Cloud Computing

An In-Depth Discussion

Introductions

- Nathaniel Gates – President of Cloud49, Anchorage AK

Nathaniel Gates is a lifelong Alaskan who understands the unique challenges businesses face operating in the Last Frontier. Nathaniel has worked in multiple industries including petroleum, oilfield services, government contracting and at Alaska Native Corporations. Nathaniel has held nearly every IT position at some time during his career, from desktop support technician to the Chief Information Officer of a billion-dollar corporation. This diversity of duties and experience has uniquely equipped Nathaniel to accurately gauge business requirements and implement appropriate technological solutions for the benefit of the business.

- Keith Dobson – Vice President of Cloud49, Anchorage, AK

With nearly 25 years of IT industry experience, Keith brings considerable experience and understanding of the unique challenges facing IT professionals today. Keith began his IT career at IBM in Anchorage in 1986, and has since worked for such notable companies as Dell Inc., Brocade Communications, Marconi Communications, Nortel Networks and Bay Networks. At Cloud 49, Keith is responsible for technology and partner strategy, as well as marketing and business development.

Agenda

- Cloud Computing Overview
- Why Now?
- Getting Started in the Cloud
- The Future of IT in Alaska?
- Questions

What is Cloud Computing?

- Simply put, cloud computing provides a variety of computing resources , from servers and storage to enterprise applications such as email, security, backup/DR, voice, all delivered over the Internet. The Cloud delivers a hosting environment that is immediate, flexible, scalable, secure, and available – while saving corporations money, time and resources.
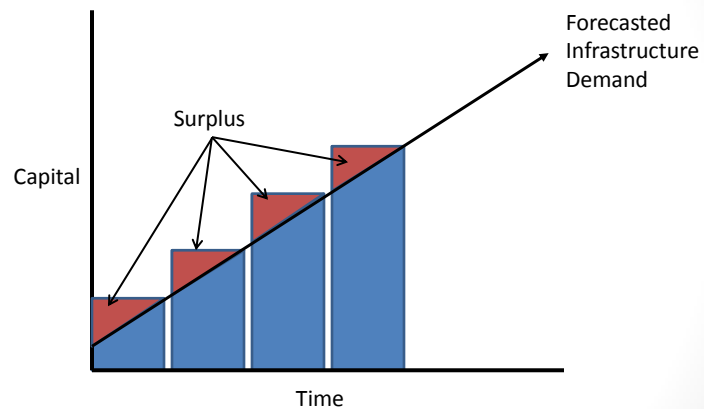
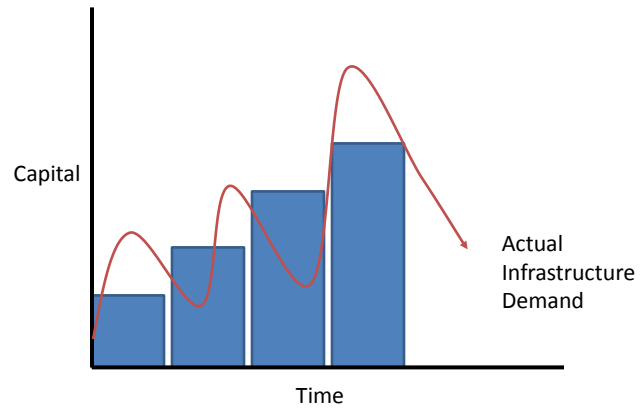**The Next Frontier** - On Demand Solutions For Your Business

Cloud

Web

Client-Server Computing
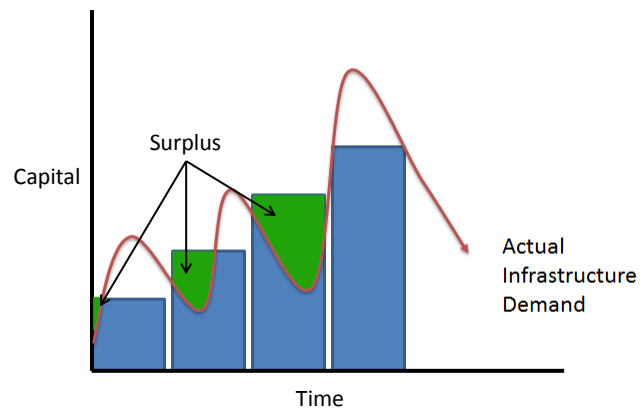
Personal Computers

