Zero to Hero in 16 Hours: HADR on SQL Server

DB
BITS

SOLUÇÕES
EM GERENC
DE DADOS

Module 4: O.S. clustering

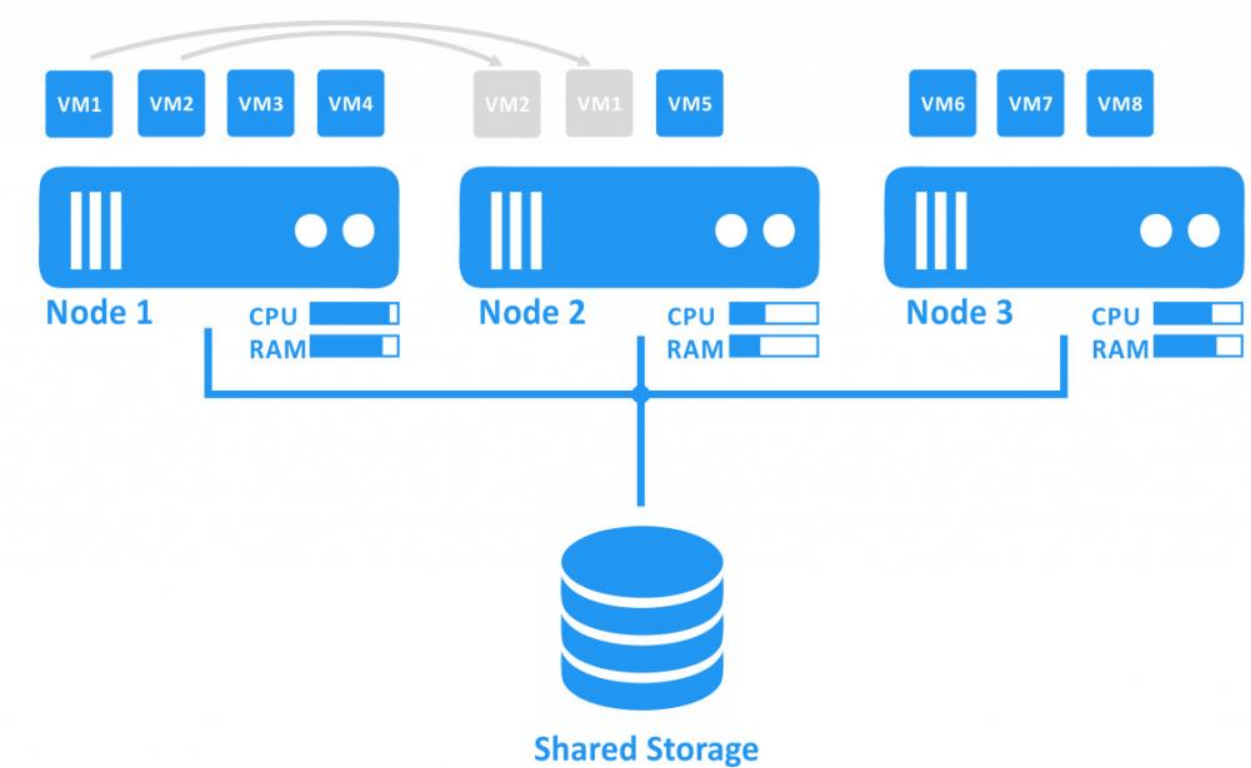