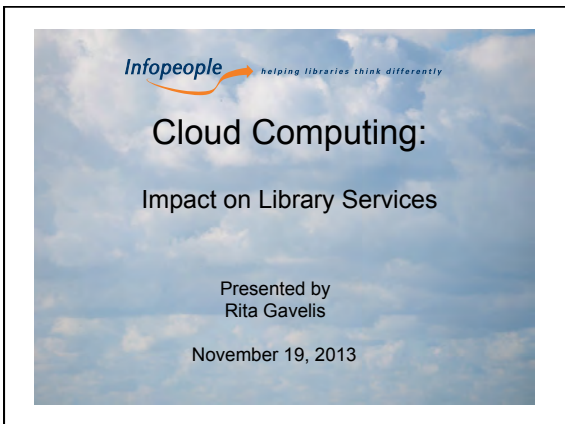


# Cloud Computing: Impact on Library Services



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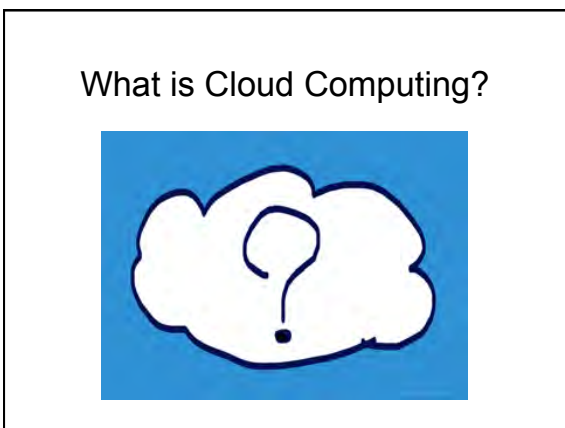
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# Cloud Computing: Impact on Library Services

How familiar are you with Cloud Computing? (Choose one)

- A. Very familiar, we use it all the time
- B. Somewhat familiar
- C. Have only heard the words
- D. Never heard of it before

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**Cloud Computing:**  
The practice of using a network of remote servers hosted on the Internet to store, manage, and process data.

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What does it *really* mean?



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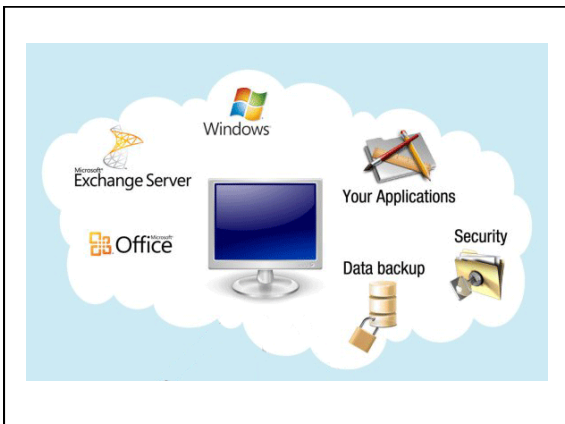
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# Cloud Computing: Impact on Library Services



