

Hybrid scenarios and Security

Adastra

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SQL Server 2016 Enhanced backup



Enhanced backup in SQL 2016 – key features



Managed backup

- Granular control of the backup schedule
- Local staging support for faster recovery and resilient to transient network issues
- Support for system databases
- Supports simple recovery mode



Backup to Azure block blobs

- Cost savings on storage
- Significantly improved restore performance
- More granular control over Azure Storage



Azure Storage snapshot backup

- Fastest method for creating backups and running restores
- Uses SQL Server database files on Azure Blob storage

Backup to Azure block blobs

- 2x cheaper storage – **page** blob vs. **block** blob
- Backup striping and faster restore
- Maximum backup size is 12.8 TB (1 TB in SQL 2014)
- Granular access and unified credential story (SAS URIs)
- Supports all existing backup/restore features (except append)



**Azure
Blob
Storage**

```
CREATE CREDENTIAL [https://<account>.blob.core.windows.net/<container>]
WITH IDENTITY = 'Shared Access Signature',
SECRET = 'sig=mw3K6dpwV%2BWUPj8L4Dq3cyNxCI'
```

```
BACKUP DATABASE database TO
```

```
URL = N'https://<account>.blob.core.windows.net/<container>/<blob1>',
```

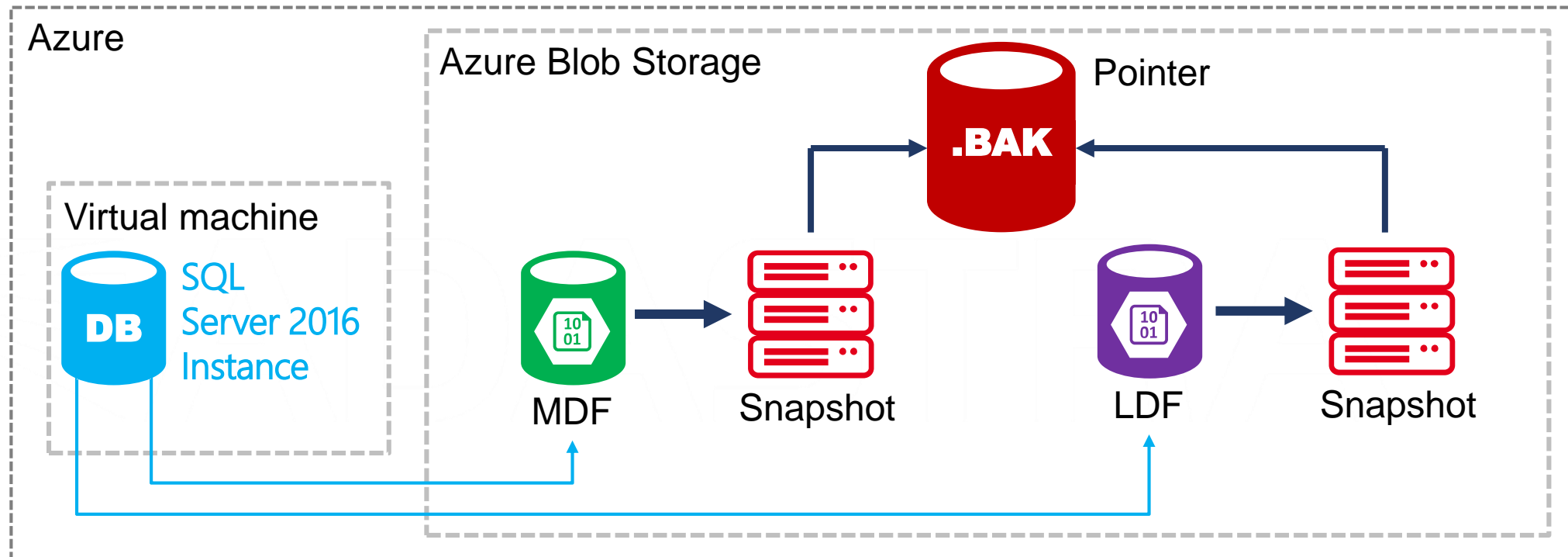
```
URL = N'https://<account>.blob.core.windows.net/<container>/<blob2>'
```

Backup to Azure with file snapshots

BACKUP DATABASE DB TO

URL = N'https://<account>.blob.core.windows.net/<container>/<backupfile.bak>'

WITH FILE_SNAPSHOT



Stretch Database in SQL 2016



Maintain large data volumes with shrinking IT?

