

Cloud Computing: Where the rubber meets the road

Ron Batra
General Manager and Director
Cloud Solutions, AT&T



NIST Definition of Cloud Computing

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.

Note 1: Cloud computing is still an evolving paradigm. Its definitions, use cases, underlying technologies, issues, risks, and benefits will be refined in a spirited debate by the public and private sectors. These definitions, attributes, and characteristics will evolve and change over time.

Note 2: The cloud computing industry represents a large ecosystem of many models, vendors, and market niches. This definition attempts to encompass all of the various cloud approaches

Source: National Institute of Standards and Technology (NIST).



5 Essential Characteristics



On Demand Self Service



Broad Network Access



Resource Pooling



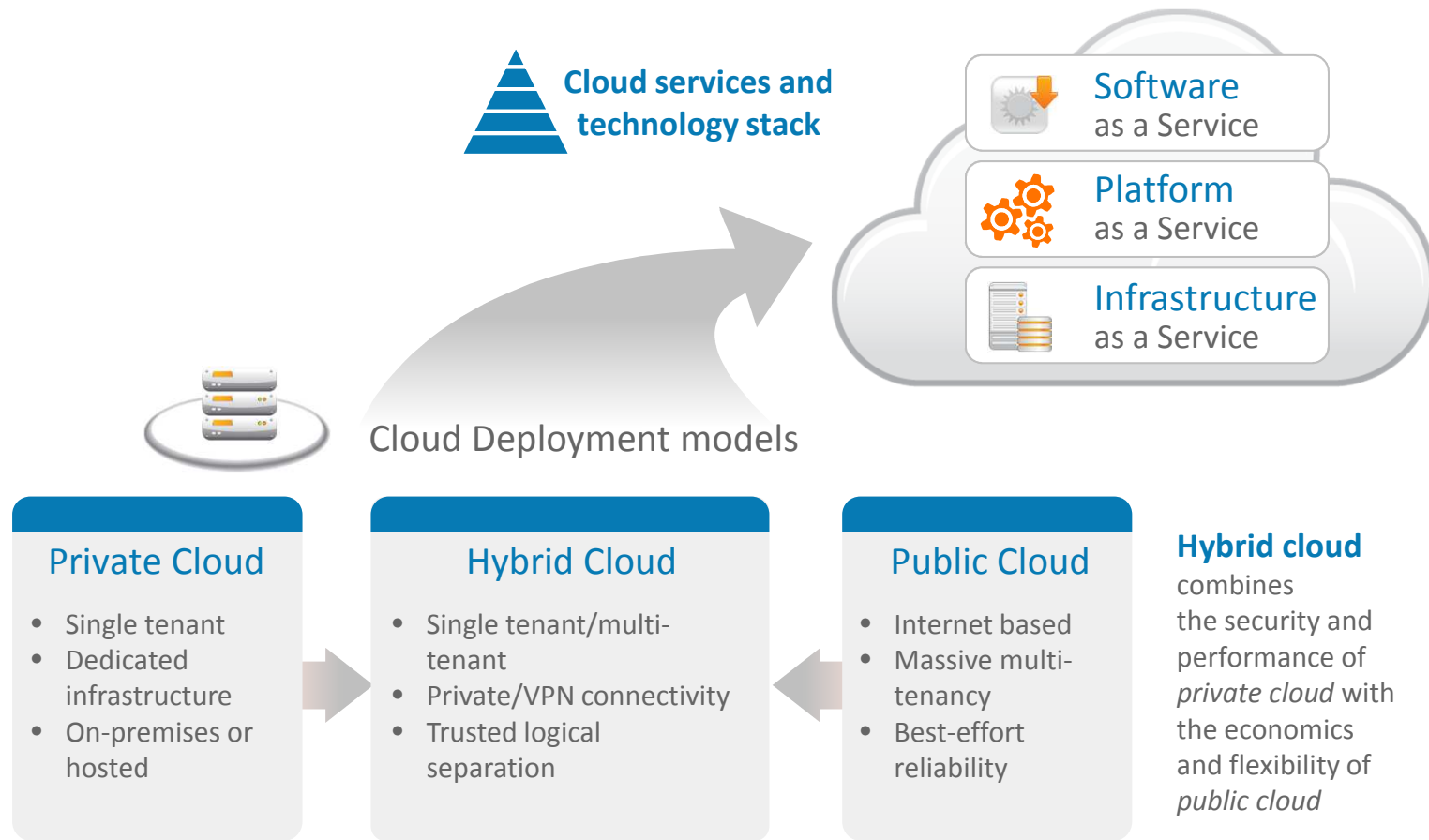
Rapid Elasticity



Measured Service



The Evolving Cloud Landscape



Cloud Deployment Value Propositions

Public Cloud

- No need to build, just buy service(s). Can lead to leaner and agile SDLC
- Financial model shift – to Op Ex. from Cap Ex
- Scale capacity **linearly** as business grows.

