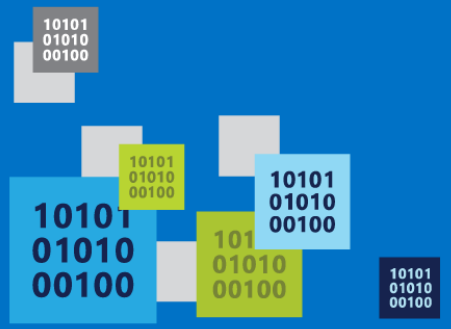
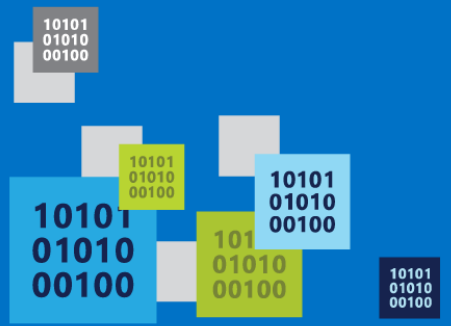
Microsoft Storage Explorer 설치
무료 저장소 개발 / 디버깅 도구
http://storageexplorer.com/



Azure 데이터 저장소 (Data Storage)

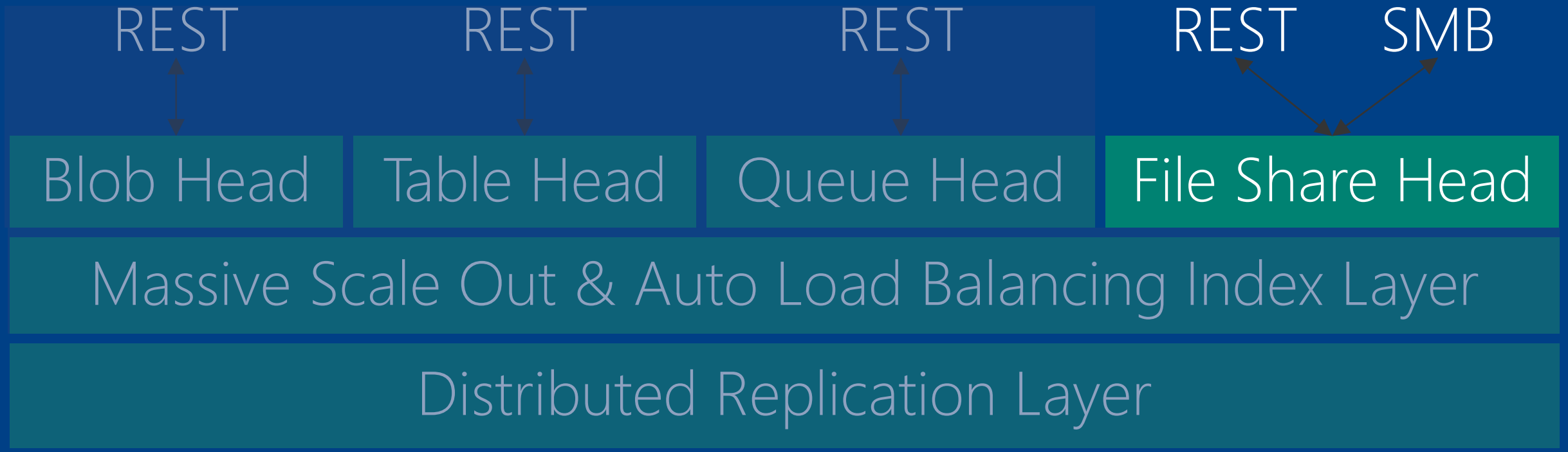
Dae Woo Kim (daewoo.kim@)
Technology Evangelist
Microsoft Korea