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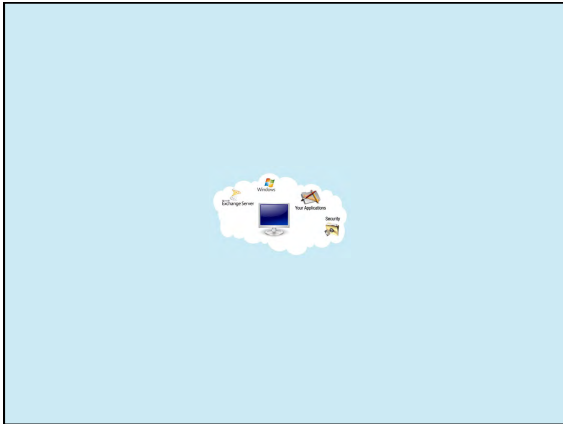
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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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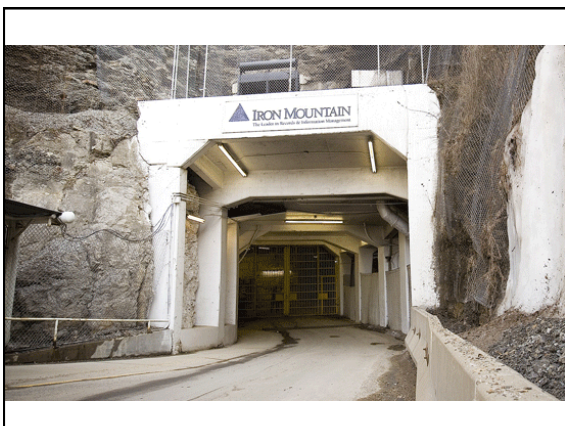
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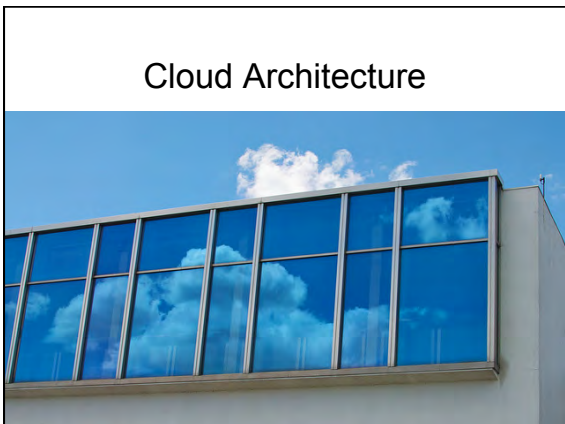
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# Cloud Computing: Impact on Library Services



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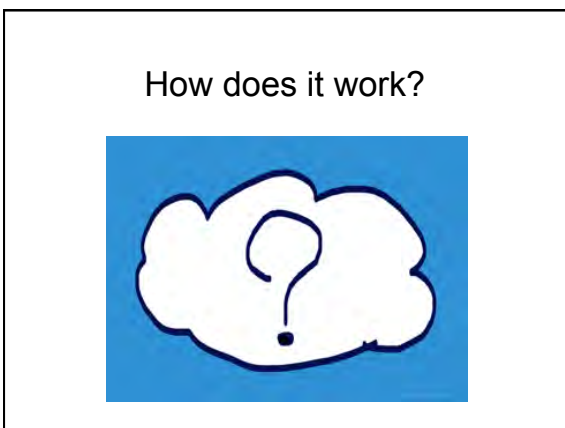
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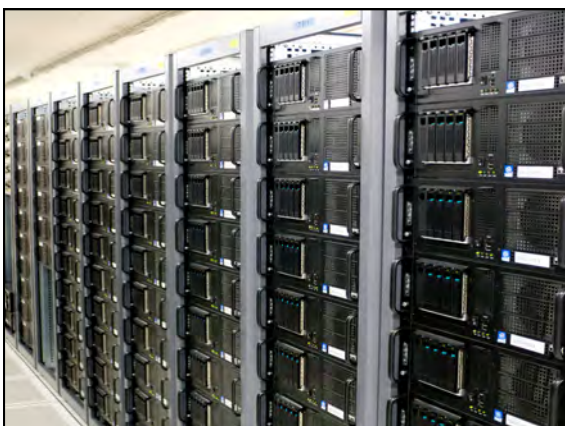
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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services

What does the Library need?



