



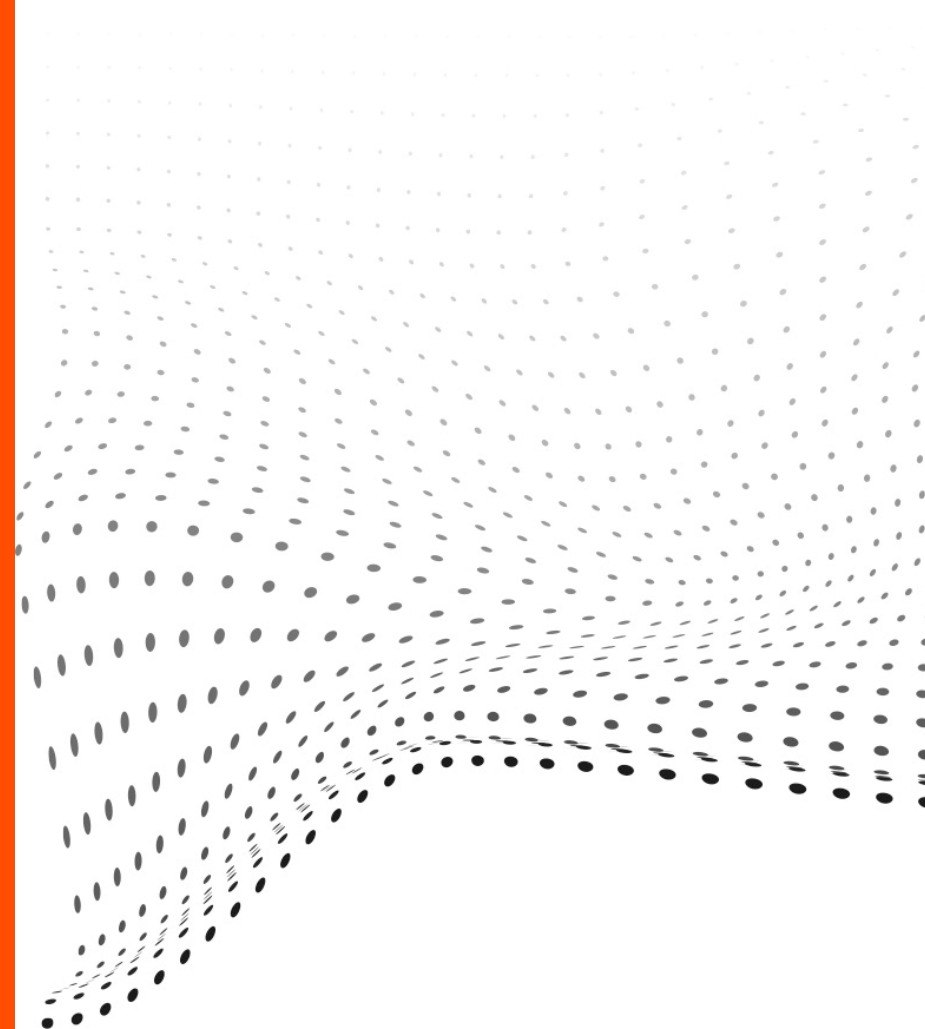
SOLUÇÕES
EM GERENCIAMENTO
DE DADOS

Zero to Hero in 16 Hours: HADR on SQL Server



Module 7: AOAG II

More Always On Availability Groups

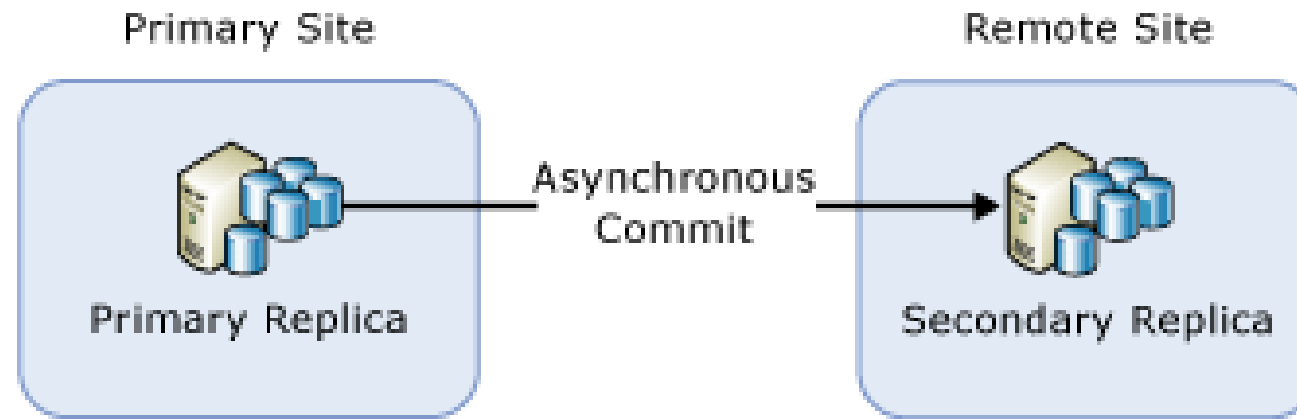


