Cloud Computing and GIS
IT4GIS
Keith T. Weber, GISP
GIS Director
ISU-GIS Training and Research Center

Goal of this presentation
• Describe and demystify “The Cloud”
  – What is it?
  – How is it different from “web services”?
  – ROI and TCO case studies

What is The Cloud
• Once upon a time…
  – Sam the server man discovered his servers were underutilized
  – To optimize their utilization rate, he made his servers available
to others
  – This was really nothing new, as ISP’s had been around for
decades
But…

- Sam’s Servers did more than just host HTML pages, they also:
  - Provided infrastructure solutions
  - And hosted services that his customers were not capable of hosting
  - Essentially, they were “servers for rent”
- This commercialization of web service hosting became known as…

Cloud Computing
By Definition

• Cloud computing is…
  – On-demand
  – Self-service services
  – Delivered in a metered fashion via a network (i.e., the Internet)
• Cloud computing follows…
  – A multi-tenancy model
  – Within a virtualized, elastic environment

TERMS

Multi-tenancy

• Virtualized servers are used by many
Virtualization

• Similar to logical hard drives, virtualization converts one physical server into many (virtual) servers
• Doing this requires:
  – Physical host server
  – Host OS + Virtualization software (e.g., Hypervisor, Hyper-V)
  – Management suite software

Elasticity

• Similar to scalability

Cloud Deployment Models
The Hybrid Model

What services are offered in the Cloud?

- If it's not html hosting, what services are offered?

aaS

- as a Service
Where does GIS fit aaS?

- Brainstorm...

SaaS and the Changing Face of Software

- An increasing number of software applications are hosted in the cloud (SaaS)
- They are offered as a subscription to the end user
- They are, of course, dependent upon a good Internet connection to function
- They also put the software developer in charge!
  - Compatibility with third party apps/automation scripts
  - Compatibility with Enterprise business constraints

Real Concerns?

- Brainstorm!

To learn more about this watch this TECH talk, Connecting GIS (https://youtu.be/lwQDb2oTzQ0)
How does *The Cloud* differ from Web Services we already learned about?

- Brainstorm
- By definition cloud computing is...
  - On-demand
  - Self-service services
  - Delivered in a metered fashion via a network (i.e., the Internet)
- Cloud computing follows...
  - A multi-tenancy model
  - Within a virtualized, elastic environment

Let’s Compare

<table>
<thead>
<tr>
<th>Cloud Servers</th>
<th>Virtualized Servers</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-demand</td>
<td>On-demand</td>
</tr>
<tr>
<td>Self-service</td>
<td>Self-service</td>
</tr>
<tr>
<td>Delivered in a metered fashion</td>
<td>Delivered in a metered fashion</td>
</tr>
<tr>
<td>Multi-tenancy</td>
<td>Multi-tenancy</td>
</tr>
<tr>
<td>Virtualized</td>
<td>Virtualized</td>
</tr>
<tr>
<td>Elastic</td>
<td>Elastic</td>
</tr>
</tbody>
</table>

ROI and TCO Scenarios

- TCO?
- ROI...
  - Case study #1, a small Idaho county wants to make GIS maps of the county available via the web
  - Case study #2, large research university wants to make GIS maps available via the web
The Partly Cloudy Approach

- Own the base, rent the spike

Considerations

- Reasons for not using the cloud
  - Security
  - Service Level Agreement

Questions?

Time for our final 2-minute Write!