Monitoring and Troubleshooting Availability Groups

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Our pristine demo environment ran exactly as designed.

The real world isn’t often that perfect.

Monitoring and Troubleshooting

Installation and Configuration Errors

Performance and Latency

Team Effort

Monitoring and Troubleshooting

Installation and Configuration Errors

Performance and Latency

Miscellaneous Issues and Errors

Monitoring and Alerting

SQL Server knows a lot about it's own health

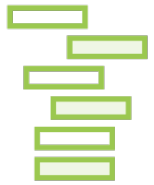
We'll take a quick look at new features specific to SQL Server 2019

Two Major Obstacles to Cluster Setup

Firewalls

Rights

Common Cluster Issues Related to Rights



There are a number of ports required (see clustering module)

Sysadmin required on every node being configured

Failover cluster needs full control over all cluster objects

Two Major Obstacles to AG Setup

Firewalls

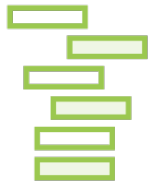
Rights

Two Major Obstacles to AG Setup

SQL Error 1418

SQL Error 35250

Troubleshooting Ports and Firewalls



Make absolutely sure the port number is correct

Check firewall logs

Test with netstat / telnet or other firewall testing approach

Maintain a good relationship with your infosec team

Endpoint Permission Options

Shared domain accounts

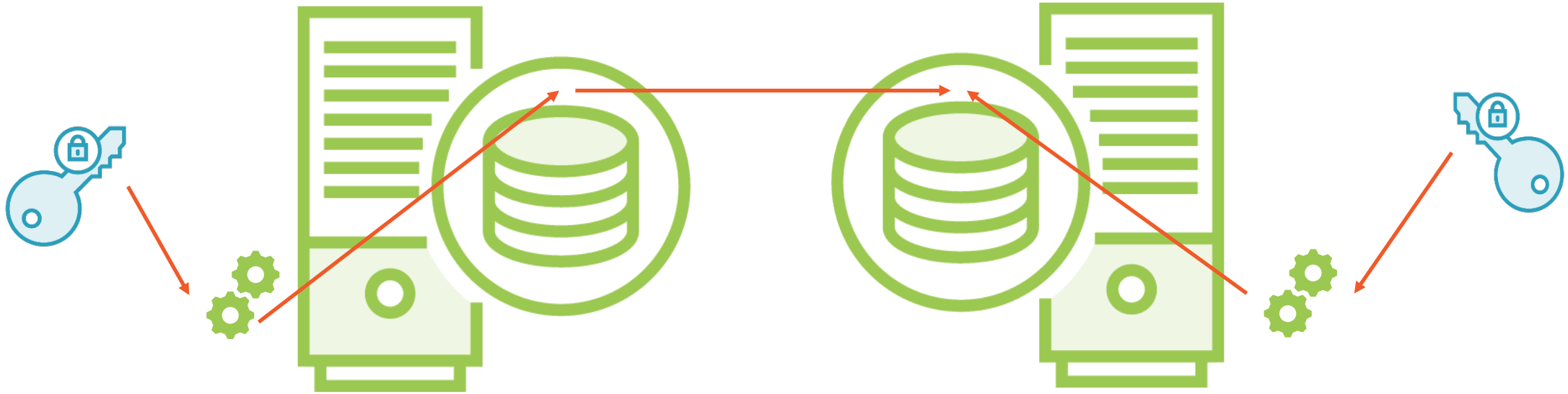
Different domain accounts (ensure GRANT CONNECT)

Certificates

SQL Server Service Account

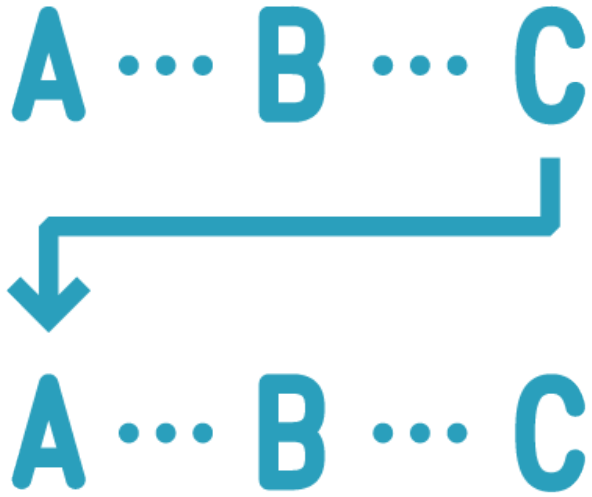
Troubleshooting connectivity
https://bit.ly/2OWgX0L

