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nfs performance tuning for hp-ux 11.0 and 11i systems

agenda
(part one)

- Environmental Considerations

- Daemons and Kernel Threads

- Automount & AutoFS

- CacheFS

- NFS PV2 vs. PV3

- NFS/UDP vs. NFS/TCP

agenda
(part two)

- NFS Mount Options

- Buffer Cache

- Kernel Parameter Tuning

- Summary of NFS differences between HP-UX 11.0 & 11i

- Summary of Recommendations

environmental considerations

- Network

- Local Filesystems

- Patching

- biod

- nfsd

- rpc.mountd

- rpc.lockd & rpc.statd

daemons and kernel threads

- How are they different from each other?

- Performance Considerations

- Should you use Automount or AutoFS in your environment?

- Troubleshooting

automount

&

autofs

- What is CacheFS?

- How does it work?

- What are its limitations?

- What's different between 10.20 and 11i CacheFS?

- Should you use CacheFS?

cachefs

- What are the differences between NFS PV2 and PV3?

- Will a PV3 client/server always outperform a PV2 client/server?

- Should you use NFS PV2 or PV3 in your environment?

nfs protocol version 2

vs.

nfs protocol version 3

nfs/udp

vs.

nfs/tcp

- Protocol-induced Overhead

- Connection Management

- Managing Retransmissions and Timeouts

- Network Switch Buffering Considerations

- Should you use NFS/UDP or NFS/TCP in your environment?

nfs mount options

- Which NFS mount options directly affect performance?

- How can you verify which mount options are in effect on a per-mountpoint basis?

- What is buffer cache and why do I want to use it?

- Why not just use lots of memory for buffer cache?

- Static Allocation vs. Dynamic Allocation

- Automounter's Influence on buffer cache performance

- How much memory should I use for buffer cache?

buffer cache considerations

- Which kernel parameters directly affect NFS performance?

- What initial settings should you use?

- Sample kernel parameter sets for NFS client & server

- Inspecting kernel parameters

- Monitoring kernel parameter usage

kernel parameter
tuning

summary of nfs differences between hp-ux 11.0 and 11i

- Default number of biod daemons
  (11.0 = 4   11i = 16)

- Default number of nfsd daemons
  (11.0 = 4   11i = 16)

- Support for AutoFS
  (11.0 – patch   11i – built-in)

- Support for NFS/TCP
  (11.0 – patch   11i – built-in)

- Default "proto" NFS mount option
  (11.0 = UDP   11i = TCP)

- Default "rsize" NFS mount option
  (11.0 = 8192   11i = 32768)

- Default "wsize" NFS mount option
  (11.0 = 8192   11i = 32768)

- Filesystem Semaphore Contention drastically reduced in 11i

- Support for large NFS files
  (11.0 – 1TB   11i – 2TB)

- NFS Buffer Cache Management Redesigned in 11i

- CacheFS - only available in 11i

summary of recommendations

Sanity Check your NFS Environment

- Network
- Local Filesystems
- Patches

- Number of daemons and threads
- Automounter command-line options
- Will CacheFS benefit you?
- When to use PV2 vs. PV3

- When to use UDP vs. TCP
- NFS Mount Options
- Buffer Cache Sizing
- Kernel Tunable Parameters