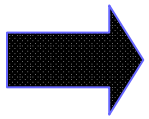
The New Economics of Cloud Computing

Doug Jones
IBM Canada Cloud Computing Team

IBM Canada Cloud Computing Team

Agenda



- **Overview of Cloud Computing**
- **Adoption Considerations**
- **Cloud Solution Examples**

Cloud is disruptive.....

Learning from previous **Disruptive Technology**

Established

- Photographic film
- Banking
- Full-service brokerage
- Campus-based instr'n
- Medical doctors
- MRI/CT scanning
- Cash & cheques
- …traditional IT?

Disruptive

- Digital photography
- ATM's
- Online brokerage
- Distance education
- Nurse practitioners
- Ultrasound
- Direct debit
- Cloud Computing

Cloud Computing

Cloud Computing is the provisioning of scalable resources as a service over the Internet (public cloud) or intranet (private cloud)

Changes in Consumption

- Users only see services
- Self service
- Billable through usage
- Rapidly provisioned
- From anywhere at anytime

Changes in Delivery

- Standardized services
- Infrastructure is Virtualized and Automated
- Dynamically Scalable
- Delivered over the internet

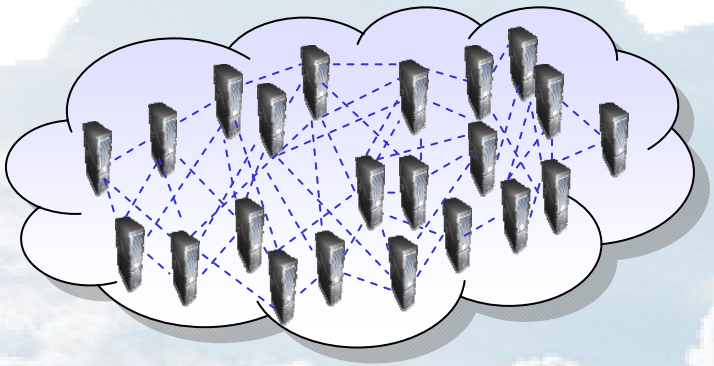
Inside a Cloud

Private

Public

Hybrid

Community



AUTOMATED PROVISIONING

Standardized Services

Service Management

- Availability
- Capacity
- Security & Privacy
- Data Management
- Disaster recovery
- Charge back
- Service Levels
- …

BPaaS

SaaS

PaaS

IaaS

- ***Simplified services***
- ***Rapidly provisioned***
- ***Pay as you go***
- ***Ease of access***

ne collaboration: LotusLive - Microsoft Internet Explorer

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LotusLive Overview | Stay Connected with E-mail | Save Time & Cut Travel Meet Online | Build Your Business Network | Work with Remote Teams | Collaborate & Share Online

News: IBM Touts LotusLive Connections Social Cloud at Enterprise 2.0

LotusLive Services

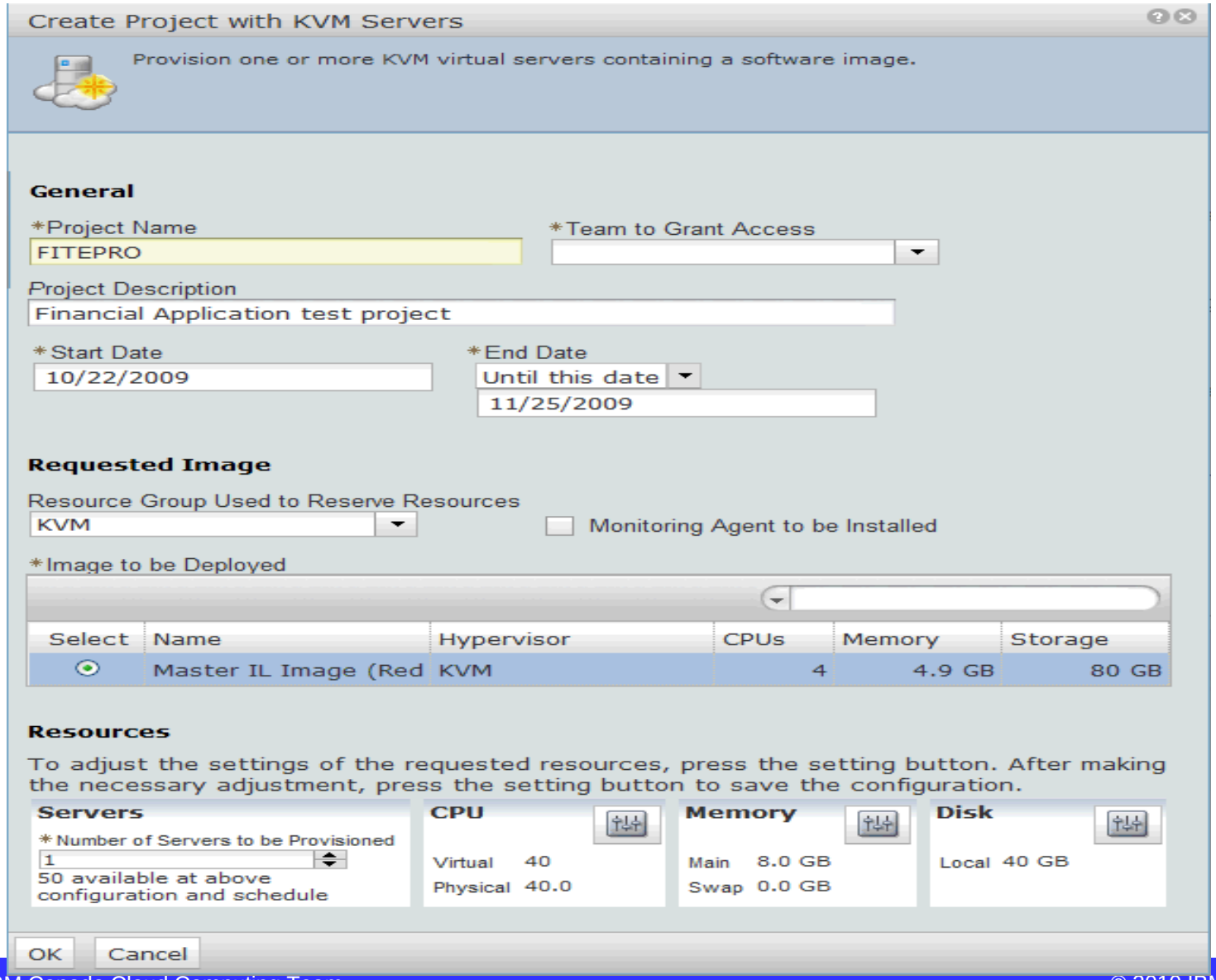
LotusLive lets you bring the right people and information together

LotusLive provides integrated social networking and collaboration services to simplify and improve your daily business interactions with customers, partners and colleagues.

Who's using LotusLive?