Mainframe
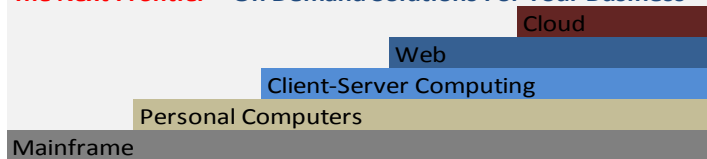
Traditional Infrastructure Model
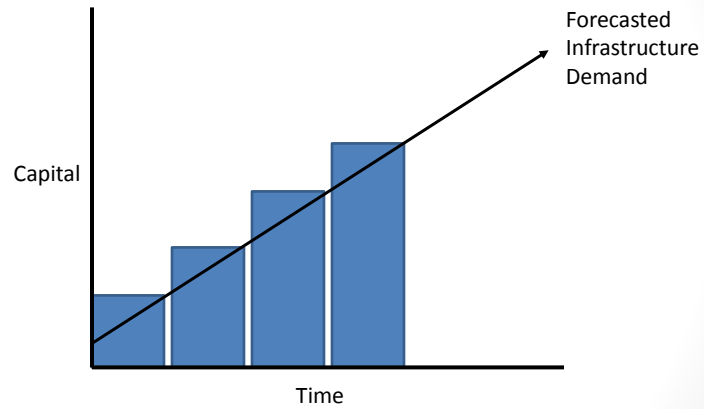
Acceptable Surplus

Unacceptable Surplus

Unacceptable Deficit
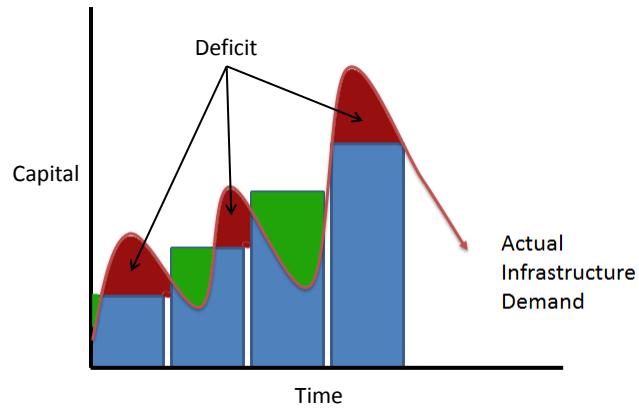
Utility Infrastructure Model
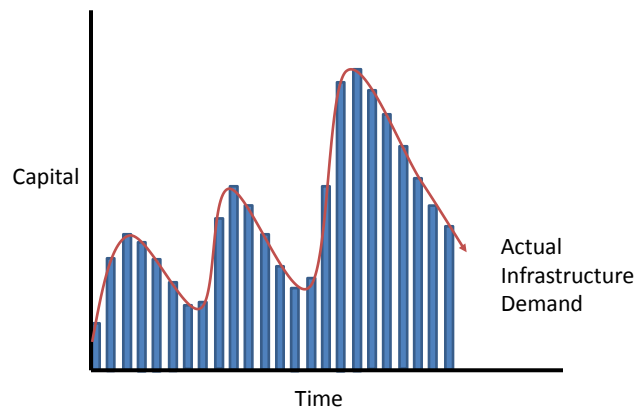
Cloud Flavors?

- SaaS – Software as a Service
- IaaS – Infrastructure as a Service
- PaaS – Platform as a Service
- DaaS – Desktop as a Service

What is Software as a Service? (SaaS)

- SaaS is a software delivery methodology that provides licensed multi-tenant access to software and its functions remotely as a Web-based service.

  - Usually billed based on usage
  - Usually multi tenant environment
  - Highly scalable architecture

SaaS is not ASP 2.0

- The ASP model concentrated on providing an organization with the ability to move certain application processing duties to leased third-party managed servers.
- ASPs were not necessarily concerned about providing shared services to multiple tenants, but rather hosting a dedicated application on behalf of the customer.
- Most ASPs did not possess the required amount of application and business knowledge regarding the applications they were running.