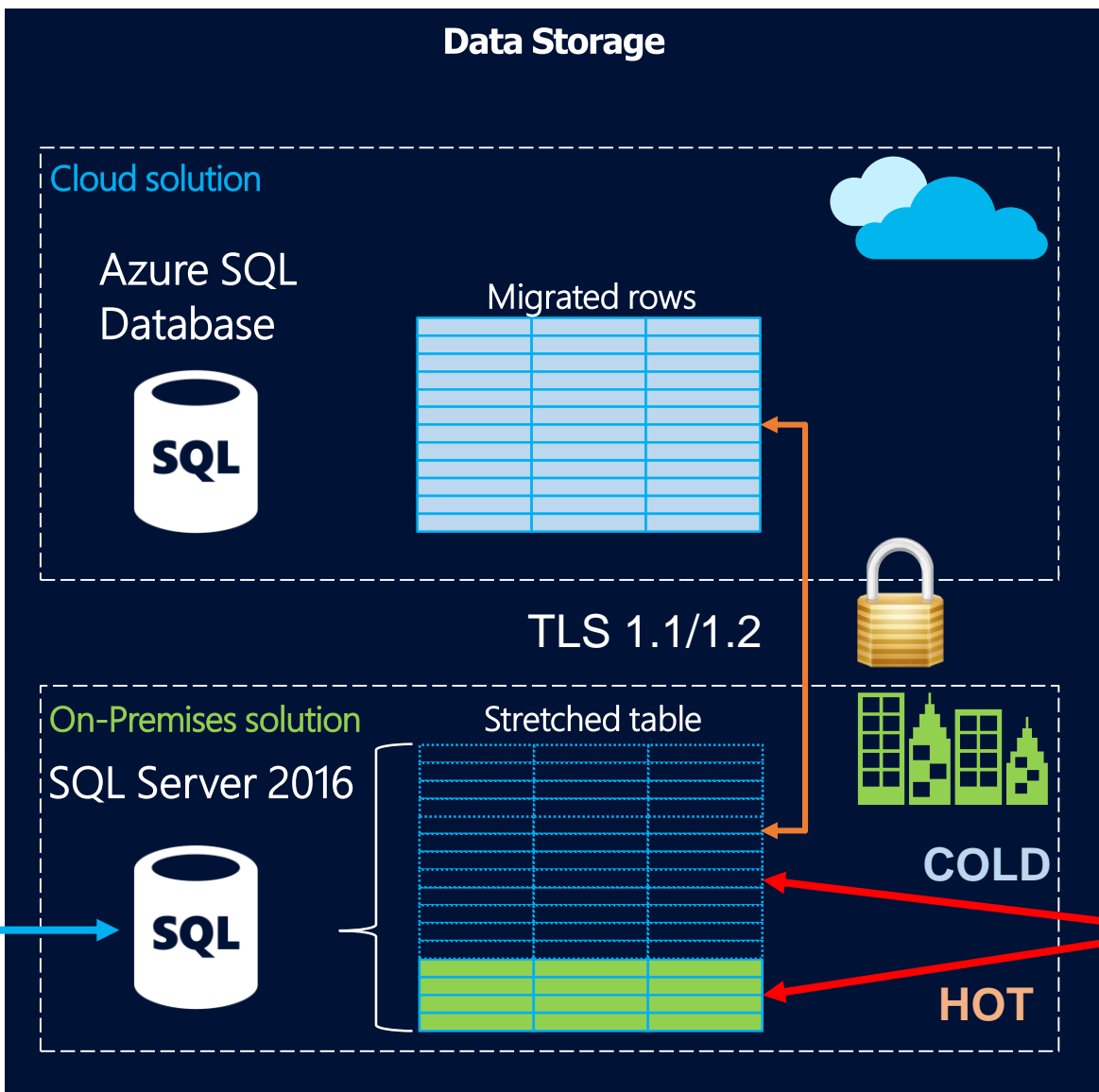
- Massive tables
(hundreds of millions/billions of rows, TBs size)
- Users want/need to retain data indefinitely
- Cold data infrequently accessed but must be online
- Datacenter consolidation
- Maintenance challenges
- Business SLAs at risk

