

# Highly Available Novell Nsure® Identity Manager

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## Introduction

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High Availability (HA) is one of the most-requested capabilities that is not already built into Identity Manager

- Asked about on every large deployment
- HA is typically achieved through the use of clustering
- Identity Manager can't be clustered using NetWare® Cluster Services (NCS)
- HA for Identity Manager has been traditionally achieved through a convoluted, manual, incomplete, and fragile process



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## The Key to Clustering Identity Manager

The key to clustering Identity Manager is the ability to share the same copy of the eDirectory™ and Identity Manager data between servers

- eDirectory data CANNOT be shared between different NetWare® servers in an NCS cluster, but can be shared using StandbyServer\* from CaminoSoft.
- eDirectory data CAN be shared between different Linux and Win32 servers
- eDirectory data can PROBABLY be shared between different AIX\* or Solaris\* servers (we haven't tried it yet)



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## Shared Storage

Sharing the eDirectory/Identity Manager data requires some form of shared or mirrored storage

- DRBD
- iSCSI
- Shared SCSI
- Fibre-channel SAN



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## Shared Storage: DRBD

DRBD (Distributed Replicated Block Device) is an Open Source project for mirroring storage between two servers

- Requires a dedicated partition on each server
- Replicates over IP
- Least expensive storage option
- Included in SUSE® LINUX
- Not available on Windows
- <http://www.drbd.org>



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## Shared Storage: iSCSI

iSCSI is an emerging standard for sharing disk devices over TCP/IP

- Client (initiator) support is included in SUSE LINUX
- A NetWare 6.5 server can be used as an iSCSI target
- Hardware can be fairly inexpensive (or not)
- <http://linux-iscsi.sourceforge.net>
- Haven't yet gotten Windows to work with a NetWare iSCSI target



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## Shared Storage: Shared SCSI

An dual-connector external SCSI disk or disk array can be shared between two servers

- Requires a SCSI adapter in each server
- Must be able to change the SCSI address of one of the SCSI adapters
- Hardware can be fairly inexpensive (or not)
- Configuration can be temperamental
- Have demonstrated on both SUSE LINUX and Windows



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## Shared Storage: Fibre-channel SAN

A Fibre-channel SAN is a high-end shared storage option often used in large or enterprise-class clusters

- Hardware can be very expensive
- Would usually only be used with an existing SAN infrastructure



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## Components of a Linux HA Cluster

A typical Linux HA Cluster has several software components, all of which are included in SUSE LINUX Enterprise Server

- Cluster Manager (heartbeat)
- Shared Storage (e.g. drbd, linux-iscsi)
- Resource fencing (heartbeat-stonith)
- Resource Monitoring (mon)



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## Components of a Linux HA Cluster (cont.)

A Linux HA Cluster also has additional hardware components

- Server interconnects (serial and additional NICs)
- Shared Storage hardware (additional disk or partitions, external shared storage)
- STONITH devices (UPS, controllable power switches)



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## Linux Cluster Manager: heartbeat

Heartbeat provides the core clustering service

- Establishes communication between the cluster nodes
- Allocates resources to the active node
- Resources are SysV init scripts
- <http://linux-ha.org/heartbeat>



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## Linux Resource Fencing: heartbeat-stonith

Resource fencing is making sure that only one server has access to a particular resource at a time

- a plugin for heartbeat
- STONITH = Shoot The Other Node In The Head
- Helps to maintain the integrity of your shared disk
- Support for many different STONITH devices
  - APC SmartUPS
  - APC MasterSwitch
  - Baytech Switch
  - Operator intervention ("meatware")

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## Linux Resource Monitoring: mon