SaaS Examples

Infrastructure as a Service (IaaS)

- IaaS is the delivery of technology infrastructure as an on demand scalable service

  - Usually billed based on usage
  - Usually multi tenant virtualized environment
  - Can be coupled with Managed Services for OS and application support

IaaS is not Managed Hosting

- Traditional managed hosting is a form of web hosting where a user chooses to lease entire server(s) housed in an off-site data center.

  - Term based contracts based on projected resource requirements

IaaS Examples

Platform as a Service (PaaS)

- PaaS provides all of the facilities required to support the complete life cycle of building and delivering web applications and services entirely from the Internet.

  - Typically applications must be developed with a particular platform in mind
  - Multi tenant environments
  - Highly scalable multi tier architecture

PaaS Examples

Deployment Models

Public cloud
- *Public cloud* (off-site and remote) describes cloud computing where resources are dynamically provisioned on an on-demand, self-service basis over the Internet, via web applications/web services, open API, from a third-party provider who bills on a utility computing basis.

Private cloud
- A *private cloud* environment is often the first step for a corporation prior to adopting a public cloud initiative. Corporations have discovered the benefits of consolidating shared services on virtualized hardware deployed from a primary datacenter to serve local and remote users.

Hybrid cloud
- A *hybrid cloud* environment consists of some portion of computing resources on-site (on premise) and off-site (*public cloud)*. By integrating public cloud services, users can leverage cloud solutions for specific functions that are too costly to maintain on-premise such as virtual server disaster recovery, backups and test/development environments.

Community cloud
- A *community cloud* is formed when several organizations with similar requirements share common infrastructure. Costs are spread over fewer users than a *public cloud* but more than a single tenant.
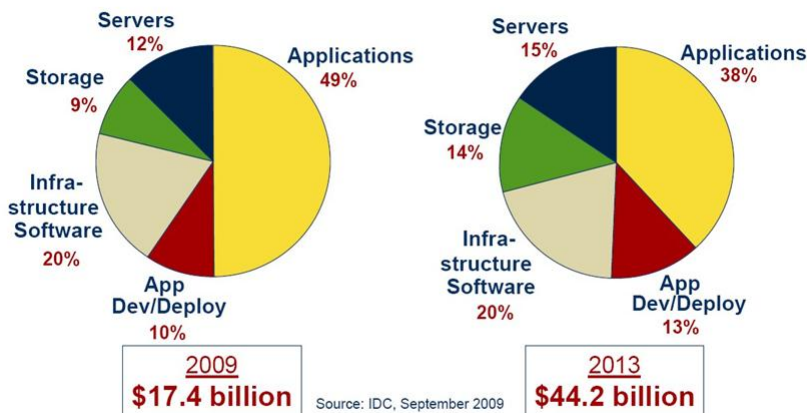
Where is the Cloud Going?

- IDC's updated IT Cloud Services Forecast predicts that public cloud computing will grow from $17.4 billion worth of IT spend in 2009 to $44 billion by 2013. [1]
- Additionally, Federal CIO Vivek Kundra has vowed to spend $19 billion of U.S. government's $70 billion IT budget on cloud computing.
- The five year growth outlook remains strong, with a five-year annual growth rate of 26% – over six times the rate of traditional IT offerings.

[1] Public Cloud Only

Cloud Distribution Examined

Worldwide IT Cloud Services Revenue* by Product/Service Type

Servers 12%
Storage 9%
Infra-structure Software 20%
App Dev/Deploy 10%
Applications 49%

2009 $17.4 billion

Servers 15%
Storage 14%
Infra-structure Software 20%
App Dev/Deploy 13%
Applications 38%

2013 $44.2 billion

Source: IDC, September 2009

* Includes revenue from delivery of Applications, App Development/Deployment SW, Systems Infrastructure SW, and Server and Disk Storage capacity via Cloud Services model; AD&D excludes online B2B messaging providers/exchanges

Why Now?