Solutions:

1. Expand server and storage
2. Move data elsewhere

Hybrid solution with Stretch Database

- All queries to On-Premises SQL
- No changes in existing scripts/app



Pricing based on

Performance (DSU)

Storage (Page Blob)

Scale up/down anytime



```
CREATE TABLE <table name> ...
WITH (
    REMOTE_DATA_ARCHIVE = ON (
        FILTER_PREDICATE =
            dbo.fn_stretchpredicate(date),
        MIGRATION_STATE = PAUSED
    )
);
```


Enhanced Availability in SQL 2016

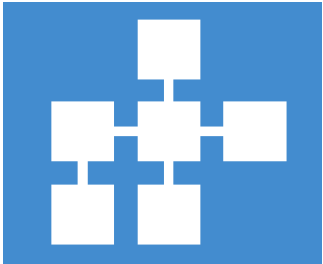


The need for mission-critical availability



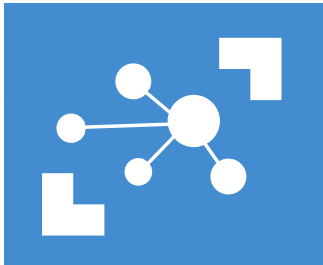
Reliable

- ✓ Detects failures reliably
- ✓ Able to handle multiple failures



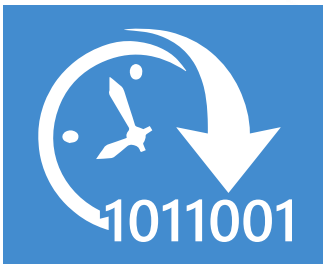
Integrated

- ✓ Unified, simplified solution
- ✓ Easy to deploy, manage, and monitor



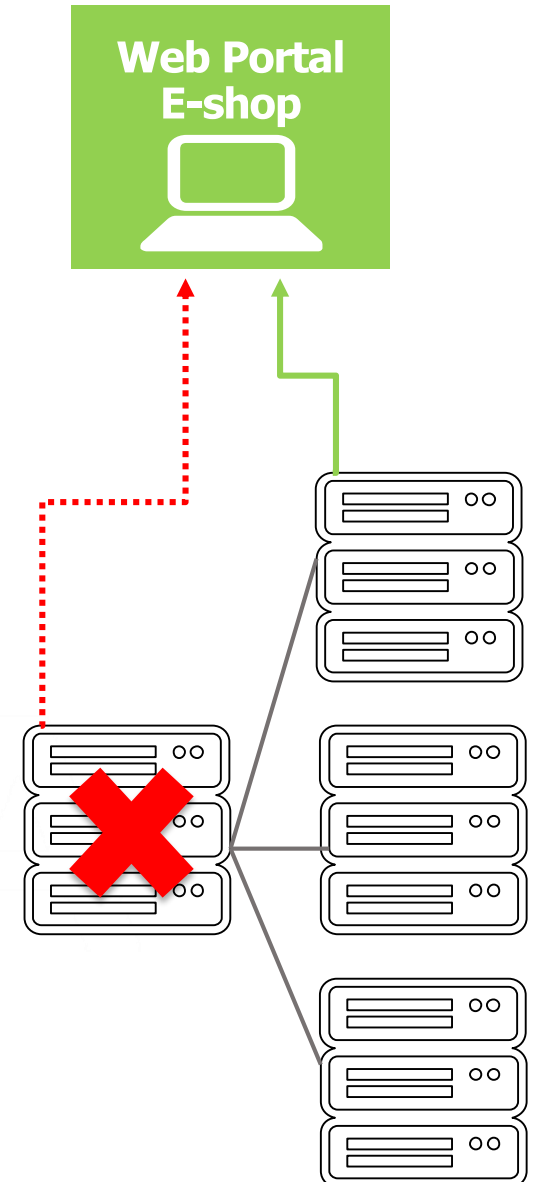
Flexible

- ✓ Reuse existing investments
- ✓ SAN/DAS environments

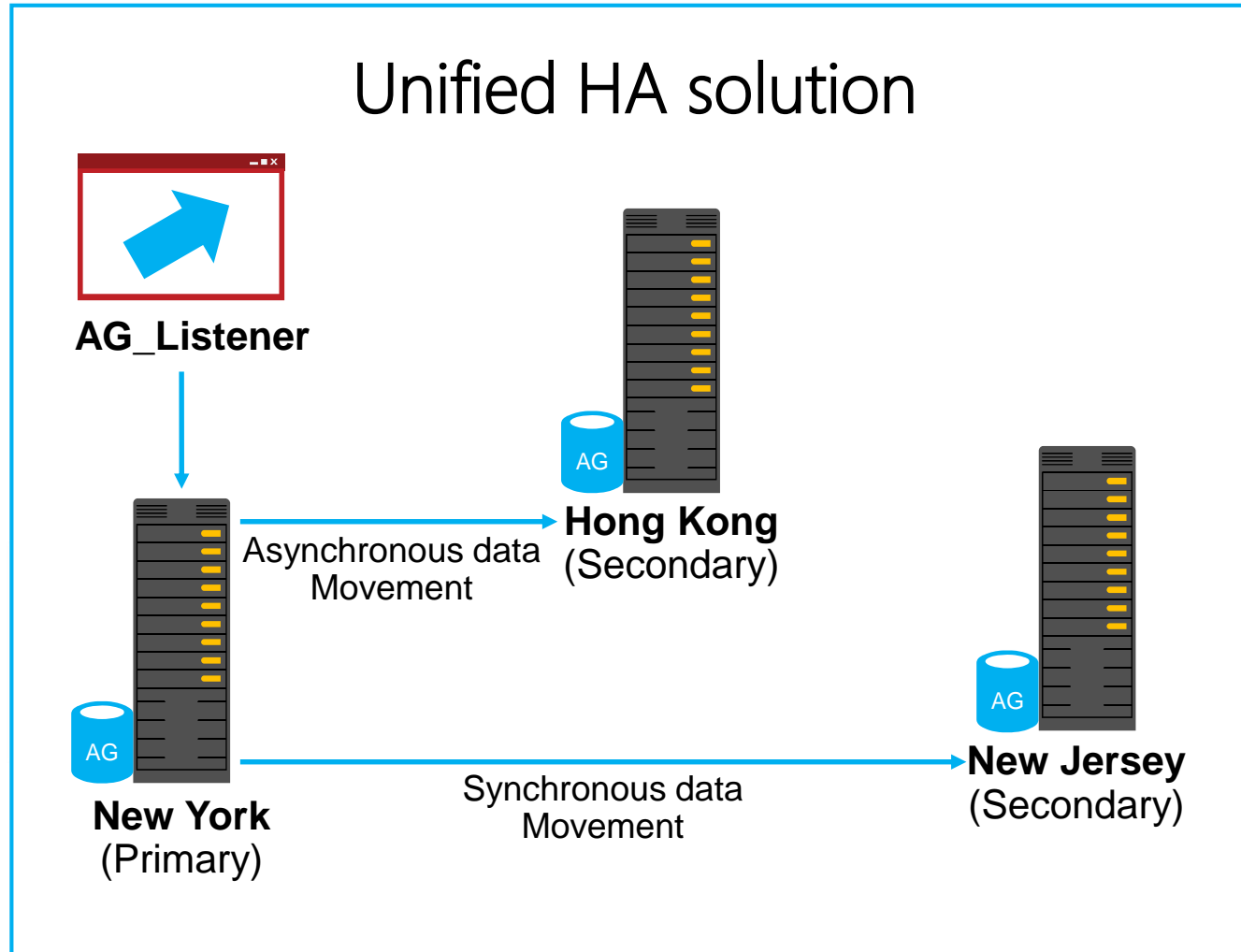


Efficient

- ✓ Able to use HA hardware resources
- ✓ Fast, transparent failover



Enhanced AlwaysOn Availability Groups



Operational Analytics

Greater scalability

- Load balancing **readable secondaries**
- Increased number of automatic failover targets
- Log transport performance

