PRIMERGY
DuplexDataManager®

Configuration Examples for
ETERNUS DX60 / DX80 (iSCSI)

Windows Server 2003 / 2008 / 2008 R2

December 9, 2009
MultiPath

I/O Fault Tolerance by Redundant Fibre Channel Paths
MultiPath handles Path Redundancy

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standby

active

ETERNUS DXxx
Load Balancing Option

Load Balancing Algorithms:
- a) AutoBalance load balancing algorithm
- b) Per LUN selectable path
standard configuration
one switch configuration

- Subnet A
  - NIC #1
  - Ethernet LAN
- Subnet B
  - NIC #2
  - MultiPath

- PRIMERGY XXX
  - Internal disks for SYSTEM,...

- subnets separated by VLAN

- LAN
  - P0
  - P1
  - CTRL 0
  - 1st RAID Disk Array Controller
  - CNTL 1
  - 2nd RAID Disk Array Controller

- ETERNUS DX60/80

! not recommended! Switch is single point of failure
direct attached (standard)
direct attached (one controller)
Tips and Tricks

- **General Recommendations for MultiPath**
  - IPv4 should be selected (IPv6 not supported)
  - Do not establish multiple connections to one target before MultiPath installation
  - For iSCSI boot "spanning tree" must be disabled at the boot NIC's switch port

- **Check presence and status of all MultiPath Groups**
  - MultiPath status must show *Active / Standby*
  - Check *Acknowledge Configuration* to enable the monitoring of missing paths
DuplexWrite

Highest Data Availability by Mirroring
DuplexWrite mirrors Data

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ETERNUS DXxx

original

mirror
Diskload Balancing Option

Diskload Balancing Algorithm:
read channel depends on block number
boundary dynamically adjusted
direct attached
one switch configuration

- **DuplexWrite**
  - Ethernet LAN
  - NIC #1
- **internal disks for SYSTEM,...**
- **PRIMERGY XXX**
- **LAN**
- **1st RAID Disk Array Controller**
- **ETERNUS DX60/80**

**not recommended**
Switch is single point of failure
Tips and Tricks

- General Recommendations for DuplexWrite
  - IPv4 should be selected (IPv6 not supported)
  - For iSCSI boot "spanning tree" must be disabled at the boot NIC's switch port

- Configure DuplexWrite first
  - Install DDM
  - Build all DuplexWrite groups and start recovery
  - ...configure your system and applications

- Check presence and status of all DuplexWrite groups
  - DuplexWrite status must show Online for all (partner) disks

- Be careful using Disk Administrator
  - Never delete a COD partition, delete DuplexWrite group first
DuplexDataManager

Highest Storage Availability by DuplexWrite & MultiPath
DuplexWrite & MultiPath

Location1

Location2
standard configuration
full redundancy
DuplexDataManager

Disaster Resilient Solution
Disaster Resilient Solution

MS Cluster & DuplexWrite & MultiPath

Cluster Interconnect

Location1

Location2
MS Cluster handles Server Redundancy
MultiPath handles Path Redundancy
Disaster Resilient Solution

DuplexWrite mirrors Data

Cluster Interconnect

Location1

Location2
standard configuration
standard configuration
using switch interconnects
2 switch solution

![Diagram of the 2 switch solution with network components and configurations.]

- **Ethernet LAN**
  - NIC #1
  - NIC #2
  - Subnet A/LAN
  - Subnet B

- **NIC #1**
- **NIC #2**

- **LAN #1/2**
- **Switch interconn.**
- Subnet A/B

- **PRIMERGY XXX**
- **Internal disks for SYSTEM,...**

- **1st RAID Disk Array Controller**
- **2nd RAID Disk Array Controller**

- **ETERNUS DX60/80**

- **Configuration note**: Not recommended. Switch failure would cause outage of the dedicated storage.
! Avoid Split Brain Situations!
- Bringup nodeA, and nodeB separately (use ServerStart)
  - Install Windows Server 2003 including latest update & hotfixes
  - Install DuplexDataManager on all nodes

- Install and configure all LAN connections
  - Configure NICs and switches
  - Configure the iSCSI SW target

- Configure the Storages
  - Shut down all but nodeA
  - Configure LUNs pairwise on both storages (DuplexWrite groups)
  - Register all nodes for each path

- Create DuplexWrite groups
  - Shut down all but nodeA
  - Create all DuplexWrite groups on storageA (no mirror disks)
  - Add second disks at storageB and start recover
  - Reboot this node (nodeA)

- Install Microsoft Cluster Services
  - Install MSCS on nodeA (nodeB off)
  - Install MSCS on nodeB (cluster installation - join)
  - Check DDM and cluster functionality
Setting up MS Cluster & DDM (WS 2008)

- Bringup all nodes separately (use ServerStart)
  - Install Windows Server 2008 including latest update & hotfixes
  - Install DuplexDataManager on all nodes

- Install and configure all LAN connections
  - Configure NICs and switches
  - Configure the iSCSI SW target

- Configure the Storages
  - Configure LUNs pairwise on both storages (DuplexWrite groups)
  - Register all nodes for each path

- Create DuplexWrite groups
  - Shut down all but one node
  - Create all DuplexWrite groups
  - Add second disks (do not start recover, status is Online - Error)
  - Reboot this node, start all other nodes

- Add the feature Failover Clustering
  - Start the Failover Cluster Management, select Validate a Configuration
  - Evaluate the cluster validation log (do not proceed until it is error free)

- Create the Failover Cluster
  - Recover all DuplexWrite groups on the node which owns the disk resource
  - Create all partitions on the cluster disk resources (DuplexWrite groups)
  - Acknowledge the MultiPath configuration on all nodes
  - If all DuplexWrite groups are Online test the functionality (e.g. Path failover, moving resources to other nodes, ...)
  - Install the Failover Clustering applications.
Documentation

- General hint: read the related documents!
- Contained on DDM-CD:
  - Readme
  - Online help (newest/best reference!)
  - Configuration slides
- DDM related links:
  - DDM's home (Intranet)
    http://synergy.pdb.fsc.net/
    > DuplexDataManager
  - Partners (Corporate Extranet)
    > Partner Portal > Product catalog > Server products > Industry standard > High availabilily
  - Online Manuals (Internet)
    http://manuals.ts.fujitsu.com/
    > Industry Standard Servers > Software > Select High Availability > Select PRIMERGY DuplexDataManager
  - PRIMERGY clustering and disaster tolerance (Internet)
    > Server High Availability > High availability software for: PRIMERGY servers
  - DuplexDataManager updates (Internet)
    http://support.ts.fujitsu.com/com/support/index.html
    > SUPPORT > Driver & Downloads > Full text search Software; Search: DuplexDataManager, MultiPath or MPIO
  - PRIMERGY servers (Internet)
  - Disk storage systems (Internet)
    http://ts.fujitsu.com/products/storage/disk/
- MS Cluster documentation
ETERNUS DX60 / DX80 (iSCSI)

P0 P1
Cntrl 0
1st RAID Disk Array Controller

P0 P1
Cntrl 1
2nd RAID Disk Array Controller

ETERNUS DX60/80