AG permissions
https://bit.ly/2OWulSF



SQL Server Performance

SQL Server Performance



Waits

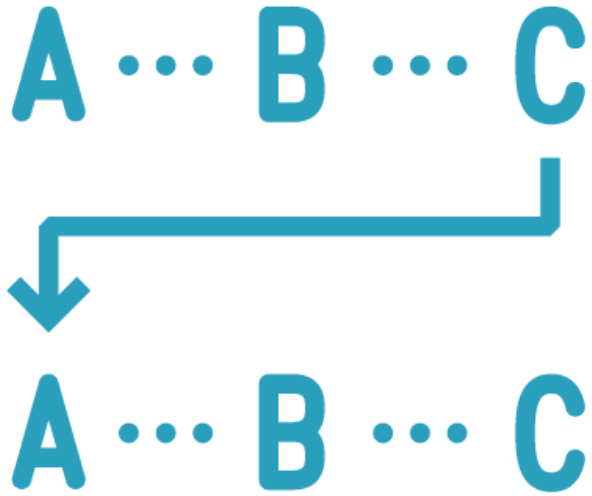
Queues

Availability Group Latency

Time to Commit on Primary

Time to Read on Secondary

SQL Server Performance



Waits

HADR_SYNCH_COMMIT

Queues

AG Replication Queues

Viewing Wait Stats in SQL Server

```
exec sp_whoisactive  -- popular community tool

select * from sys.dm_os_wait_stats   -- SQL DMV
```

