High Availability with Windows Failover Clustering and Geo-Clustering

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What this presentation covers

- Today’s IT requirements
- The costs of downtime
- Understanding Windows Failover Clustering
- New features in Ws2012 / R2 clustering
- Geo-clusters
- Architecting availability
- Additional references
Today’s IT Requirements

- Agility
  - Meeting quickly changing business conditions
- Reducing complexity
- Increasing automation
- Consumerization of IT
- Reducing costs
  - CapEX
  - OpEx
- Data control and security
The Costs of Downtime

- **Gartner**
  - $5600 p/m
  - $300K p/h

- **Amazon 30 minute outage in 2013**
  - $66,240 p/m
  - Approximately $3M

- Its not just dollars
  - Customer / end user confidence
  - Reputation
Windows Failover Cluster Overview

- Provides protection from unplanned downtime
- Automated failover
- Server-level
- Maximum of 64 nodes
- Added as a Windows Server Feature
New Features in Windows Failover Clustering for WS2012 & R2

- Windows Server 2012
  - 64 node cluster
    - Up from 16
  - 4000 VMs per cluster
  - 1024 VMs per node
  - Tunable heartbeat

- Windows Server 2012 R2
  - Shared virtual hard disk
  - Virtual machine drain on shutdown
  - Virtual machine network health detection
  - Active Directory-detached cluster
Windows Failover Cluster
Cluster Quorum Types

- **Node Majority**
  - For clusters with an odd number of nodes
  - Can sustain failures of half the nodes minus one

- **Node and Disk Majority**
  - For clusters with an even number of nodes
  - Can sustain failures of half the nodes if the disk witness remains online

- **Node and File Share Majority**
  - For clusters with special configurations
  - Like Node and Disk Majority but uses a file share witness
Adding the Failover Clustering Feature

- Server Manager
- Add Roles and Features
- Features
- Failover Clustering
Creating the Cluster

- Failover Cluster Manager
- Validate the configuration
  - Select Nodes
  - Tests:
    - System
    - Networking
    - Storage
- Create Cluster
  - Select Nodes
  - Cluster name
  - Virtual IP
  - Select Quorum
  - Storage
Multi-site Failover Clusters

- Disaster recovery
- Protects against loss of entire location
- Storage synced with SAN-to-SAN replication
Multi-site Failover Clusters

- **Best practices**
  - Even number of node
  - Node and File Share Majority option
    - Including a file share witness
  - Consider DNS replication
    - TTL
  - Tuning heartbeat to adjust for latency
  - Asynchronous storage replication
  - Using the same HBAs and NICs on each site
Architecting Availability

- Technology
  - Failover Clustering
- People
  - Training
- Processes
  - Standards
  - Documentation
  - Runbooks
FAQs

Q: Do I need specialized hardware for the failover cluster nodes?
A: No. You can use stand servers. Microsoft will support the cluster if it passes the validation tests.

Q: Do all the cluster nodes have to be configured the same?
A: No

Q: Do I need a SAN if I want to build a Windows Failover Cluster?
A: No. But you do need shared storage

Q: can you implement a Windows Failover Cluster on with virtual machines?
A: Yes. You can implement a Windows Failover Cluster at either the host or guest level.
Additional References

- **Failover Clustering Overview**

- **Requirements and Recommendations for a Multi-Site Failover Cluster**

- **Windows Server 2012: Building a Two-Node Failover Cluster**

- **Creating a Windows Server 2012 R2 Failover Cluster using Starwind SAN V8**
  - [http://www.starwindsoftware.com/white-papers/](http://www.starwindsoftware.com/white-papers/)

- **Windows Server 2012 Geo-Clustering**
  - [www.starwindsoftware.com](www.starwindsoftware.com)
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