Improved manageability

- DTC support – Distributed Transactions
- Database-level health monitoring
- Group Managed Service Account
- Domain-independent Availability Groups

In Summary

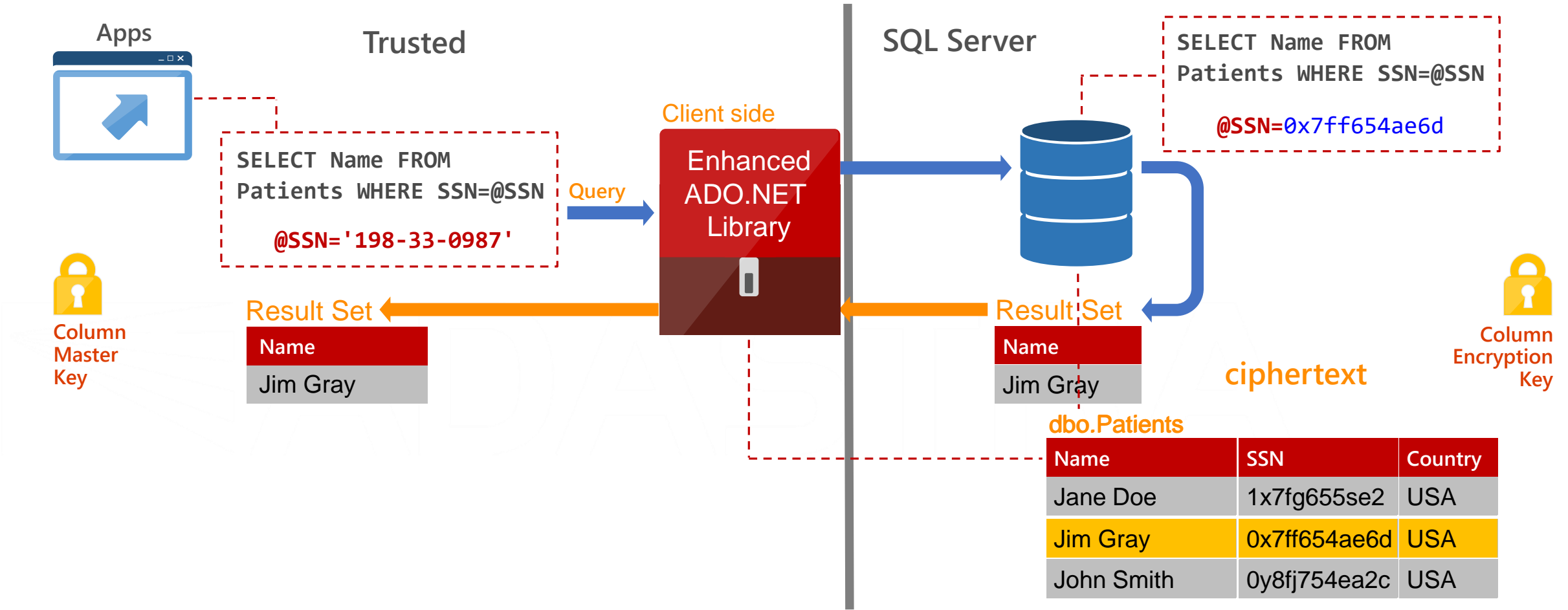
2005 / 2008 / 2008 R2	2012 / 2014	2016
<ul style="list-style-type: none">○ Failover Clustering○ Database Mirroring○ Replication○ Transaction Log Shipping	<ul style="list-style-type: none">○ AlwaysOn Availability Groups	<ul style="list-style-type: none">○ Increased Auto Failover Targets○ Automatic failover based on DB Health○ Cross / No Domain Support○ DTC Support○ Round robin load balancing of replicas○ SSISDB Support○ GMSA support○ Online Operations○ Log Transport Performance○ Standard Edition Support

Always Encrypted



Always Encrypted

- To protect sensitive data
- Separatio between those who own the data and those who manage the data