Goals

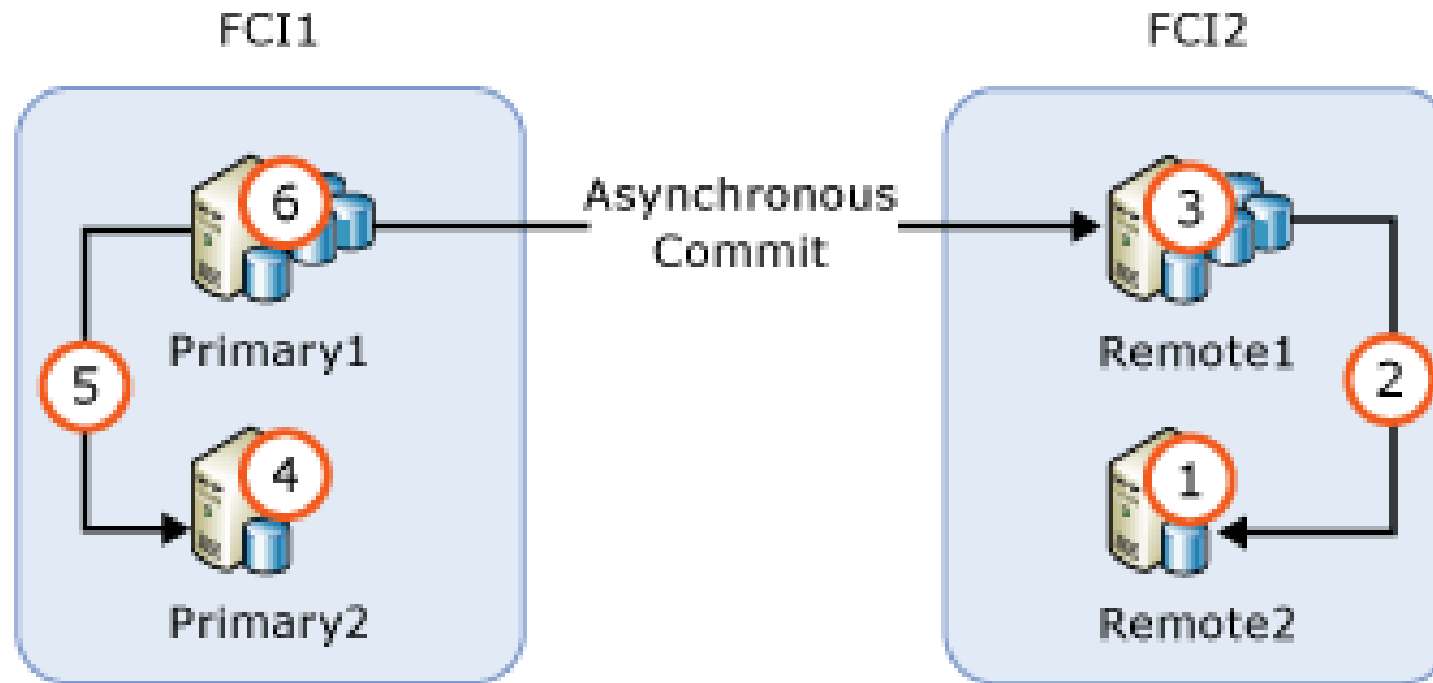


- Patching considerations
- AOAG between Datacenters (multiple subnets)
- Distributed AGs
- Troubleshooting and health checks
- Timeout fine tuning
- DMVs