Private Cloud

- Control
 - Costs
 - Timeline
 - Strategy
- Security
- Internet/VPN Connectivity

Hybrid Cloud

- Mix and Match Computing Services, as applicable
- Leverage existing assets and infrastructure
- Good balance between control and trying a new paradigm



AT&T Cloud Solutions

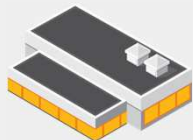
Delivering Value Across the Managed IT Services Spectrum

Customer Managed

Infrastructure

Fully Managed

Application



Global locations;
Highly reliable facilities

- “On-net” apps
- Critical Internet/
Intranet linkage
- Minimal latency

Colocation



On-demand compute,
storage & platform
services

- Short-term compute
needs
- Test/development
environments

Cloud Services



Flexible multi-tenant &
physically dedicated
managed infrastructure
options at the network,
compute & storage layers

- Reliable, flexible,
VMware-based
managed infrastructure
- Business critical apps

**Managed Hosting &
Private Cloud**



Full Application
Management including
functional support &
development

- Large-scale enterprise
websites or apps
- Mission critical service
requirements

Application Services

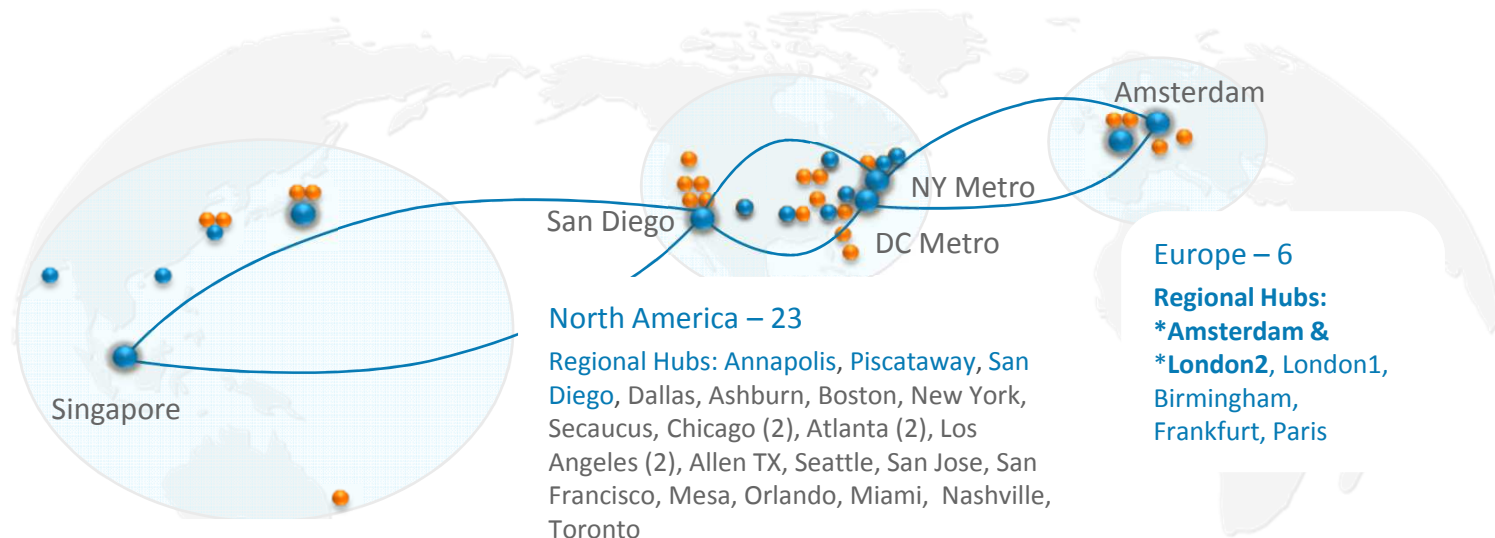
*Our network, technology & service expertise delivers
fast & efficient IT infrastructure as a service*

virtually anytime, anywhere with network-based security



AT&T Colocation - Delivering Services on a Global Basis

AT&T has an expansive global footprint of 38 IDCs, 8 of which support cloud services