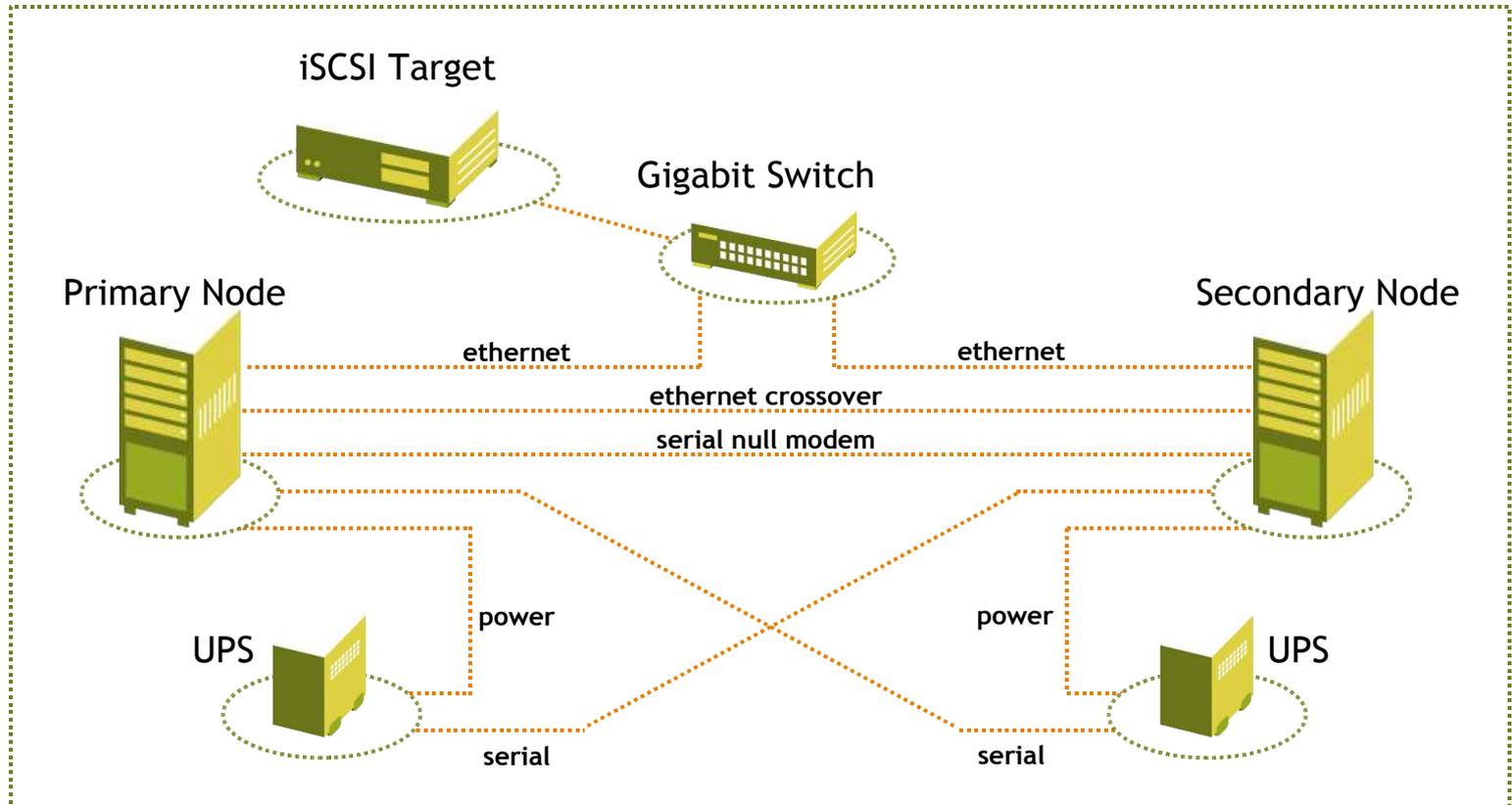
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mon is an extensible monitoring and notification system

- necessary because heartbeat doesn't monitor status of resources after they are started
- need custom monitors to allow monitoring of ndsd
- need custom alerts to allow ndsd to be restarted or failed over
- <http://www.kernel.org/software/mon>

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# Linux iSCSI Cluster



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## Components of a Windows HA Cluster

