Agenda

- Introduction

- NetApp Advantage for Developers

- What is P4 Flex?
  - Components
  - Workflows

- Perforce in AWS and Hybrid Cloud Model

- Key Takeaways

NetApp is a global provider of software, systems and services to manage and store data

$6.1B

$

Annual Revenue

12,000+

Global Employees

3,200

Patent Assets

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Challenges in Application development environment

Managing Risk

Speed

Economics

Scale

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Faster TTM Depends on..

Developers Focus

- Code & Testing (Unit/Smoke tests)
- Maintain Version Control
- Continuous Integration
- Automate as much as possible

CI environments

- Faster & Scalable
- Builds can be repeatable and reliable
- Turn every build in to a potential release candidate

Images by xkcd.com

Application Development demands in a DevOps practice

The equations gets simpler

$$\text{Business Impact} = \frac{\text{Value}}{\text{Time}} = \text{TTM}$$

Shorter the Time, higher the Value and more Impact with faster Time to Market (TTM)

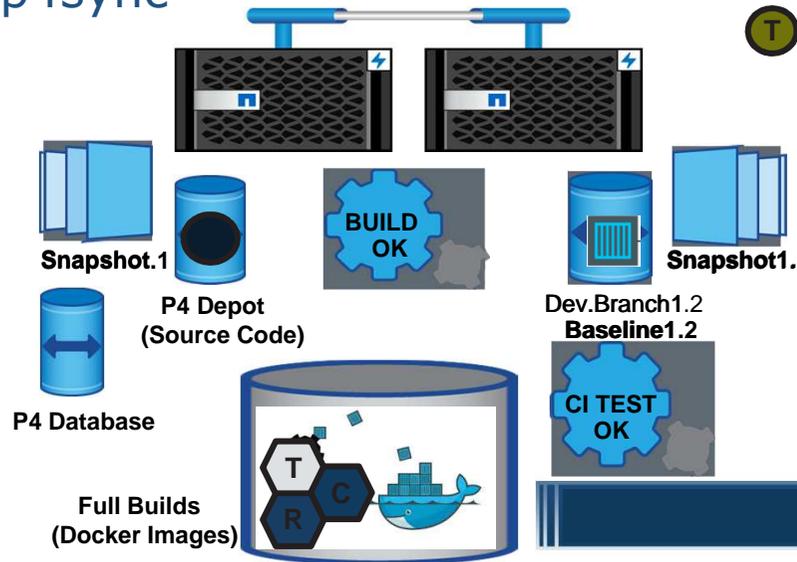NetApp®

NetApp Advantage with P4 Flex for Developers   #1

Build/CI and Development template using NetApp Snapshots and Flexclone
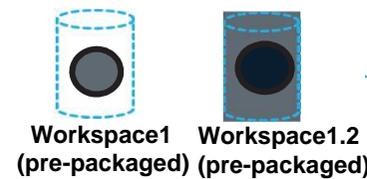
P4   Jenkins

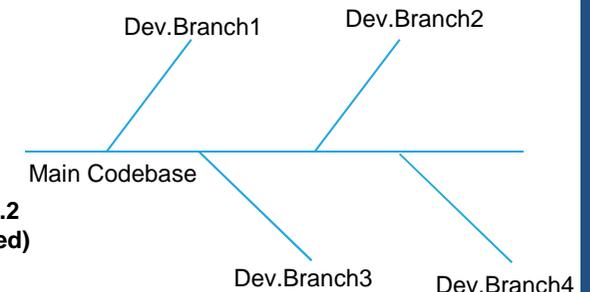Developer Environment

Continuous Integration (CI) Environment

p4client

p4sync

- **Risk Mitigation**
- **50% build time improvement**
- **20x-40 reduction in storage space**
- **Instantaneous Workspace Creation(<1min)**

P4 flex

T

C

p4push

L

Snapshot.1

Snapshot1.2

R

Dev.Branch1   Dev.Branch2

BUILD OK

Dev.Branch1.2
Baseline1.2

**P4 Depot
(Source Code)**

Workspace1
(pre-packaged)

Workspace1.2
(pre-packaged)

Main Codebase

P4 Database

CI TEST OK

Dev.Branch3   Dev.Branch4

**Full Builds
(Docker Images)**

T

C

R

QA/Staging   Deploy

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NetApp Advantage with P4 Flex for Developers #2

