

Massively Deployment of **GPFS** Nodes using **Diskless Remote Boot** in **Linux**

Authors : Rock Kuo, Waue Chen, Che-Yuan Tu, Barz Hsu
Supervisor : Steven Shiau, Jazz Wang

2008/05/23

Grid Technology Division, NCHC, Taiwan



NCHC



Agenda

- ♦ Introduction
- ♦ *IBM GPFS*
- ♦ *NCHC DRBL*
- ♦ *Testbed Architecture*
- ♦ *Demo*
- ♦ Reference
- ♦ Questions



Introduction

- ◆ DRBL
 - ◆ Fast deployment 2 commands in 10 mins
 - ◆ Central Management Interface
 - ◆ Backup Mechanism Clonezilla
- ◆ Application
 - ◆ Computer Classroom
 - ◆ Storage Cluster

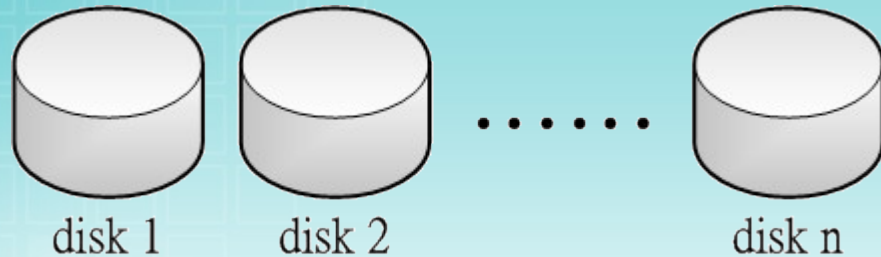


IBM GPFS

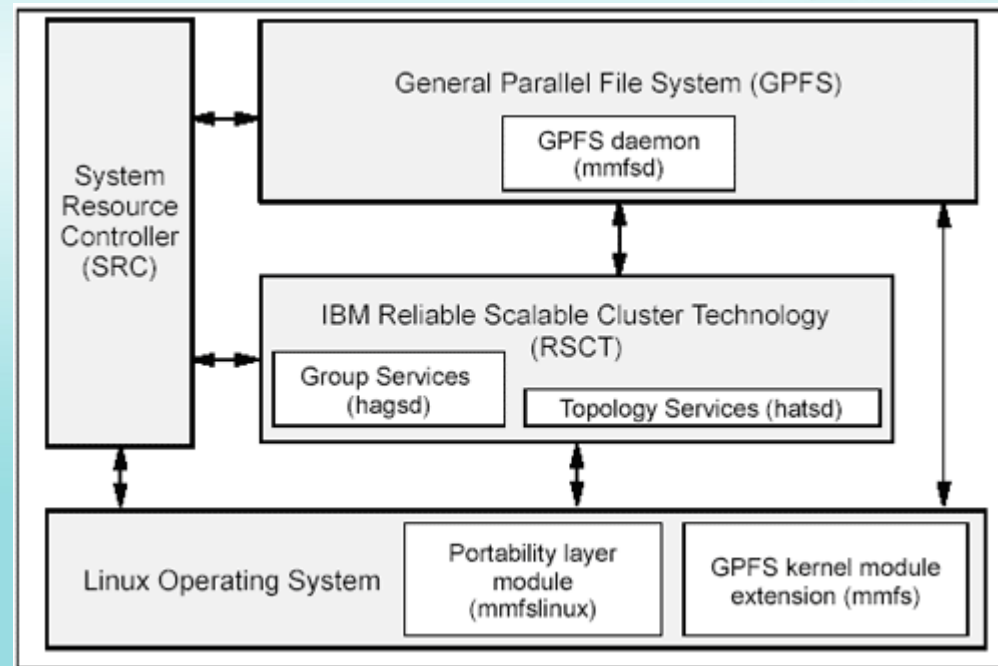
- ◆ *General Parallel File System* is IBM's parallel, shared-disk file system for cluster computers
- ◆ Provides concurrent high-speed file access to applications executing on multiple nodes of clusters
- ◆ Why GPFS?
 - ◆ *Improved system performance*
 - ◆ *High recoverability and increased data availability*
 - ◆ *Enhanced system flexibility*
 - ◆ *Simplified administration*