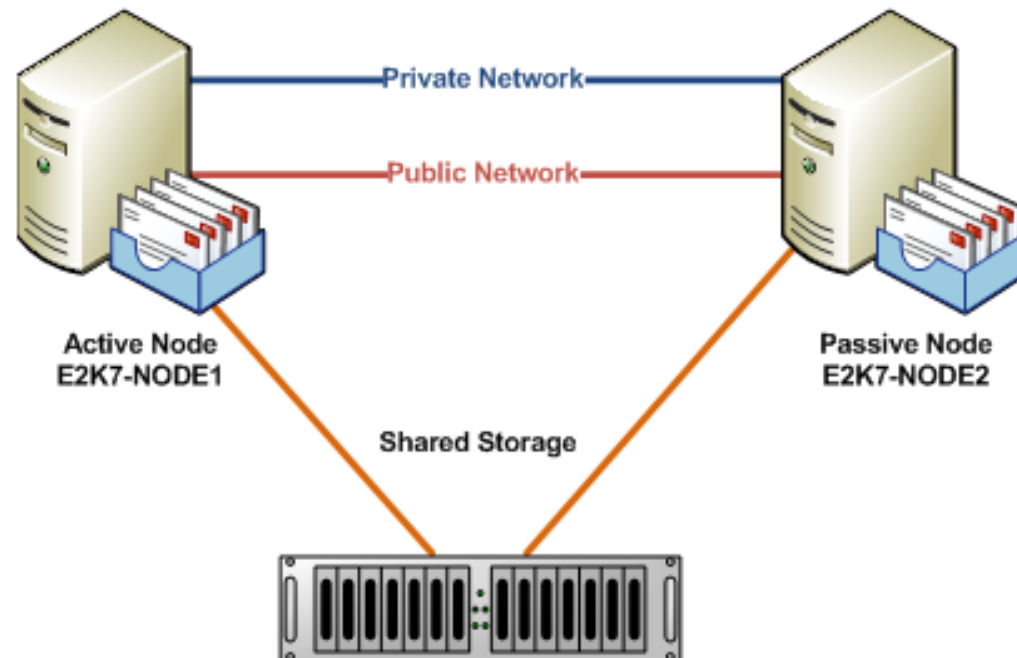**Getting into the serious stuff**
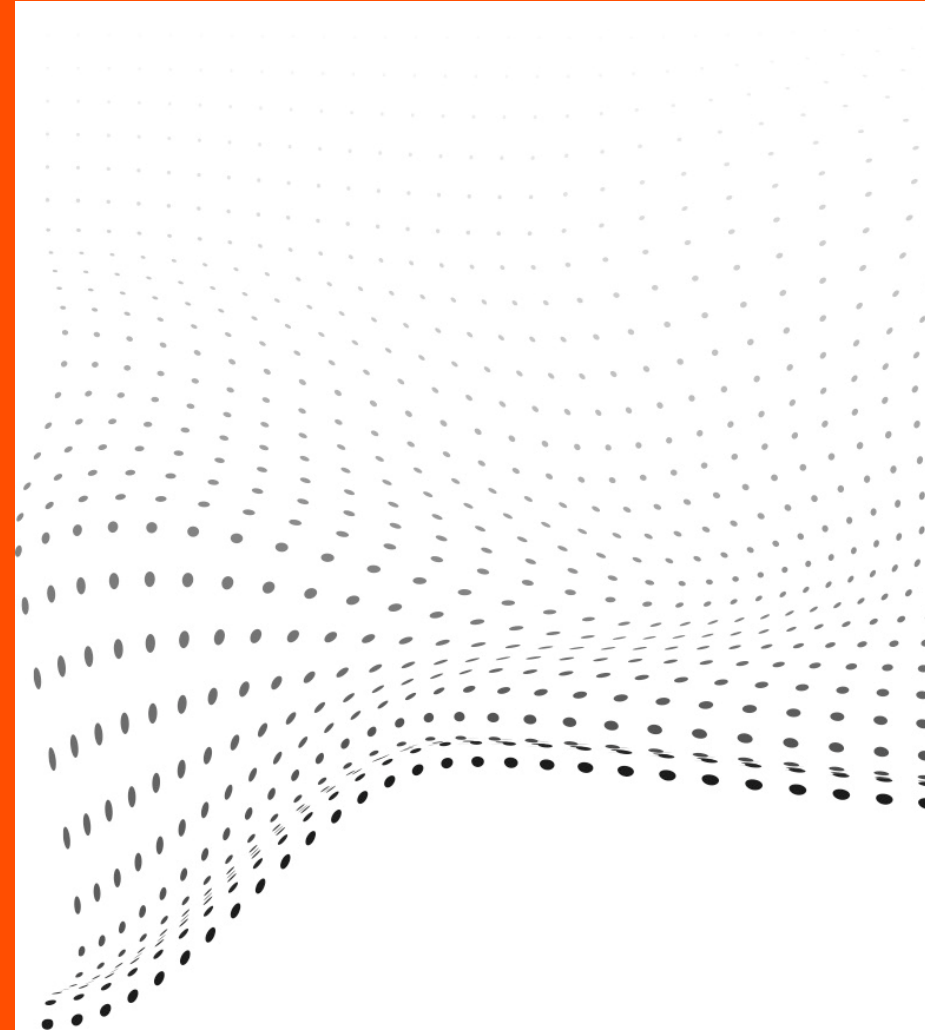
Goals

