses Unlimited Domains and User Accounts FREE Virtuozzo Power Panel FREE nightly backups FREE cPanel or Plesk 9 Available [details] No set-up fee	2 CPU Cores Guaranteed (Burst to 8 Cores) Hardware RAID 10 CentOS 5 Operating System 4 IP Addresses Unlimited Domains and User Accounts FREE Virtuozzo Power Panel FREE nightly backups FREE cPanel or Plesk 9 Available [details] No set-up fee
$199 monthly	**$229 monthly**	**$349 monthly**
Features, Upgrades and Options	Features, Upgrades and Options	Features, Upgrades and Options
ORDER	ORDER	ORDER

http://www.servint.net/supervps.php

Managed Colocation

- **Rackspace**
- **. . .**

Clouds

- **Amazon Elastic Compute Cloud (Amazon EC2)**
- **Google App Engine**
- **Microsoft Azure Services Platform**
- **. . .**

Amazon Web Services (AWS)

- **Amazon Elastic Compute Cloud (Amazon EC2)**
- Amazon Simple Storage Service (Amazon S3)
- Amazon SimpleDB
- Amazon CloudFront
- Amazon Simple Queue Service (Amazon SQS)
- Amazon Elastic MapReduce

Amazon Machine Images (AMIs)

- Debian
- Fedora
- Gentoo Linux
- Red Hat Enterprise Linux
- OpenSolaris
- openSUSE Linux
- Oracle Enterprise Linux
- Ubuntu Linux
- Windows Server 2003
- . . .

On-Demand Instances

United States	Europe	
Standard On-Demand Instances	**Linux/UNIX Usage**	**Windows Usage**
Small (Default)	$0.10 per hour	$0.125 per hour
Large	$0.40 per hour	$0.50 per hour
Extra Large	$0.80 per hour	$1.00 per hour
High CPU On-Demand Instances	**Linux/UNIX Usage**	**Windows Usage**
Medium	$0.20 per hour	$0.30 per hour
Extra Large	$0.80 per hour	$1.20 per hour
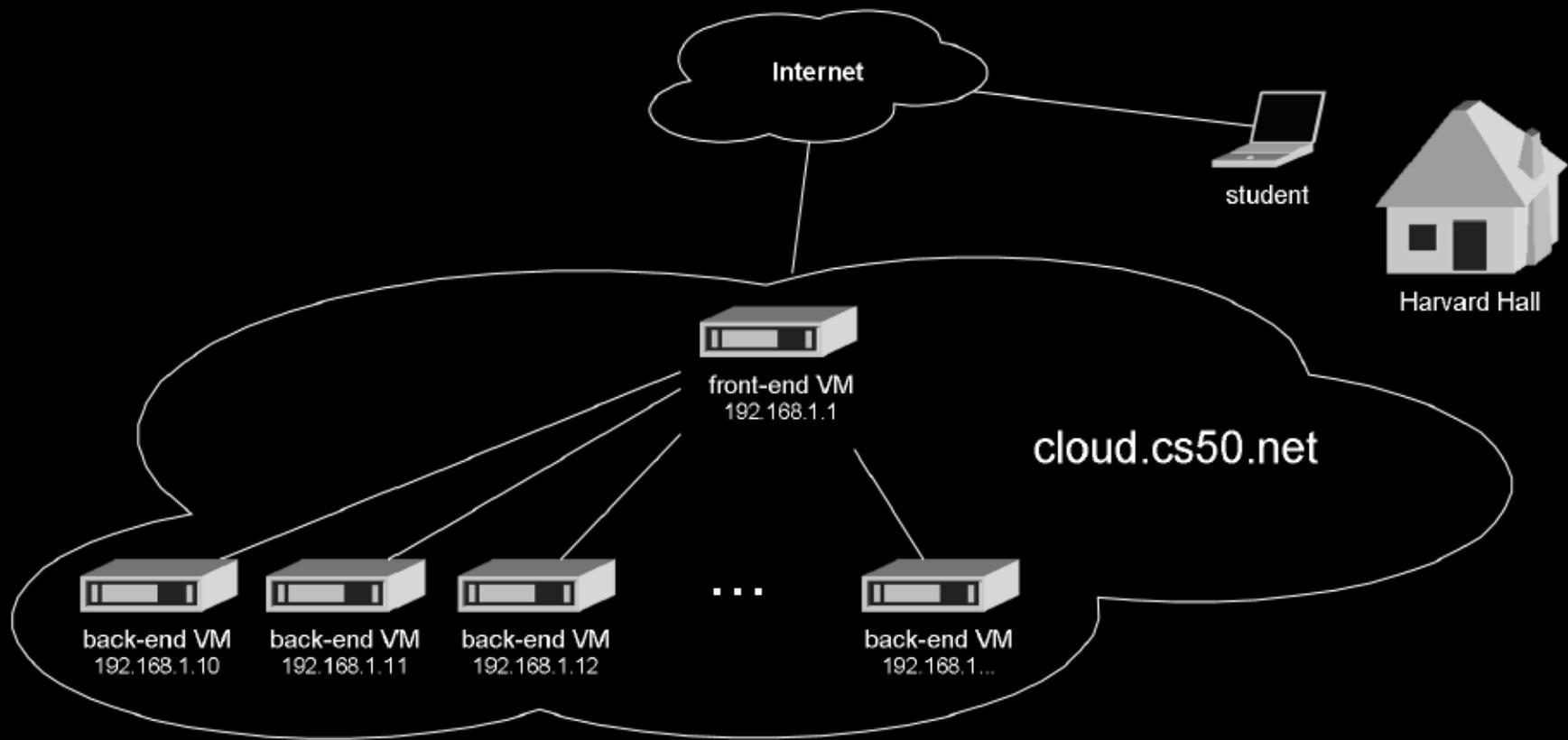
Cost Less than $15 per Student

	CPU	Disk	I/O Requests	Bandwidth
Sep	2,275 Hrs	125 GB	45,348	14 GB
Oct	3,425 Hrs	108 GB	93,257,314	191 GB
Nov	5,484 Hrs	199 GB	337,019,916	239 GB
Dec	5,206 Hrs	300 GB	427,639,962	52 GB
Jan	5,208 Hrs	300 GB	1,502,614,186	62 GB

Concerns

- **Time**
- **No _____**
- **PEBKAC**
- **"cloud is laggy"**
- **"Cloud is wicked laggy"**
- **Bandwidth Costs**
- **"Lightning Strike Triggers Amazon EC2 Outage"**

"Sometimes he spends a long time on broad concepts that we already understand, rather than focusing on details like return types or proper usage of functions. For example, he explained cloud computing like 17,000 times, and we don't even need to understand it for the psets."

AWS in Education

- **Educators**

- **Researchers**

- **Students**

- **Education IT**

CS 50 in a Box

Ultra Hal

New Contestants On the Turing Test

Posted by CmdrTaco on Wednesday October 08, @11:15AM
from the **game-on** dept.

vitamine73 writes

"At 9 a.m. next Sunday, six computer programs — 'artificial conversational entities' — will answer questions posed by human volunteers at the University of Reading in a bid to become the first recognized 'thinking' machine. If any program succeeds, it is likely to be hailed as the most significant breakthrough in artificial intelligence since the IBM supercomputer Deep Blue beat world chess champion Garry Kasparov in 1997. It could also raise profound questions about whether a computer has the potential to be 'conscious' — and if humans should have the 'right' to switch it off."

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