

IDERA®

SOLUTIONS FOR THE CLOUD

WHAT IS THE CLOUD?

The cloud delivers information technology as a service on demand, allowing users to only consume the capacity they need. The cloud is the infrastructure that the services run on. The cloud is a computing solution that provides shared resources over the Internet or on a private network. Computers in the cloud are configured to work together. The various applications use the collective computing power as if they are running on a single system. The flexibility of the cloud is a function of the allocation of resources on demand. This assignment of resources facilitates the use of the cumulative resources of the system, negating the need to assign specific hardware to a task. With the advent of the cloud, resources are used as an aggregated virtual computer. This amalgamated configuration provides an environment where applications execute independently without regard for any particular configuration. Users only access the resources that they need for a particular task. As such, users benefit from the flexibility, economies of scale, and optimized management of resources.

VIRTUALIZATION

One of the critical elements that makes the cloud work is virtualization to consolidate resources, and reduce space and energy consumption. The cloud involves three relevant concepts of virtualization: virtual machines, hypervisors, and containers.

- **Virtual machines** represent a logical part of a physical machine. Physical machines are divided into multiple parts to allow multiple tenants to share its resources.
- **Hypervisors** manage virtual machines. Hypervisors logically divide a physical machine into multiple virtual machines to provide platform virtualization. Hypervisors control and present the physical resources of a machine as virtual resources to the virtual machines. Hypervisors enable other software (that is, usually operating systems) to run concurrently, as though they had full access to the physical machine. Native, bare-metal, or type 1 hypervisors run directly on the physical hardware. Hosted or type 2 hypervisors require a host operating system to run.
- **Containers** are a lightweight alternative to full hardware virtualization. Instead of the platform virtualization that hypervisors provide, containers provide operating system-level virtualization. Containers enable a single machine or virtual machine to operate multiple instances of an operating system. Each container is isolated in its operating environment within the operating system. All containers share a host operating system and kernel. However, each container maintains its process and network space.

CLOUD BUILDING BLOCKS

The cloud concept consists of two building blocks: the front end and the back end. These two elements are connected through a network, in most cases the Internet.

- **The front end** is the vehicle by which the user interacts with the system. The front end is composed of a client computer or the computer network of an organization, and the applications used to access the cloud.
- **The back end** is the cloud itself. The back end provides the applications, computers, servers, and data storage that creates the cloud of services.

CLOUD LAYERS

The cloud concept is built on three layers: the bottom infrastructure layer, the middle platform layer, and the top application layer. Each layer provides a distinct level of functionality. This stratification of the components of the cloud provides a means for the layers of the cloud to become a commodity.

- **The bottom infrastructure layer** is the foundation of the cloud. This layer consists of the physical assets (for example, servers, network devices, storage disks). Users do not control the underlying infrastructure when using infrastructure as a service (IaaS). However, users can control the operating systems, storage, deployment applications, and (to a limited degree) select networking components.
- **The middle platform layer** provides the application infrastructure. Platform as a service (PaaS) provides access to operating systems and associated services. This layer provides a way to deploy applications to the cloud using programming languages and tools supported by the cloud provider. Users do not control the underlying infrastructure. However, users control the deployed applications and (to some degree) the configurations of the application hosting environment.
- **The top application layer** runs applications and provides these applications to the users on demand.

CLOUD SERVICE DELIVERY MODELS

The cloud concept offers three service delivery models: infrastructure as a service, platform as a service, and software as a service. These models determine the levels of sharing and possible multiple-tenancy that a cloud provider offers its tenants. At each level in the stack, tenants share components that are part of that delivery model.

- **Infrastructure as a service (IaaS)** is at the lowest layer. At this level, tenants share infrastructure resources (for example, processors, network, storage, and the operating system). Tenants install their middleware components and applications. This setup gives tenants flexibility. However, this setup also makes configuration and maintenance more difficult, especially in organizations with many applications.
IaaS provides tenants with shared computing capacity, network-accessible storage, and an operating system. Tenants must install, configure, manage, and maintain everything else separately.
- **Platform as a service (PaaS)** is a layer above IaaS. PaaS builds upon IaaS to deliver progressively more business value by simplifying at the platform level and saving significant time, effort, and resources. PaaS provides tenants with middleware components, databases, storage, connectivity, reliability, caching, monitoring, and routing. Tenants continue to use their applications. However, tenants can use shared middleware services, such as monitoring, security, and databases, and patterns of expertise for transaction-oriented web and database applications.

- **Software as a service (SaaS)** is a layer above PaaS. With SaaS, tenants use and share everything that they might share in an IaaS and PaaS solution, plus an application. In this case, all tenants share the same application. However, all tenants can keep their data isolated. With SaaS, new tenants are added easily because tenants just select and customize a cloud application without worrying about building the middleware and installing the application.
- **Database as a Service (DBaaS)** is a sub-variety of PaaS (or SaaS, depending on perspective). The same PaaS principles regulate DBaaS. DBaaS delivers the typical functionalities of a database management system in the cloud.

