Your First Step to Cloud Computing

Building a sustainable future

IBM Cloud Computing Laboratories around the world
Agenda

Recap the basic and types of Cloud Computing

Architecture and building blocks for public and private clouds

Private cloud implementation examples

Quickstart your cloud project with CloudBurst
Type of Clouds – Delivery and Service Models

- **Private Clouds**
  (data center - Intranet)

- **Hybrid Clouds**
  (public and private)

- **Public Clouds**
  (provider – Internet)


**‘Services’ as a service**

- **Software as a service**
  (people collaboration, business processes and application)

- **Platforms as a service**
  (optimized middleware – application servers, database servers, portal servers, etc.)

- **Infrastructure as a service**
  (virtualized servers, storage, networking)
Cloud Computing Concerns

**Less Control**
Many companies and governments are **uncomfortable** with the idea of their information located on **systems they do not control**. Providers must offer a high degree of security transparency to help put customers at ease.

**Compliance**
Complying with SOX, HIPPA and other **regulations may prohibit** the use of clouds for some applications. Comprehensive auditing capabilities are essential.

**Reliability**
High availability will be a key concern. IT departments will worry about a **loss of service** should outages occur. Mission critical applications may not run in the cloud without strong availability guarantees.

**Data Security**
Migrating workloads to a **shared network and compute infrastructure** increases the potential for **unauthorized exposure**. Authentication and access technologies become increasingly important.

**Security Management**
Providers must supply easy, visual controls to **manage firewall and security settings** for applications and runtime environments in the cloud.
The future: Three co-existing delivery models

- High risk and migration cost
  - Mission critical
  - Packaged applications
  - High compliance

- Standarized for cloud
  - Test systems
  - Pre-production
  - Developer platform

- New SaaS workloads
  - High volume, low cost analytics
  - Collaborative business networks
  - Industry scale “smart” applications

Typical workloads migrating to cloud today:
What is the industry definition?

- **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**.

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*This definition is from the latest draft (v15) of the NIST Working Definition of Cloud Computing published by the U.S. Government's National Institute of Standards and Technology*
Architectural Model for Cloud Computing

Service Request & Operations

End User Requests & Operators

... Service Catalog Request UI Operational UI

IT Infrastructure & Application Provider

Access Services

Datacenter Infrastructure

Cloud Administrator

Virtual Image Management

Service Catalog, Component Library

Design & Build

Image Library (Store)

Deployment

Operational Lifecycle of Images

Service Management

Standards Based Interfaces

Service Catalog, Component Library

Service Catalog, Component Library

Service Creation & Deployment

Virtualized Infrastructure

Service Management

Standards Based Interfaces

Service Oriented Architecture

Information Architecture

Standards Based Interfaces

Virtualized Infrastructure
Key building blocks of Clouds are familiar…

**Simplification/Consolidation**
- Consolidation, systems management, and monitoring
- Reduce infrastructure complexity, staffing requirements, and costs
- Improve business resilience and utilization

**Advanced Virtual Resource Pools**
- Remove physical resource boundaries
- Allocate less than physical boundary
- Improve scalability, increase utilization
- Reduce hardware costs

**Advanced Service Management**
- Service catalog, metering, and automated deployment of virtualized resources
- Integrated virtualization management with IT processes
- Reduce overhead, improve productivity

**User Self Service**
- Centralized, robust, self serve portal for 24X7 access to tools, information, IT and business services
- Improve user satisfaction & productivity
- Control and manage delivery, support & administrative costs
A **Dynamic Infrastructure** provides the foundation for efficient delivery of cloud based services

Effective Cloud Computing deployment is built on a **highly optimized** dynamic infrastructure ….

**Cloud Services Delivery**
- Elastic Scaling
- Rapidly provisioned
- Flexible pricing
- Ease of use
- Standardized offerings

...leveraging virtualization, energy efficiency, standardization and automation to **free up operational budget for new investment**.
Dynamic Infrastructure – the technologies are there from IBM
China Cloud Center for Software Development and Testing

China Cloud Computing Center

- Built by IBM for municipal government of Wuxi, China
- Accelerates transformation to a service-led economy

Enabling Features

- Public cloud: Access through internet or secure connection
- Promotes software start-up company growth
- Accelerates development and test cycles through quick resource on-boarding
- Offers secure, network isolated environments
- Delivers backup/restore capabilities to protect customer assets
IBM Internal Deployment Experiences
Technology Adoption Program (TAP) Cloud Deployment

What is TAP?