- What is it?
- WSFC – foundations – Quorum
- "Grandpa's Cluster"
- Planning and validating the Cluster
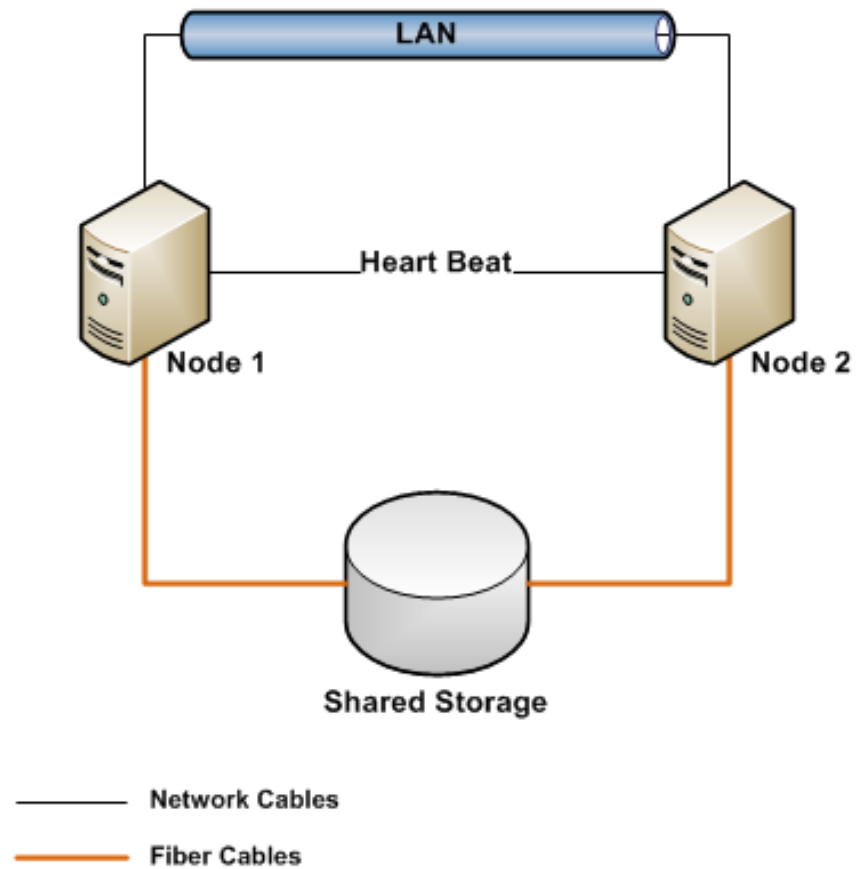- Infrastructure considerations

What is Clustering?

What is Clustering?