CLOUD DEPLOYMENT MODELS

The cloud concept offers four deployment models: public cloud, private cloud, hybrid cloud, and community cloud.

- **Public clouds** are available to the general public or a large group. Public clouds are owned, managed, and operated by an organization selling cloud services. Public clouds dynamically provision resources over the Internet using web applications from an off-site third-party provider. The provider supplies shared resources and bills by utility computing (that is, a pay-as-you-go pricing model). A primary reason that organizations move to public clouds is to replace their capital expenses with operating expenses while minimizing these operational expenses.
- **Private clouds** are deployed for the exclusive use of an organization. That is, the private cloud is dedicated and isolated for that organization. The organization or a third party owns, manages, and hosts the private cloud. The location of the infrastructure of a private cloud is on-premises or off-premises. A third party controls a managed private cloud. A hosted private cloud is hosted and operated off-premises.
- **Hybrid clouds** are a combination of public and private clouds. Hybrid clouds use services that are in both the public and private space. The public cloud provider and the organization divide the responsibility of managing the hybrid cloud. By using a hybrid cloud, organizations can determine the objectives and requirements of the services to be created and have the flexibility to obtain these services based on the most suitable methodology.
- **Community clouds** are deployed for the exclusive use of a community, which is a group of people from different organizations that share a common interest or mission (for example, vertical markets and academic institutions). One or more members of the community, a third party, or a combination of both own, manage and host community clouds. Community clouds exist on-premises of one of the parties that are involved or off-premises for everyone.

CLOUD PROVIDERS

For public clouds, for IaaS and DbaaS, the leading mature cloud providers are Amazon Web Services, Microsoft Azure, and Google Cloud Platform.

SERVICE DELIVERY MODEL	IaaS	IaaS	PaaS (DbaaS)
FUNCTION	compute	storage	databases
OFFERING	virtual machines	object storage	relational databases
AMAZON WEB SERVICES (AWS)	Amazon Elastic Compute Cloud (EC2) <ul style="list-style-type: none"> • Microsoft • Windows • Linux 	Amazon Simple Storage Service (S3)	Amazon Relational Database Service (RDS) <ul style="list-style-type: none"> • Microsoft SQL Server • Oracle Database • MariaDB • MySQL • PostgreSQL
MICROSOFT AZURE	Azure Virtual Machines <ul style="list-style-type: none"> • Microsoft Windows • Linux • Microsoft SQL Server • Oracle software • IBM software • SAP HANA 	Azure Blob Storage	SQL Database Azure Database for MySQL Azure Database for PostgreSQL
GOOGLE CLOUD PLATFORM (GCP)	Google Compute Engine <ul style="list-style-type: none"> • Microsoft Windows • Linux 	Google Cloud Storage	Google Cloud SQL <ul style="list-style-type: none"> • PostgreSQL • MySQL

For Microsoft Windows, cloud storage can be mapped as a network drive or a removable drive via third-party software (for example, [CloudBerry Drive](#) and [Mountain Duck](#) for Amazon S3, Microsoft Azure, and Google Cloud). Network drives are available to other computers in the local network. Removable drives are available only to users of the local system. Microsoft Windows sends fewer requests to network drives, and Microsoft Windows is more tolerant of delays for network drives.

IDERA'S PRODUCTS

Most of IDERA's products can run on cloud virtual machines, support database instances on cloud virtual machines, and can access mapped cloud drives. Several of IDERA's products support cloud databases.

DATABASE MANAGEMENT

Monitoring and Performance

- **SQL Diagnostic Manager for SQL Server** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It supports Microsoft Azure SQL Database. It can access mapped cloud drives.
- **SQL Diagnostic Manager for MySQL** runs on cloud virtual machines with Microsoft Windows and Linux. It supports MySQL and MariaDB instances on cloud virtual machines. It supports Amazon RDS for MySQL, MariaDB, and Amazon Aurora. It supports Google Cloud SQL for MySQL and Oracle MySQL Cloud Service.
- **SQL Inventory Manager** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It supports Amazon RDS for SQL Server and Microsoft Azure SQL Database. It can access mapped cloud drives.
- **SQL Doctor** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It supports Amazon RDS for SQL Server and Microsoft Azure SQL Database.
- **SQL Defrag Manager** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **DB Optimizer** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **Precise for Databases** (Oracle, Sybase, SQL Server, DB2) runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.

Backup and Administration

- **SQL Safe Backup** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases. It supports Amazon S3 and Microsoft Azure Blob Storage.
- **SQL Enterprise Job Manager** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **SQL Admin Toolset** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **DBArtisan** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It supports Azure SQL Database.