Spinning up multiple Docker containers instantly using NetApp flexclones and Junction Paths
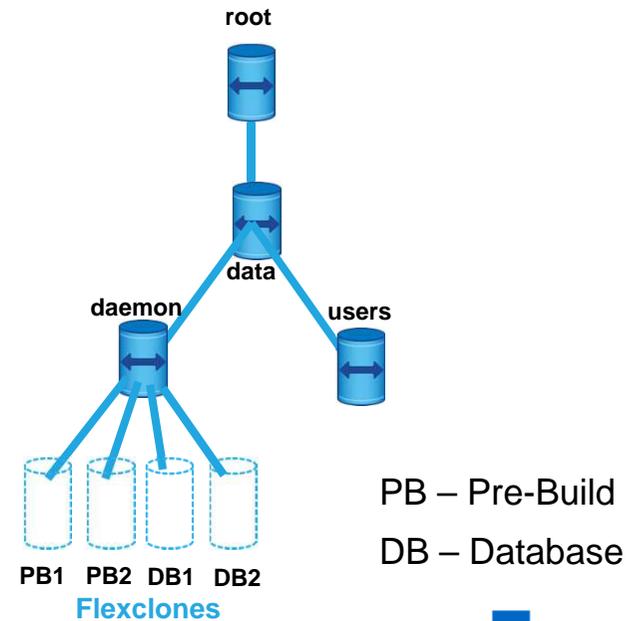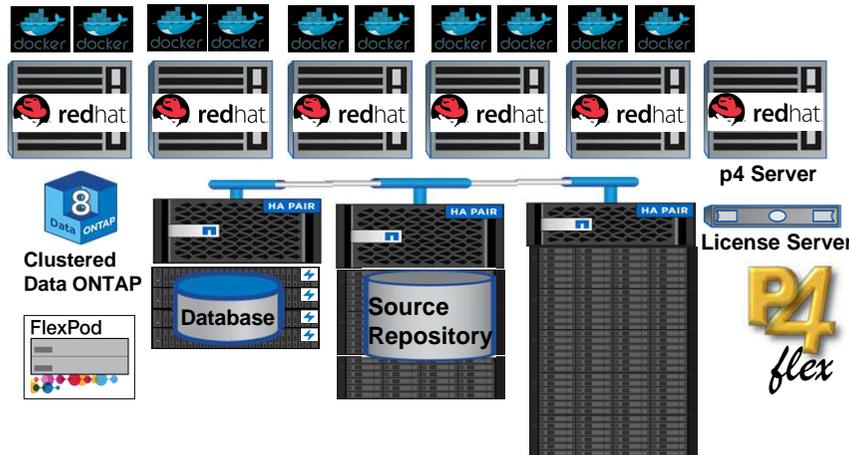
- Persistent data for containers
- Reduced Manageability and complexity
- Sharing data between multiple containers
- Scalability and Load balancing of microservices and containers
- Single mount on the container for all Pre-build objects, logs and/or Databases

kubernetes

Manage/Provision Docker for builds/QA

Jenkins

Start the build with `run -v /mnt/data/daemon/PB1`

Data ONTAP 8

Clustered Data ONTAP

FlexPod

Database

Source Repository

p4 Server

License Server

P4 flex

root

data

daemon   users

PB1 PB2 DB1 DB2
Flexclones

PB – Pre-Build

DB – Database

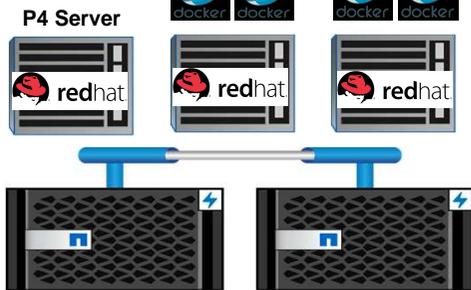Mount all the Docker containers the root junction path - /root/data/daemon

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NetApp Advantage with P4 Flex for Developer #3

Accelerate Development process using NetApp flexclone and snap restore for Databases