Philosophy of GPFS



Concept of GPFS



GPFS Operation (From IBM)

NCHC DRBL



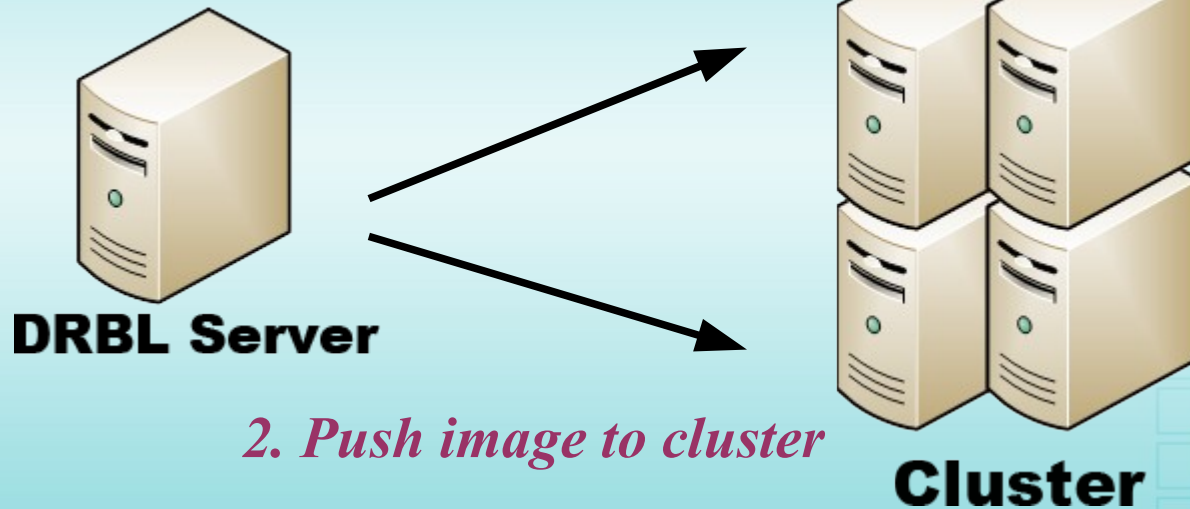
- ◆ *Diskless Remote Boot in Linux* provides a diskless environment for client machines
- ◆ Technology used by DRBL
 - ✧ NFS, NIS, DHCP, PXE
- ◆ Why DRBL?
 - ✧ *To deploy cluster environment quickly*
 - ✧ *To centralize management of your machines*
 - ✧ *To provide Single System Image mechanism*