Real Connections
View Company

Example - “Test & Development Cloud”

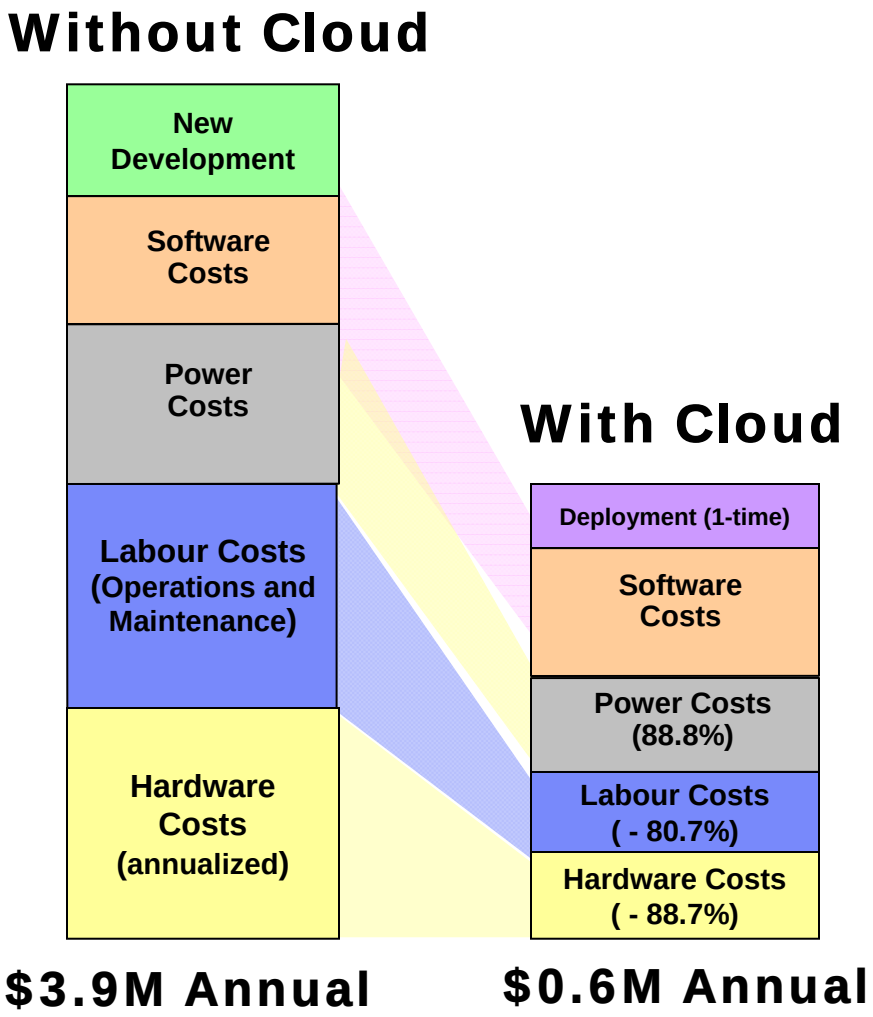


Cloud Economics

VIRTUALIZATION + AUTOMATION + STANDARDIZATION + SELF SERVICE = Cost Flexibility

… to free budget for new investment and speed deployment of new capabilities.

IBM's Technology Adoption Program

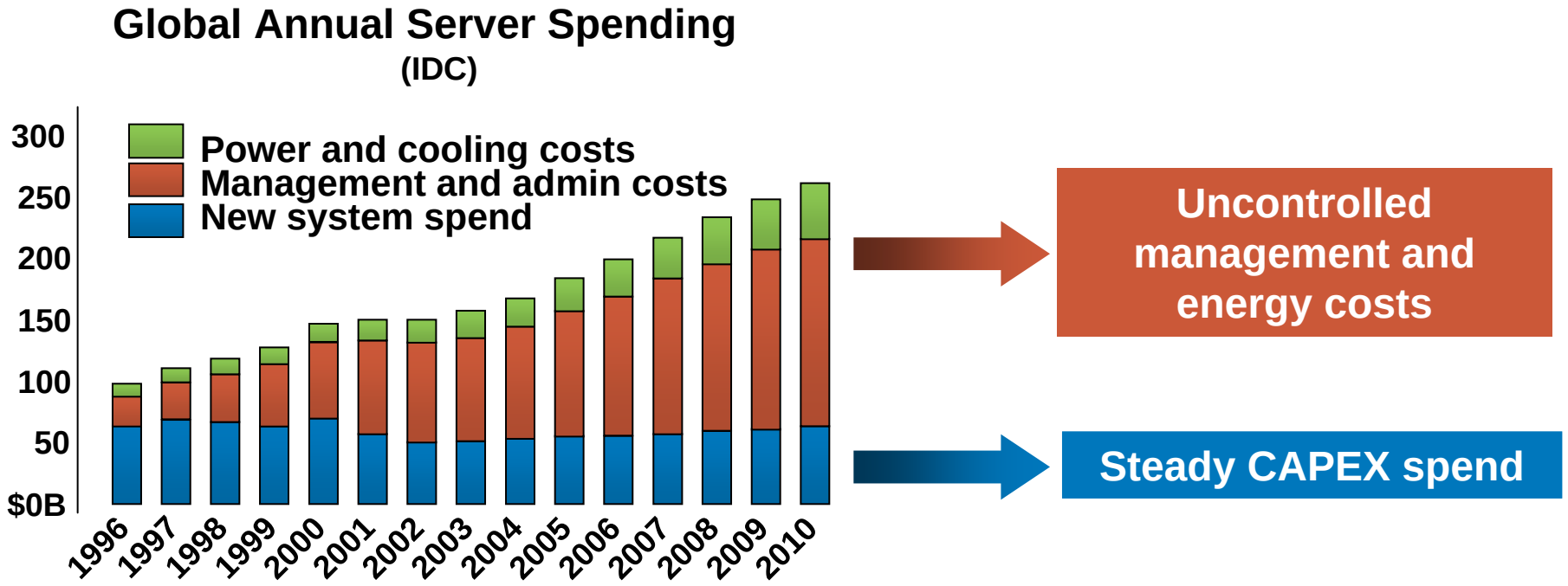


Annual savings:
$3.3M(84%)

- Payback Period: 73 days
- Net Present Value (NPV): $7.5M
- Internal Rate of Return (IRR): 496%
- Return On Investment (ROI): 1039%
- 488 servers to 55
- 15 Admin to 2

Note: TAP = Technology Adoption Program

Escalating IT Management costs

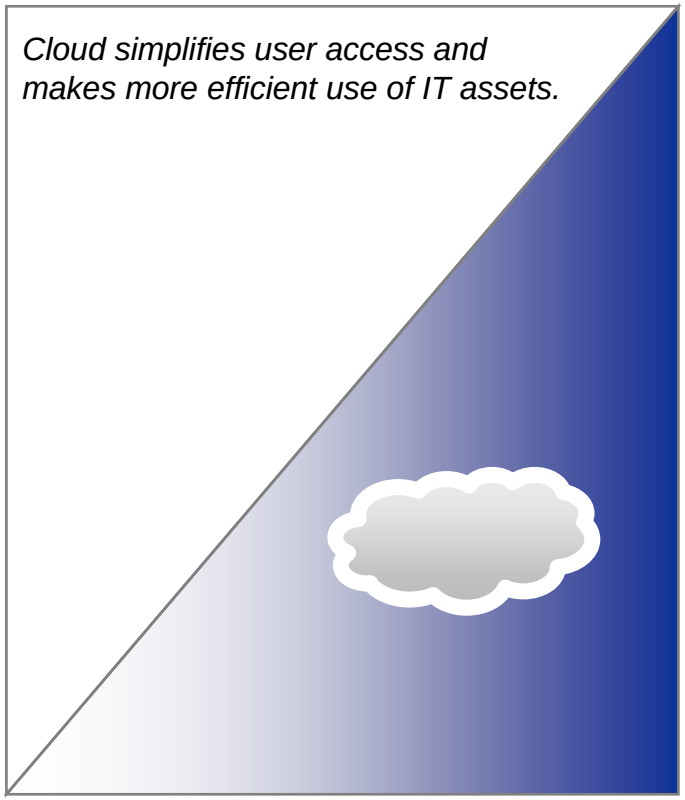


To make progress, delivery organizations must address the server, storage and network **operating cost** problem, not just CAPEX

Source: IBM Corporate Strategy analysis of IDC data

So What's Different About Cloud?