Security and Compliance

- **SQL Compliance Manager** runs on cloud virtual machines with Microsoft Windows. It supports Microsoft SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **SQL Secure** runs on cloud virtual machines with Microsoft Windows. It supports SQL Server instances on cloud virtual machines. It can access mapped cloud drives. It supports Microsoft Azure SQL Database.

Data Modeling and Architecture

- **ER/Studio Data Architect** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It supports data modeling operations for Microsoft Azure SQL Database and SQL Server on cloud virtual machines (such as Microsoft Azure VM) as well as other cloud-hosted platforms.
- **ER/Studio Business Architect** runs on cloud virtual machines with Microsoft Windows. It can access mapped cloud drives.
- **ER/Studio Enterprise Team Edition** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It supports data modeling operations for Microsoft Azure SQL Database and SQL Server on cloud virtual machines (such as Microsoft Azure VM) as well as other cloud-hosted platforms.

Development

- **Aqua Data Studio** runs on cloud virtual machines with Microsoft Windows, Linux, and macOS. It supports database instances on cloud virtual machines. It supports connections to and SQL operations on cloud platforms (Amazon Redshift, Google BigQuery, Azure SQL Database) as well as MySQL and PostgreSQL databases connected through Amazon (AWS) Aurora and Google SQL Cloud.
- **Rapid SQL** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.
- **DB Change Manager** runs on cloud virtual machines with Microsoft Windows. It supports database instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases.

Infrastructure Performance

- **Uptime Infrastructure Monitor** runs on cloud virtual machines with Microsoft Windows, Linux, and Unix. It can monitor cloud virtual machines, and databases on cloud virtual machines. It does not support cloud databases or cloud storage.

Application Performance

- **Precise for Applications** (SAP, PeopleSoft, Oracle E-Business Suite, .NET, Java/J2EE) runs on cloud virtual machines with Microsoft Windows. It supports instances on cloud virtual machines. It can access mapped cloud drives. It does not support cloud databases or cloud storage.

		Run on cloud VMs	Support cloud VMs	Support DBs on cloud VMs	Mapped cloud drives	Support cloud storage
DATABASE MANAGEMENT	MONITORING & PERFORMANCE					
	SQL Diagnostic Manager for SQL Server	MW	n/a	MSS	yes	n/a
	SQL Diagnostic Manager for MySQL	MW & L	n/a	yes	yes	n/a
	SQL Inventory Manager	MW	n/a	MSS	yes	n/a
	SQL Doctor	MW	n/a	MSS	yes	n/a
	SQL Defrag Manager	MW	n/a	MSS	yes	n/a
	DB Optimizer	MW	n/a	various	yes	n/a
	Precise for Databases	MW	n/a	various	yes	n/a
	BACKUP & ADMINISTRATION					
	SQL Safe Backup	MW	n/a	MSS	yes	AS3 & MABS
	SQL Enterprise Job Manager	MW	n/a	MSS	yes	n/a
	SQL Admin Toolset	MW	n/a	MSS	yes	n/a
	DBArtisan	MW	n/a	MSS	yes	n/a
	SECURITY & COMPLIANCE					
	SQL Compliance Manager	MW	n/a	MSS	yes	n/a
SQL Secure	MW	n/a	MSS	yes	n/a	
DATABASE DEVELOPMENT	DATA MODELING & ARCHITECTURE					
	ER/Studio Data Architect	MW	n/a	various	yes	n/a
	ER/Studio Business Architect	MW	n/a	n/a	yes	n/a
	ER/Studio Enterprise Team Edition	MW	n/a	various	yes	n/a
	DEVELOPMENT					
	Aqua Data Studio	various	various	various	yes	no
	Rapid SQL	MW	n/a	various	yes	n/a
DB Change Manager	MW	n/a	various	yes	n/a	
IT MANAGEMENT	INFRASTRUCTURE PERFORMANCE					
	Uptime Infrastructure Monitor	various	various	various	n/a	no
	APPLICATION PERFORMANCE					
Precise for Applications	MW	yes	various	yes	no	

SUMMARY

Accessing your databases and applications in the cloud has become easy to do, with multiple options available for selection based on your specific needs. Whatever the cloud configuration, IDERA provides a wide range of database tools to help you manage and monitor your environment.

[LEARN MORE](#)

IDERA understands that IT doesn't run on the network – it runs on the data and databases that power your business. That's why we design our products with the database as the nucleus of your IT universe.

Our database lifecycle management solutions allow database and IT professionals to design, monitor and manage data systems with complete confidence, whether in the cloud or on-premises.

We offer a diverse portfolio of free tools and educational resources to help you do more with less while giving you the knowledge to deliver even more than you did yesterday.

Whatever your need, IDERA has a solution.

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