DRBL Operation Architecture

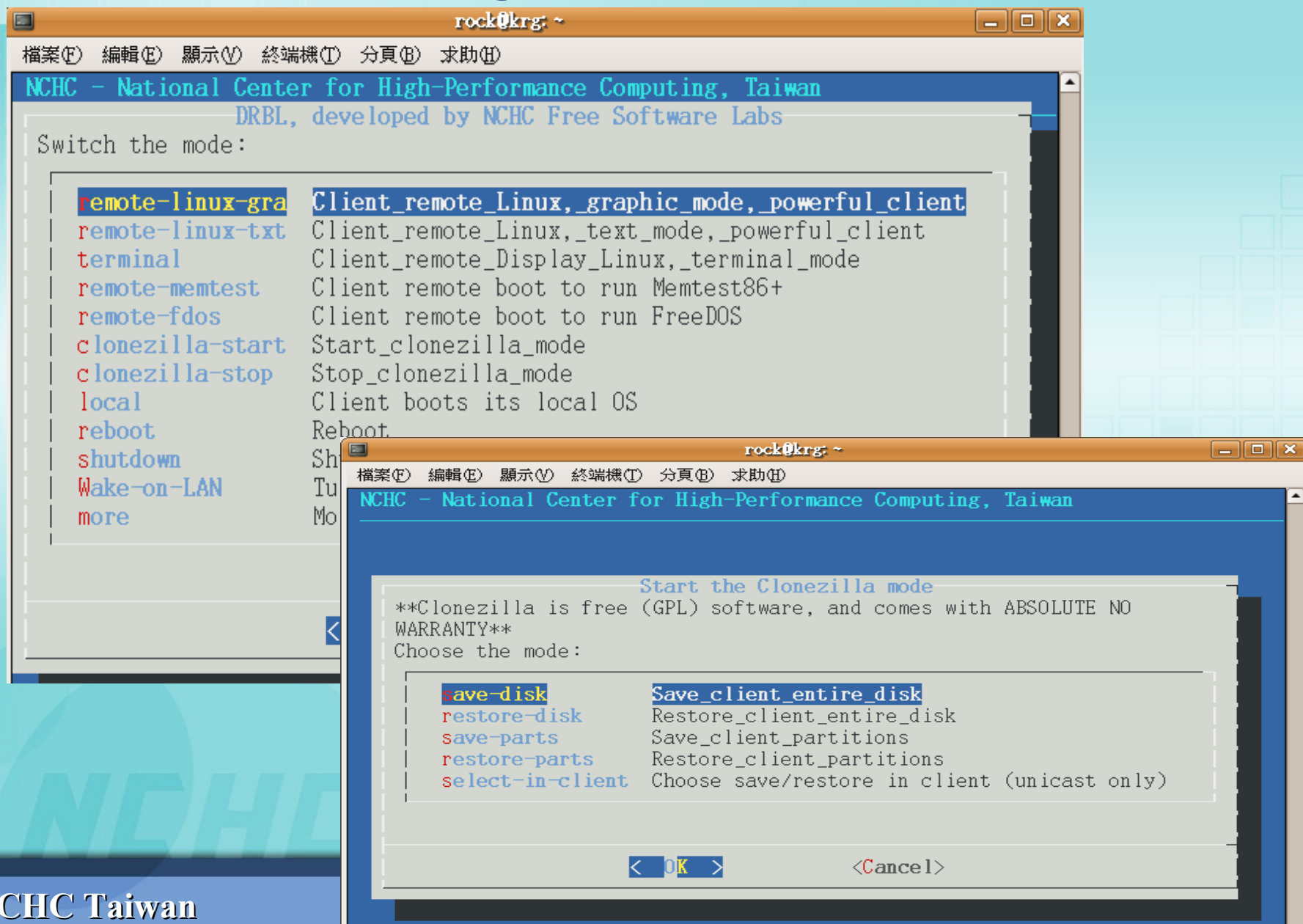
1. Config image environment

3. Nodes enable PXE in BIOS



DRBL Operation Architecture

DRBL Management Interface



Why use DRBL & GPFS

1. Deploys GPFS nodes quickly
2. Uses GPFS to utilize client disks effectively

Duo to DRBL is Diskless

3. Uses DRBL to manage your GPFS Storage Cluster
4. Adds and removes storages dynamic with fault tolerance support



Testbed



Each node:

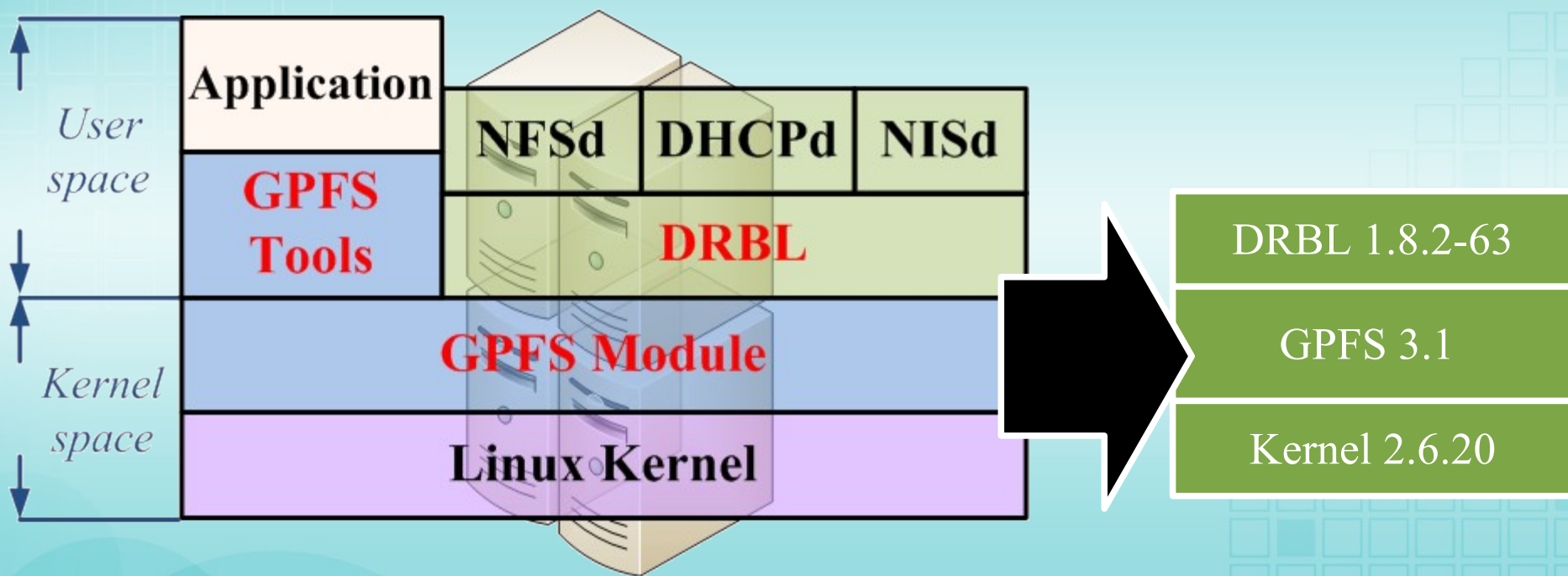
CPU: Intel(R) Core(TM)2 Quad CPU Q6600 @ 2.40GHz