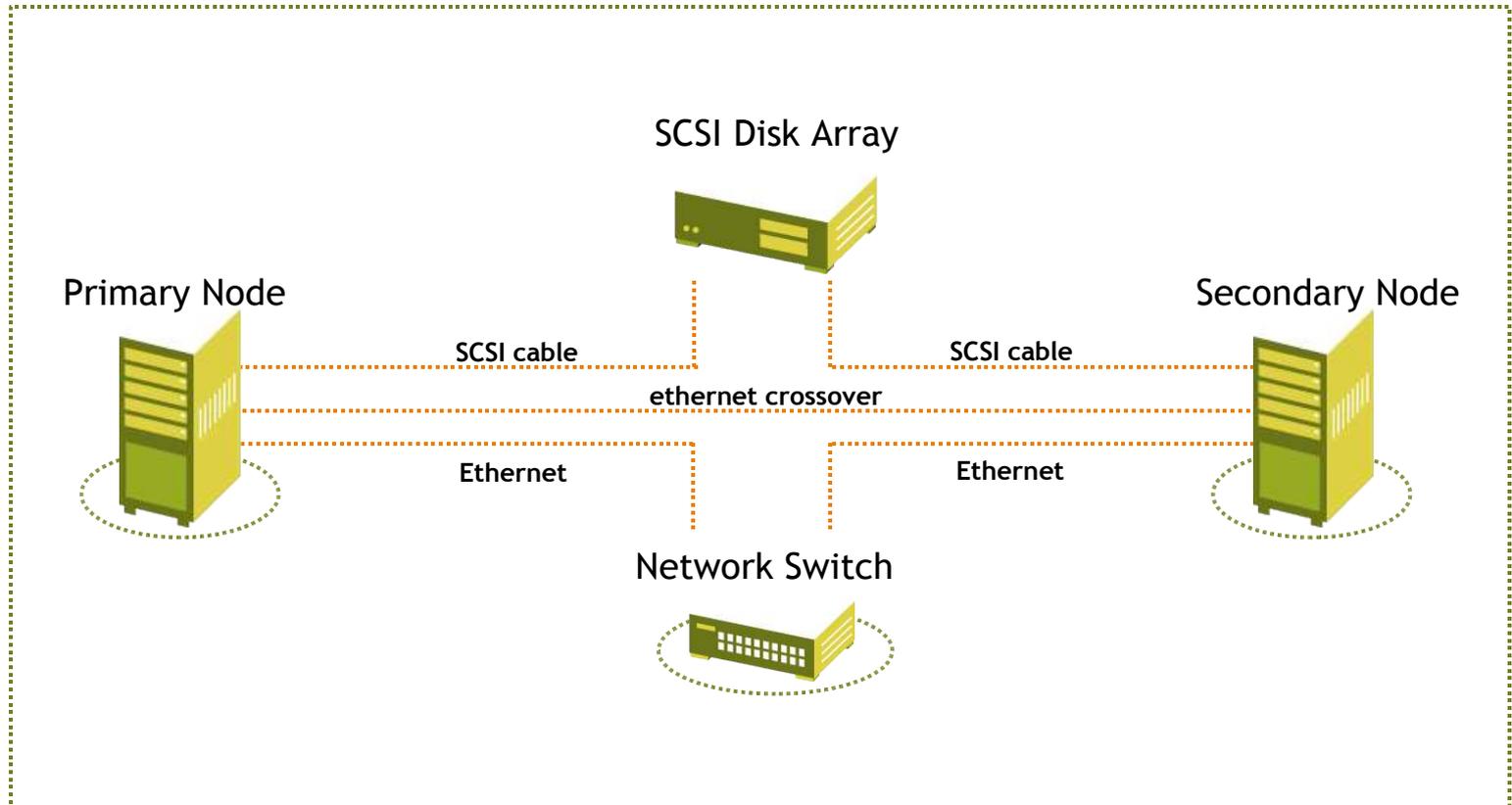
A typical Windows HA Cluster includes:

- Windows Cluster Services (included in Windows Server Enterprise Edition)
- Shared Storage hardware (e.g. shared SCSI, iSCSI, SAN)
- Quorum disk hardware (additional disk or partition on shared storage device)
- Server interconnects (extra NICs)



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## Windows Shared SCSI Cluster



Demo

Q&A

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