Capability	From	To
Server/Storage Utilization	10-20%	70-90%
Self service	None	Unlimited
Provisioning	Weeks	Minutes
Change Management	Months	Days/Hours
Release Management	Weeks	Minutes
Metering/Billing	Fixed-cost model	Granular
Payback period for new services	Years	Months



Legacy environments ⟷ **Cloud enabled enterprise**

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End User Perspective

"Clouds will transform the IT industry… profoundly changing the way people work and companies operate"

The Economist

Similar to ATM & Point of Sale

End User

- ***Simplified services***
- ***Rapidly provisioned***
- ***Pay as you go***
- ***Ease of access***

CIO Perspective

Cloud computing can be disruptive

- Reduced control of IT services delivered over the Internet
- Perceived cost gap between a cloud service and traditional IT

Cloud Computing is also a opportunity for the CIO

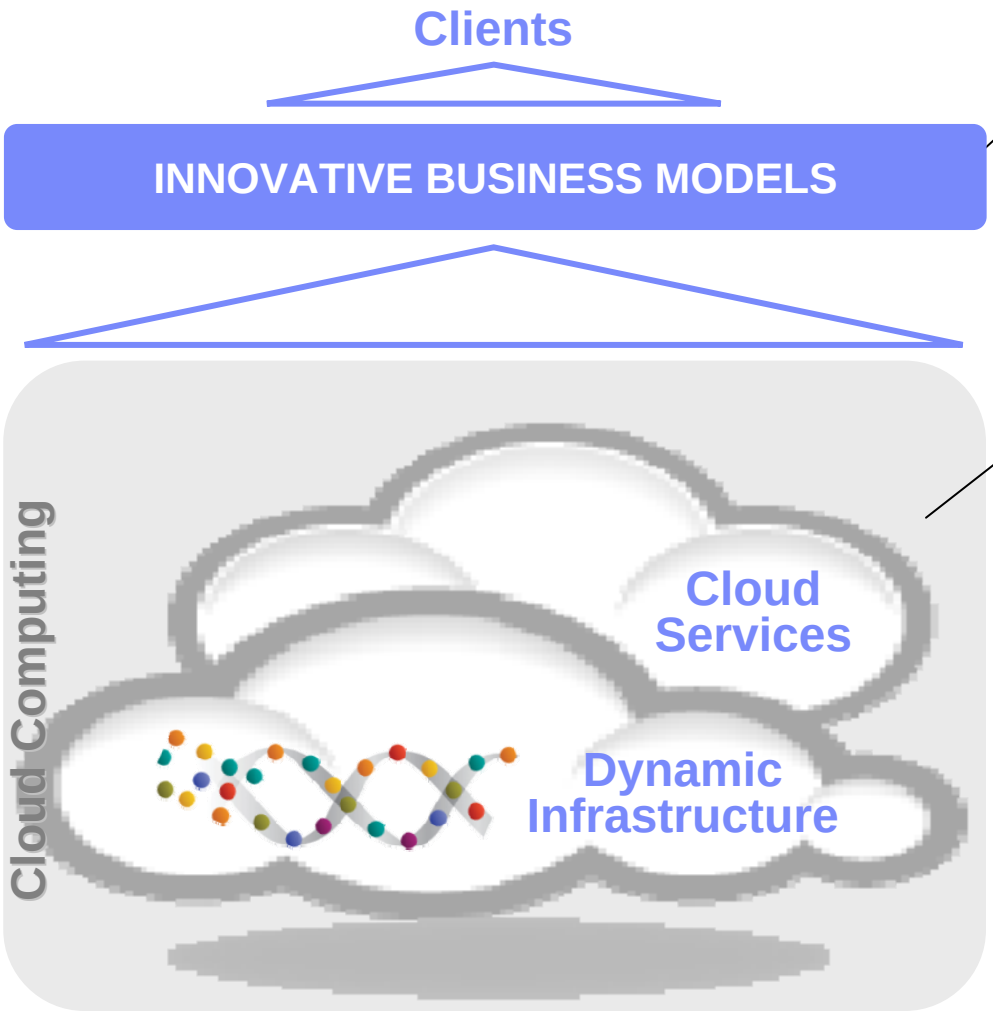
- Drives standardization
- Lower cost & improved pricing models
- Greater range of services and capabilities
- Greater visibility in billing / chargeback to LOBs
- Increased ability to focus on enabling the business...

Business Perspective

ROI

- Improved services at a lower cost
- Pay per use (user / service)
- Moving Capital expenditure to Operating expenditure
- Greater visibility in billing & chargeback
- Increased responsiveness
- Supports globalization & green
- Business Innovation

Cloud Computing can enable Business Innovation & Speed



Business Value:
New combinations of services create differentiating value at lower cost in less time

Cloud Services delivered from a **Dynamic Infrastructure**:

- Open standards-based
- Common components and processes
- Flexible scaling
- Request driven provisioning

UK Government commits to cloud computing for public sector

23 June, 2009, by Team Outlaw

The Government has asked all public sector bodies to make future IT purchases consistent with cloud computing so that it can move all its digital services into a private, secure 'cloud' called 'G-cloud' for government bodies.

In its Digital Britain report the Government said that it wanted the public sector to reap the benefites of scalable, speed of provisioning and flexible pricing that it says cloud computing can bring.

While it consults with an IT trade body the Government has told all departments to make sure that all IT procurement from now on is compatible with cloud computing.

"All those Government bodies likely to procure ICT services should look to do so on a scaleable, cloud basis such that other public bodies can benefit from the new capability," said the Digital Britain report.

Cloud computing is the use of massive central computing resources for IT work, with more modest computers connected to servers by networks. With the increasing ubiquity of broadband internet access

- ***UK announces G-Cloud.***
- ***All IT Procurement from now on must be compatible with cloud computing***
- ***All Government Bodies procuring IT services should do so on a cloud basis such that other bodies can benefit.***
- ***Cloud's will extend governments ability to reach the people with much more scale.***
- ***Cloud will make it much simpler for the government to maintain and support IT.***

Cloud Computing

and the

Canadian Environment

Presented at the Global Government Cloud Computing Roundtable.