Asia/Pacific – 9

Regional Hubs: *Singapore & Tokyo4

Tokyo3, Hong Kong (2), Shanghai (2),
*Sydney, Bangalore

North America – 23

Regional Hubs: Annapolis, Piscataway, San Diego, Dallas, Ashburn, Boston, New York, Secaucus, Chicago (2), Atlanta (2), Los Angeles (2), Allen TX, Seattle, San Jose, San Francisco, Mesa, Orlando, Miami, Nashville, Toronto

South America – 1

*Sao Paulo, Brazil 2Q14

Europe – 6

Regional Hubs:

*Amsterdam &
*London2, London1,
Birmingham,
Frankfurt, Paris

- **Regional Hub / ‘Super’ IDCs** – Targeted regional centers offering full range of managed & application services
- **IDC Expansions** – Investments to expand our capacity & footprint
- **Additional AT&T IDCs**

* Expansions Planned: Specifics concerning any future IDC expansion, including locations and timing, are subject to change



AT&T Managed Hosting & Private Cloud

Meeting Critical Needs of Enterprise Customers

Robust Virtualized Private Cloud

Two managed delivery models

Self Serve

- Customers create business templates that suit their needs
- Predictable MRR with auto scale features
- AT&T manages the hardware stack & hypervisor; Customer manages the virtualized environment (OS + APP)

Fully Managed

- High-touch customer service
- AT&T manages the entire stack; Customer owns their business application
- Predictable MRR plus charge on a per VM basis



Integrated self serve functionality,
service delivery automation
& auto scaling



Storage



Servers



Network

Multi-Tenant or Dedicated Service Options

Automated Service Delivery

Pay Per Virtual Machine

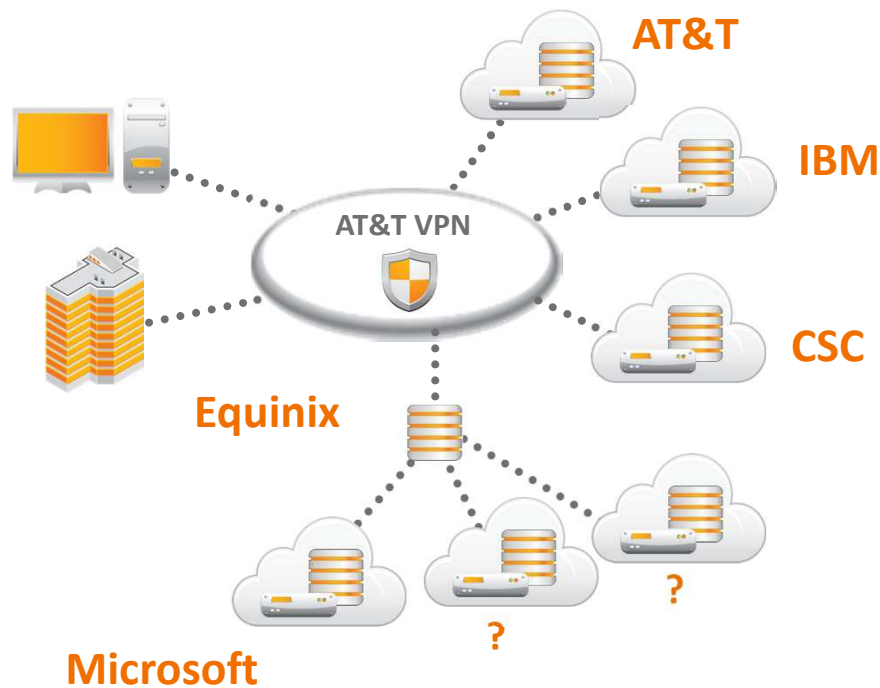
Differentiated customer support
backed by 99.99 SLA