https://aka.ms/azure-camp-jun

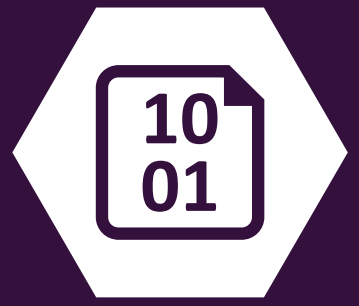


목차

Azure 저장소 아키텍처



Blobs



Microsoft Azure
Storage Blob

두가지 종류의 Blob

Block Blob

Page Blob

Block Blob

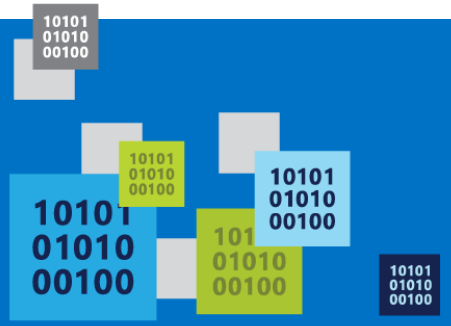
스트리밍 작업(streaming workloads)에 적합

개별 blob은 연속적인 block들로 구성됨

개별 block은 block id로 식별됨

Blob당 200GB 크기 제한

Etags 를 통해 Optimistic Concurrency 구현



Page Blob

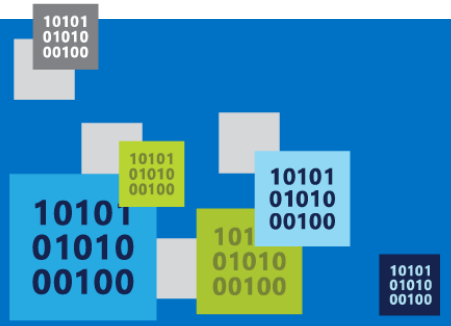
랜덤 (random read/write workloads) 작업에 적합

개발 blob은 page의 배열로 구성

개별 page는 blob의 시작부터 offset으로 식별됨

Blob당 1TB 크기 제한

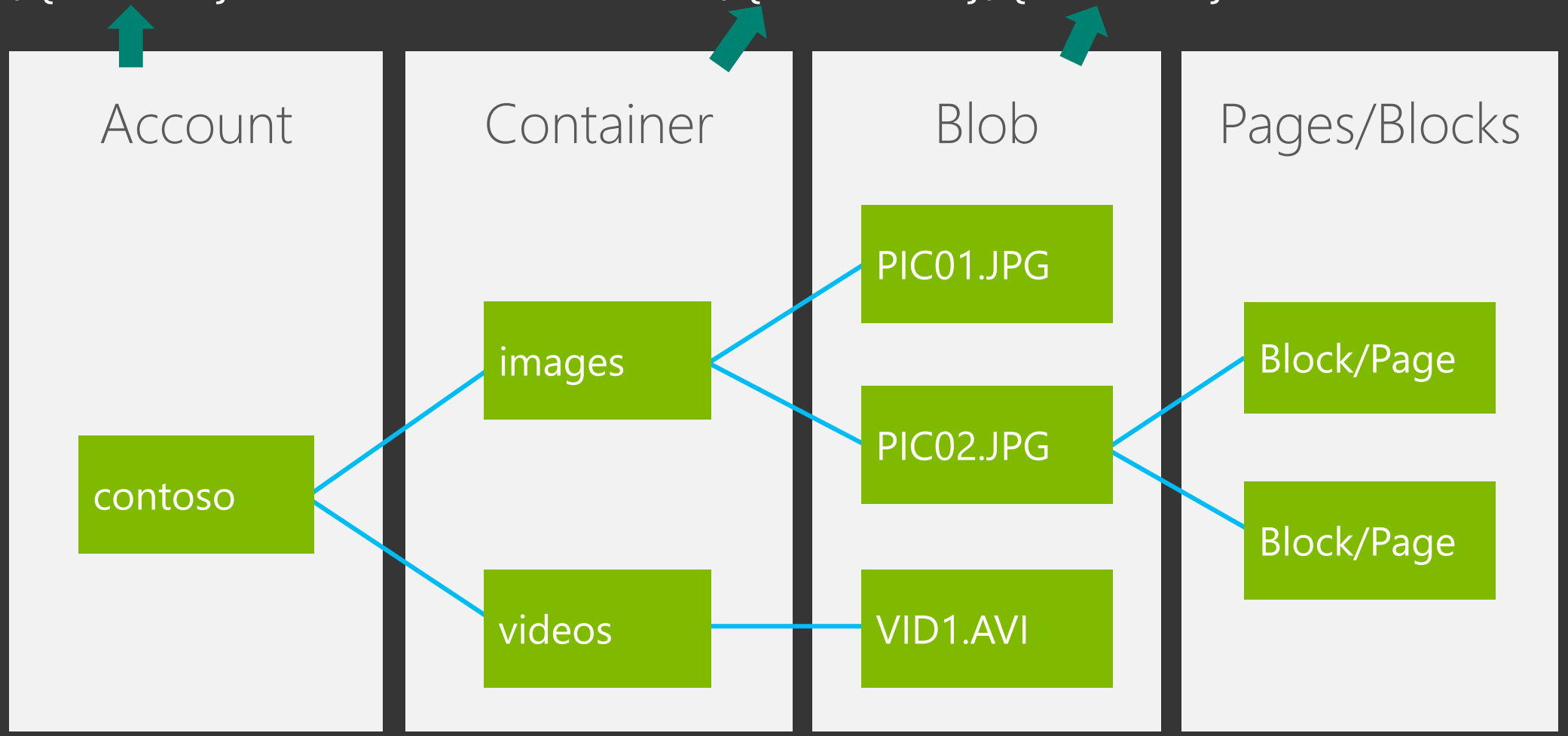
Lease를 통해 Optimistic 또는 Pessimistic (locking) concurrency 구현됨



Blob 저장소 구조

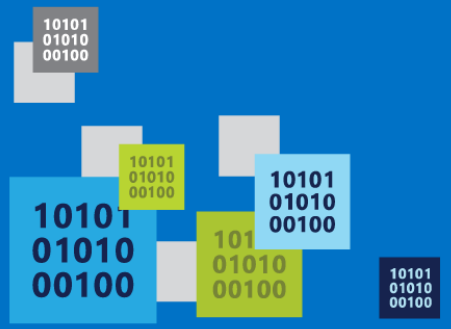
Microsoft Azure

`http://{account}.blob.core.windows.net/{container}/{blobname}`



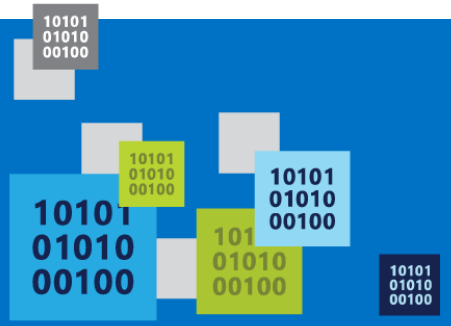
Microsoft

Demo: blob과 통합



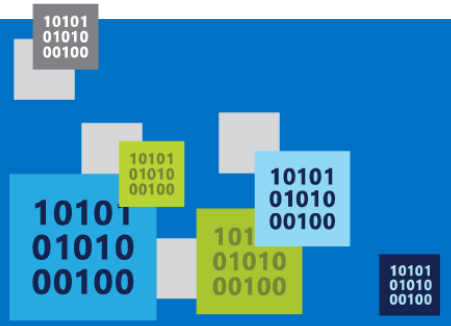
Containers

- 계정(Account) 당 여러개의 Container
- 특수 목적의 $root container



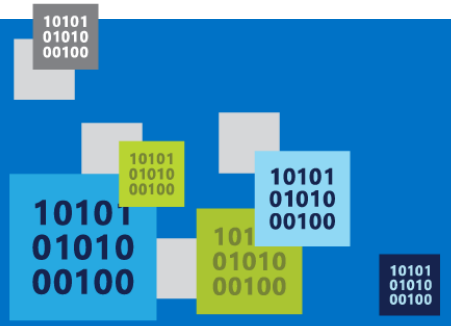
Containers

- Container는 여러 세트의 blob을 보관
- 접근 정책(access policies)은 container 레벨로 제공
- Container와 함께 metadata가 보관됨
- Blob들의 목록이 container에 존재



대역폭(Throughput)