Ottawa, Ontario, Canada,
October 6.2009

Jirka Danek, CTO at Public Works Government Services Canada

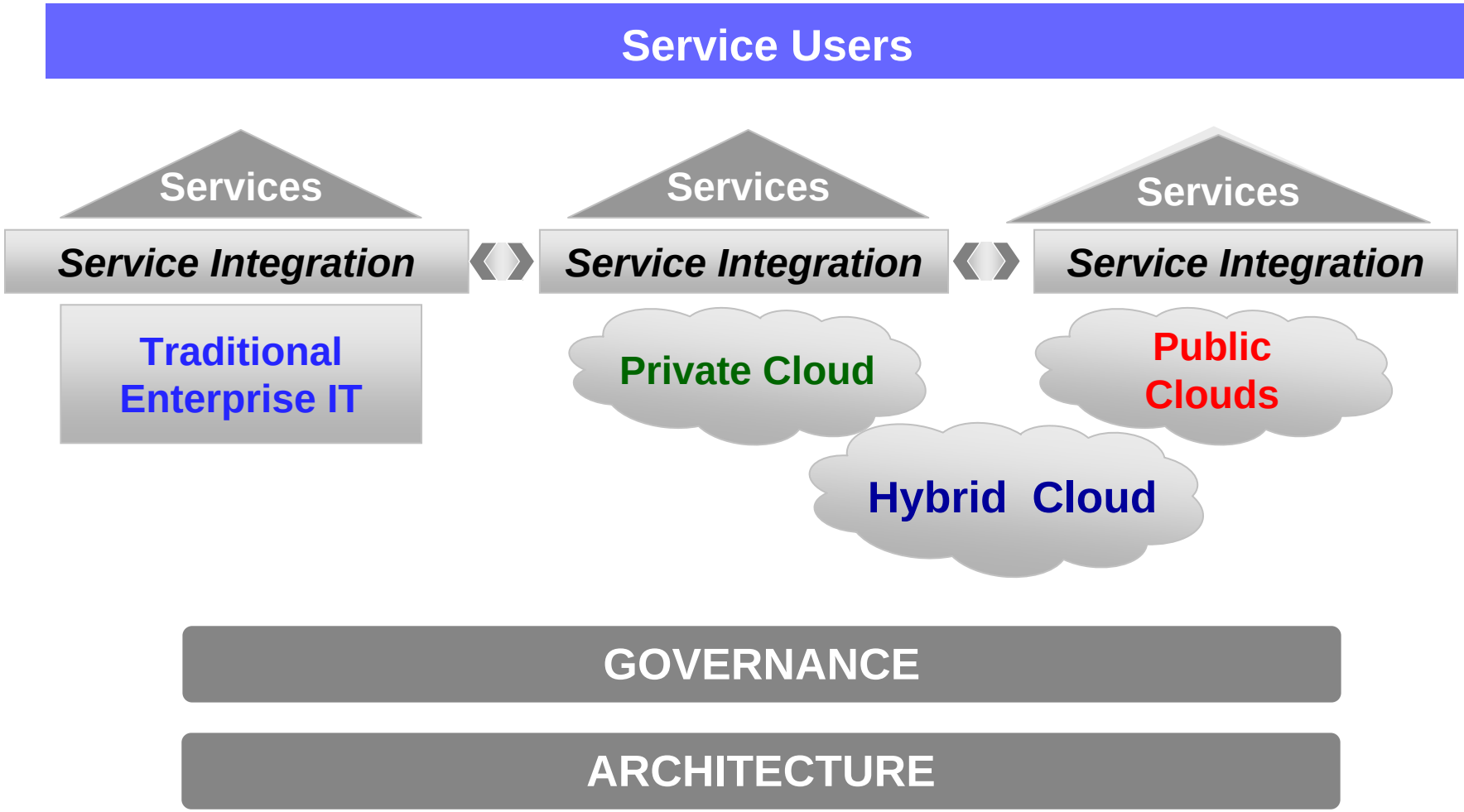
Opportunity:

Today there is a tremendous opportunity for Canada to position itself as a world leader in Cloud Computing.

Agenda

- **Overview of Cloud Computing**
- **Adoption Considerations**
- **Cloud Solution Examples**

Three co-existing delivery models



Private & Public Considerations

Private Cloud

- Single tenant
- Access limited to client.
- Drives best practices while retaining greater customization and control.

Public Cloud

- Multi tenant
- Service provider owned and managed.
- Delivers select set of standardized services on a flexible pay per use basis.

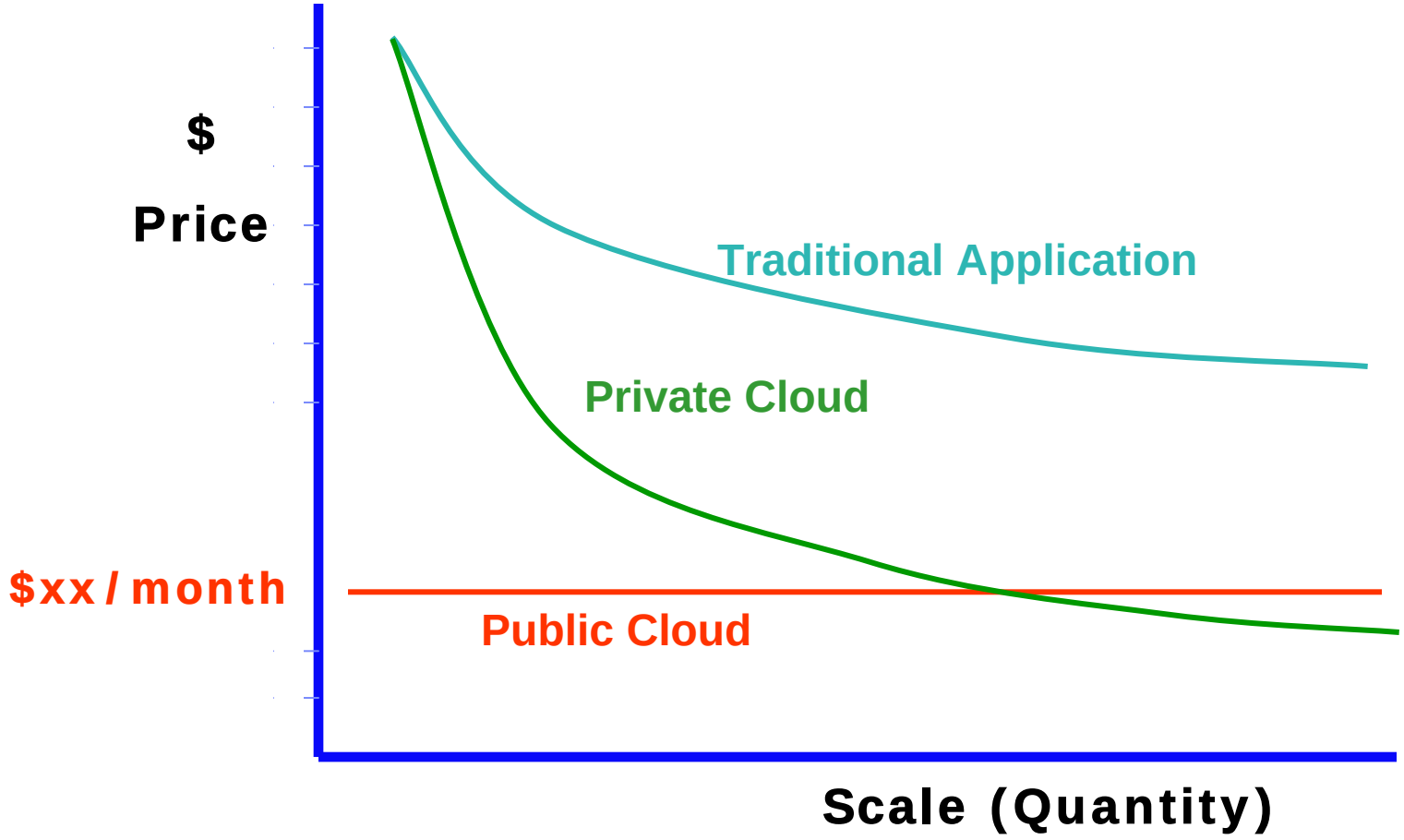
Customization

Security and Privacy

Capital preservation (Capex to Opex)

Time to deploy

While public clouds offer low predictable costs, private clouds can provide even more savings



What IT Services workloads are we seeing move to cloud delivery?

- Test and Pre-production systems
- Mature packaged offerings, like e-mail and collaboration
- Software development environments
- Batch processing jobs with limited security requirements
- Isolated workloads where latency between components is not an issue
- Storage Solutions / Storage as a Service
- Backup Solutions / Backup & Restore as a Service
- Some data intensive workloads if the provider has a cloud storage offering tied to the cloud compute offering

What IT Services workloads may not be ready for cloud delivery today?