AT&T NetBond Program

Extending our patented network technology to key Cloud Service Provider Partners

Network Enabled Cloud Ecosystem



- On-Net Enterprise Cloud
- Predictable network performance & reduced latency
- Security & control
- Dynamic scaling maintains performance
- Integrated Management: Network & Cloud
- Mobile Integration



Robust Portfolio of Managed Applications

Enterprise Applications



- eBusiness Suite
- PeopleSoft Enterprise
- EDGE Applications
 - (GRC, Siebel, Mobility, Endeca)
- Fusion Applications and Middleware
- Enterprise Perf Management
 - (Hyperion, OBI, OBIEE, OBIA)
- Engineered Systems and Optimized Solutions



- SAP ERP Central Component (ECC)
- SAP Business Suite
- SAP Business Warehouse (BW)
- SAP BusinessObjects
- Ariba
- SAP HANA
- Sybase ASE

ERP, CRM, SFA, SCM, HCM, Financials, Procurement

eCommerce

Managed eCommerce:

- AT&T Commerce to Go
- Hybris
- IBM WebSphere
- Oracle Commerce

Managed Middleware:

- Adobe Experience Manager
- IBM WebSphere Application Server
- IBM WebSphere Portal
- JBoss by Red Hat
- Java
- Oracle Endeca
- Magento
- Microsoft.net

eCommerce, Managed Middleware, Portals, Microsites, Service Oriented Architecture

Messaging & Collaboration



- Exchange
- Lync
- Office 365
- Sharepoint

AT&T Unified Communications (UC) and Collaboration Applications:

- AT&T Connect
- AT&T Telepresence Solution
- AT&T UC as a Service

Email – IM, Messaging, Calendar, Contacts, Conferencing, Blogs, Wiki



Why are we going Cloud ?

Current Trend

Outsourcing

Consolidation

Cost Savings

Seasonal Capacity



Top 10 Cloud Computing Use Cases

Cross-Referenced by Delivery Model

	Use Case	Public	Private	Hybrid
1	Seasonal Capacity	IaaS, PaaS	IaaS, PaaS	IaaS, PaaS
2	Financial Model (Opex. Vs. CapEx)	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS
3	Non-Core Competency	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS
4	Outsourcing	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS
5	Short Life Cycle Projects	IaaS, PaaS	IaaS, PaaS	IaaS, PaaS
6	Disaster Readiness	IaaS, PaaS	IaaS, PaaS	IaaS, PaaS
7	Massively Scalable Computing	IaaS, PaaS	IaaS, PaaS	IaaS, PaaS
8	Infrastructure Consolidation	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS	IaaS, PaaS, SaaS
9	Universal Access	Pictures, Videos, other media	N/A	N/A
10	Data Center Real Estate/Capacity Management	IaaS, PaaS	IaaS, PaaS	IaaS, PaaS



Cloud Computing Use Case Value Drivers

	Use Case	Top 3 Business and Technology Drivers		
1	Seasonal Capacity	Capacity Gap and Duration	Application and Infrastructure Architecture	Total Cost
2	Financial Model	Cash Flow	Cost of Borrowing	Total Cost
3	Non-Core Competency	Organizational Direction	Existing On-Premise Investment	Application Portfolio
4	Outsourcing	Organizational Direction	Application Architecture	Total Cost
5	Short Life Cycle Projects	Capacity Gap and Duration	Application Architecture and Integration Cost	Total Cost
6	Disaster Readiness	Degree of Business Continuity Desired	Recovery Time Objectives (RPO/RTO)	Total Cost
7	Massively Scalable Computing	Capacity Gap and Usage Pattern (s)	Application and Infrastructure Architecture	Total Cost
8	Infrastructure Consolidation	Existing Footprint	Economies of Shared Infrastructure	Total Cost
9	Universal Access	Number of Devices	Application Portability	Total Cost
10	Data Center Real Estate/Capacity Management	Existing Footprint	Organizational Direction	Also relates to #3 and #4