FUNCTIONAL

Modify → Test → Build

Dev#1   Dev#2

Jenkins
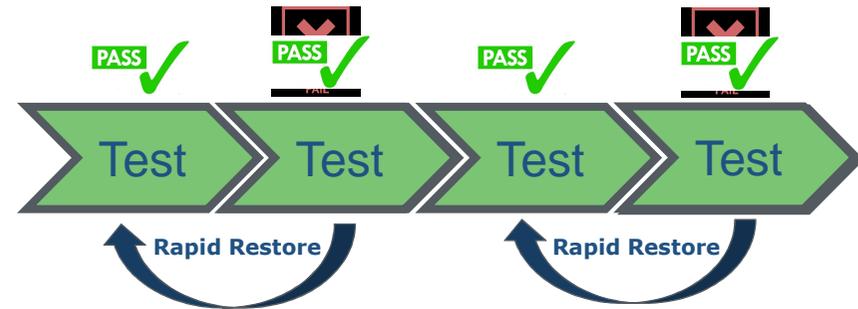
P4 Server

Use Cases
- Mask sensitive data for compliance
- Load custom data
- Modify App Logic
- Modify App Schema
- Validate Software update and patches

Scalable development / test environment

Prod DB   DB Clone #1   DB Clone #2

REGRESSION

Promote Changes

Staging/ Production

QA#1   QA#2

PASS ✓   PASS ✓   PASS ✓   PASS ✓

Test → Test → Test → Test

Rapid Restore   Rapid Restore

- Mitigating Risk
- Increased productivity
- More test cycles improve Code Quality
- Rapid recovery from failures lead to faster TTM

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NetApp Advantage with p4flex for Developer

Claim to fame

User WorkSpace CreationTime

Optimized way using NetApp takes <1 min.

72mins

Scale: 2units=1 minute

Traditional way using "rsync" takes >70minutes

Build completion Time

Build times using NetApp reduced by 50%

24hrs

Scale: 1unit = 1hour

Traditional Build times

Storage Space Efficiency during Code Development, Unit tests and builds

3TB

Up to 20x - 40x Storage space reduction using NetApp

60TB

Other Storage

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P4 Flex Team

PERFORCE

PM Clary
Technical Account
Manager

Paul Allen
Senior Integrations
Engineer
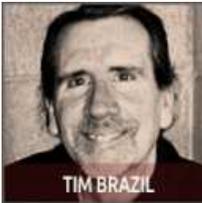
Tim Brazil
Performance
Engineer

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Lawrence Bunka
Sr. Product Strategy
Manager

Narjit Chadha
Solutions Architect

Bikash Roy Choudhury
Principal Architect

P4 Flex Overview

- ## What is it?

  - P4 flex is an open-source **p4broker** script which is shared to the developer community (http://forums.perforce.com/) to refine and customized to their own environment.
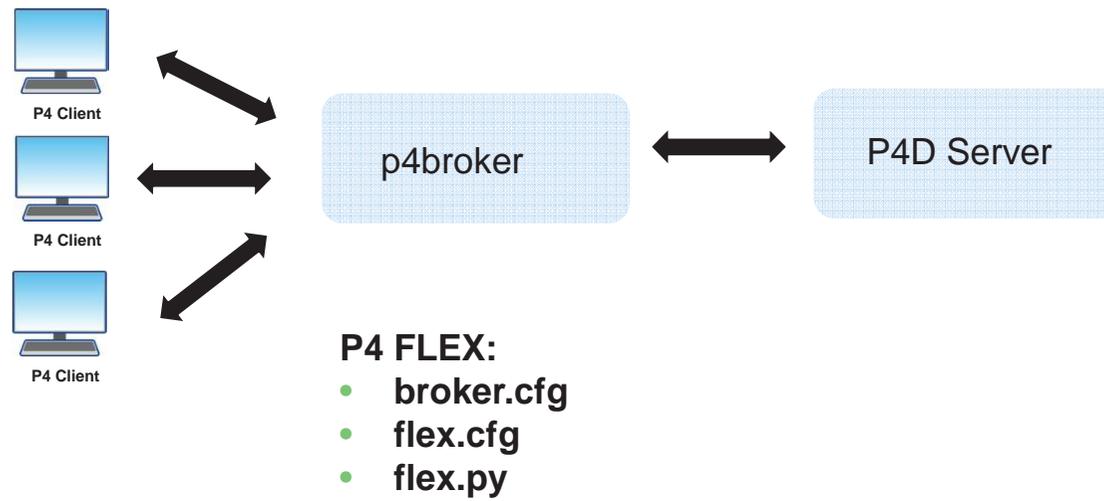
  - A starting reference