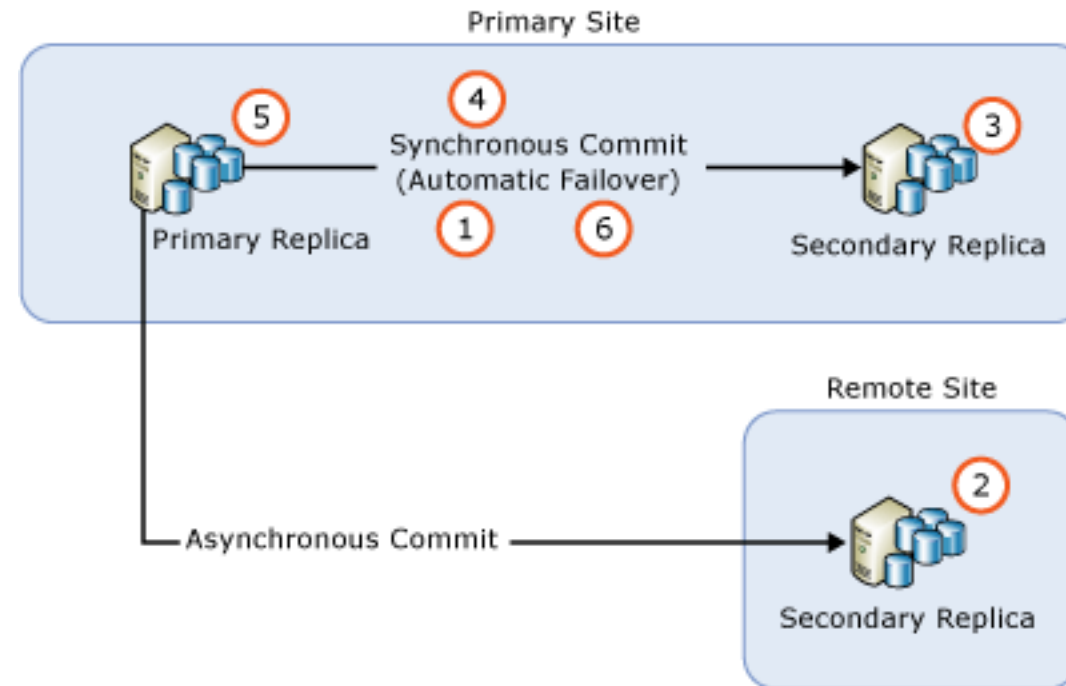
Patching and upgrade considerations



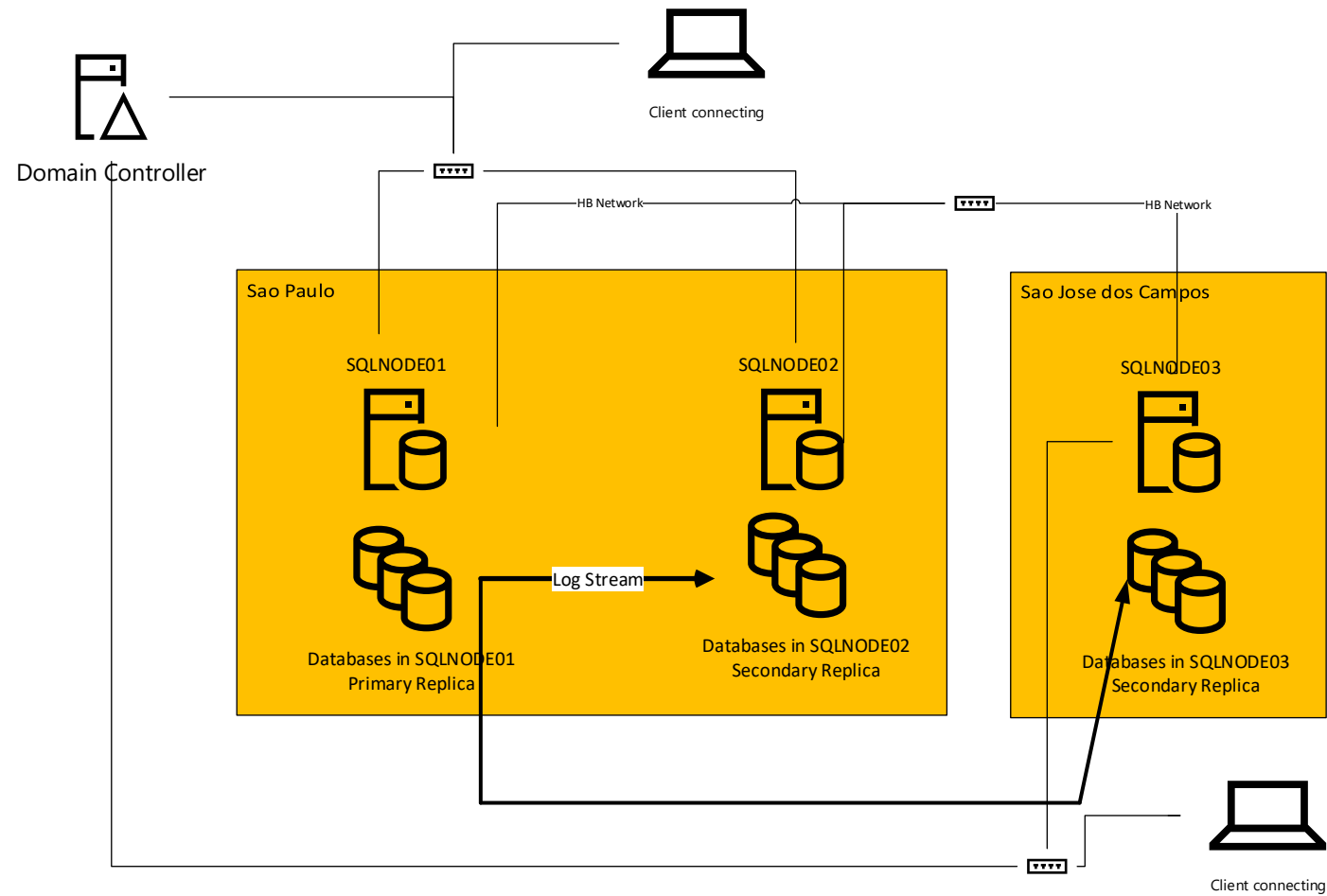
Patching and upgrade considerations



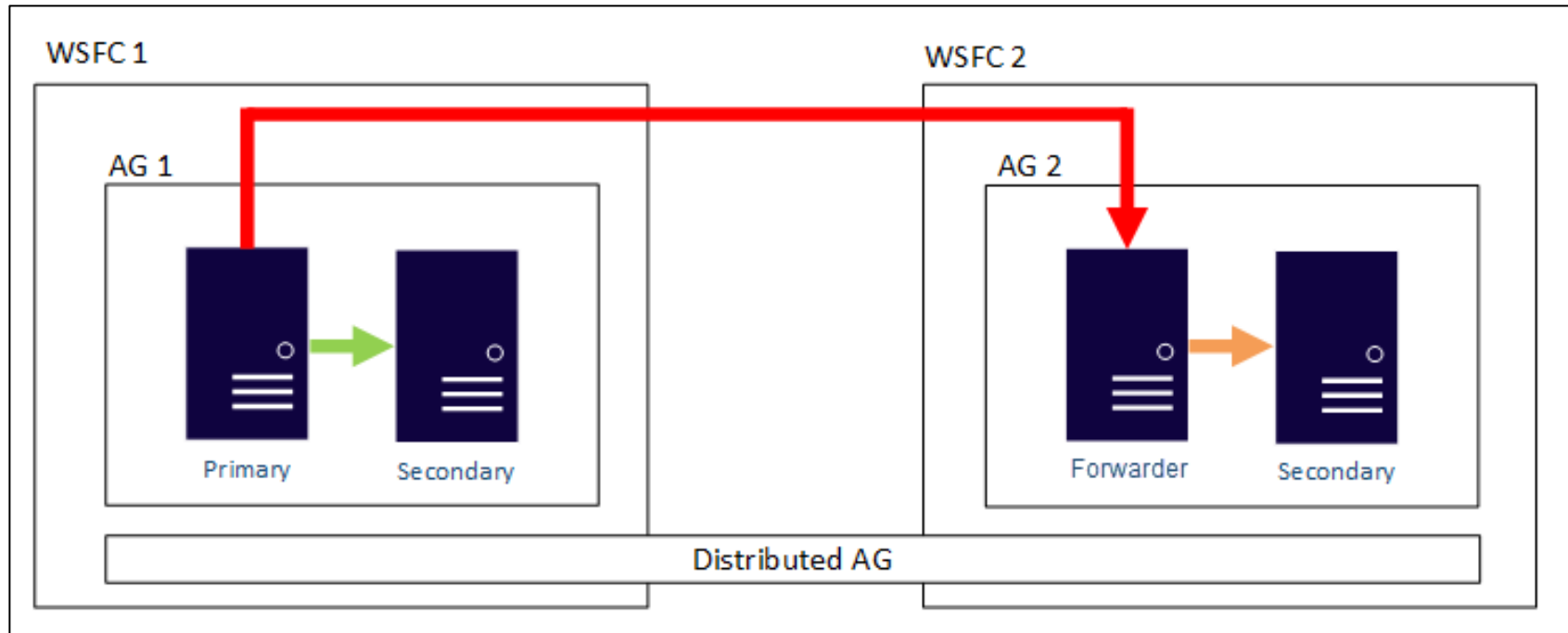
Patching and upgrade considerations



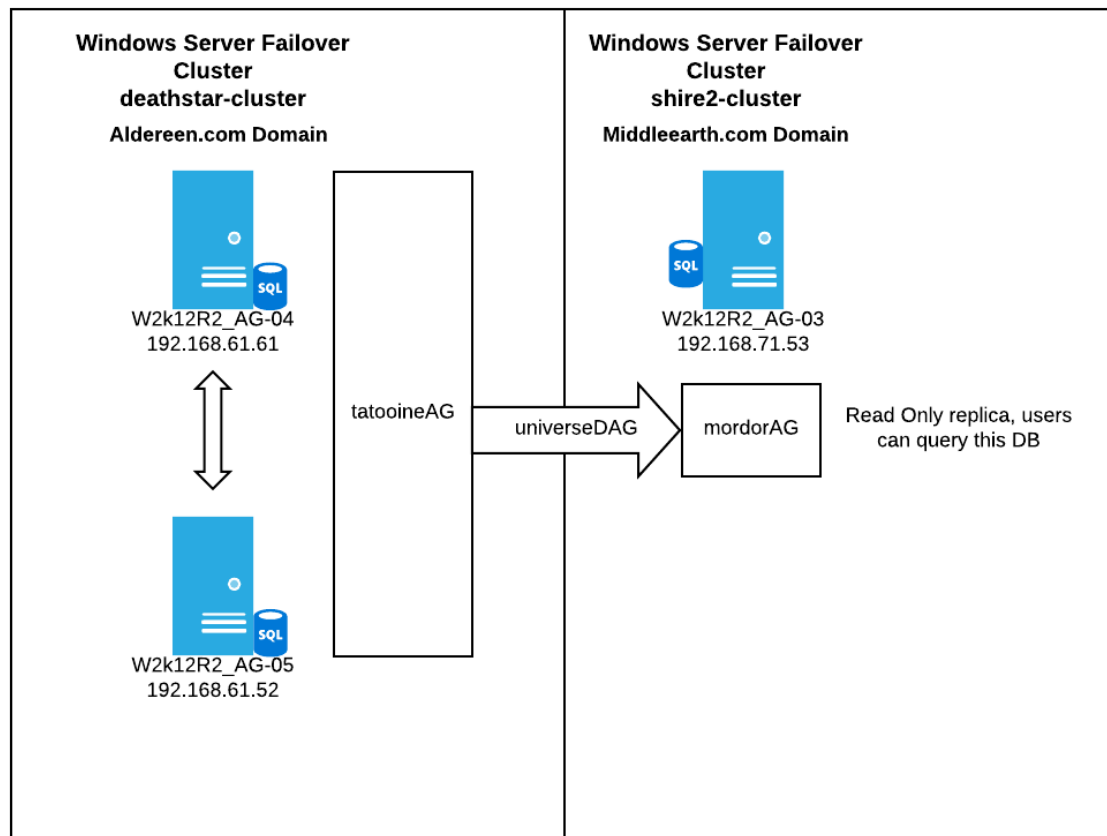
AO AG between Datacenters



Distributed Availability Groups



Distributed Availability Groups



Troubleshooting



Availability Group Properties - AGPombo

Select a page

- General
- Backup Preferences
- Permission
- Read-Only Routing