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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services

**Software as a Service**

Easier to Administer  
Everyone has the Same Version

**SaaS**

Accessible from Anywhere      Collaboration is Easy

Software is Automatically Updated

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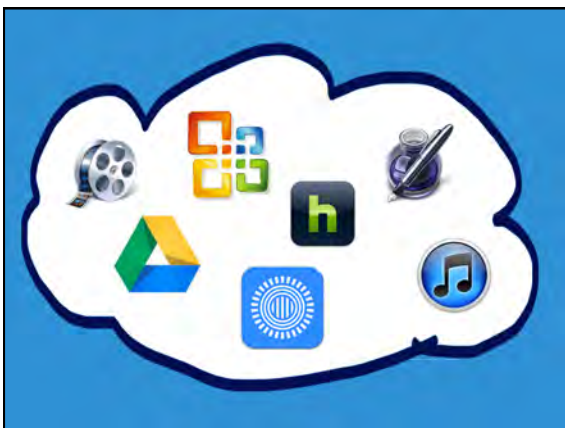
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**Platform as a Service**

Easier to Administer  
Geographically Distributed Teams

**PaaS**

Services Obtained Worldwide      One Vendor, One Bill

Operating System is Automatically Updated

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# Cloud Computing: Impact on Library Services



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**Infrastructure as a Service**

Easier to Administer

Complete Desktop virtualization

**IaaS**

Dynamic Scaling                      Policy-Based Services

Administrative Tasks are Automated

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# Cloud Computing: Impact on Library Services

## Development as a Service



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## Identity as a Service



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## Security



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# Cloud Computing: Impact on Library Services

### Types of Cyber Crime



Hacking

Identity Theft

Spam

Viruses

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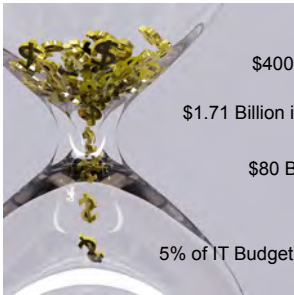
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### Cost of Crime



\$400 Billion in 2011

\$1.71 Billion in 1st Quarter of FY2014

\$80 Billion by 2017

5% of IT Budget Goes Toward Security

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### Securing Data



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# Cloud Computing: Impact on Library Services



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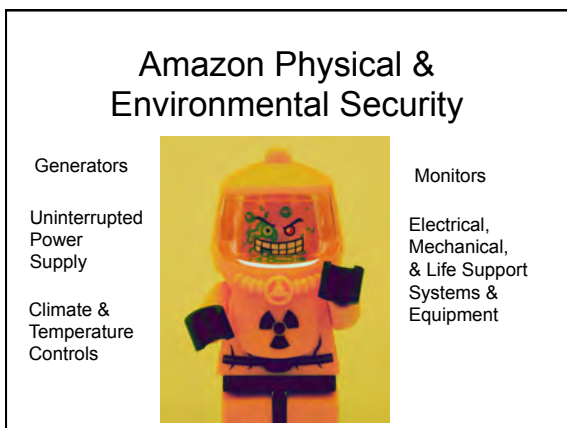
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# Cloud Computing: Impact on Library Services



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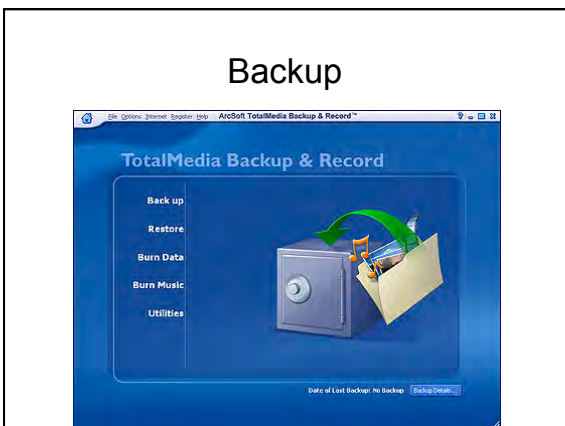
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# Cloud Computing: Impact on Library Services