Important SQL Server Team Blogs

SQL Server CSS Team: https://blogs.msdn.microsoft.com/psssql/

SQL Server Team: https://blogs.msdn.microsoft.com/sql_server_team

Always On Team: https://blogs.msdn.microsoft.com/sqlalwayson

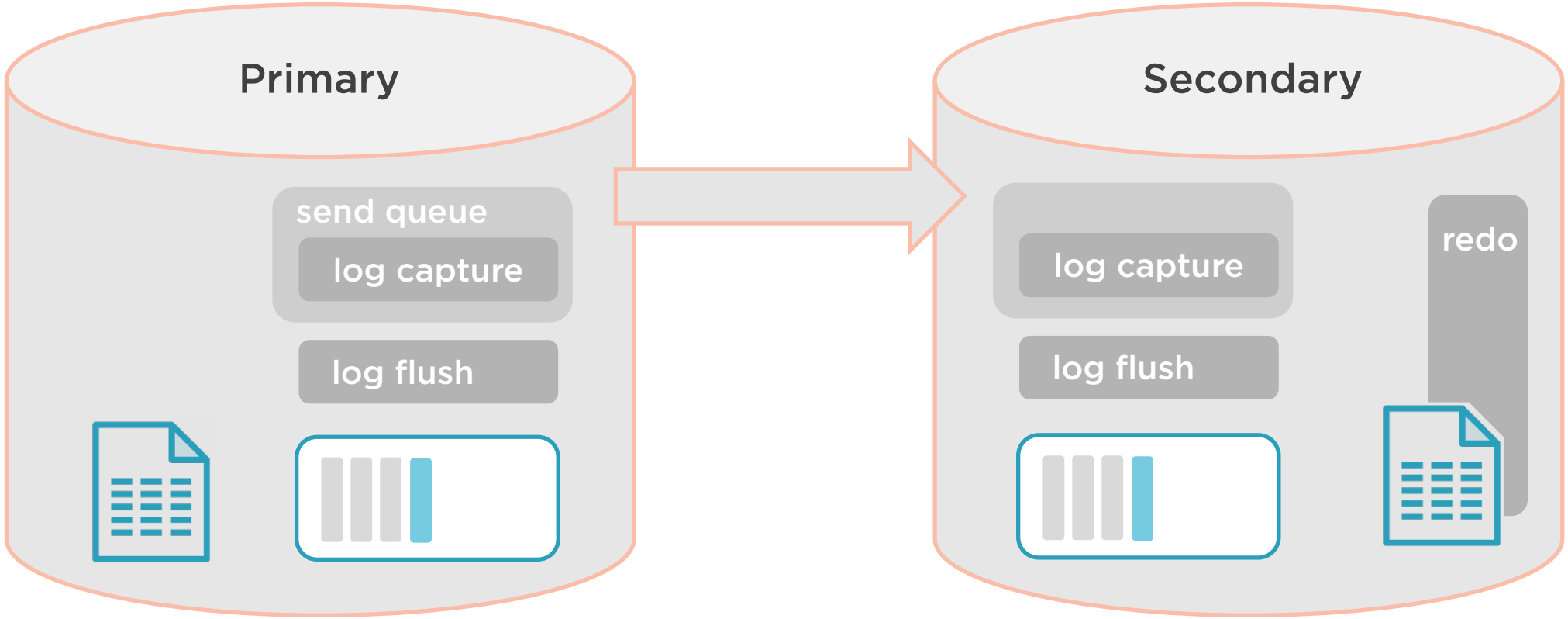
SQL Server Extended Events

Event based

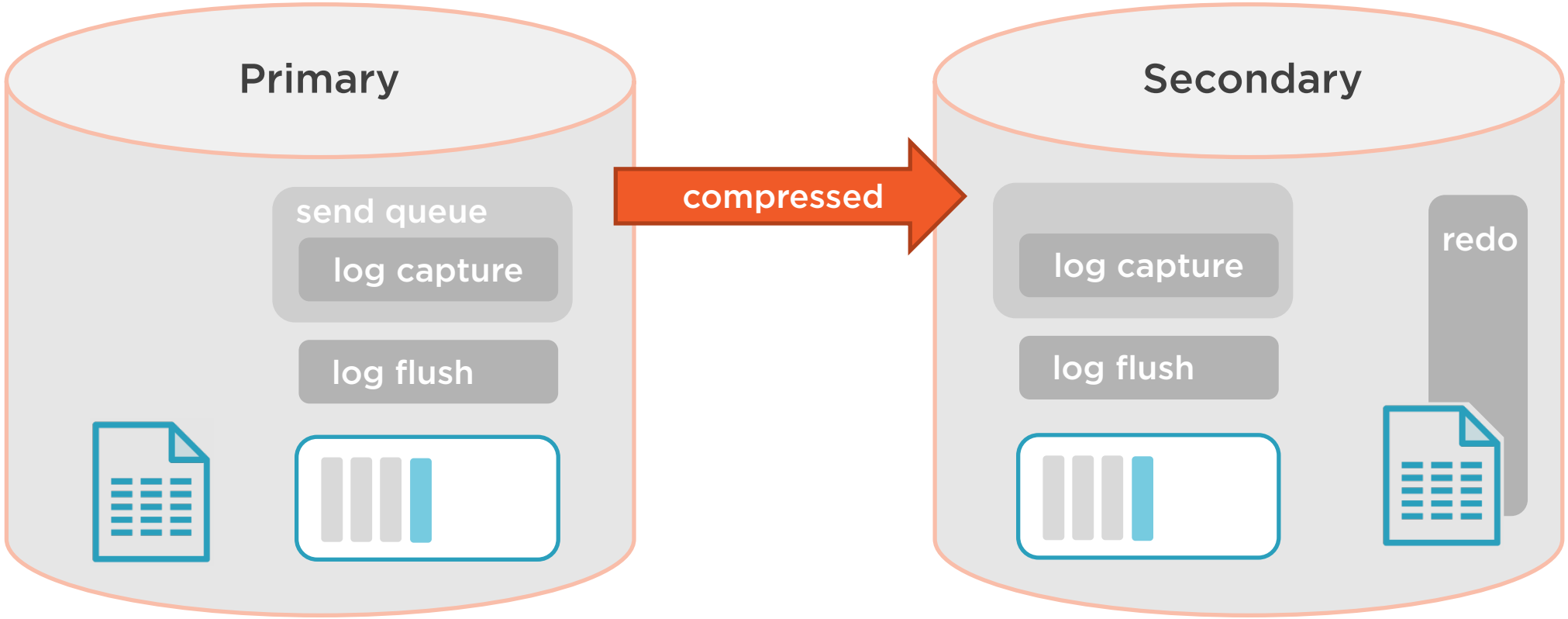
You can capture events of interest

Event messages contain meta-data about the event that occurred

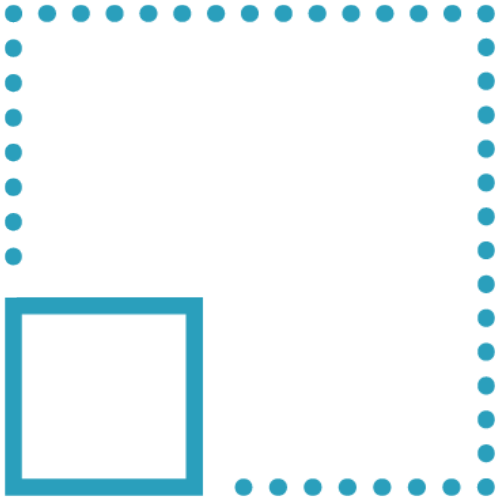
Data Synchronization



Data Synchronization

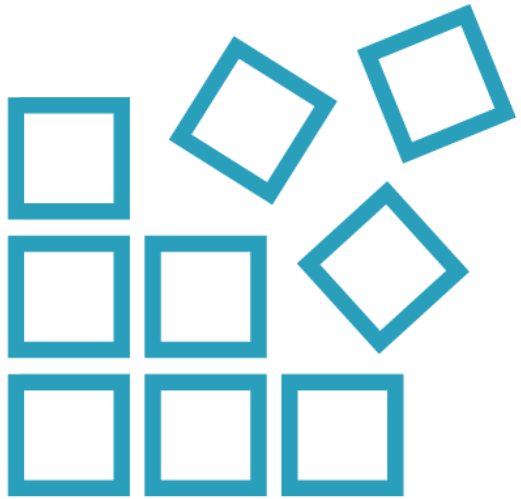


Log Block Compression



Asynchronous

Compressed by default



Synchronous

Not compressed by default

Replica Object Drift

Dependent Object Synchronization in AG

Automatically Synched	Items Not Synched
Database Level Objects	Instance Level Objects
Tables	Logins
Views	Linked Servers
Stored Procs	Agent Jobs
User Defined Functions	Certificates and Keys
Database Users	SSIS Catalogs

- Drift prevention
  - Disciplined change controls
  - Explicit ID of DB level objects
  - Explicit ID of instance level objects
- Supplement with additional approaches
  - Regular object audits
  - PowerShell or TSQL scripts

