Linux Server Configurations for MySQL Database & Clustering

Marc Nozell
marc.nozell@hp.com
Hewlett-Packard

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Introduction

Marc Nozell (marc.nozell@hp.com)
Linux Technology Expert
Linux Infrastructure Solutions Engineering
Enterprise Solution Alliances
Hewlett-Packard

ProLiant-based solutions on Linux since '99
Work with Linux-centric ISVs
Agenda

• Server hardware considerations
• MySQL database configurations
• MySQL replication configurations
• MySQL cluster using blade servers
Hardware Considerations

- Memory speed & CPU cache
- Multiple I/O Channels
- Redundant power
- Hot-Swap disks
- Network
- Management built in
Hardware Considerations

- CPUs
  - Xeon EM64T, Opteron => large 64bit memory address space
- Memory
  - PC3200
  - ECC memory
- Power
  - Redundant power, fans
  - Hot plug power supplies
- Monitoring is vital!
Hardware Considerations

• Multiple I/O Channels
  – Hardware RAID
  – Fibre Channel
  – Hot Swap disks
  – Database server: RAID 1+0 (4+ disks)
  – MySQL Slaves: RAID 0 or RAID 5

• Set larger RAID strip size to 128k+
Hardware Considerations

• Networking
  – Switched, gigabit network
  – More NICs are better
  – Segment data/management
  – NIC bonding
Hardware Considerations

- Remote access
  - Frequently serial console aggregation
  - iLO (Insight Lights-Out) on motherboard of HP ProLiant
    - ssh & web-based interfaces to the console
    - Own NIC, power
    - Power on system, virtual Floppy/CD
    - Access to POST
    - XML, scriptable, perl example scripts
Typical small system

- 2p Intel Xeon 3.6Ghz, 2MB L2 Cache
- Up to 12G, PC2300
- Use BIGMEM Linux kernels
- 2x1” Ultra320 SCSI hot plug disks, SmartArray 6i controller
- HP ProLiant DL360 G4
Typical single server

- 2p Xeon 3.6Ghz, 2MB L2 Cache or 2p Opteron 252 (2.6Ghz)
- Up to 12G / 16G
- Use BIGMEM Linux kernels
- 6x1” Ultra320 SCSI hot plug disks, SmartArray 6i controller – 1.8TB
- HP ProLiant DL380 G4 or DL385
Scaling up, Single System

- 2 or 4p Opteron 852
- Up to 64GB
- 4x1” Ultra320 SCSI hot plug disks, SmartArray 6i controller – 1.2TB
- HP ProLiant DL585
Building blocks

- Blades are more than just servers on the side
- Integrated Network, Power, SAN, management, high density
- Interesting use of spares
HP ProLiant BL20p G3

- 8 per 7u enclosure
- 2P Xeon 3.6Ghz, 2M L2 (HT & EM64t)
- up to 8Gb
- 2x1” UltraWide hotplug SCSI RAID
- 4 x 10/100/1000 NICs + iLO
- Dual port Fibre Channel support
- Management NIC (iLO)
HP ProLiant BL25p G3

- 8 per 7u enclosure
- 2P Opteron 2.6Ghz, 1M L2
- up to 16Gb
- 2x1” UltraWide hotplug SCSI RAID
- 3 10/100/1000 NICs + iLO
- Dual port Fibre Channel support
- Management NIC (iLO)

MySQL®
HP ProLiant BL30p

• ½ height – 16/enclosure!
• 2P Xeon 3.2Ghz
• up to 4G
• 2x1” IDE disks
• 2 x 10/100/1000 NIC + iLO
• Nice fit for MySQL Cluster storage engine.
HP ProLiant BL35p

- ½ height – 16/enclosure!
- 2P Opteron 2.6Ghz
- up to 8GB
- 2x1” IDE disks
- 2 10/100/1000 NIC + iLO
- Nice fit for MySQL Cluster storage engine.
MySQL Fault Tolerant Architectures
MySQL Shared Storage

- Shared physical SAN, separate LUNs
- MySQL binaries & data on SAN
- If blade fails, boot a replacement
MySQL Replication with Cluster File System

- Add cluster file system, reduce management
- Shared MySQL binaries only & data on SAN
- If blade fails, boot a replacement
MySQL Cluster example

- 2 MySQL nodes
- 1 Management node
- 8 Storage nodes
MySQL node

- 'typical node'
- Hardware RAID for OS & app
- Optionally SAN for storage, ease of backup
MGM Node

- Anything, co-resides with an MySQL node
Storage Node

• 4 storage nodes to give maximum redundancy
• CPU/Memory
• disk I/O not a major concern
  – No RAID
  – No SCSI
Network

- More is better
- Redundant 10/100/1000 switches
MySQL Cluster for High Availability

- MySQL Cluster in a blade shelf
- 2 MySQL nodes
- 1 MGM node
- 2 sets of 4 storage nodes
  - 4 x BL20p G3
  - 4 x BL30p
- 2 GBE2 Switches
HP Management Software

• HP ProLiant Support Pack (PSP) for Linux
  – No cost download, management agents & drivers, array management tools, diagnostics, ROM flash, etc

• HP Insight Manager (HP SIM)
  – No cost download, Blade enclosure aware, can monitor other vendor’s platforms

• OpenView Operations/Windows
  – MySQL SPI plug-in for monitoring multiple instances of MySQL database
Thanks to…

More information

• Visit HP booth
  – MySQL cluster on BL20p & BL30p in 7u enclosure
• HP ProLiant & Blade servers
  – http://www.hp.com/go/proliant
  – http://www.hp.com/go/blades
• HP & Linux
  – http://www.hp.com/go/linux
• HP ActiveAnswer whitepapers – Configuration guide + whitepapers
  – http://www.hp.com/go/activeanswers
• HP Consulting & Integration Linux Reference Architecture
  – http://www.hp.com/go/lra