- **Workloads which depend on sensitive data normally restricted to the Enterprise**
  - Employee Information - Most companies are not ready to move their LDAP server into a public cloud because of the sensitivity of the data
- **Workloads composed of multiple, co-dependent services**
  - High throughput online transaction processing
- **Workloads requiring a high level of auditability, accountability**
  - Workloads subject to Sarbanes-Oxley, for example
- **Workloads based on 3rd party software which does not have a virtualization or cloud aware licensing strategy**
- **Workloads requiring high customization (e.g. customized SaaS)**

Current Top Workloads

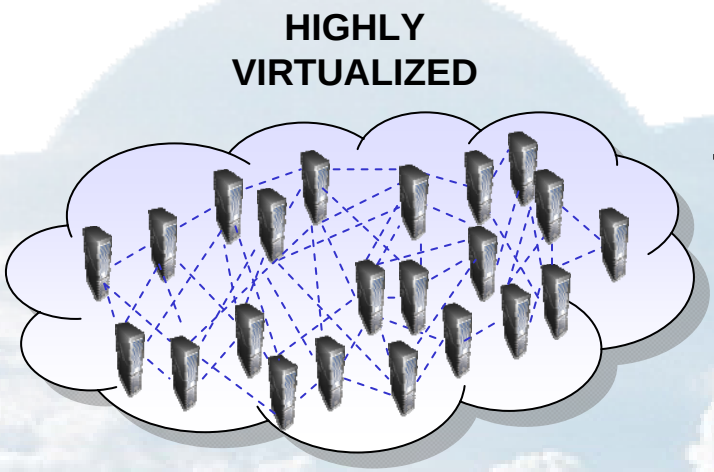






	Business Analytics	Collab'n & Email	Devel't &Test	Desktop & Devices	Infra. & Storage	Business Services	Service Mgmt
Public		✓	✓	✓	✓	✓	✓
Private	✓		✓	✓	✓		

Service Management is Critical



AUTOMATED PROVISIONING

Standardized Services

Service Management

- Availability
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- …

Service Management Gets *Easier* … … for Cloud Consumers

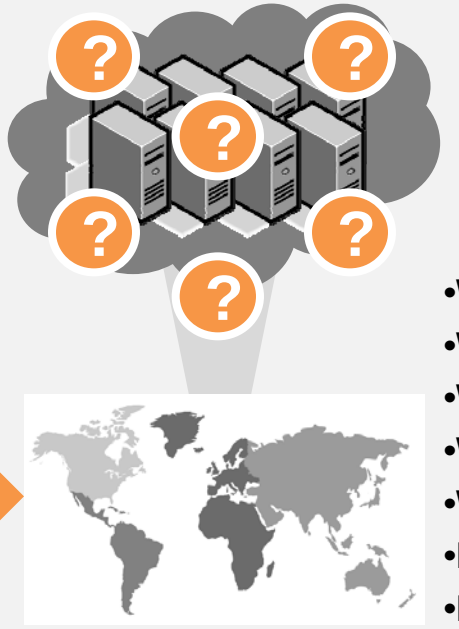
Service Management Gets *Harder* … … for Cloud Providers

Security & Privacy

Traditional or Private Cloud

- We Have Control
- It's located at X.
- It's stored in servers Y, Z.
- We have backups in place.
- Our admins control access.
- Our uptime is sufficient.
- The auditors are happy.
- Our security team is engaged.

Public Cloud

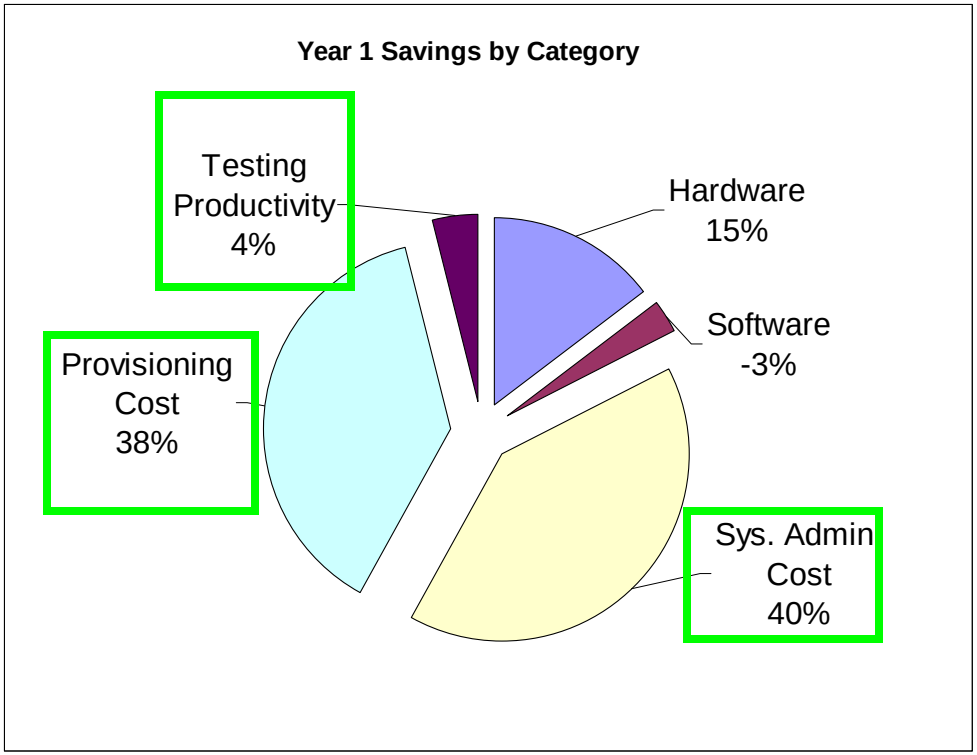


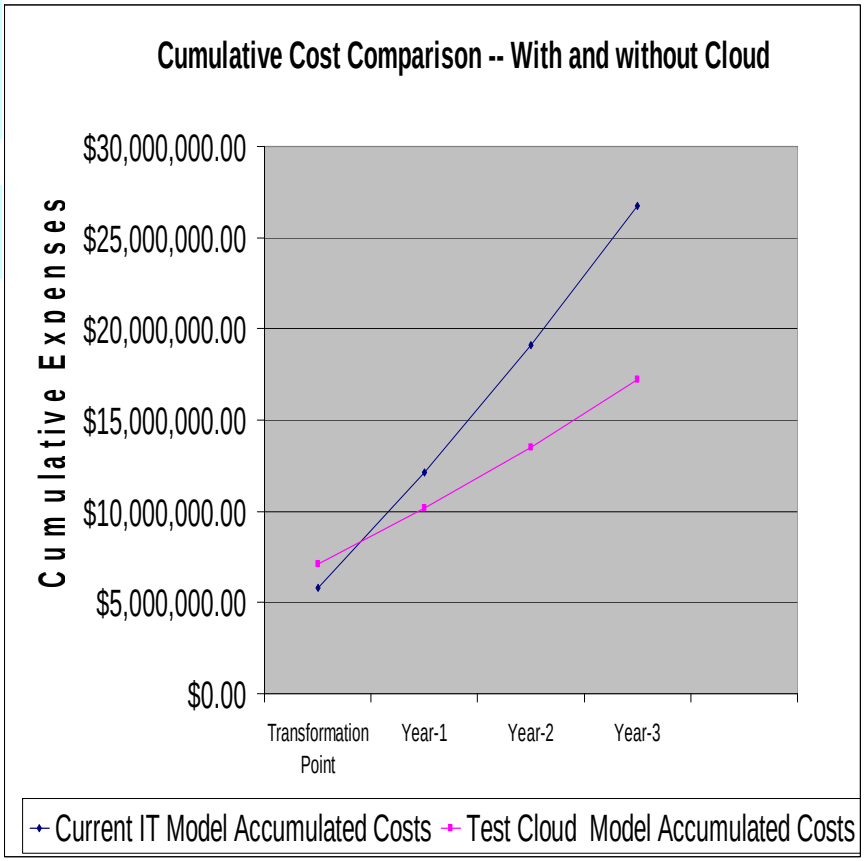
- Who Has Control?
- Where is it located?
- Where is it stored?
- Who backs it up?
- Who has access?
- How resilient is it?
- How do auditors observe?
- How does our security team engage?