E2K7-MBX Single Copy Cluster

Private Network

Public Network

Active Node
E2K7-NODE1

Passive Node
E2K7-NODE2

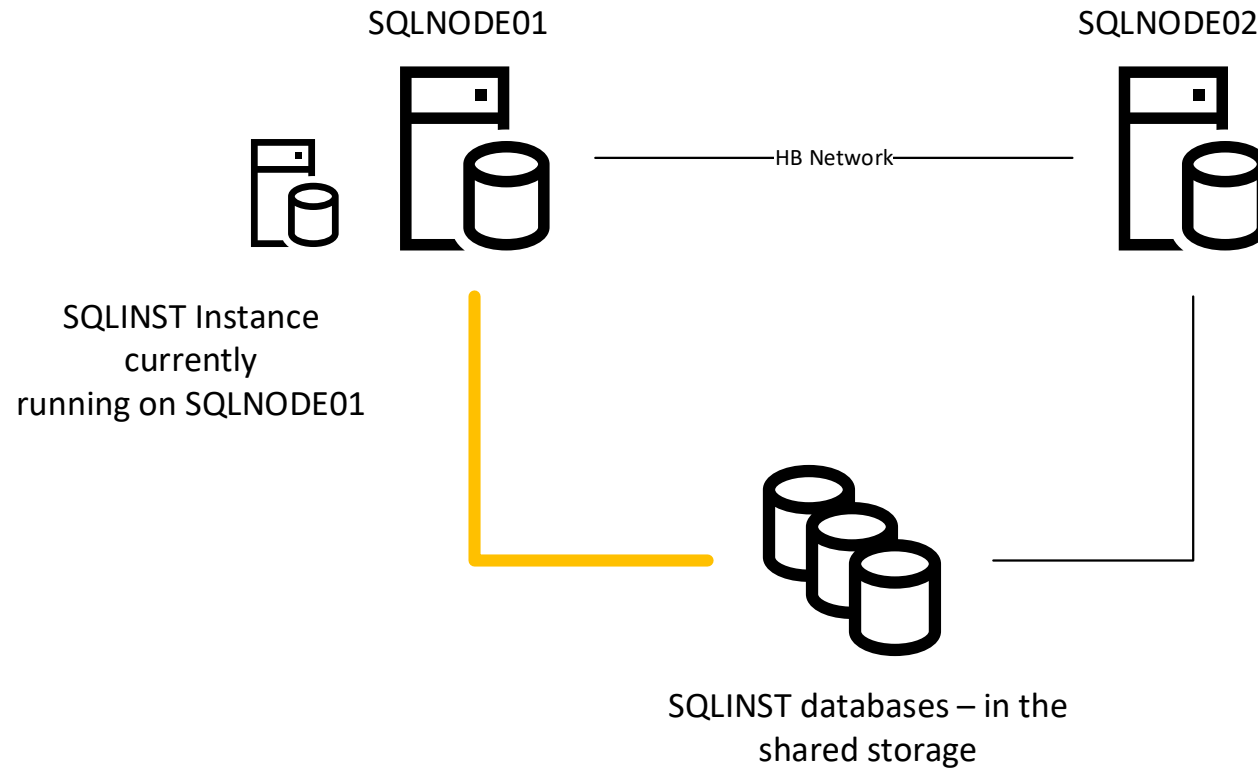Shared Storage

What is Clustering?
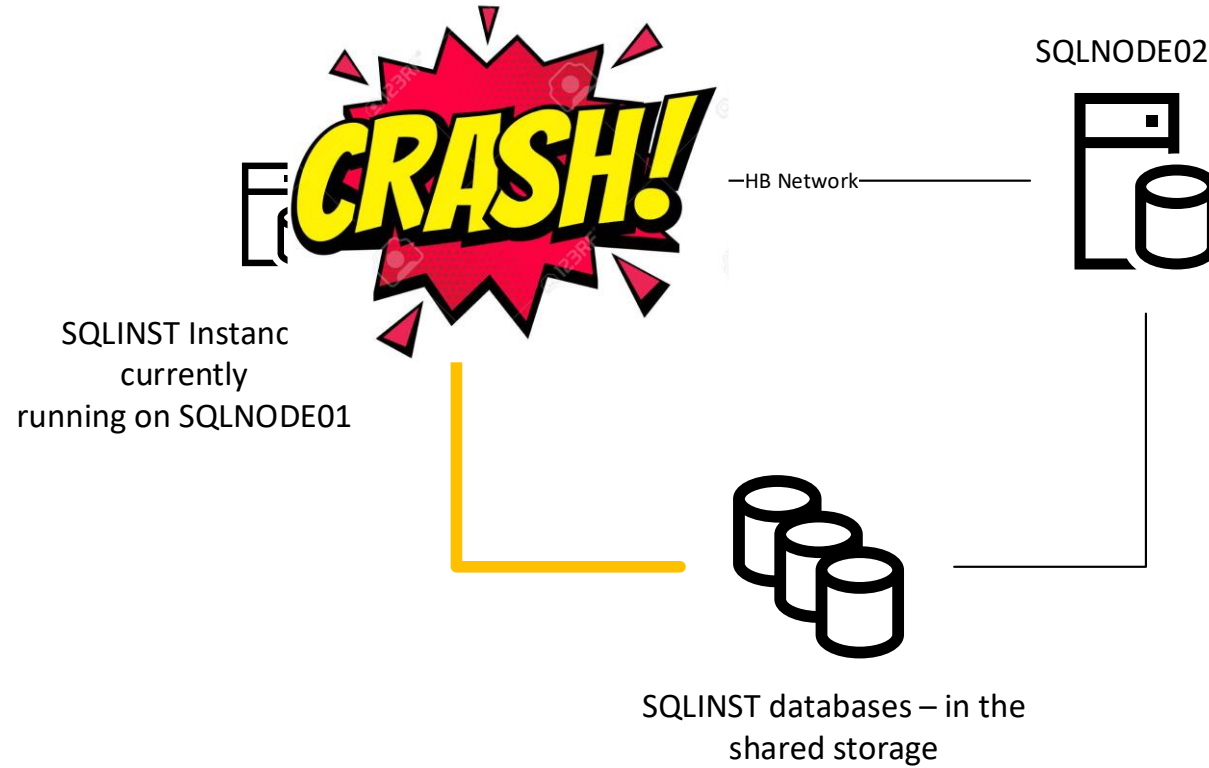
What is Clustering?

