IBM DB2 for z/OS in the age of cloud computing

Reliability, availability, security and mobility

IBM

Contents

Highlights

- Highly virtualized server that supports mixed workloads
- Self-serving capabilities in private, membership or hybrid cloud environments
- Divisional support of responsibilities
- Customized implementations to suit your business
- Platform foundation services for cloud use cases

Introduction

What is cloud computing, and what is driving this market trend?

Cloud computing is a platform that allows on-demand, pay-for-use access to applications or computing resources, as services, from the Internet. The era of cloud computing is a paradigm shift that is occurring as the result of severe market competition and a dramatically changing business environment. Firms are being prompted to adopt various state-of-the-art information solutions to improve their business operations. The drivers for implementing cloud computing services are:

- Improve speed of business
- Reduce costs
- Improve customer communications
- Facilitate mobilization
- Manage the increase in the variety, velocity and type of data

IBM cloud computing is designed for business

Many industry-leading companies use IBM cloud computing. Why? With the IBM cloud, you can unlock more value in your business and in the technology you already have. The cloud can integrate enterprise-grade services and help speed up the way you innovate.

What is data as a service, and what are the drivers?

According to the analyst firm Ovum, data as a service (DaaS) is a natural and logical evolution of the as-a-service model.[1] As the volume, variety and complexity of data continue to increase, the skills that are necessary to master them become proportionally scarcer. Transferring the burden of data sourcing and management, and allowing users to focus on finding value in its use, require little endorsement for many organizations.

DaaS for business empowers businesses to use data as a standalone asset and to connect with partner data to make smarter decisions. IBM® DB2® for z/OS® DaaS is a service in the IBM cloud that is designed to offer variety, scale and connectivity. It includes cross-channel, cross-device, and known and anonymous data without compromising reliability, availability and security.

DB2 for z/OS

Many of the world's top banks, retailers and insurance providers store mission-critical operational data in IBM z Systems™ and DB2 for z/OS. DB2 for z/OS and z Systems are designed to handle rapidly changing, diverse and unpredictable workloads while maximizing resource utilization and investment. Simply put, DB2 for z/OS is among the most scalable, reliable and cost-effective data servers available.

The mainframe was originally designed to handle a complete range of applications, from small to large, both commercial and scientific. Virtualization of hardware and efficiency of operation have now become significant areas of impact in technology today.

IBM DB2 for z/OS includes a cloud solution that offers organizations the opportunity to remove expensive hardware and move to a responsive, virtual environment (Figure 1). With DB2 for z/OS on the cloud, you can reduce cost and complexity in your IT infrastructure, simplify compliance, and get the most out of your core asset—your data, without impacting security. By moving to the cloud, you can transform and adapt while limiting risk and cost to achieve agility and efficiency by standardizing best practices.
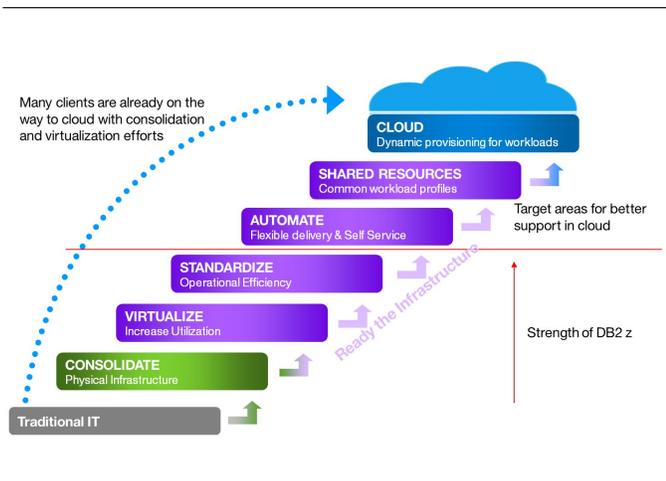
Figure 1: Movement from traditional DB2 for z/OS environments to the cloud.

Many enterprise companies consolidate their IT infrastructure, operating in a service-provider model for their business units. They already implemented methods to automate the delivery of IT solutions, mostly driven by the need to reduce the cost of the IT infrastructure.

IBM z Systems and the IBM products that run on these systems—including DB2 for z/OS—use cloud support. This support provides functionality for dynamic provisioning of IT solutions to potentially replace individual approaches and shift to a self-service mode of operation.

IBM DB2 for z/OS experts have prioritized the seamless transition of the solution to a cloud environment. In response to the growing demand for organizations to move to the cloud, IBM has placed essential focus on the technical support that is required to effect a successful transition. Although the technical hurdles must be cleared with efficiency and proficiency, a successful transition to the cloud has another essential requirement. That is, use deployment on the cloud as a way to improve the overall consumability of DB2 for z/OS for clients, from usability to functionality to access to performance.