Total Cost of Ownership – Page 1

For a Business evaluating a move to Cloud

	Cost Item	Category	On Premise (Private Cloud)	Public Cloud	Hybrid Cloud
1	Server Hardware	Infrastructure	Y	Usage Based	**
2	Storage Hardware	Infrastructure	Y	Usage Based	**
3	Security Hardware	Infrastructure	Y	Usage Based	**
4	Security Software Licensing	Software	Y	Usage Based	**
5	Security Software Maintenance	Software	Y	Usage Based	**
6	Networking Hardware	Infrastructure	Y	Usage Based	**
7	Networking Software	Infrastructure	Y	Usage Based	**
8	Datacenter Facility	Facility	Y	Usage Based	**
9	Utilities and Power	Facility	Y	Usage Based	**
10	Data Transfer	Infrastructure	N	Y**	**
11	Server Software Licensing	Infrastructure	Y	**	**
12	Server Software Maintenance	Software	Y	**	**
13	Dev Platform Licensing	Software	Y*	Y *	**
14	Dev Platform Maintenance	Software	Y*	Y*	**

Open Source Products typically do not carry licensing costs

*** Depends on Configuration*



Total Cost of Ownership – Page 2

For a Business evaluating a move to Cloud

	Cost Item	Category	On Premise (Private Cloud)	Public Cloud	Hybrid Cloud
15	Applications Licensing	Software	Y	Usage Based **	**
16	Applications Maintenance	Software	Y	Usage Based **	**
17	Data Center Staff	People	Y	N	**
18	Server Administration	People	Y	N	**
19	Network Administration	People	Y	N**	**
20	Security Administration	People	Y	N**	**
21	Storage Administration	People	Y	N**	**
22	Platform (Database, Middleware Administration)	People	Y	Y	Y
23	Application Developer(s) – several technologies	People	Y	Y	Y
24	Project Management	People	Y	Y	Y
25	Architecture - Infrastructure	People	Y	N*	**
26	Architecture - Technology	People	Y	N*	**
27	Architecture - Application	People	Y	Y	**

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Total Cost of Ownership – Page 3

For a Business evaluating a move to Cloud

	Cost Item	Category	On Premise (Private Cloud)	Public Cloud	Hybrid Cloud
28	Architecture Integration and Middleware	People	Y	Y	**
29	Architecture – Cloud	People	Y	Y	Y
30	Architecture - Enterprise	People	Y	Y	**
31	Operations (IT, Business etc.)	People	Y	Y**	**
32	Cloud Integration	People/Software	N	N**	Y
33	Testing Software (Licensing)	Software	Y	Usage Based**	**
34	Testing Software (Maintenance)	Software	Y	Usage Based**	**
35	Testing Life Cycle (Project)	People	Y	Y	**
36	Business Process Engineers/Analysis	People	Y	Y	Y
27	Architecture – Application	People	Y	Y	**
28	Architecture Integration and Middleware	People	Y	Y	**
29	Architecture – Cloud	People	Y	Y	Y
30	Architecture – Enterprise	People	Y	Y	**

Open Source Products typically do not carry licensing costs

*** Depends on Configuration*



Use Cases



AT&T helps large Municipality with Data Archiving

Business Challenge

- Like most municipalities, this city is required to oversee mountains of data, everything from municipal records to data storage
- In house data solutions can be costly to agencies that may require additional hardware or physical real estate space necessary to maintain archived records
- IT resources needed to monitor and maintain equipment taking time away from more strategic projects and initiatives



Enabled Solution

- AT&T Synaptic Storage as a ServiceSM

Value Delivered

- Provides a seamless way to retain and archive data housed in a highly reliable AT&T data centers that can be accessed at any time
- Improves total cost of ownership by not having to pay unnecessary capital costs for additional hardware, upgrades, real estate expansion and IT resources.
- Flexible and scalable solution allowing agencies to scale up or down, depending on data size
- A pay-as-you-go service providing data storage “in the cloud” that allows agencies to have complete control over how and when they use it and pay only for the amount of storage needed



AT&T helps local School Districts with Archiving Records

Business Challenge

- The state board of education requires school districts to retain student transcripts, health and immunization records for 60 years after students attendance
- School districts are also required to retain budget, financial, and other selected records for 10 years
- Capital budgets to fund additional equipment for the purchase of SAN, NAS, or Tape Storage are constrained
- Retrieval of records stored on tape is expensive and does not allow the School District to respond to parent or other requestors in a timely manner

Enabled Solution

- AT&T Synaptic Storage as a ServiceSM

Value Delivered

- Data Archival and data storage in geo-diverse locations
- Reduced total cost of ownership versus in house solutions
- Lower latency data access than tape options
- Ability to scale storage up or down on demand to accommodate data aging, retention, and deletion rules
- Pay only for the amount of storage used, always right sized, minimizing cost of ownership
- Integration with current archiving and back up tools to minimize costs
- Security, audit, and retention policies to meet compliance requirements