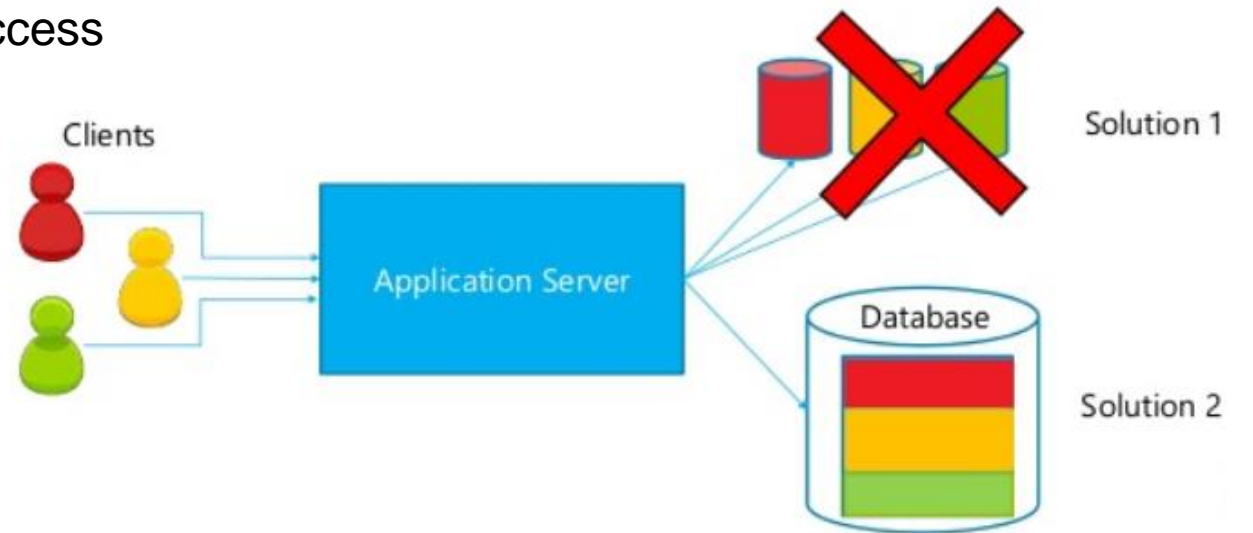


Row-Level Security



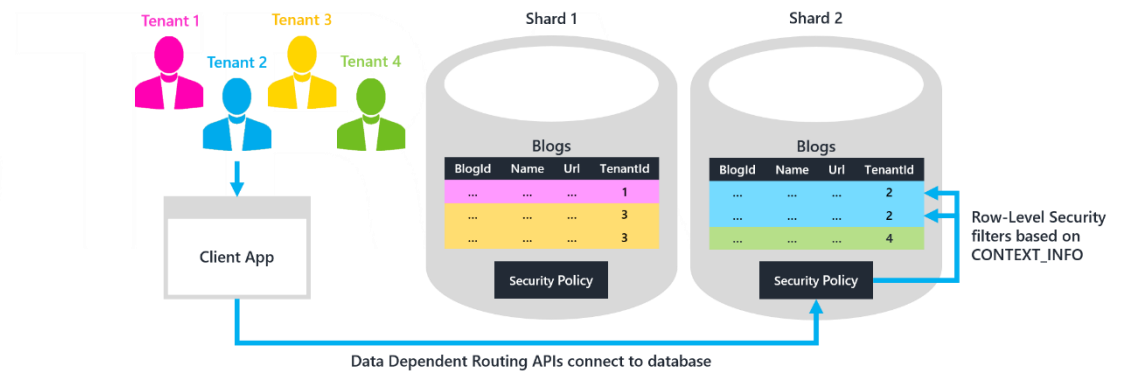
Row-Level Security

- enables you to implement restrictions on data row access
 - access to only the relevant data
- access restriction logic is located in the database



Scenarios

- Sales
 - Allows Managers to view data rows for their own region only
- Finance
 - Restrict access to rows of financial data based on the employee's business division, or based on the employee's role within the company
- Multi-tenant app
 - A multi-tenant application can create a policy to enforce a logical separation of each tenant's data rows from every other tenant's rows. Efficiencies are achieved by the storage of data for many tenants in a single table. Of course, each tenant can see only its data rows.



Thank you!

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