Safety Net



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**Keep Out!**



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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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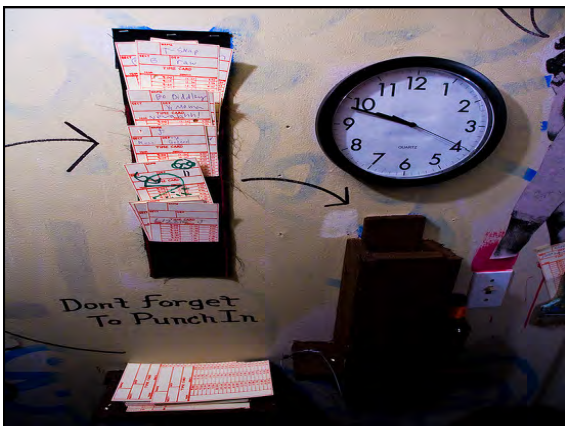
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# Cloud Computing: Impact on Library Services



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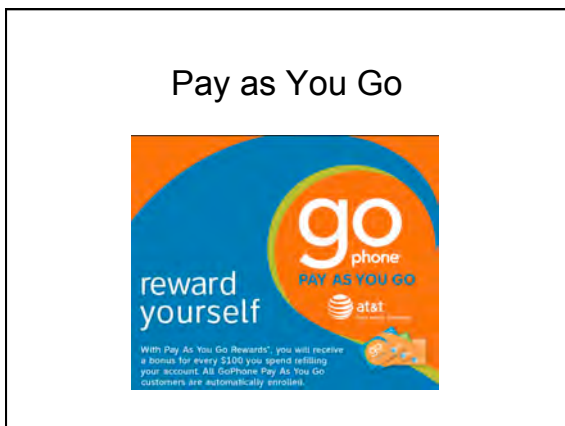
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# Cloud Computing: Impact on Library Services

## Pre-Pay




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## TechRepublic Comparison

Providers	Variety of Pricing Plans	Average Monthly Price	Cost Reduction / Optimizations
Amazon (EC2)	Pay as you go, year	\$ 136.03	\$ 0.250
Autodesk	Pay as you go	\$ 102.20	\$ 0.180
GoGrid	Pay as you go, month	\$ 179.20	\$ 0.120
Microsoft	Pay as you go, semester	\$ 116.40	\$ 0.145
Terremark	Pay as you go	\$ 96.36	\$ 0.170
IBM	Pay as you go, year, semester	\$ 211.70	\$ 0.150
AT&T	Pay as you go	\$ 62.32	\$ 0.190
Google	Pay as you go	\$ 109.85	\$ 0.130
Openwave	Pay as you go, monthly	\$ 62.49	\$ 0.150
SoftLayer	Pay as you go, monthly	\$ 111.11	\$ 0.100
Ver	Pay as you go	\$ 94.40	\$ 0.120
Spotify	Monthly	\$ 227.50	??
Netflix.com	Monthly	\$ 71.30	\$ 0.050
LinkedIn	Pay as you go	\$ 45.78	\$ 0.104
Mapbox	Pay as you go, membership	\$ 76.15	\$ 0.100
Time 2	Pay as you go	\$ 142.83	??

Thoran Rodrigues' TechRepublic Article: <http://goo.gl/JVVVd>

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**Avoiding  
Unneeded  
Expenditures**

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# Cloud Computing: Impact on Library Services

## Estimate Your Usage



<https://cloudability.com/>

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## Check Your Usage

**This Month's Activity as of July 8, 2011**  
 The billing cycle for this report is July 1 - July 31, 2011. The AWS service usage charges on this page currently show activity for all accounts through approximately 2/28/2011.