- "A failover cluster is a group of independent computers that work together to increase the availability and scalability of clustered roles."

- So, if my SQL SERVER is running on Server 1 and it stops or fails, Server 2 takes place to provide the same service to clients.

How does it work?

SQLNODE01

SQLNODE02

HB Network

SQLINST Instance
currently
running on SQLNODE01

SQLINST databases – in the
shared storage

https://www.brentozar.com/archive/2012/02/introduction-sql-server-clusters/

How does it work?

SQLNODE02

HB Network

SQLINST Instance
currently
running on SQLNODE01

CRASH!

SQLINST databases – in the
shared storage

How does it work?

SQLNODE01

SQLNODE02

HB Network

SQLINST Instance
currently
running on **SQLNODE02**

SQLINST databases – in the
shared storage

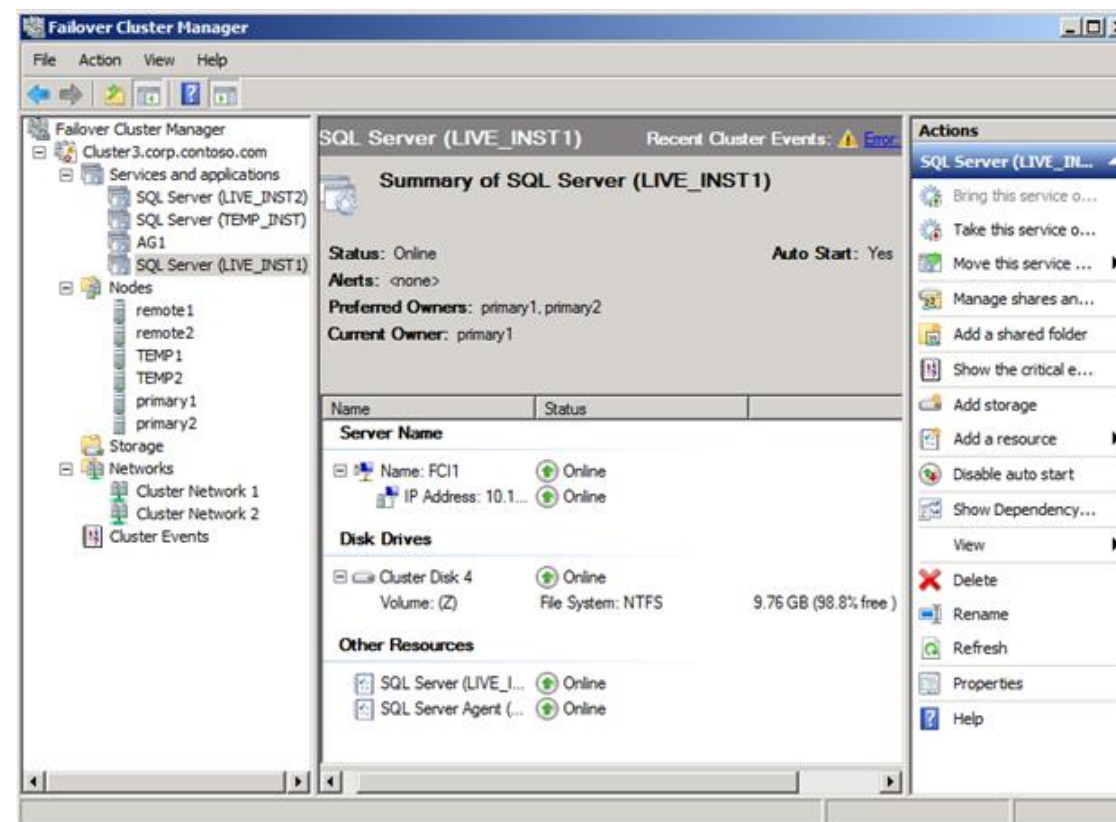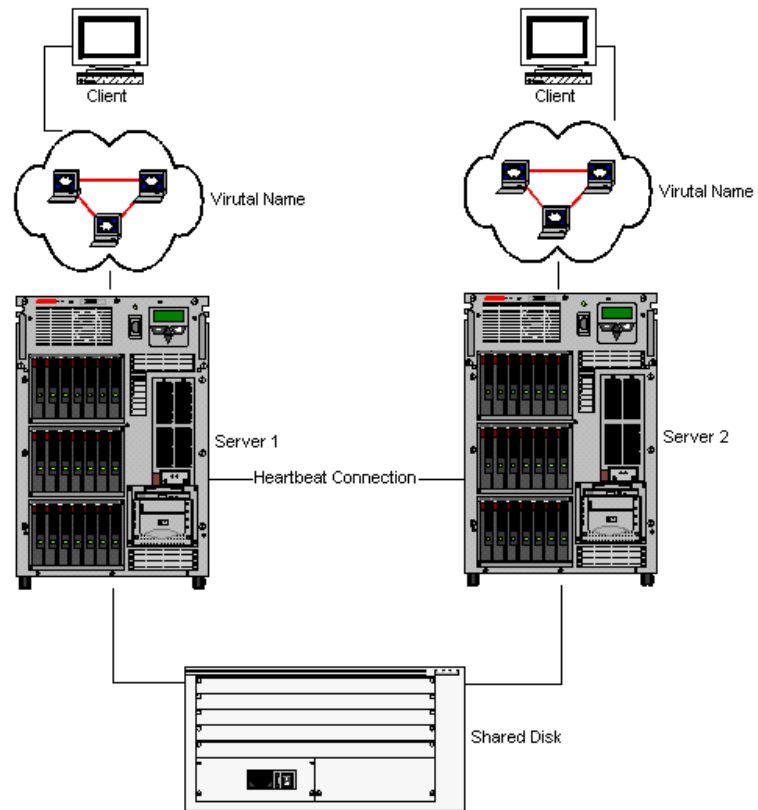https://www.brentozar.com/archive/2012/02/introduction-sql-server-clusters/

Terminology

- Node
- Cluster resource
- Role (old group)
- Network name resource
- Resource dependency
- Preferred owner
- Quorum

https://docs.microsoft.com/en-us/sql/sql-server/failover-clusters/windows/windows-server-failover -clustering-wsfc-with-sql-server?view=sql-server-ver15
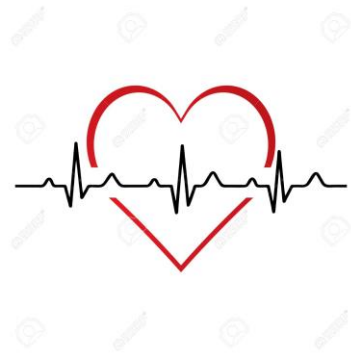
"Grampa's cluster"

"Grampa's cluster"

- LooksAlive: lightweight health check every 5 seconds (check if service is operational)
- IsAlive: check every 60 seconds (@@SERVERNAME) or if LooksAlive fails
- **LooksAlivePollInterval** can be changed in the Cluster Service properties
- **IsAlivePollInterval** can be changed in the Cluster Service properties