- 파티션당 제공
- Blob당 60MB/s 제공



PutBlob

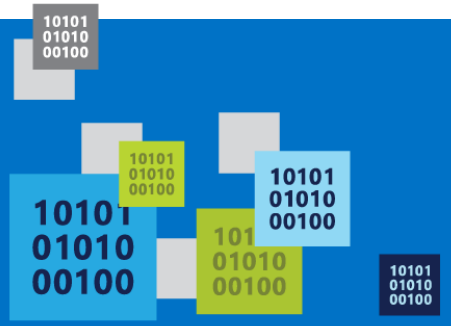
GetBlob

DeleteBlob

CopyBlob

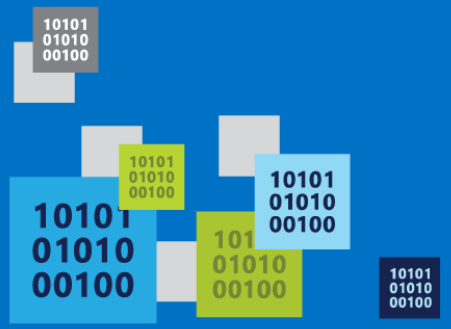
SnapshotBlob

LeaseBlob



Blob Details – Main Web Service Operations

Demo: blob 저장소

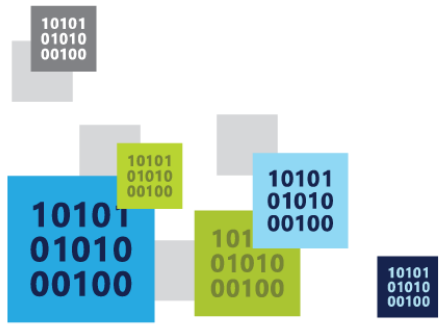


Blob은 항상 이름으로 접근

Can include '/' or other delimiter in name

e.g. /<container>/myblobs/smurf.png

blob name



Blob 리스트 샘플

http://adventureworks.blob.core.windows.net/
Products/Bikes/SuperDuperCycle.jpg
Products/Bikes/FastBike.jpg
Products/Canoes/Hybrid.jpg
Products/Canoes/Flatwater.jpg
Products/Canoes/Whitewater.jpg
Products/Tents/PalaceTent.jpg
Products/Tents/ShedTent.jpg

GET http://.../products?comp=list&prefix=Tents

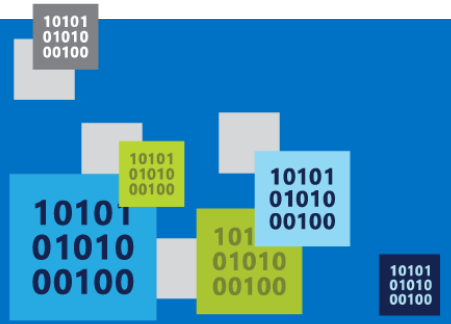
```
<Blobs>
        <Blob><Name>Tents/PalaceTent.jpg</Name>[...]</Blob>
        <Blob><Name>Tents/ShedTent.jpg</Name>[...]</Blob>
</Blobs>
```

Blob 리스트 샘플 전체 응답 response

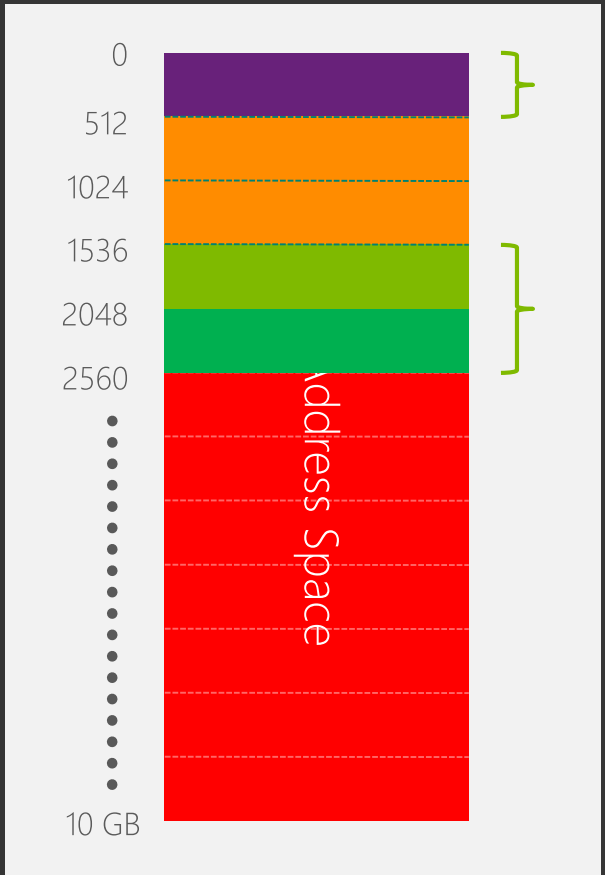
```
<Blobs>
        <Blob>
                <Name>Tents/PalaceTent.jpg</Name>
                <Url>https://readinesscloudcamp.blob.core.windows.net/products/Tents/PalaceTent.jpg</Url>
                <LastModified>Wed, 17 Dec 2014 09:00:26 GMT</LastModified>
                <Etag>0x8D1E7EF08F31520</Etag>
                <Size>150027</Size>
                <ContentType>image/jpeg</ContentType>
                <ContentEncoding />
                <ContentLanguage />
        </Blob>
        <Blob>
                <Name>Tents/ShedTent.jpg</Name>
                <Url>https://readinesscloudcamp.blob.core.windows.net/products/Tents/ShedTent.jpg</Url>
                <LastModified>Wed, 17 Dec 2014 09:00:26 GMT</LastModified>
                <Etag>0x8D1E7EF08EA6257</Etag>
                <Size>150027</Size>
                <ContentType>image/jpeg</ContentType>
                <ContentEncoding />
                <ContentLanguage />
        </Blob>
</Blobs>
```

Blob block 업로드 혜택

효율적인 연속 업로드와 재시도
병렬 및 순서와 무관한 block 업로드



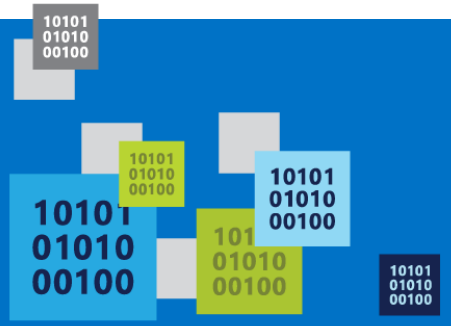
Page Blob – 랜덤 Read/Write



Sparse 저장소:
오직, page에 데이터가 저장될때 비용이 부과됨
(Only charged for pages with data stored in them)