Cloud configurations

Discussions about cloud often revolve around a public virtual space. Looking closer, other types of cloud configurations are possible:

- **The private cloud.** IT capabilities are provided as a service, over an intranet, within the enterprise and behind the firewall.
- **The hybrid cloud.** Internal and external service delivery methods are integrated.
- **The public cloud.** IT activities and functions are provided as a service over the Internet.

Whether your organization chooses a private, public or hybrid cloud, management and hosting options still remain open. Selecting a managed private cloud or hosted private cloud depends on your database management strategy and budgetary concerns. Consider both areas when making the best choice for your company.

Enhancements in DB2 for z/OS in support of cloud use cases focus on requirements from enterprises that support private and hybrid cloud configurations.

DB2 for z/OS cloud provisioning

DB2 can be provisioned as a software stack, and variations can be accommodated upon installation. The DB2 environment scope can include:

- A DB2 system
- Migration to a new version of a DB2 system
- A database in an existing DB2 system
- Access to an existing database in an existing DB2 system
- A copy of an existing database

Cloud infrastructure in IBM z Systems

The appropriate cloud infrastructure should be designed to support the division of responsibilities and the ability to customize implementation. The functionality that is needed in support of the public cloud is different from the functionality that is needed in support of a private or hybrid cloud.

Enterprises often report that they need the speed of self-service, but that they would not compromise operational efficiency. Essentially, they are accustomed to a highly customized environment.

Additionally, IBM z Systems environments are highly virtualized and shared. Many subject matter experts are involved in cloud service provisioning use cases to cover different aspects of system management, such as storage, networking and security.

The infrastructure for cloud use cases should be designed to seamlessly incorporate the separation of responsibilities.

IBM z/OS Management Facility

IBM z/OS Management Facility helps to improve the repeatability of tasks and improve efficiencies while saving time and workforce expenditures. z/OS Management Facility is also designed to use role-based assignments, creating clear workforce tasks while minimizing questions about who should perform which task.

z/OS Management Facility delivers the following features:

- Workflow capability that is designed to help improve the ability to repeat tasks:
  - Sequences the flow of tasks to manage the configuration of the system
  - Uses role-based assignments and issues notifications to alert users about their next steps in the process
  - Helps users simplify work through guided steps, assign responsibilities and track progress, all by using the workflows task
- A guided flow through the steps to accomplish a task:
  - XML metadata file that contains steps and details
  - Wizards to update and submit jobs and to execute shell scripts and REXX execs
  - Step features:
    - Manual or automated in a wizard
    - Dependency on other steps
    - Various stages until completion
    - Option to skip or override steps
  - History of all activities in the workflow task

DB2 and z/OS Management Facility

To help you understand how z/OS Management Facility works with DB2 for z/OS, assume that an application needs a function that is provided in the latest version of DB2. As a step of the application deployment, you need to migrate the existing DB2 system to that new version. Traditionally, this approach involves running many migration steps. For some of these steps, you must manually check or run them, which is a long and involved process.

Now, the migration steps can be expressed in customized z/OS Management Facility workflows, assigned to the responsible user ID and run automatically. Default z/OS Management Facility workflow artifacts for common DB2 provisioning use cases are introduced in DB2 11. You can customize them (for example: remove steps, add steps or change steps) to reflect the specific configuration of a DB2 system or group of systems that support similar workload characteristics.

Additional benefits and features

A redeployment of your existing DB2 for z/OS environment to the cloud or another space is a significant transition. IBM is prepared and equipped to help your organization undergo such an undertaking.

Beyond the redeployment, DB2 for z/OS provides additional features and benefits:

- Improved Java data access performance without changing code
- Custom-developed, framework-based or packaged application
- A bind tool
- Static SQL execution value to existing DB2 for z/OS applications
- More predictable and stable response times
- Limits on user access to tables by granting execute privileges on query packages
- Aid for forecasting accuracy and capacity planning
- Decreased CPU cycles to increase overall capability
- A choice between dynamic or static execution at deployment time

Why IBM?

IBM DB2 for z/OS teams have a long history, experience and technical expertise in working with physical and virtual DB2 for z/OS deployments, including transitions to public, private or hybrid cloud environments. IBM is committed to supporting the entire spectrum of DB2 for z/OS deployments and transitions, and IBM's cloud-focused strategies are custom-implemented for organizations that are looking to make that transition.

For more information

For more information about using IBM DB2 for z/OS in the cloud, see the following websites:

- IBM DB2 for z/OS: **ibm.com**/software/data/db2/zos/family
- IBM z/OS Management Facility: **ibm.com**/systems/z/os/zos/features/zosmf
- IBM cloud computing: **ibm.com**/cloud-computing/us/en

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1 Tom Pringle, "Data-as-a-service: the Next Step in the As-a-service Journey," Ovum, 18 July 2014, last accessed on 28 April 2015: http://www.ovum.com/research/data-as-a-service-the-next-step-in-the-as-a-service-journey

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