WSFC – foundations – Quorum

Quorum = "A **quorum** is the minimum number of members of a deliberative assembly (a body that uses parliamentary procedure, such as a legislature) necessary to conduct the business of that group. According to *Robert's Rules of Order Newly Revised*, the "requirement for a quorum is protection against totally unrepresentative action in the name of the body by an unduly small number of persons."

https://en.wikipedia.org/wiki/Quorum

Quorum configuration in Windows Server

- Node Majority
- Node Majority with disk witness
- Node Majority with file share witness
- No majority

Dynamic quorum and dynamic witness

- Windows Server 2012 introduced dynamic quorum

- Windows Server 2012 R2 introduced dynamic witness

- Always have the cluster with an odd number of votes
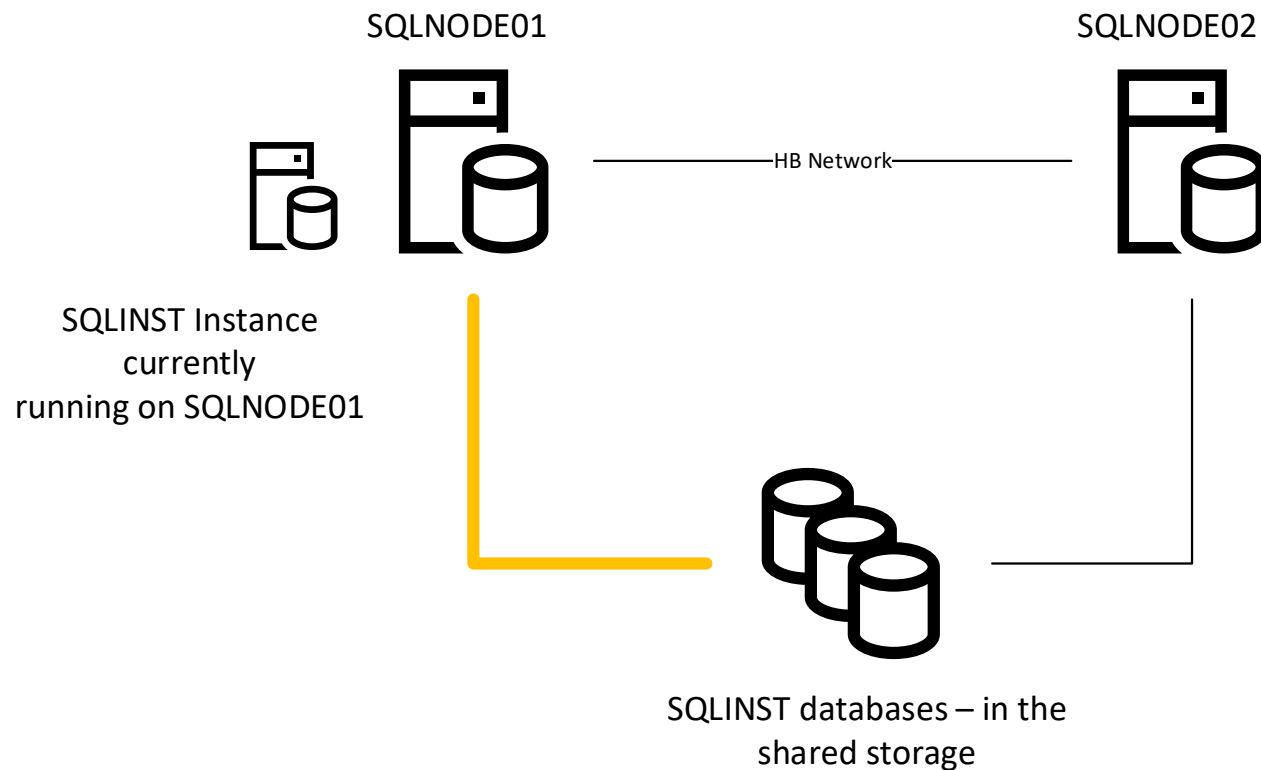
Example with a 5 node cluster:

- Random Last man standing situation (2012)

- Precise Last man standing situation (2012 R2)

Nowadays...