• Prototype and deploy new IBM technologies with 100,000 early adopters who will test-drive and provide feedback on new applications
• Based on their feedback, IBM decides which of the many new technology applications to move into production

Solution

• Tivoli Provisioning Manager:
  • Automated provisioning of Servers, Operating Systems and Middleware and Storage.
• IBM Tivoli Monitoring:
  • Integrated monitoring of performance and availability
• WebSphere Portal and Process Server:
  • Centralized, standard, and reliable interface

Solution Benefits

• Reduce system admin install and configuration time of TAP solutions from 3 to 5 days to less than an hour
• Projects can start immediately
• Lowers costs in hardware (4:1) and administration (7:1)
• Dramatic labor (-80.7%) and capital depreciation (-91.6%) savings
• Enable 25,000 IBM innovators to quickly and easily prototype and deploy new technologies for 100,000 early adopters

Pain Points

• Responding to rapidly changing business needs is difficult
• Deployment of infrastructures is mostly manual, slow, tedious, labor intensive, and error prone
• Servers are not available quickly and cost effectively for innovation
IBM CloudBurst

… Smart Business Systems, Pre-packaged Private Cloud Offering

✓ Integrates service management software system with hardware (network, servers, storage), and quickstart services as an integrated offering to deliver an internal private cloud

✓ Rapid implementation of a cloud environment
  • Takes the guesswork out of establishing a private cloud by pre-installing and configuring the necessary software on the hardware and leveraging services for customization to your environment

✓ With IBM CloudBurst, customers can
  • Deploy private cloud for new business initiatives
  • Enable rapid provisioning of resources for development and testing
  • Improve services …. improved time to value services delivered to end user, reduced human error due to automation and standardization
  • Reduce operational expenses …. 
    - Improve asset utilization and financial return
    - Reclaim capacity and unused compute power
    - Gain productivity through automation
    - Shift support resources from infrastructure maintenance to projects of innovation

Based on 100+ customer engagements
IBM CloudBurst at a Glance

- A **service delivery platform** that is pre-integrated at the factory
- A **Built-for-purpose** based on the architectural requirement of specific workloads
- Delivered and supported as a **single product**
- Prepackaged, pre-configured servers, storage, networking, software and installation services needed to stand up a **private cloud**

**QuickStart Services**

Deploy and integrate BladeCenter hardware in customer data center
- Configure local storage area network
- Configure users and security profiles
- Configuration and discovery of virtualized compute, network and storage resources
- Configure self-service portal

**On-site and hands-on platform training including topics like:**
- BladeCenter, local SAN and network switch management
- Administrator and user level training

**Cloud Software Configuration:**

- Systems Director 6.1.1 with BOFM, AEM; ToolsCenter 1.0; DS Storage Manager for DS4000 v10.36; VMware VirtualCenter 2.5 U4; LSI SMI-S provider for DS3400
- VMware ESXi 3.5 U4 hypervisor on all blades
- Tivoli Provisioning Manager v7.1
  - DB2 ESE 9.1; WAS ND 6.1.0.13; TDS 6.1.0.1
  - Special purpose customized portal and appliance wizard that enables client portal interaction
- Tivoli Monitoring v6.2.1 (OS pack)

**Base Hardware Configuration:**

- 1 x 42U equipment rack
- 1 x 3650M2 Systems Management Server
- 1 x HS22 cloud management blade server
- 1 x BladeCenter H chassis with redundant Ethernet and Fibre Channel switch modules
- 3 x managed HS22 blade servers
- DS3400 FC attached storage

Customer background:
Dongying is located in the central area of the Yellow River Delta and boasts rich oil and ecological resources and is home to China’s second largest oil field. Shengli Oilfield produced 26 million tons of crude oil per year.

Program mission:
Building cloud computing centre in Dongying economic development zone, providing advanced development / testing and e-government service platform, help its petroleum industry develop more innovative application services.

Solution:
- End-to-end IBM Cloud Computing Centre based on IBM cloud offerings
- IBM CloudBurst
- IBM hardware – System p and BladeCenter
- IBM software – Tivoli, Rational, WebSphere and DB2

IBM and Shandong Dongying Government signed the “Yellow River Delta Cloud Computing strategic cooperation agreement”. IBM is helping the Dongying government build a cloud that will provide software development and test resources for software startup companies via the web through a self-service user interface. In addition, this cloud will be expanded to also be an e-government services platform for the Dongying economic development zone as well as a Research and Development platform for eco-friendly oil cultivation.
IBM Cloud Offerings

- **Cloud Consulting**
  - Business Consulting for Cloud Computing
  - Infrastructure Consulting Services for Cloud Computing
  - Infrastructure strategy & planning for cloud computing
  - IT optimization services
  - Security and Resiliency Consulting

- **Cloud Implementation**
  - Tivoli Service Automation Manager
  - Service Management for Cloud Computing
  - IBM design & implementation for test environments
  - Virtual Infrastructure Access
  - Self-enablement portal
  - Scale out File Services
  - IBM security solutions for cloud computing

- **Cloud Delivered**
  - Computing on Demand (CoD)
  - LotusLive
  - Remote data protection services
  - Managed data protection for desktops and laptops
Thank you!