However Cloud can also provide improved Security

ROI analysis example- Banking (large # of servers)

Payback Period (months)	**4.85**
Total Initial Investment for Test Cloud	**$1,313,958.33**
Net Present Value (NPV)	**$6,172,325.64**
Estimated ROI over 3 years	**469.75%**
Estimated avg. annual ROI	**156.58%**



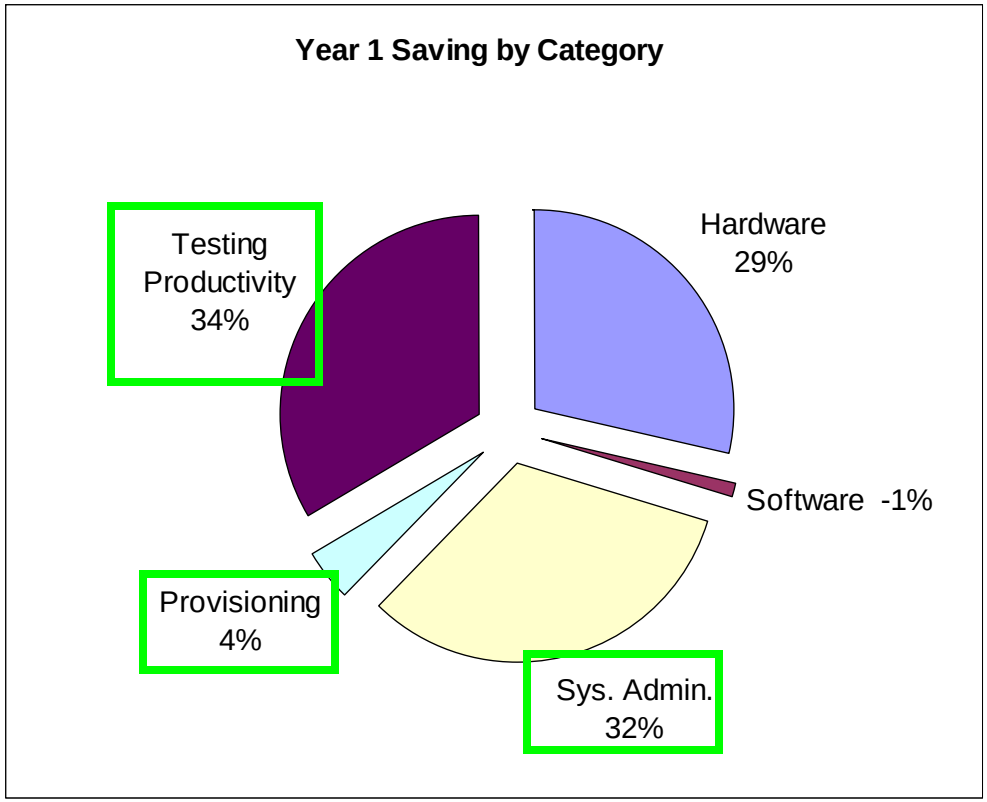


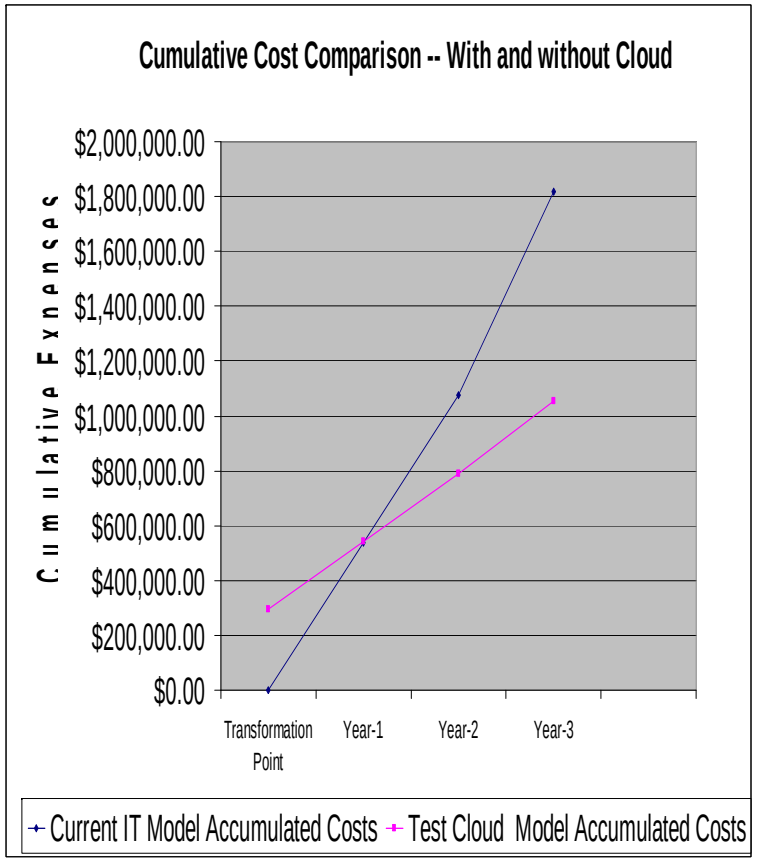
= Service Management driven savings

ROI projections from IBM Research Study 2009

ROI analysis example- Manufacturing (SO account - small)

Payback Period (months)	12.18
Total Initial Investment for Test Cloud	$294,583.33
Net Present Value (NPV)	$669,678.84
Estimated ROI over 3 years	227.33%
Estimated avg. annual ROI	75.78%