Summary Activity by Account Download Report

You can download a detailed activity report in Comma Separated Value (CSV) format. Previous Month's Activity

Expand All Services Collapse All Services Table

Amazon Elastic Compute Cloud			
US East (Northern Virginia) Region			
Amazon EC2 on-demand Linux/UNIX Reserved Instances	\$0.02 per Small Instance (m1.small) instance-hour (or partial hour)	188 hrs	3.64
Amazon EC2 on-demand Linux/UNIX	\$0.085 per Small Instance (m1.small) instance-hour (or partial hour)	3 hrs	0.26
Amazon EC2 EBS	\$0.10 per GB-month of provisioned storage	2,976 GB-Mo	0.30
	\$0.10 per 1 million I/O requests	319,963 I/Os	0.05
	\$0.01 per 10,000 gets (when loading a snapshot)	14,236 Requests	0.01
			<b>0.26</b>
Amazon Simple Storage Service			
			0.05
AWS Data Transfer (excluding Amazon CloudFront)			
			0.01

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# Cloud Computing: Impact on Library Services



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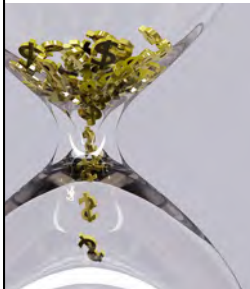
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**Operational Costs**



- Salary + Benefits = Labor
- Utilities
- Rent
- Software / Licensing

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# Cloud Computing: Impact on Library Services

## Monthly Labor



Salary & Benefits = \$5,000  
Time spent on task = 20%  
 $\$5,000 \times .20 = \$1,000$

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## Adjustments



3 Temp workers  
@ \$5,000 each  
 $\$5,000 \times 3 = \$15,000$   
For 2 months  
 $\$15,000 \times 2 = \$30,000$

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## Utilities



Electric company charges you \$.10 per kwh  
Kwh = Kilowatt Hour  
1 Kilowatt = 1,000 watts  
825 Watt Server  
Runs 24/7  
 $825 \times 24 = 19,800$  watts per Day  
Divided by 1,000 = 19.8  
 $19.8 \times \$.10 = \$1.98$  per day  
= \$60.22 / mo    = \$722.70 / yr

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# Cloud Computing: Impact on Library Services

**Rent**  
= \$5 per sq foot  
Your Server room is 10' by 10'  
10 x 10 = 100sq ft x \$5 = \$500



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**Licensing**



A mail exchange  
Server = \$1800/yr

Google mail  
Server = \$0

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**Transitioning  
to the  
Cloud**

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# Cloud Computing: Impact on Library Services



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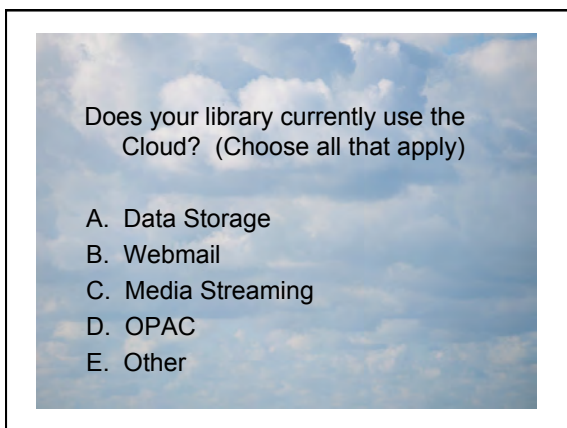
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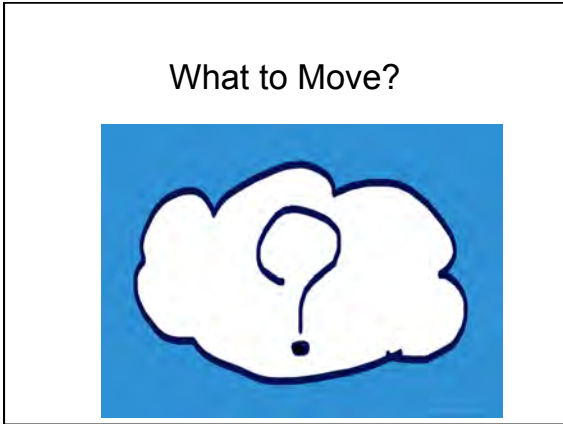
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# Cloud Computing: Impact on Library Services