Script ? Help

Availability group name: AGPombo

Cluster type: Windows Server Failover Cluster

Required synchronized secondaries to commit: 0

☒ Database level health detection

☐ Per database DTC support

☐ Basic Availability Group

Availability Databases

Database Name
Pombo

Add Remove

Availability Replicas

Server Instance	Role	Availability Mode	Failover Mode	Connections in Primary Role
SQL11	Secondary	Synchronous commit	Automatic	Allow all connections
SQL12	Primary	Synchronous commit	Automatic	Allow all connections
SQL13	Secondary	Asynchronous commit	Manual	Allow all connections

Ready

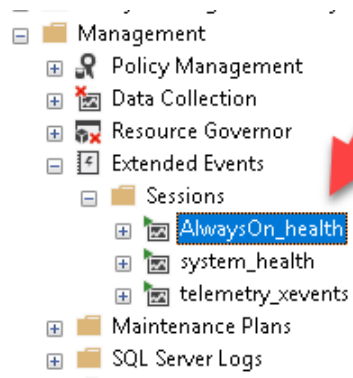
ays enable it)
from ONLINE

Troubleshooting



```
CREATE EVENT SESSION [AlwaysOn_health] ON SERVER
ADD EVENT sqlserver.alwayson_ddl_executed,
ADD EVENT sqlserver.availability_group_lease_expired,
ADD EVENT sqlserver.availability_replica_automatic_failover_validation,
ADD EVENT sqlserver.availability_replica_manager_state_change,
ADD EVENT sqlserver.availability_replica_state,
ADD EVENT sqlserver.availability_replica_state_change,
ADD EVENT sqlserver.error_reported(
    WHERE ([error_number]=(9691) OR [error_number]=(35204) OR [error_number]=(9693) OR [error_number]=(26024))
ADD EVENT sqlserver.hadr_db_partner_set_sync_state,
ADD EVENT sqlserver.lock_redo_blocked
ADD TARGET package0.event_file(SET filename=N'AlwaysOn_health.xel',max_file_size=(5),max_rollover_files=(4))
WITH (MAX_MEMORY=4096 KB,EVENT_RETENTION_MODE=ALLOW_SINGLE_EVENT_LOSS,MAX_DISPATCH_LATENCY=30 SECONDS,MAX_EVENT
```