Shared Access Signatures

Blob과 containers 접근 제어를 위한 방안



Shared Access Signatures – 두가지 접근 방안

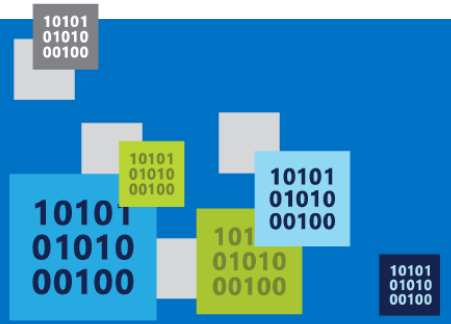
Ad-hoc: Stored Access Policy

정책기반: Shared Access Signature

Shared Access Signatures – Revocation

짧은 기간에 사용하고 재발행

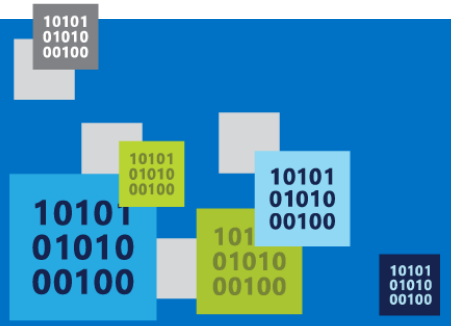
삭제할 수 있는 container 레벨 정책에 적용



Shared Access Signatures – Ad Hoc Signatures

짧은 기간의 Shared Access Signature 생성

- Blob 또는 Container에 사인
- AccessPolicy Start, Expiry와 Permissions
- 필드에 HMAC-SHA256 사인

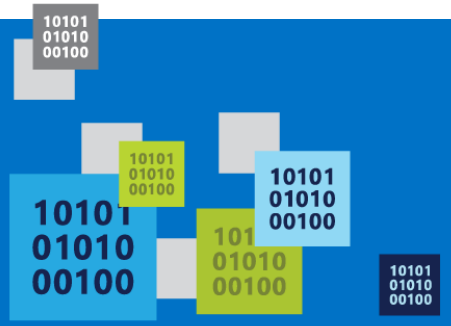


Shared Access Signatures – Ad Hoc Signatures

적용 사례

URL에 1회 적용

E.g. 모바일 클라이언트에게 container 에 업로드를 위한 URL을 제공



Shared Access Signatures
Ad Hoc Signatures

Microsoft Azure

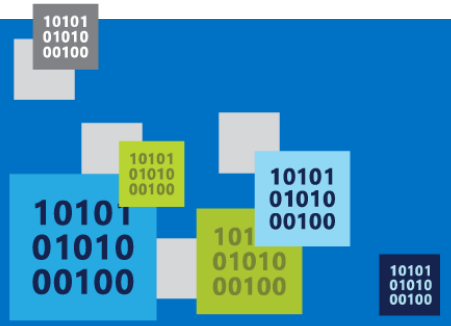
```
http://...blob.../pics/image.jpg?
sr=c&st=2009-02-09T08:20Z&se=2009-02-10T08:30Z&sp=w
&sig= dD80ihBh5jfNpymO5Hg1IdiJIEvHcJpCMiCMnN%2fRnbI%3d
```

Microsoft

Store Access Policy – 정책 기반 Signatures

Container 레벨 정책 생성

StartTime, ExpiryTime, Permissions 을 지정



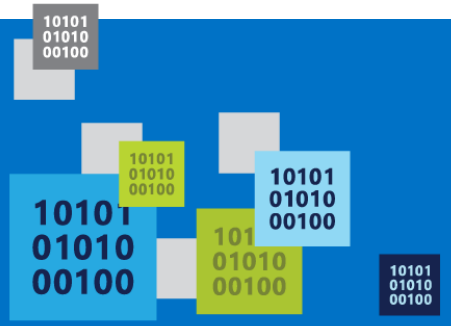
Store Access Policy – 정책 기반 Signatures

Shared Access Signature URL 생성

사인된 blob이나 container

사인된 identifier Optional pointer to container 정책

Signature HMAC-SHA256 of above fields

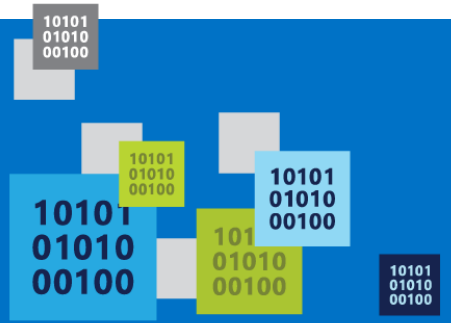


Store Access Policy – 정책 기반 Signatures

Use case

회수 가능한 권한을 특정 사용자나 그룹에 부여

revoke: container 정책을 수정하거나 삭제



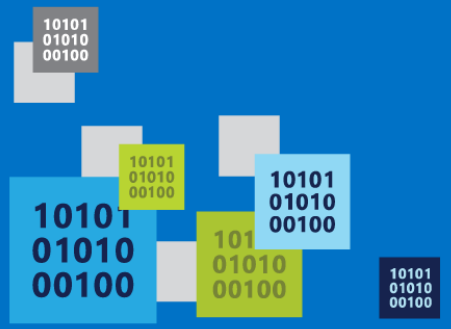
Store Access 정책
정책 기반 Signatures

Microsoft Azure

```
http://...blob.../pics/image.jpg?
sr=c&si=MyUploadPolicyForUserID12345
&sig=dD80ihBh5jfNpymO5Hg1IdiJIEvHcJpCMiCMnN%2fRnbI%3d
```

Microsoft

Demo: Shared Access Signatures



Files

Microsoft Azure
Storage Files

Sharing Files – 예전 방식

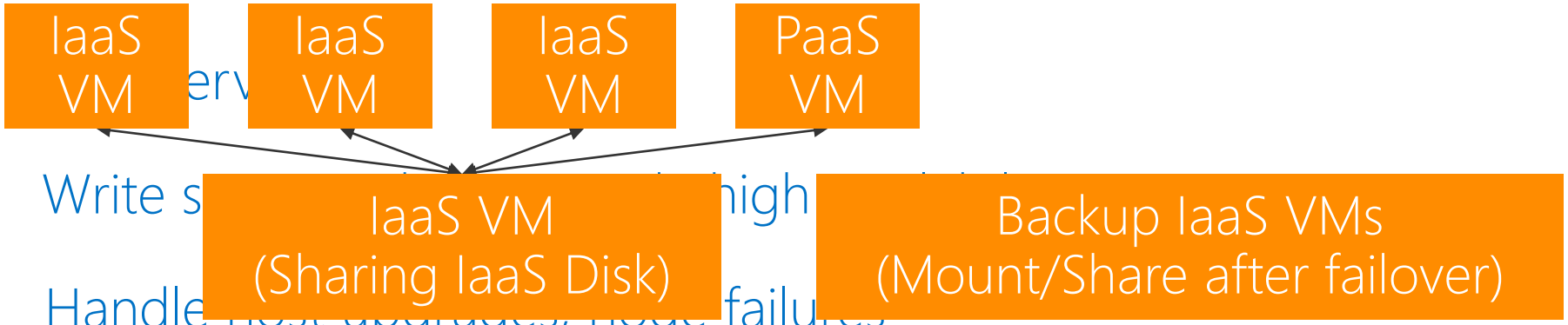
Setup an IaaS VM to host a File Share backed by an IaaS Disk