- We still have the old checks and in SQL SERVER we also have:
- SP_Server_diagnostics (SQL SERVER 2012)
- Which can be used for troubleshooting other components as well

- https://www.sqlskills.com/blogs/joe/under-the-covers-with-sp_server_diagnostics-data-part-i/

But where will my data reside?

SQLNODE01

SQLNODE02

HB Network

SQLINST Instance
currently
running on SQLNODE01
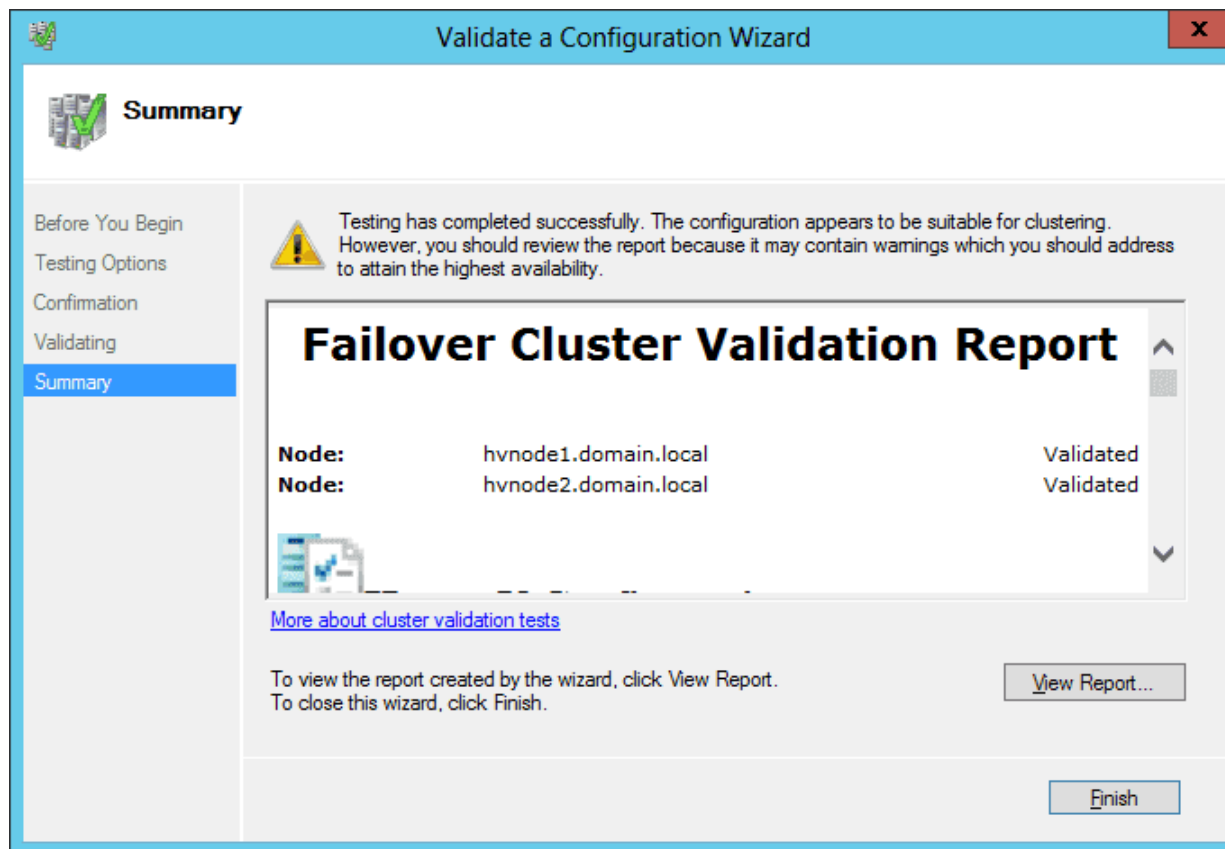
SQLINST databases – in the
shared storage

Step-by-step

Both nodes are already in the Domain

1. Plan for Ips, Virtual names and Disks
2. Present the disks (luns) to each node;
3. Install the Clustering role;
4. Make sure the user installing the cluster has proper privileges in the AD;
5. Create the Cluster;
6. Add the nodes;
7. Validate the Cluster configuration.

Validation Report

Fim do módulo