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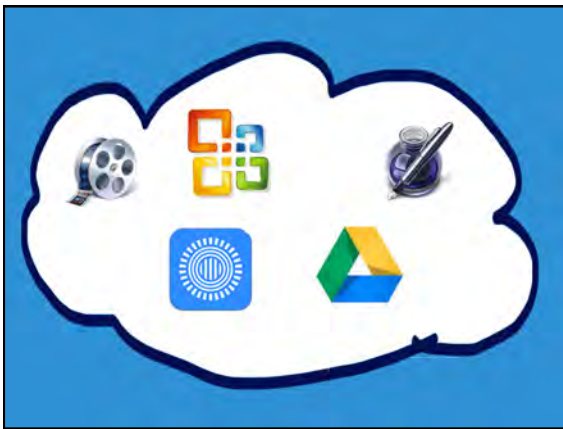
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# Cloud Computing: Impact on Library Services



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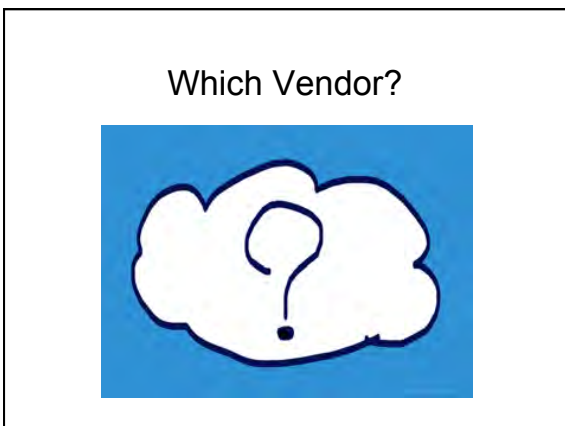
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# Cloud Computing: Impact on Library Services



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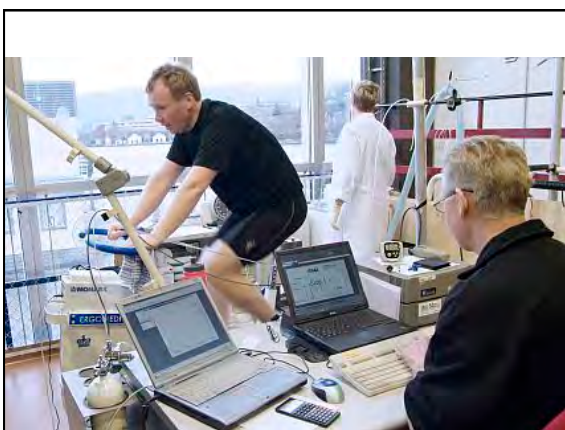
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# Cloud Computing: Impact on Library Services




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**This Month's Activity as of July 8, 2011**  
 The billing cycle for this report is July 1 - July 31, 2011. The AWS service usage charges on this page currently show activity for all accounts through approximately 07/08/2011

Summary	Activity by Account		Total
You can download a detailed activity report in Comma Separated Value (CSV) format. <a href="#">Download Report</a>			
<a href="#">Expand All Services</a>   <a href="#">Collapse All Services</a> <span style="float:right"><a href="#">Printer Friendly Version</a></span>			
<b>Amazon Elastic Compute Cloud</b>			
US East (Northern Virginia) Region			
Amazon EC2 running Linux/UNIX Reserved Instances			
\$0.02 per Small Instance (m1.small) instance-hour (or partial hour)	188 hrs		3.74
Amazon EC2 running Linux/UNIX			
\$0.083 per Small Instance (m1.small) instance-hour (or partial hour)	3 hrs		0.25
Amazon EC2 EBS			
\$0.10 per GB-month of provisioned storage	2,976 GB-Mo		0.30
\$0.00 per 1 million I/O requests	319,963 I/Os		0.03
\$0.01 per 10,000 gets (when loading a snapshot)	14,236 Requests		0.01
<a href="#">Download Usage Report</a>			
<b>Amazon Simple Storage Service</b>			
<a href="#">Download Usage Report</a>			
<b>AWS Data Transfer (excluding Amazon CloudFront)</b>			
0.01			