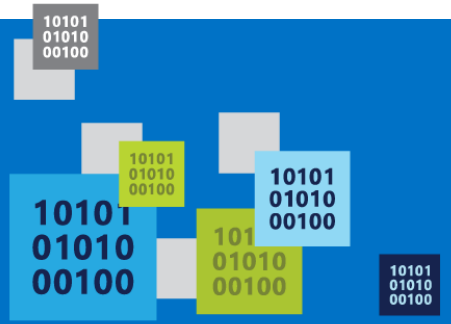
Write code to find the IaaS File Share from the rest of the VMs in

Write s high

Handle failures

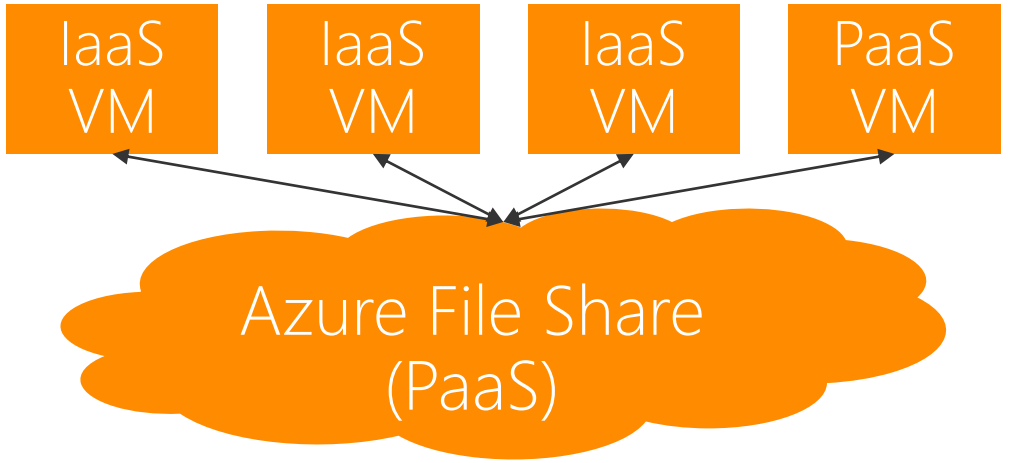
You can only access the File Share from other VMs

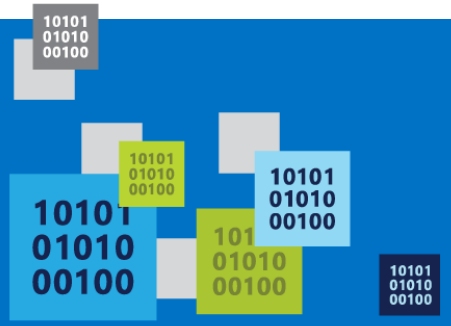




Azure Files

- Azure의 공유된 네트워크 파일 저장소
- 가용성, 안정성, 확장성과 관리되는 자동화 서비스
- 두개의 인터페이스 지원: SMB, REST





Azure Files – 적용예

- VM과 어플리케이션간 공유하는 데이터
- 서비스들의 설정 공유
- 개발/테스트/디버깅

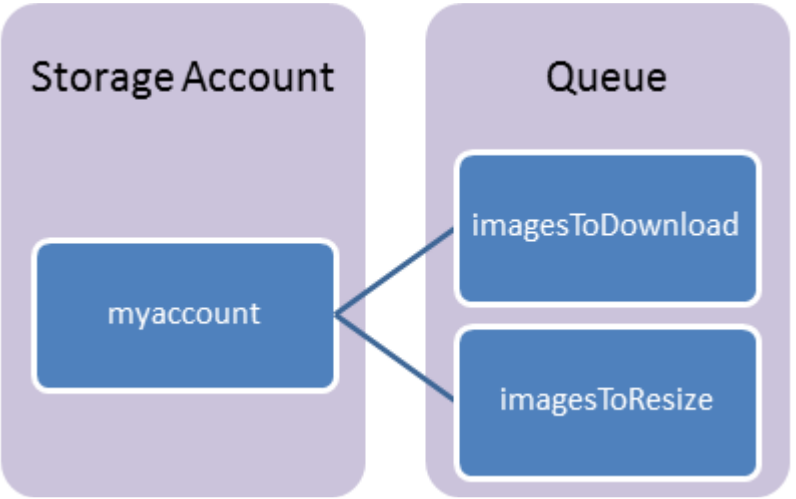
Queues

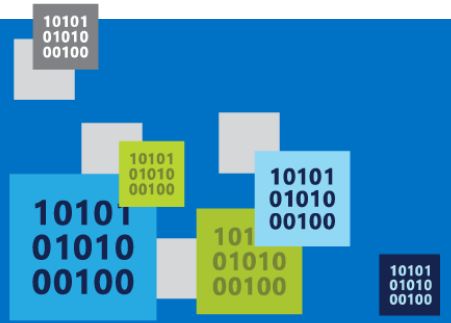
Microsoft Azure

Storage Queue

Queue 구성요소

- 저장소 계정 : 모든 Azure 저장소 접근은 저장소 계정을 통해 처리
- Queue: queue는 여러개의 message를 소유
- Message: message는 64KB까지 저장 가능한 포맷





Queue URL 형식

Queue는 아래의 URL 형식으로 접근 가능

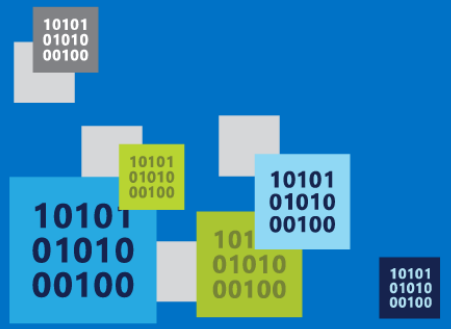
http://{storage-account}.queue.core.windows.net/{queue}