- The acceptance and proliferation of hardware virtualization and multi-tenant applications
- The Internet has become ubiquitous and an accepted method of connecting providers with consumers
- ISPs/Telcos are offering robust, redundant and managed corporate internet service enabling service consolidation efficiencies.
- The cost verses risk equation has tipped toward shared solutions
- Computing capabilities are being seen as a ongoing service rather than an internal capital expense

The Reality

- Enterprises will be dragged kicking and screaming through the gates of cloud computing by the economy, consumers, SMBs and emerging markets.

Build or Rent?

- The total cost of ownership to build and maintain datacenter infrastructure includes both hard and soft costs.
- An accurate comparison requires knowledge of all variables over the life of the project or hardware.

Cloud Scenario Assumptions	Input Variables Here
# of Servers	30
% of Time Running during Month	95%
Average CPU per Server	2
Average RAM per Server	4
Avg. Storage Per Server (includes Images)	250
Average Networks Deployed	2
Ougoing Bandwidth Per Server (GB)	125.00
Average Sub-Administrators	2
Average Cloud Files Storage Days	5000

What Soft Costs?

Hardware or Service Item	5yr Total Costs	% of Solution
Server Hardware	$ 128,571	9%
Server Network Ports	$ 33,429	2%
Storage Hardware	$ 180,000	12%
Storage (Back End) Network Switches	$ 60,000	4%
Backup SAN Storage	$ 100,000	7%
OS Licensing	$ 21,429	1%
VM Licensing	$ 42,857	3%
Load Balancing	$ 70,000	5%
Firewalls	$ 60,000	4%
Miscellaneous Costs	$ 50,000	3%
Internet Access	$ 180,000	12%
Design Consulting	$ 5,000	0%
Implementation Consulting	$ 40,000	3%
Maintenance/Consulting (5 yrs)	$ 50,000	3%
Staff Labor Design	$ 5,000	0%
Staff Labor Implementation	$ 10,000	1%
Staff Labor Maintenance (5 yrs)	$ 68,000	5%
Staff Training	$ 25,000	2%
Performance Monitoring / Configuration Mgmt	$ 25,000	2%
Cost of Over Utilization / Service Deficits	unknown	
Cost of Under Utilization / Service Surplus	unknown	
5 year capital costs	$ 1,154,286	
Space, Power, Cooling (5 years)	$ 337,200	23%
Total TCO over 5 years	$ 1,491,486	

Total Hard Costs	47%
Total Soft Costs	53%
Total Grey Costs	unknown

Enterprise Cloud Solutions

1. Hybrid Cloud
   - Scalability of the Public Cloud with the control and security of a private cloud
2. Test / Development / QA Platform
   - Use cloud infrastructure servers as your test and development platform
3. Disaster Recovery
   - Keep images of your servers on cloud infrastructure ready to go in case of a disaster
4. Cloud File Storage
   - Backup or Archive your company data to cloud file storage
5. Load Balancing
   - Use cloud infrastructure for overflow management during peak usage times

Enterprise Cloud Solutions (cont)

6. Overhead Control
   - Lower overhead costs and make your bids more competitive
7. Distributed Network Control and Cost Reporting
   - Create an individual private networks for each of your subsidiaries or contracts
8. Messaging Alternatives
   - Replace Microsoft Exchange and SharePoint with Google Apps
9. Rapid Deployment
   - Turn up servers immediately to fulfill project timelines
10. Functional IT Labor Shift
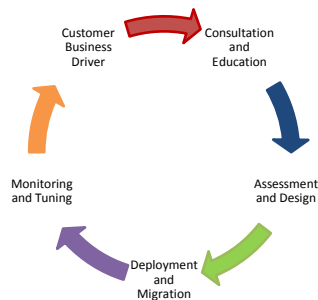   - Refocus your IT labor expense on revenue producing activities

How to get started

- Evaluating the business case for public, private and hybrid cloud models
- Developing an enterprise integration and migration strategy towards cloud provisioning
- Review enterprise applications for SaaS candidates
- Review enterprise requirements for cloud security, governance and standards
- Determine optimal management of your virtualized environment and cloud implementation
- Review case studies from early adopters of SaaS, PaaS and IaaS solutions