Exercise Your Replicas

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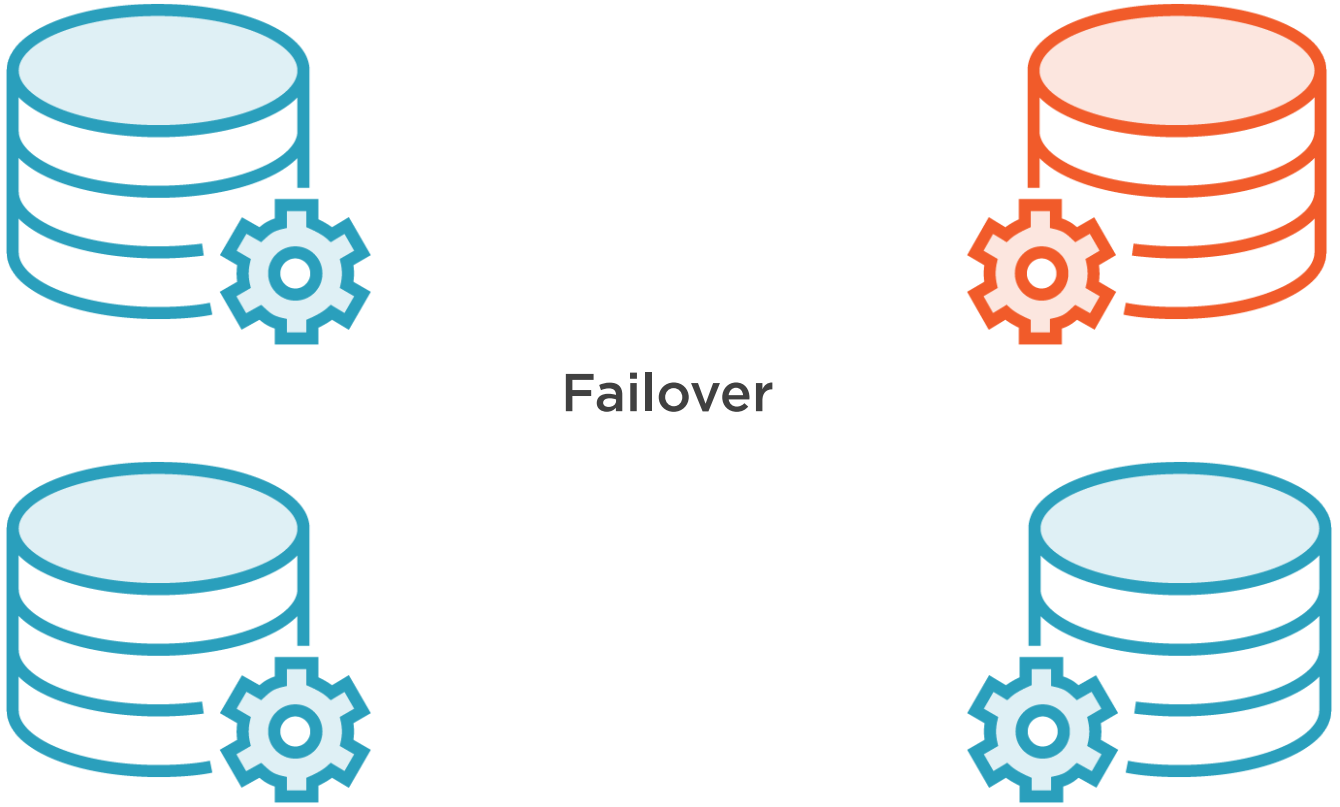

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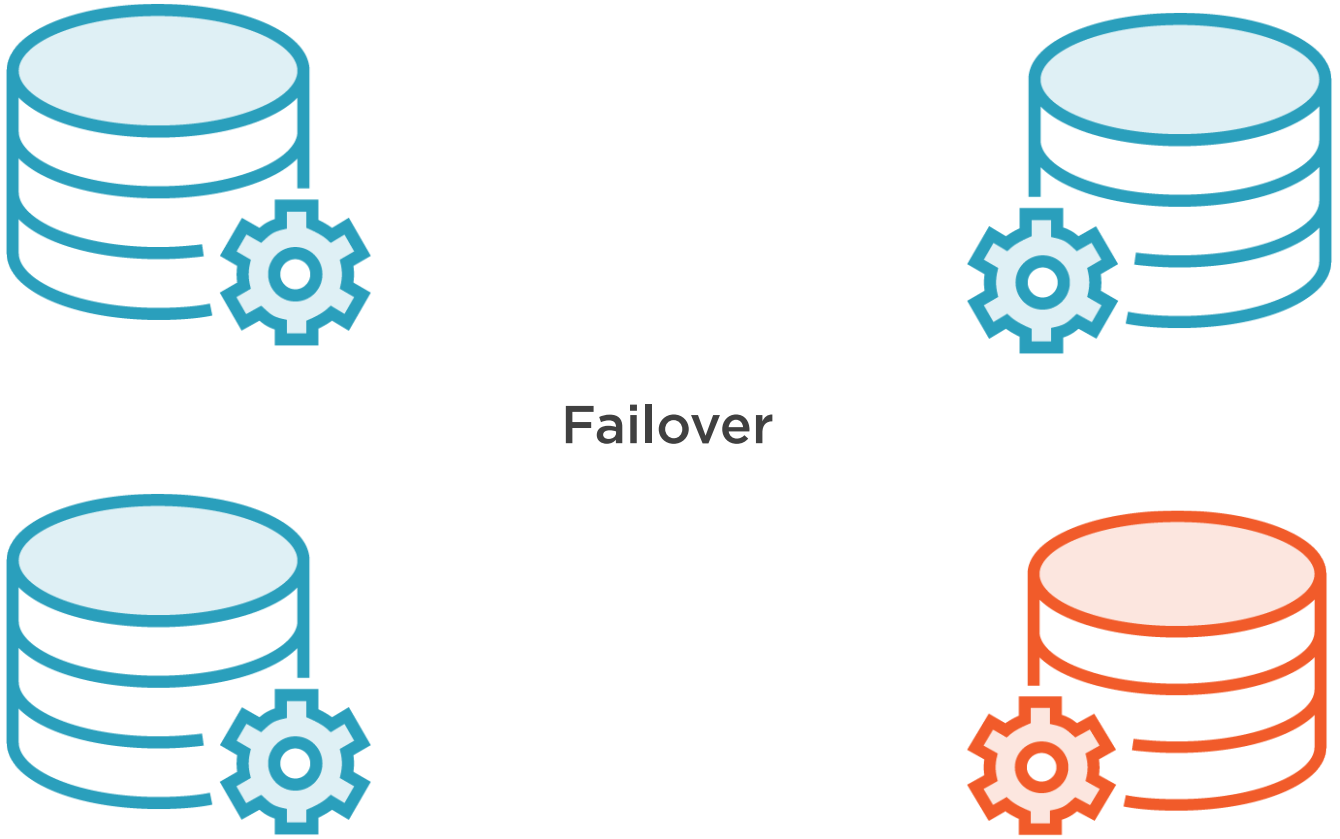
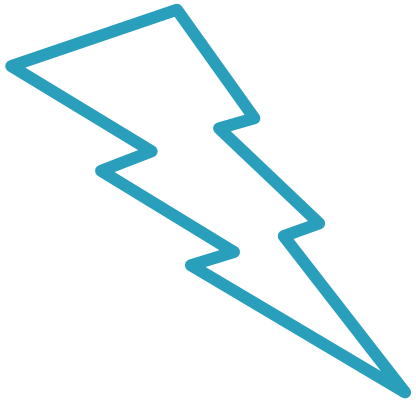