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# Cloud Computing: Impact on Library Services



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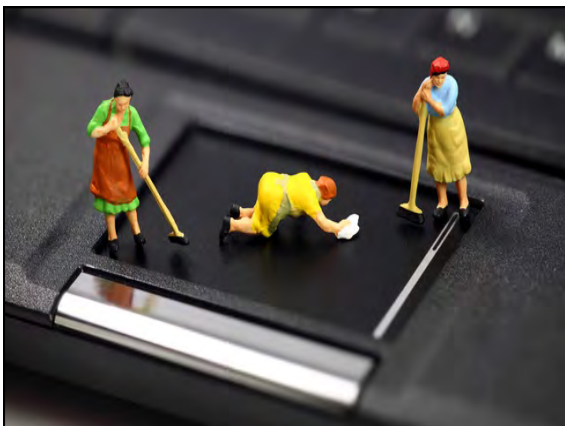
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# Cloud Computing: Impact on Library Services



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**This Month's Activity as of July 9, 2011**  
The billing cycle for this report is July 1 - July 31, 2011. The AWS service usage charges on this page currently show activity for all accounts through approximately 07/08/2011

Summary		Activity by Account	Download Report
You can download a detailed activity report in Comma Separated Value (CSV) format.			
Expand All Services   Collapse All Services		Printer Friendly Version	Totals
<b>Amazon Elastic Computer Cloud</b>			
US East (Northern Virginia) Region			
<b>Amazon EC2 running Linux/UNIX Reserved Instances</b>			
\$0.03 per Small Instance (m1.small) instance-hour (or partial hour)	188 hrs	5.64	
<b>Amazon EC2 running Linux/UNIX</b>			
\$0.085 per Small Instance (m1.small) instance-hour (or partial hour)	3 hrs	0.26	
<b>Amazon EC2 EBS</b>			
\$0.10 per GB-month of provisioned storage	2,876 GB-Mo	0.30	
\$0.10 per 1 million I/O requests	21,963 I/Os	0.03	
\$0.01 per 10,000 gets (when feeding a snapshot)	14,258 Requests	0.01	
	Download Usage Report	<b>0.26</b>	
<b>Amazon Simple Storage Service</b>			
	Download Usage Report	<b>0.05</b>	
<b>AWS Data Transfer (excluding Amazon CloudFront)</b>			
		<b>0.01</b>	

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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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# Cloud Computing: Impact on Library Services



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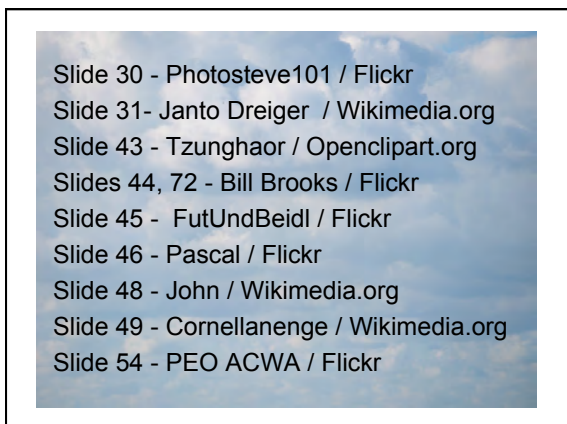
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# Cloud Computing: Impact on Library Services

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Slide 58 - Martin Pettitt / Flickr  
Slide 60 - Philo Nordlund / Flickr  
Slides 73, 74 - Kheel Center / Flickr  
Slide 76 - Tim Dorr / Flickr  
Slide 91 - Daniil Vasiliev / Flickr  
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Slide 101 - James Halliday / Flickr  
Slide 103 - Elliott Brown / Flickr

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