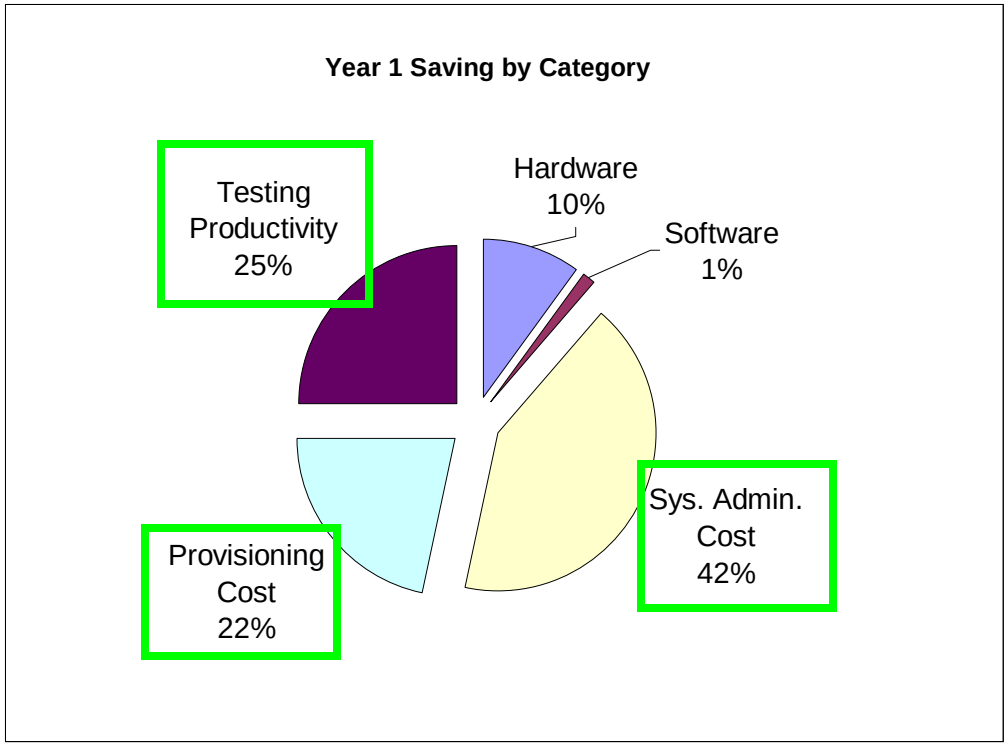


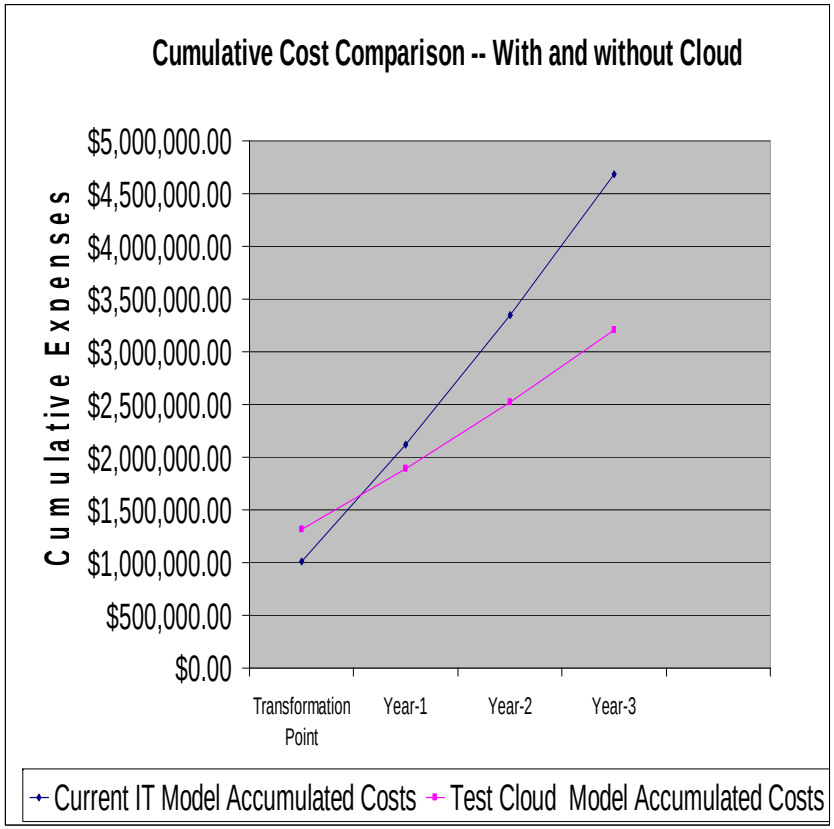
= Service Management driven savings

ROI projections from IBM Research Study 2009

ROI analysis example- Banking (medium # of servers)

Payback Period (months)	6.82
Total Initial Investment for Test Cloud	$302,958.33
Net Present Value (NPV)	$935,880.13
Estimated ROI over 3 years	308.91%
Estimated avg. annual ROI	102.97%



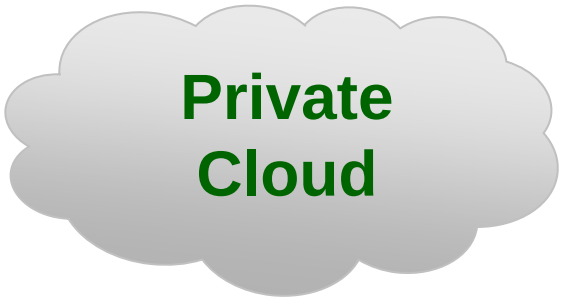


= Service Management driven savings

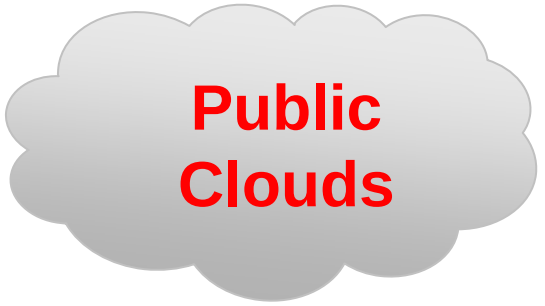
ROI projections from IBM Research Study 2009

Top Cloud Adoption Considerations

- Defining & Standardizing Services
- Network Enhancements
- Seamlessly integrating clouds & enterprise



- Service Management



- Security & Privacy
- Regulatory compliance
  - Location of data, investigative support, etc.

Agenda

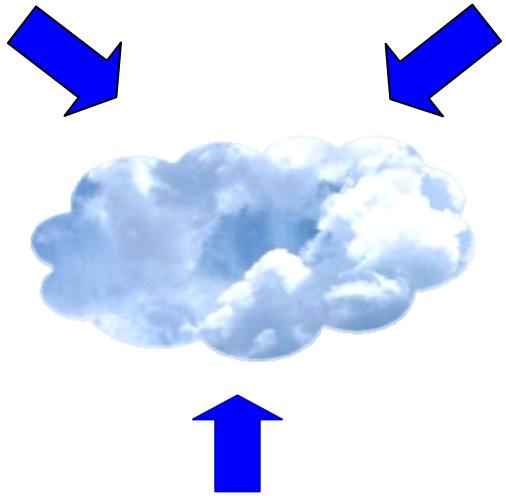
- **Overview of Cloud Computing**
- **Adoption Considerations**
- **Cloud Solution Examples**

Three approaches

PLANNING

Define a Cloud strategy & roadmap

- Understand where the business value is
- Define a cloud strategy
- Map out a roadmap



CONDITION THE EXISTING INFRASTRUCTURE

Create a Dynamic infrastructure

- Simplify, Consolidate, Virtualize, Optimize the Network, Implement Service Mgmt, Security and Resiliency

WORKLOAD SOLUTIONS

Solve a pressing business problem with an isolated Cloud deployment

- Choose a workload solution
- Choose between a Private, Public or Hybrid Cloud solution
- Focus on defining services to be provided, what will be different
- Implement & Measure ROI

Current Top Workloads







	Business Analytics	Collab'n & Email	Devel't &Test	Desktop & Devices	Infra. & Storage	Business Services	Service Mgmt
Public		✓	✓	✓	✓	✓	✓
Private	✓		✓	✓	✓		

Test & Development clouds are prime candidates

- **30% to 50% of all servers within a typical IT environment are dedicated to test**
- **Most test servers run at less than 10% utilization, if they are running at all!**
- **IT staff report a top challenge is finding available resources to perform tests in order to move new applications into production**
- **30% of all defects are caused by wrongly configured test environments**
- **Testing backlog is often very long and single largest factor in the delay new application deployments**
- **Test environments are seen as expensive and providing little real business value**

* *"Industry Developments and Models – Global Testing Services: Coming of Age," IDC, 2008 and IBM Internal Reports*

Test & Dev Cloud

Customer Benefits

- Avoid Hardware & Software purchases
- Immediate vs. weeks to set up a test environment
- Strong ROI
- Better testing

Challenge:

- Cost to provision test environments was too high
- Provisioning time for test environments was too long

Solution:

- 75% + Capital utilization improvement; Significant license cost reduction
- Reduce Test Provisioning cycle times from weeks to minutes
- Reduce risk and improve Quality- eliminate 30% + of all defects that come from faulty configurations.
- Reduced labour by 60%