Monitoring and Alerting



Extended Events

Policy Based Management

SQL Server Extended Events

Event based

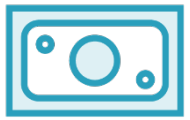
You can capture events of interest

Event messages contain meta-data about the event that occurred

Baselines are critical to monitoring and troubleshooting

Extended Events

Events are lightweight but not free



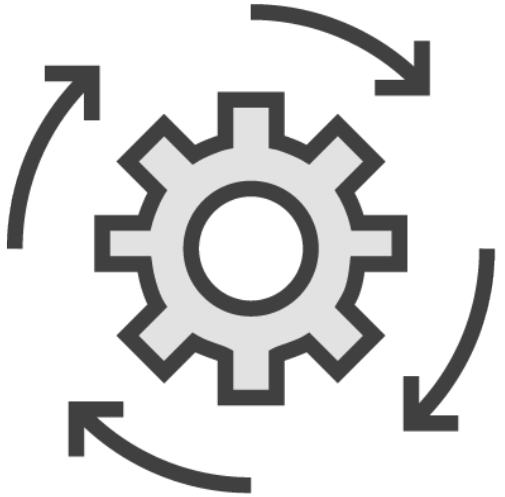
Use very focused sessions that are only enabled when needed

https://bit.ly/2z9pDH1

Policy Based Management

Active Monitoring

Structured Policy Definition



Configurable Actions for Violations

Policy Based Management Training

Microsoft Documentation

https://bit.ly/2Q3EQjS

Pluralsight Course

https://bit.ly/2PtsZyG

2019 feature information as of SQL PASS 2018

2019 Features for Availability Groups

- **Support for AG on containers with kubernetes for orchestration**
- **Linux support for MS DTC**
- **Secondary-to-primary replica connection redirection**

Secondary-to-primary Connection Redirection

- **Read scaling and DR option for when cluster type = NONE**
- **Allow seamless failovers in environments without a listener**
- **Configured much like read-routing is today**

2019 Synchronous Replicas

2017 Synchronous Replicas

2019 Synchronous Replicas

System DB support for replication of instance level objects!

Thank You

Reach out to me @sqljudo

Learn more about basic availability groups at https://bit.ly/2RRvN5y

Good luck!