AT&T helps School Districts prepare Disaster Recovery Planning

Business Challenge

- School districts must have a recovery plan in place in the event of a severe storm, fire, or another emergency that could cause the districts' computers to be inaccessible, or records to be destroyed
- Capital expense associated with building a duplicate data center in a local bunker or in another region of the country was not financially feasible
- Paying for Disaster Recovery services and then competing for the use of resources in the event of an emergency does not seem operationally or financially prudent

Enabled Solution

- AT&T Synaptic Compute as a ServiceSM
- AT&T Synaptic Storage as a ServiceSM

Value Delivered

- Off site location allows for geographic diversity
- Inexpensively stores critical data while still making it available in a matter of minutes to internet enabled recovery sites and end users with appropriate security authorizations
- Easy and inexpensive to conduct regular tests of the disaster plan
- Meet other temporary needs during non-disaster times for special projects, test and development work, financial closeout periods, payroll processing or other computing capacity needs
- Avoid capital Investment while minimizing risks from disasters, weather, and emergencies



AT&T helps world's leading provider of Integrated Logistics with the flexibility to meet business demands

Business Challenge

- Rolling out a new global print application for end of month bookings and needed to scope dedicated hardware into their existing infrastructure
- They had capital expenditure, along with staff and supporting cost concerns and needed to be able to leverage flexible scalability for the print and other similar applications



Enabled Solution

- AT&T Synaptic Compute as a ServiceSM

Business Value Delivered

- Flexibility & scalability to support their new global print application along with other similar applications in the same environment
- Capability to scale up or down instantly over a web interface and turn off resources when not in use – giving them the flexibility to utilize the global print application for 10 days out of the month as they need
- Cost effective solutions with rapid provisioning
- Controlled costs and reduced capital expenditures by buying only those computing resources that were needed
- Reduced capital investments by procuring computing capacity as a service rather than buying equipment



AT&T helps Insurance Providers with Testing and Development

Business Challenge

- Customer is a leading provider of customized, innovative, reinsurance and insurance solutions
- Needed a place without investing more hardware for testing and developing their applications

Enabled Solution

- Synaptic Compute as a ServiceSM

Business Value Delivered

- Confidence in a trusted provider
- Leveraged existing applications for both production & for testing and development
- Reduction of capital expense investments for customer's seasonal needs, (analytical reports/research) by procuring computing capacity as a service rather than buying equipment
- Leveraged existing relationship to provide better overall value
- Additional security by leveraging their existing AVPN network
- Cost effective with rapid provisioning



AT&T alleviates a Leading Expense and Travel Management Provider's Storage Concerns

Business Challenge

- A leading expense and travel management provider for Fortune 500 and 1000 companies, required increased space and power to support their continuously growing SAN environment

Enabled Solution

- AT&T Synaptic Storage as a ServiceSM

Business Value Delivered

- Strategic relationship that will enable their business to grow and remain a leader in their industry.
- Leverage multiple services to meet their needs
- A true enterprise grade pay-per-use environment that allows for storage of fax images, internal documents, and flat files
- Low-cost alternative to in-house data storage with the ability to expand as their business and storage needs grow
- Maintain control of storage management without the worry of expanding hardware and data center space



AT&T helps a global Automation and Information Solution company streamline Test and Development processes

Business Challenge

- Increasing demands to streamline test and development processes
- Lengthy procurement processes for resources
- Limited IT resources

Enabled Solution

- Synaptic Compute as a ServiceSM

Business Value Delivered

- Streamlined technology processes for “right sizing” customer’s test server infrastructure to one that could be easily and quickly scaled up/down as needed
- Reduced IT capital expenditures for additional server infrastructure
- Eliminated a lengthy procurement process for new resources
- Improved IT productivity and lead time to end user customers
- Increased revenues by improving time to market for new applications



Next Steps

How can AT&T help you launch your enterprise into the cloud?



Identify cloud adoption strategies and tactics.



Determine the need for cloud networking or internetworking.



Establish application requirements for movement to the cloud.



Assess your current state.



MOBILIZING
YOUR
WORLDSM