Queue URL 형식

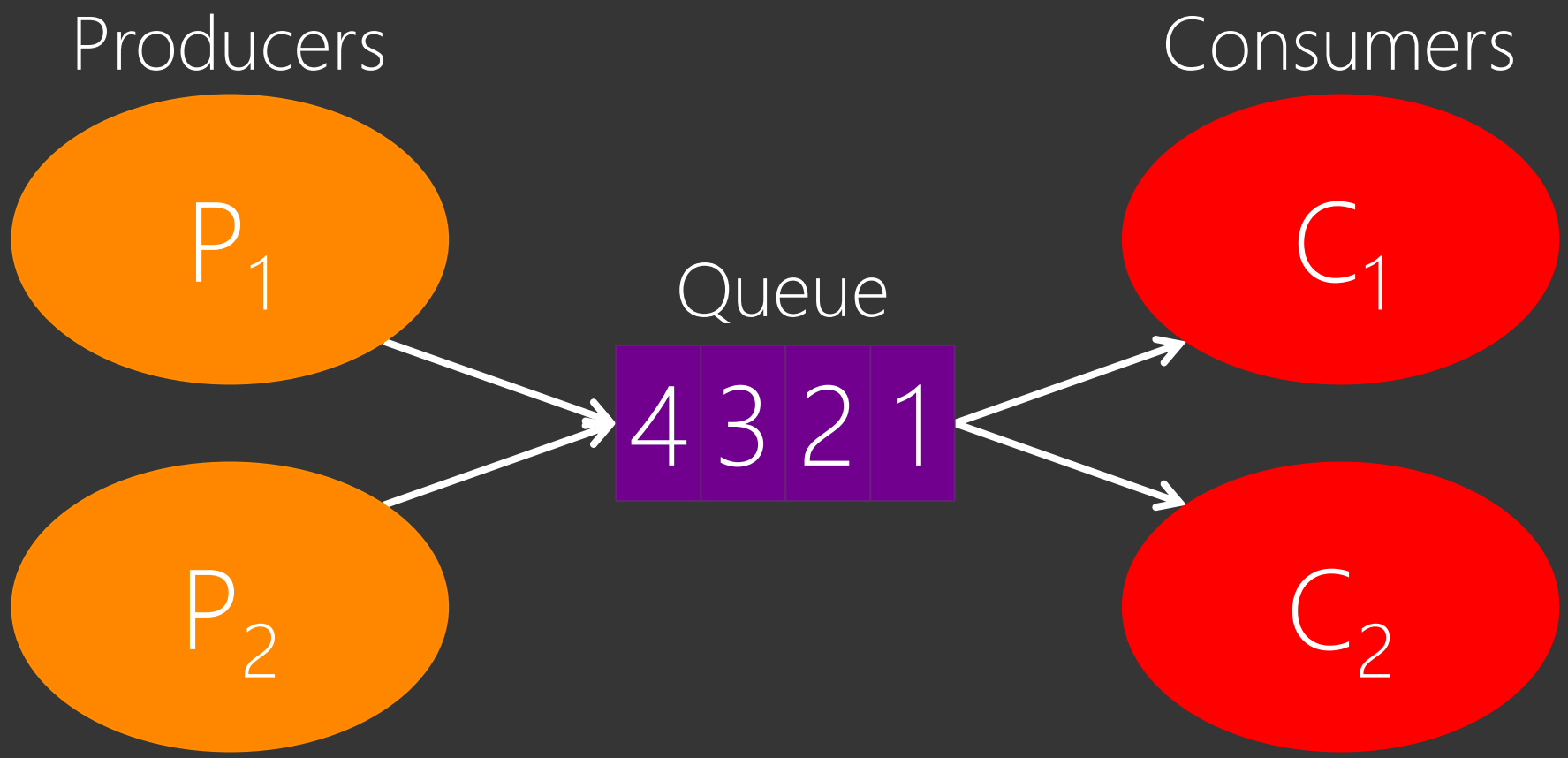
Example:

http://myaccount.queue.core.windows.net/imagesToDownload

Demo: 비동기 처리를 위한 웹 어플리케이션



Queue 기반 부하 조절 패턴



Queue Considerations

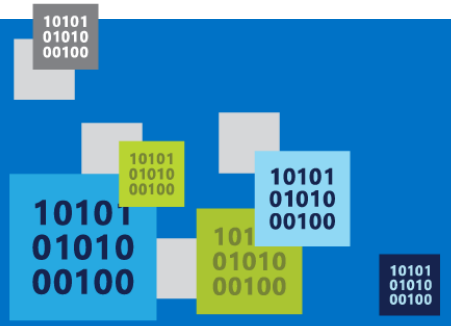
Message들은 순차처리되나 FIFO를 보장하지는 않음

Message는 적어도 한번 처리되어야 함

Message는 여러번 처리될 수 있음

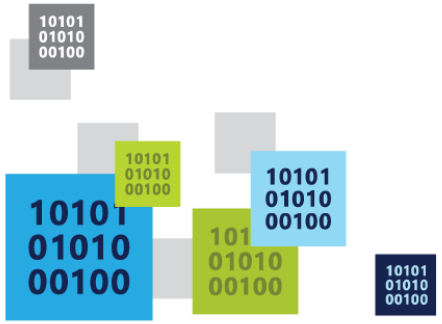
.DequeueCount 가 매번 증가

-> DequeueCount 처리가 중요함

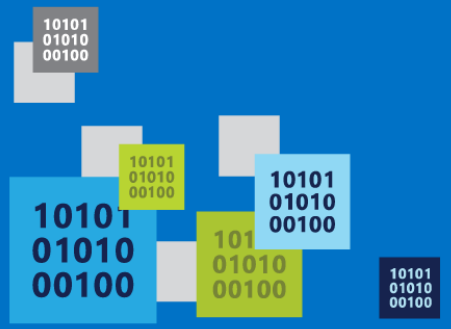


Queue 고려사항

Message들은 7일간 저장됨



Demo: Queues in Code



Tables

Microsoft Azure
Storage Table

Table 저장소 구조

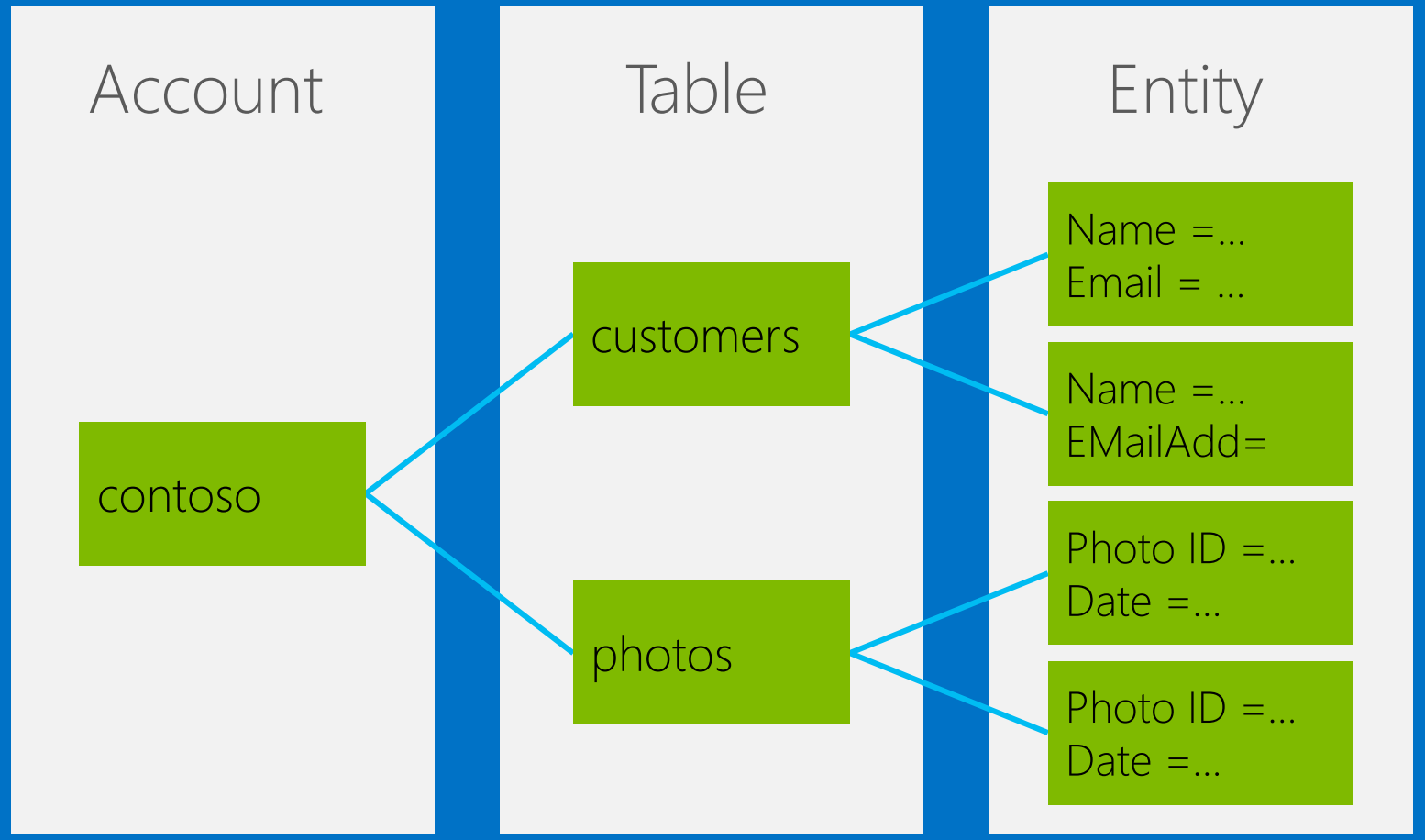

Account
Table
Entity
contoso
customers
photos
Name =...
Email = ...
Name =...
EMailAdd=
Photo ID =...
Date =...
Photo ID =...
Date =...

Table 저장소

Not an RDBMS Table!
'Entities'가 주요한 컨셉

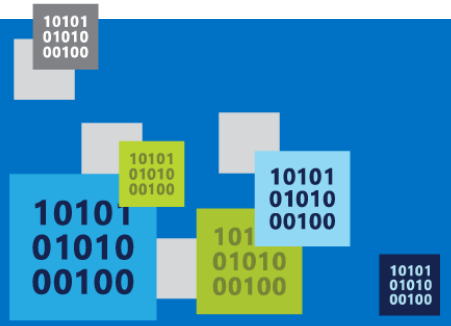


Table 저장소

Entity는 255개의 property를 보유 가능
개별 entity 당 1MB 저장 가능

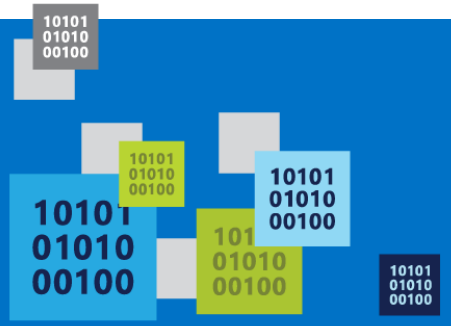


Table 저장소

Entity Properties

PartitionKey & RowKey 는 필수 Properties

복합키가 entity를 고유하게 식별

유일하게 색인된 property

정렬 순서를 정의

Demo: table

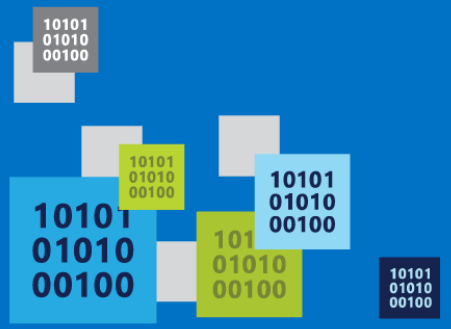


Table 저장소

PartitionKey의 목적

Entity Locality

Entity Group Transactions

Table Scalability

Table 저장소

PartitionKey의 목적

Entity Locality

같은 partition의 entity는 함께 저장됨

효율적인 쿼리와 지역 캐시 가능

모든 쿼리에 가능한 partition key를 넣어 쿼리하는게 유리함

Table 저장소

PartitionKey의 목적

Entity Group Transactions

같은 partition에 위치할 경우 여러 CRUD를 하나의 transaction으로 처리 가능

Table 저장소

PartitionKey의 목적

Table Scalability

처리량 – 500 tps/partition 및 7,000 tps/account

Azure가 table 저장소 사용 패턴을 모니터링

Table 저장소

PartitionKey의 목적

Table Scalability

파티션들에 대한 자동 부하 조절

개별 파티션은 다른 저장소 노드로 제공될 수 있음

트래픽 요구를 충족할 수 있도록 테이블을 확장 가능

Table Storage Details

Entity Properties

Timestamp property

Optimistic Concurrency

HTTP Etag로 노출됨

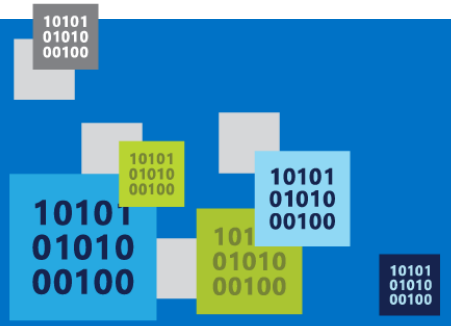


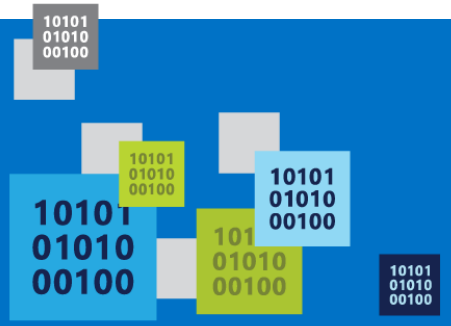
Table Storage Details
Entity Properties

다른 property에는 고정된 스키마 없음

개별 property는 <name, typed value>로 저장됨

Property는 표준 .NET 형식:

string, binary, bool, DateTime, GUID, int, int64, double



Demo: Enter “data” with varying shape into a table

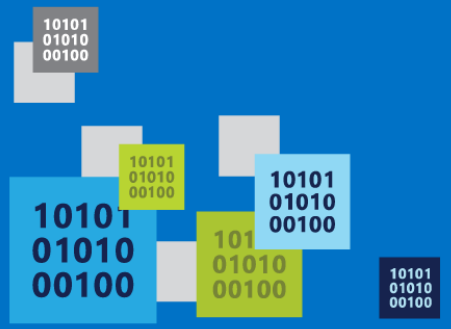
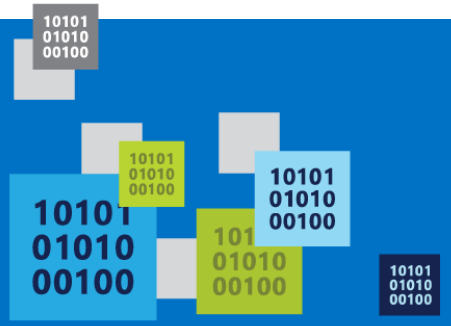


Table 저장소

CRUD 지원

Upsert와 Entity Group Transactions 처리 포함

Table들은 metadata 보유



Microsoft Azure

StorSimple

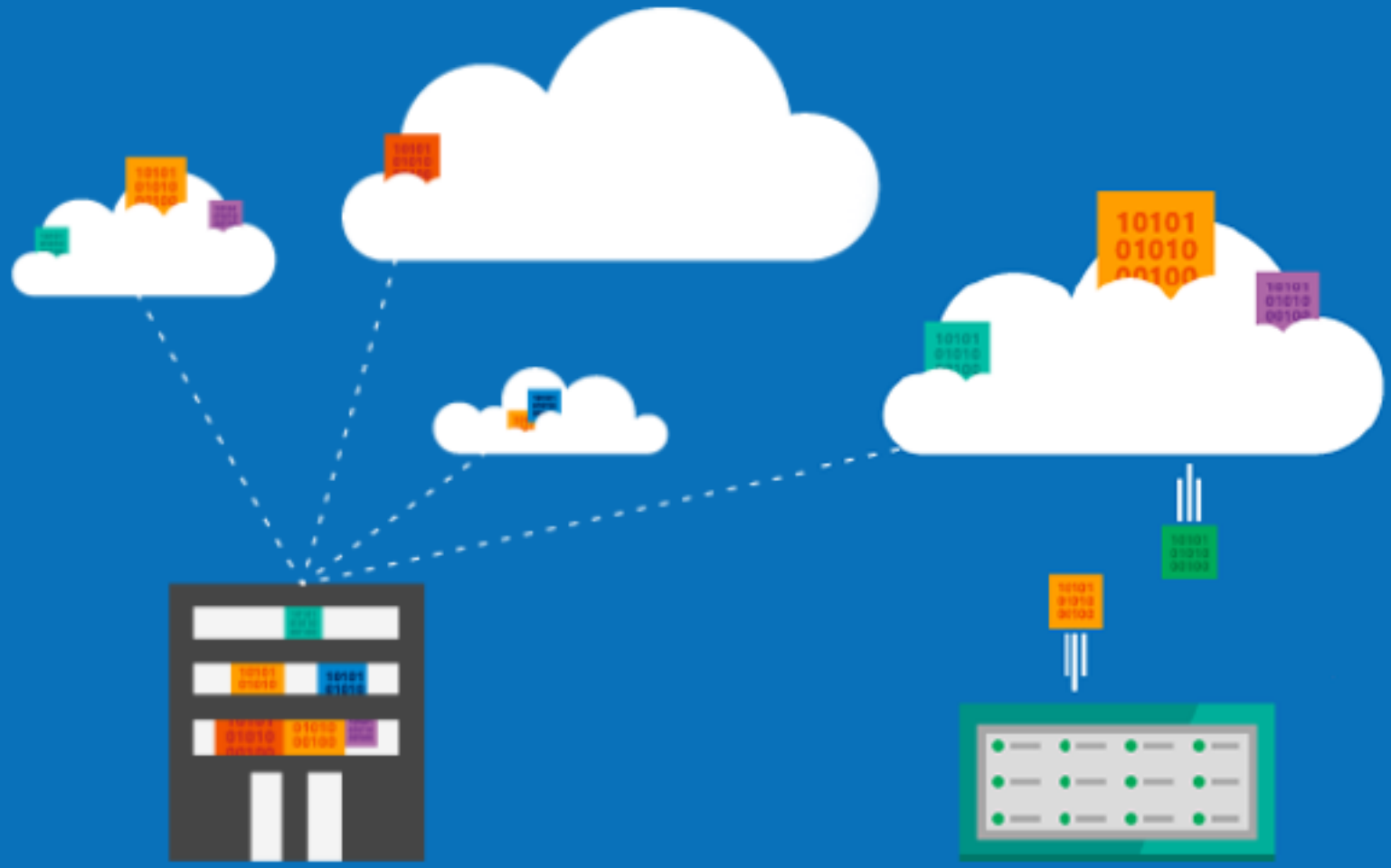
Microsoft

Microsoft Azure

Microsoft Azure StorSimple

Microsoft

StorSimple + Microsoft Azure = Hybrid Cloud Storage



StorSimple

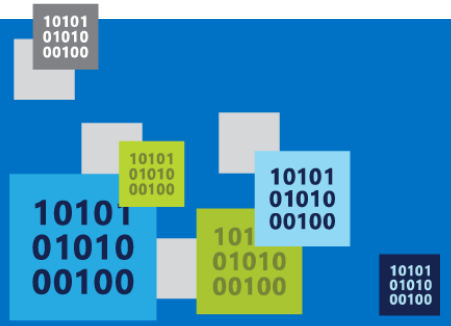
Designed to:

저장소 비용 절감

저장소 관리 단순화

재난 복구 기능 향상 및 효율성 증대

데이터 이동성 제공



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