CSE 451: Operating Systems
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Module 26
Cloud Computing

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• A datacenter has 50 - 250 containers
• A container has 1,000 - 2,000 servers
• A server has two processors, 2 disks, tons of memory, battery backup
• Processors are chosen for power efficiency, not performance

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Personal computing

Office applications
Math and science
Databases and storage
Email
Web browser

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Cloud email accessed through the browser

... with the cloud provider's domain name ...

... or with your own

Why not office applications too?

Why not everything else?
Consider …

- Sharing is easy
- Someone else does backup
- Someone else handles software updates
- There's 7x24x365 operations support, auxiliary power, redundant network connections, geographical diversity
- Scalability – both up and down – is instantaneous
- Many fewer demands on the local operating system and machine

Amazon Elastic Compute Cloud (EC2)

- $0.68 per hour for
  - 4 cores of 2.5 GHz 64-bit 2007 Xeon or Opteron
  - 15 GB memory
  - 1.69 TB scratch storage
- Need it 24x7 for a year?
  - $3900

- $0.085 per hour for
  - 1 core of 1.2 GHz 32-bit Intel or AMD
  - 1.7 GB memory
  - 160 GB scratch storage
- Need it 24x7 for a year?
  - $490

This includes
- Purchase + replacement
- Housing
- Power
- Operation
- Reliability
- Security
- Instantaneous expansion and contraction
- 1000 processors for 1 day costs the same as 1 processor for 1000 days!