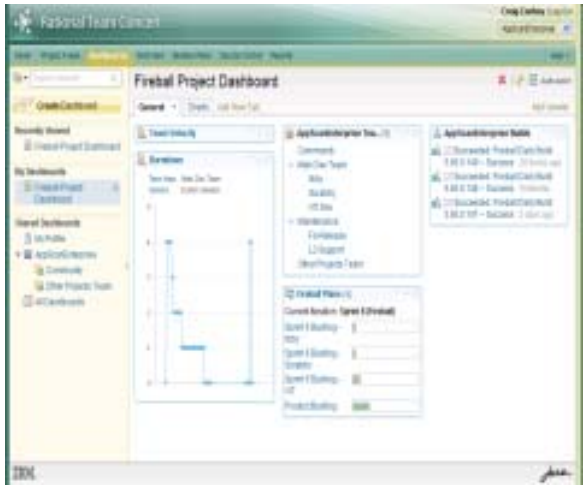
With a few mouse clicks, clients can provision development and test environments on the IBM Cloud

www.ibm.com/cloud/developer

Step 1 ***Click and Choose the Service you need***

Step 2 ***Choose the hardware and usage configuration***

Step 3 ***Application provisioned and ready to run***



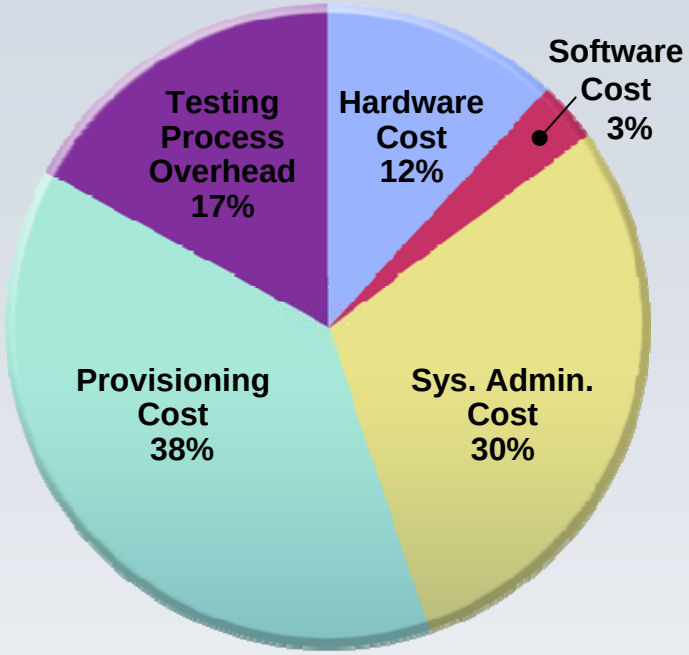
Benefits of a Dev & Test Cloud

Domain	Impact
Increased Speed	Resources can be provisioned in minutes rather than weeks
Better Code Quality	Code levels can be maintained across all test environments to ensure consistency with production
Cost Efficiency	Resources are returned to the common pool and redeployed instead of sitting idle Pay-per-use encourages efficient use of resources Significant reduction in labour for configuration, operations, management and monitoring of the test environments Reduced SW license costs **(Public)** Pay-per-use model ensures that clients only pay for what they use, when they use it) **(Public)** No infrastructure overhead and build-out costs

Test Cloud ROI Analysis

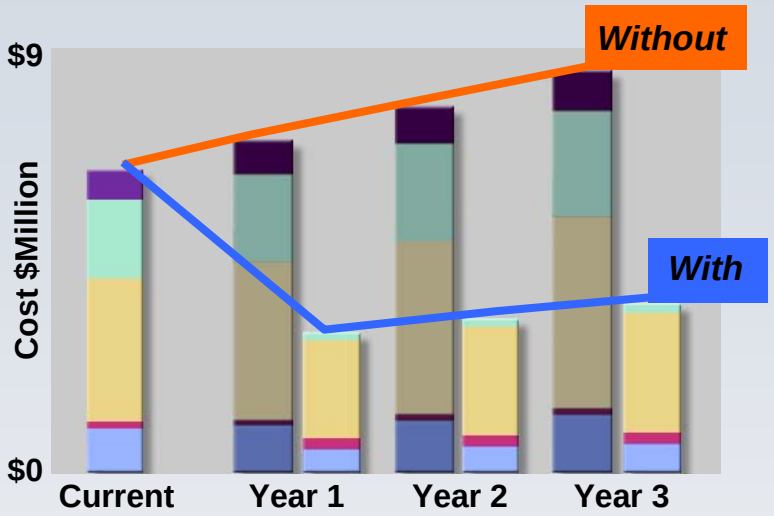
Saving by Category

1st Year After Cloud Transformation



Cost Structure

With and Without Cloud Transformation



Desktop Cloud

Customer Benefits

- Improve end-user productivity
- Reduce end-user support costs
- Green, energy savings
- No capital or one-time expense
- Highly secure hosting model
- Fast provisioning

Quebec School Board

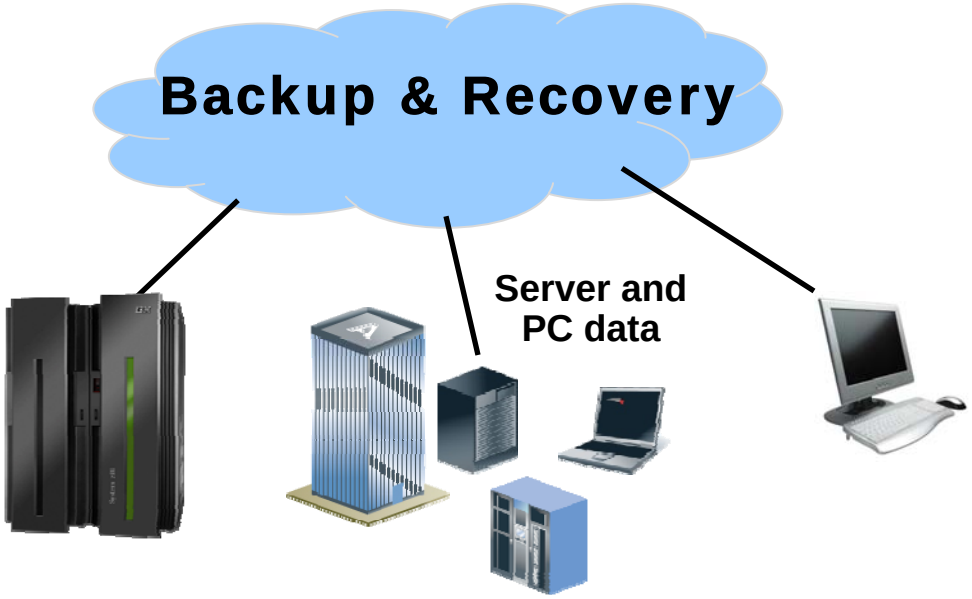
Challenge:

- Management and costs associated with desktop platforms in 77 locations

Solution:

- Desktop virtualization
- 3500+ thin clients
- Collaboration with application development vendors
- Use up to 73% less power over traditional fat client deployments

Backup & Recovery Cloud



Customer Benefits

- Recover from anywhere
- Canadian locations
- Pay as you go
- Faster
- Automatic & Simple

Canadian Manufacturing Company

Challenge:

- Cloud-based service provider required an equally flexible backup and restore function for critical client data
- Business growth and business risk associated with data loss

Solution:

- Offsite, Platform-as-a-Service backup and restore solutions
- Reduced risk, financial and non-financial savings

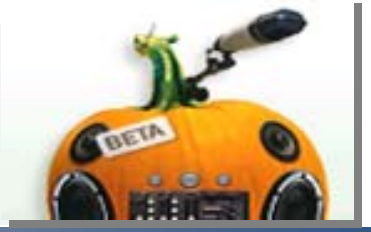
Cloud Computing within IBM

Yielding a cumulative benefit to IBM in excess of $4.1B

IBM Technology Adoption Program (TAP)

http://www.tap.ibm.com/

Saving IBM over $3.5M per year



Self-service, on demand IT delivery solution for 3,000 IBM researchers across 8 countries

Enterprise class utility computing solution for clients

Systems platform testing for Enterprise Clients, SMBs, & ISVs

Cloud computing solution for IBM Learning Centers in Europe

Conclusions

- Cloud Computing is happening
- Considerable market growth & maturity over next 5 years
- The value is high for Users, IT & Business
- Challenges & risks need to be considered and managed
- Users will drive cloud adoption
- Most enterprises will end up with a blend of traditional & cloud based environments

Thank you!

For more information, please visit:
ibm.com/cloud

Or contact:
djones@ca.ibm.com