Managing Big Workspaces with Storage Magic

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NetApp
Go further, faster

Perforce
Version everything.
What’s a big workspace?

- Working with art or media for games
- Working with EDA data
- Large amount of build artifacts
- 80+ GB, 90 minute build time is not unusual
What’s the problem?

- Storage is cheap! CPUs are fast!
- But…
  - A personal workstation still has limits
  - You may lose more than an hour every time you need a new workspace fully populated with source and build data
A little trick: lazy copies

- What Perforce does for branches…
- Storage solutions can do for workspaces
Step One: Make a reference workspace

- Create a volume on the filer
- Make the new workspace
- Sync the data
- Build
- Snapshot
- This is our baseline
Step Two: Prepare a new workspace

- Clone the snapshot
- Mount the cloned volume
- Assign cloned volume ownership
Step Three: Register a new workspace

- Define workspace in Perforce
- Flush metadata: make Perforce think you have the same data as the reference workspace
- Sync to head (optional)
Step Four: Keep the template up to date

- Run a build daemon
- Sync and build reference workspace
A success story

Standard workspace methods

80 minutes

Hard links

40 minutes

Workspace cloning

2-3 minutes
No build necessary
Minimal data transfer work
Saves millions of $$$
NetApp FlexClone
Behind the Magic
NetApp Snapshot™ Technology

- Take snapshot 1
  - Copy pointers only
  - No data movement
- Take snapshot
- Continue writing data
  - Write data anywhere
  - Does not affect the snapshot
FlexClone

- Clone from snapshot
Cloned Data | Blocks in LUN or File | Blocks on the Disk

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- Clone from Snapshot

Results:
- Both parent and clone can change independently
- Both file systems share common blocks
- Disk space is only allocated when there are updates and/or additions to either the parent or the clone volume.
FlexClone: Rapid thin-provisioned copies

Without FlexClone™

Production Storage

6 TB Database

Test & Dev Storage

30 TB Storage
5 full copies

With FlexClone

6 TB Storage
1 copy, 4 clones
Considerations

- Do not leave abandoned workspaces (CLEAN UP)
- If using bisect workflow, use “p4 sync/flush –p” to prevent spamming the server
- Limited to 32,767 FlexClones per volume for Data ONTAP 8.1 and for prior releases it is 255.
- Use SAN protocols (FCP or iSCSI) for Perforce Database
Compounding Effect: Snapshot + Dedupe + Snapmirror + Flexclone

Production Site
- Full Copy
- FlexClone Copies
- Data Mine
- Disk Backup

DR or Remote Site
- Full Copy
- DR Test
- Test Patches
- Develop
- Test
- Patches
- Quick and easy to set up and take down
- Use your remote site to create workspaces for distributed development.
- Very space efficient
- Reduces bandwidth utilization
- Provide replicated (read-only) copy of Perforce File Depots
- Other uses for FlexClone:
  - Performance Testing
  - Product Testing
  - Diagnosing Issues
Demo!

Get your stopwatches out…
Other uses for read-write snapshots

- Basic backup and recovery
- HA/DR planning (conference session)
- ‘Shelving’ a workspace
Alternatives

- ICManage Views (conference session)
- ZFS snapshots
- Using hard links to reference workspace
Contact
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