Service Deployment Methodology

- It is paramount that IT and business goals are aligned throughout the process when considering a move to cloud computing, such as cost savings, security, control, flexibility, manageability, simplification, ease of use, expandability, reliability, availability…

Customer Business Driver → Consultation and Education → Assessment and Design → Deployment and Migration → Monitoring and Tuning →

Assessment and Design

Proper alignment with business and technical goals

- **Cloud Assessment and Design**
  Working with business users and IT professionals to define high-level requirements (Business Driver)
  Assessing the Pros and Cons for using Cloud solutions
  Determining appropriate risks and management strategies for Cloud solutions
- **Cloud Solution Selection**
  Determining specific business and technical challenges
  Choosing the right Cloud alternatives (type and delivery model)
  Identifying the management requirements for the different Cloud alternatives
  Defining the solution alternatives and the merits / risks with each
- **Security Assessment & Planning**
  Performing Security Assessment (Regulatory Compliance requirements)
  Establishing appropriate security controls and processes
  Implementing continuous monitoring and response plan for security breaches

Deployment and Migration

Assessment and Design leads to a working solutions document (published best practice solutions guides)

- Solutions planning
- Investment planning & acquisition
- Integration & test
- Deployment, documentation, operations & maintenance

Monitoring and Tuning

Effectively Monitoring Your Cloud Ecosystem

- A cloud monitoring solution should identify problems before they become critical and adapt as business requirements change. A nice option may be to deploy a third party monitoring service to ensure customer satisfaction and allow an unbiased perspective on application performance. By implementing a comprehensive monitoring solution IT organization are equipped with the tools to determine real business value for cloud solutions and to provide an important feedback mechanism for tuning their cloud solutions.

Conclusion

- Cloud Computing is outpacing the IT industry
- Real business value can be realized by customers of all sizes
- Cloud solutions are simple to acquire, don't require long term contracts and are easier to scale up and down as needed
- Proper planning and migration services are needed to ensure a successful implementation
- Public and Private Clouds can be deployed together to leverage the best of both
- Third party monitoring services ensure customer are getting the most out of their cloud environment
- Security Compliance and Monitoring is achievable with careful planning and analysis

Preparing for the Future

Sampling of IT skills likely to be in demand in the future
- Functional application development and support
  - I.e. Oracle, SAP, SQL, linking hardware to software
- Leveraging data to make strategic business decisions
  - I.e. Business Intelligence : Applying sales forecasts to inventory and manufacturing decisions
- Mobile apps
  - Android, iPhone, Windows Mobile
- WiFi engineers
  - USF to include broadband communications (LTE replaces GSM/CDMA)
- Optical engineers
  - Optical offers the highest bandwidth today (PON, CWDM, DWDM)
- Virtualization Specialists
  - Economies of scale require virtualization (server, storage, client…)
- IP Engineers
- Network Security Specialists
- Web developers
- Social Media developers
- Business Intelligence application development and support

The Future of the Cloud in Alaska

- As for the strategic nature of the Cloud for the future of Alaska, location is everything. We can draw a parallel to UPS and FedEx in their decisions to place a major hub in Anchorage because of Alaska's central proximity to the Pacific Rim, Europe, and the US.   National Cloud players such as Google, Microsoft, and Oracle will see the value of our proximity in relation to latency speeds to serve those markets. This will create a significant opportunity for Alaska to provide large scale commercial datacenter services not just to Alaskans but to all of these markets.

- This scenario is dependent upon the new undersea fiber projects that are in various stages of implementation. These include linking Tokyo to London with a spur into Alaska, along with another undersea cable project linking Alaska to the Pacific Rim. The proximity of Alaska with these markets along with the advantage of cooler temperatures and access to low cost energy will give Alaska the framework for a new industry providing long term jobs and revenue for the State.

- Cloud adoption is occurring very rapidly in the lower 48 now, collectively we (Alaskans) need to have a strategy to keep these high paid technology sector jobs in Alaska and over time, create significantly new opportunities for future Alaskans to play a major role in this shift to utility computing services.

Thank you!

Any Questions?