GO



Troubleshooting

Synchronizing

Cluster Quorum Information

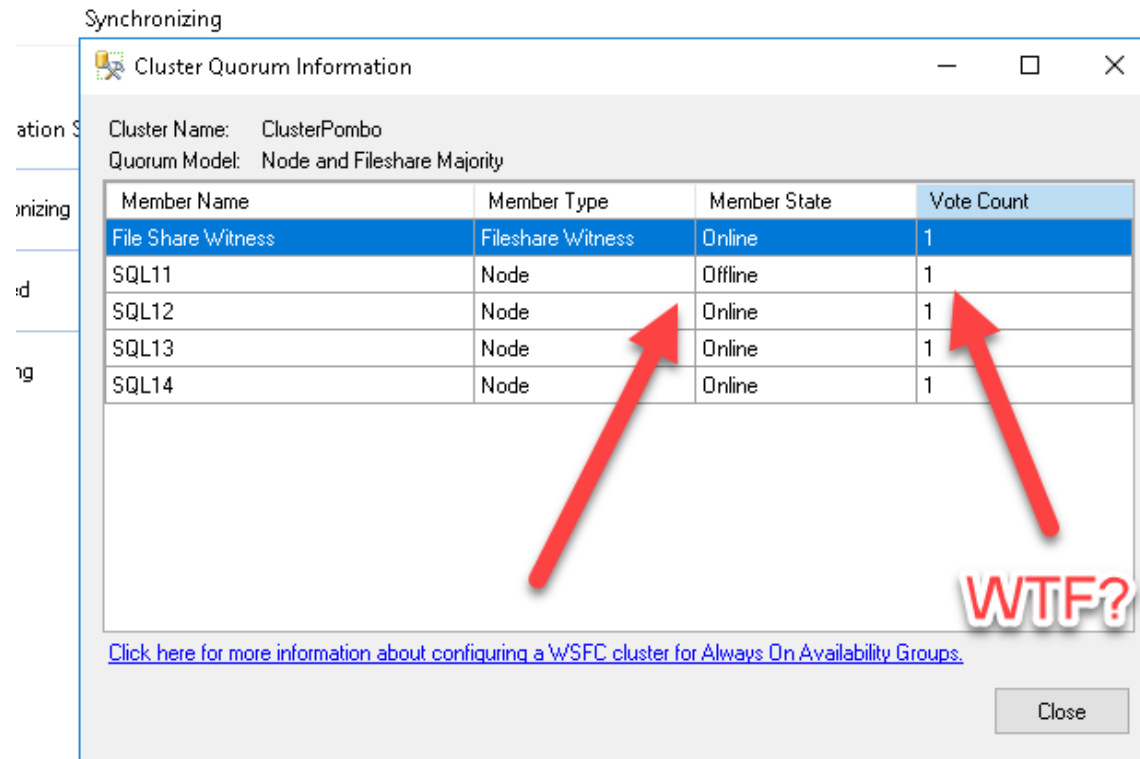
Cluster Name: ClusterPombo
Quorum Model: Node and Fileshare Majority

Member Name	Member Type	Member State	Vote Count
File Share Witness	Fileshare Witness	Online	1
SQL11	Node	Offline	1
SQL12	Node	Online	1
SQL13	Node	Online	1
SQL14	Node	Online	1

WTF?

[Click here for more information about configuring a WSFC cluster for Always On Availability Groups.](#)

Close



Troubleshooting



In POSH:

(Get-Cluster).WitnessDynamicWeight

Get-ClusterNode | ft name, dynamicweight, nodeweight, state -AutoSize

The screenshot shows a PowerShell console window and a SQL Server Enterprise Manager window. The PowerShell console displays the output of the commands (Get-Cluster).WitnessDynamicWeight and Get-ClusterNode | ft name, dynamicweight, nodeweight, state -AutoSize. The SQL Server Enterprise Manager window shows the 'Nodes (4)' view with a table of cluster node details.

