Core Cloud Services - Cloud Storage Options

Types of data

There are three primary types of data that Azure Storage is designed to hold.

1. **Structured data**. Structured data is data that adheres to a schema, so all of the data has the same fields or properties. Structured data can be stored in a database table with rows and columns. Structured data relies on keys to indicate how one row in a table relates to data in another row of another table. Structured data is also referred to as *relational data*, as the data's schema defines the table of data, the fields in the table, and the clear relationship between the two. Structured data is straightforward in that it's easy to enter, query, and analyze. All of the data follows the same format. Examples of structured data include sensor data or financial data.
2. **Semi-structured data**. Semi-structured data doesn't fit neatly into tables, rows, and columns. Instead, semi-structured data uses *tags* or *keys* that organize and provide a hierarchy for the data. Semi-structured data is also referred to as *non-relational* or *NoSQL* data.
3. **Unstructured data**. Unstructured data encompasses data that has no designated structure to it. This lack of structure also means that there are no restrictions on the kinds of data it can hold. For example, a blob can hold a PDF document, a JPG image, a JSON file, video content, etc. As such, unstructured data is becoming more prominent as businesses try to tap into new data sources.

Blob storage

Cloud Blob Storage is *unstructured*, meaning that there are no restrictions on the kinds of data it can hold. Blobs are highly scalable and apps work with blobs in much the same way as they would work with files on a disk, such as reading and writing data. Blob Storage can manage thousands of simultaneous uploads, massive amounts of video data, constantly growing log files, and can be reached from anywhere with an internet connection.

Blobs aren't limited to common file formats. A blob could contain gigabytes of binary data streamed from a scientific instrument, an encrypted message for another application, or data in a custom format for an app you're developing.

Cloud Blob storage lets you stream large video or audio files directly to the user's browser from anywhere in the world. Blob storage is also used to store data for backup, disaster recovery, and archiving. It has the ability to store up to 8 TB of data for virtual machines. The following illustration shows an example usage of Azure blob storage.

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Azure Queue

Azure Queue storage is a service for storing large numbers of messages that can be accessed from anywhere in the world.

Azure Queue Storage can be used to help build flexible applications and separate functions for better durability across large workloads. When application components are decoupled, they can scale independently. Queue storage provides asynchronous message queueing for communication between application components, whether they are running in the cloud, on the desktop, on-premises, or on mobile devices.

Typically, there are one or more sender components and one or more receiver components. Sender components add messages to the queue, while receiver

components retrieve messages from the front of the queue for processing. The following illustration shows multiple sender applications adding messages to the Azure Queue and one receiver application retrieving the messages.

Storage tiers

Cloud offers three storage tiers for blob object storage:

1. **Hot storage tier**: optimized for storing data that is accessed frequently.
2. **Cool storage tier**: optimized for data that are infrequently accessed and stored for at least 30 days.
3. **Archive storage tier**: for data that are rarely accessed and stored for at least 180 days with flexible latency requirements.

Comparison between Cloud Data Storage and On-Premises Storage

Cost effectiveness

An on-premises storage solution requires dedicated hardware that needs to be purchased, installed, configured, and maintained. This requirement can be a significant up-front expense (or capital cost). Change in requirements can require investment in new hardware. Your hardware needs to be capable of handling peak demand, which means it may sit idle or be under-utilized in off-peak times.

Azure data storage provides a pay-as-you-go pricing model, which is often appealing to businesses as an operating expense instead of an upfront capital cost. It's also scalable, allowing you to scale up or scale out as demand dictates and scale back when demand is low. You are charged for data services only as you need them.

Reliability

On-premises storage requires data backup, load balancing, and disaster recovery strategies. These requirements can be challenging and expensive as they often each need dedicated servers requiring a significant investment in both hardware and IT resources.

Azure data storage provides data backup, load balancing, disaster recovery, and data replication as services to ensure data safety and high availability.

Storage types

Sometimes multiple different storage types are required for a solution, such as file and database storage. An on-premises approach often requires numerous servers and administrative tools for each storage type.

Azure data storage provides a variety of different storage options including distributed access and tiered storage. This variety makes it possible to integrate a combination of storage technologies providing the best storage choice for each part of your solution.

Agility

Requirements and technologies change. For an on-premises deployment, these changes may mean provisioning and deploying new servers and infrastructure pieces, which are a time consuming and expensive activity.

Azure data storage gives you the flexibility to create new services in minutes. This flexibility allows you to change storage back-ends quickly without needing a significant hardware investment.