RAM: 2GB DDR2 667

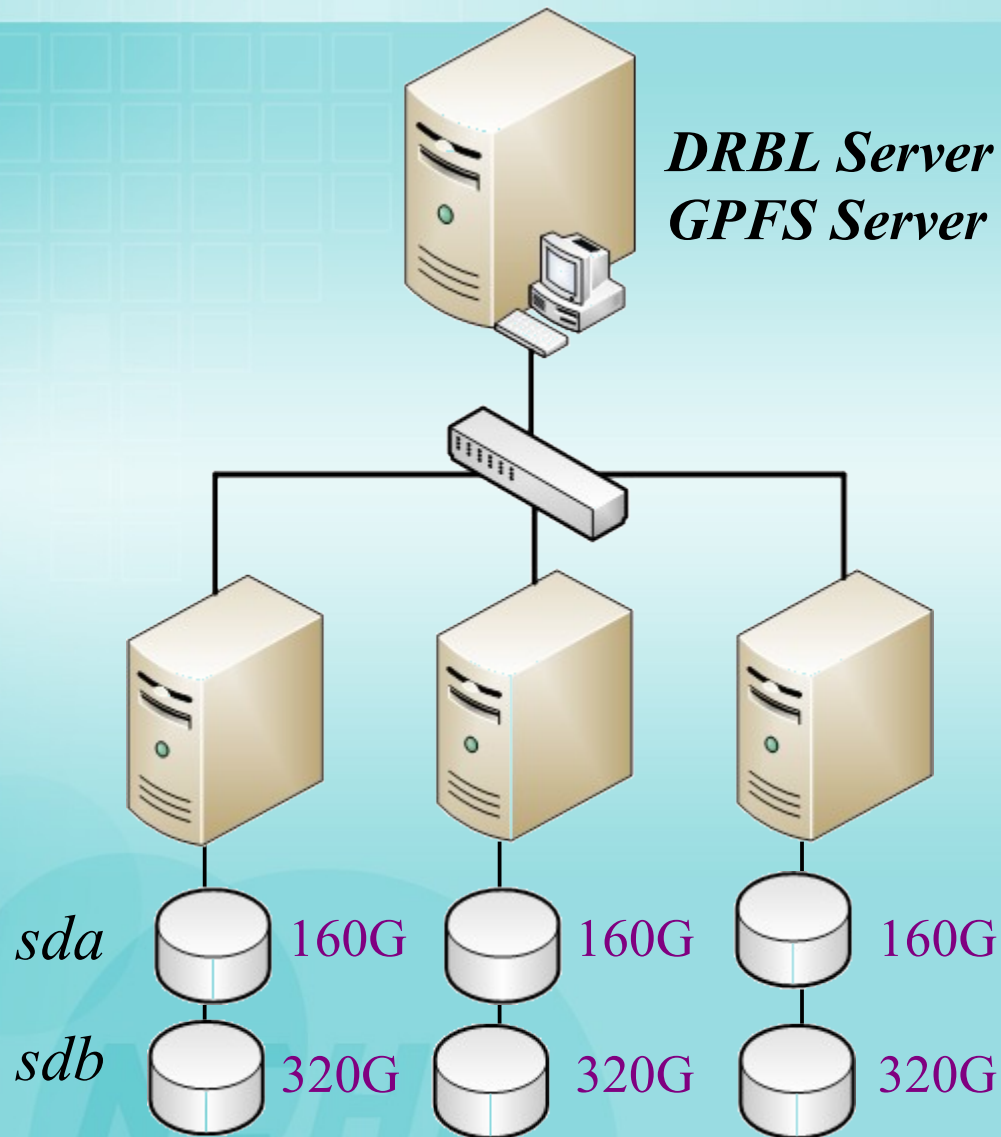
Disk: sda->160G, sdb->320G

NIC: Intel Corporation 82566DM Gigabit Network Connection

Testbed Architecture



Testbed & Demo



Total Disks ->320G



Total Disks ->1T440G

GPFS Storage Cluster

Demo

- ◆ Install DRBL and GPFS
 - ✧ *drblsrv -i ; drblpush -i*
 - ✧ http://trac.nchc.org.tw/grid/wiki/GPFS_DRBL
- ◆ **Demo 1: Run GPFS in DRBL environment**
 - ✧ *Run GPFS on 4 nodes*
 - ✧ *Use 2 disks*
- ◆ **Demo 2: Add new disks**
 - ✧ *Add 4 disks*
 - ✧ *GPFS will merge new & old disks into to one*

Summary

◆ Application

✧ Science-domain application

- 3D Fly Circuit image database
- Gene sequence decode

✧ Storage Service

- ex. Window Live SkyDrive, Goole Gmail

◆ Future

✧ Compare with Lustre, gfs.....

✧ GPFS Portal

Reference

- ◆ NCHC DRBL web site,
<http://drbl.sourceforge.net/>
- ◆ IBM GPFS web site,
<http://www-03.ibm.com/systems/clusters/software/gpfs/index.html>
- ◆ NCHC Grid Architecture Research Group,
<http://trac.nchc.org.tw/grid/wiki>
- ◆ Octavian L., Andreas L., Dag W., Dino Q., Configuration and Tuning GPFS for Digital Media Environments, *ibm.com/redbooks*, 2005
- ◆ Concepts, Planning, and Installation Guide, Version 3 Release 2, 2007
- ◆ Advanced Administration Guide, Version 3 Release 2, 2007
- ◆ Marcelo B., Terry J., Scott K., et al., Sizing and Tuning GPFS, *International Technical Support Organization*, 1999

Questions

rock@nchc.org.tw