Name	DynamicWeight	NodeWeight	State
SQL11	0	1	Down
SQL12	1	1	Up
SQL13	1	1	Up
SQL14	1	1	Up

Name	Status	Assigned Vote	Current Vote	Site
SQL11	Down	1	0	
SQL12	Up	1	1	
SQL13	Up	1	1	
SQL14	Up	1	1	

Troubleshooting



- The Cluster Log:
- Get-ClusterLog -UseLocalTime -Destination "c:\temp" -TimeSpan <previous X mins>

```
00001b44.00000b84::2020/02/18-10:58:28.192 DBG [Schannel] Authorization succeeded
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [SV] Incoming (second) connection from SQL12 is secure
00001b44.00000b84::2020/02/18-10:58:28.193 INFO [ReM] Got stream info from fe80::6d51:91b9:c8f6:cabf%8::~3343~ to fe80::8de8:5fdc:65cb:a18f%8::~55503~
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM] Exchanging local info.
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM] Sending local info.
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM] Local info sent, receiving remote info.
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM] Remote info received from 2:SQL12.
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM][Leader] I did not initiate connection, getting epoch from stream NodeObject.
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [NODE] Node 1: To n2 getting epoch (currently 1)
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM][Leader] I am the leader, my epoch = 1, sn = 1
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM][Leader] The follower's epoch = 2, SN = 1, Fault Tolerant Session ID = 6917c0e
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [ReM][Leader] My node did not initiate the connection.
00001b44.00000b84::2020/02/18-10:58:28.193 INFO [ReM][Leader] This is a reconnect (initiator epoch <2>, receiver's epoch <1>).
00001b44.00000b84::2020/02/18-10:58:28.193 WARN [ReM][Leader] Ignoring connection with 2 because the connection was initiated at Fe
00001b44.00000b84::2020/02/18-10:58:28.193 INFO [CORE] Node 1: Clearing cookie b86185ca-ba42-4b99-9cd0-c270ade19355
00001b44.00000b84::2020/02/18-10:58:28.193 DBG [CHANNEL fe80::8de8:5fdc:65cb:a18f%8::~55503~] Close().
00001b44.00000b84::2020/02/18-10:58:28.194 INFO [ReM] Eating connection.
00001b44.00001164::2020/02/18-10:58:28.466 INFO [RGP] node 1: Tick
00001b44.00001164::2020/02/18-10:58:28.466 INFO [RGP] node 1: selected partition 1202(2) as node 2 has quorum
00001b44.00001164::2020/02/18-10:58:28.466 INFO [RGP] node 1: selected partition 1202(2) to join [using info from 2]
```

Timeout finetune



Availability Replicas

	Readable Secondary	Seeding Mode	Session Timeout (seconds)	Endpoint URL
✓	Yes	Automatic	30	TCP://SQL11.datalab.com:5
✓	Yes	Automatic	30	TCP://SQL12.datalab.com:5
✓	Yes	Automatic	30	TCP://SQL13.datalab.com:5

< >

(Review) Failure detection components



- **Resource DLL (RHS):** determines the IsAlive value at the cluster heartbeat interval, and is controlled by CrossSubnetDelay and SameSubnetDelay cluster properties
- **sp_server_diagnostics**, which reports the component health on an interval controlled by the HealthCheckTimeout property
- **Lease mechanism**, which is used as a Looks-Alive between the cluster resource host and the SQL processes
- **Session Timeout**, which detected the soft errors/ small timeouts or insufficient resources

DMVs



- `sys.dm_hadr_auto_page_repair`
- `sys.dm_hadr_availability_group_state`
- `sys.dm_hadr_database_replica_cluster_states`
- `sys.dm_hadr_availability_replica_cluster_node`
- `sys.dm_hadr_database_replica_states`
- `sys.dm_hadr_availability_replica_cluster_state`
- `sys.dm_hadr_instance_node_map`
- `sys.dm_hadr_availability_replica_states`
- `sys.dm_hadr_name_id_map`
- `sys.dm_hadr_cluster`
- `sys.dm_tcp_listener_states`
- `sys.dm_hadr_cluster_members`
- `sys.dm_hadr_cluster_networks`
- `sys.dm_hadr_automatic_seeding`
- `sys.dm_hadr_physical_seeding_stats`

Fim do módulo