P4 Flex Overview

- ## Support

  - Support is through the developer community forums in which Perforce and NetApp are members.
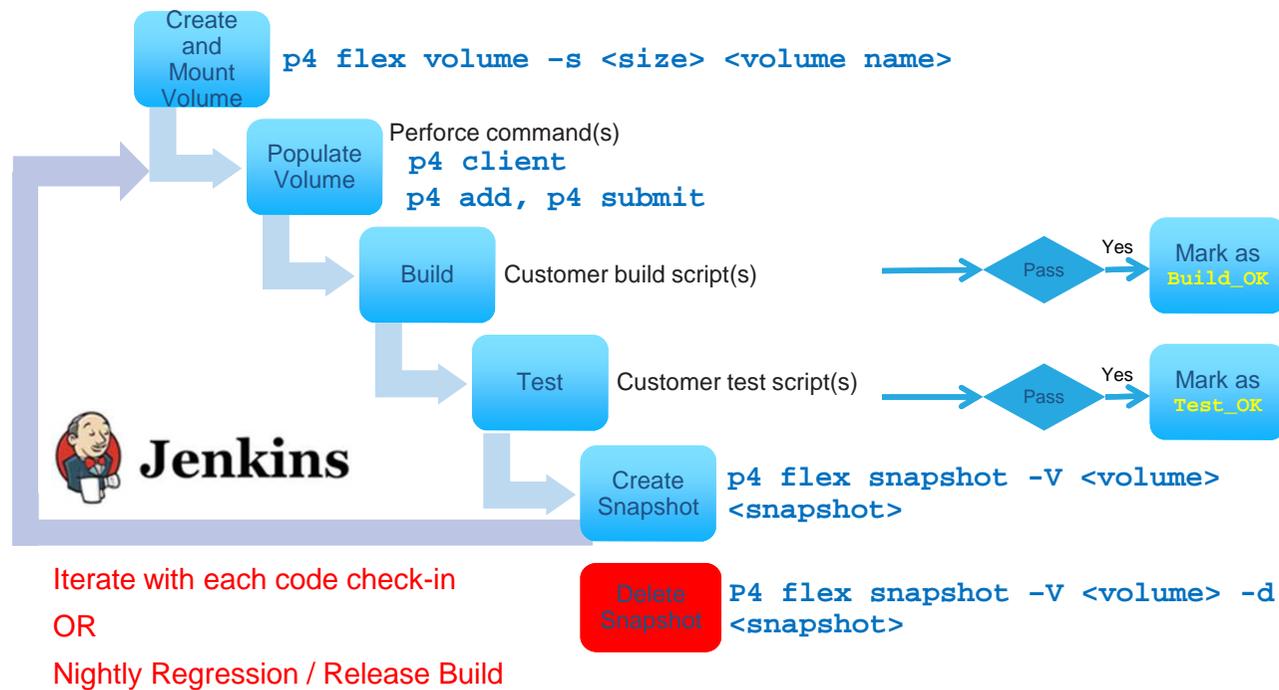
    - Posted on Perforce Workshop (https://swarm.workshop.perforce.com/projects/netapp-p4flex)

  - Currently only supports Linux/Unix and NFS environments.

P4 Flex Components

P4 FLEX:
- **broker.cfg**
- **flex.cfg**
- **flex.py**

Perforce Flex - Build Flow

Iterative Continuous Build/Test/Snapshot flow

Create and Mount Volume — `p4 flex volume -s <size> <volume name>`

Populate Volume

Perforce command(s)
`p4 client`
`p4 add, p4 submit`

Build — Customer build script(s) → Pass — Yes → Mark as `Build_OK`

Test — Customer test script(s) → Pass — Yes → Mark as `Test_OK`

Create Snapshot — `p4 flex snapshot -V <volume> <snapshot>`

Delete Snapshot — `P4 flex snapshot -V <volume> -d <snapshot>`

Jenkins

Iterate with each code check-in
OR
Nightly Regression / Release Build

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Perforce Flex – Developer Flow

FlexClone Enabled Workspace Creation

```
View list of
available
snapshots
```
`p4 flex snapshots`

```
Create
FlexClone
```
`p4 flex clone -V <volume> -S <snapshot> <clone name>`

`CeChownList.pl –u <user> -d <dir>`

```
Update
Workspac
e
```
`p4 client`
`p4 flush @<change #>`

```
Work
Space
Ready
```
Develop as usual…

```
Delete
FlexClone
```
`p4 flex clone –d <clone name>`
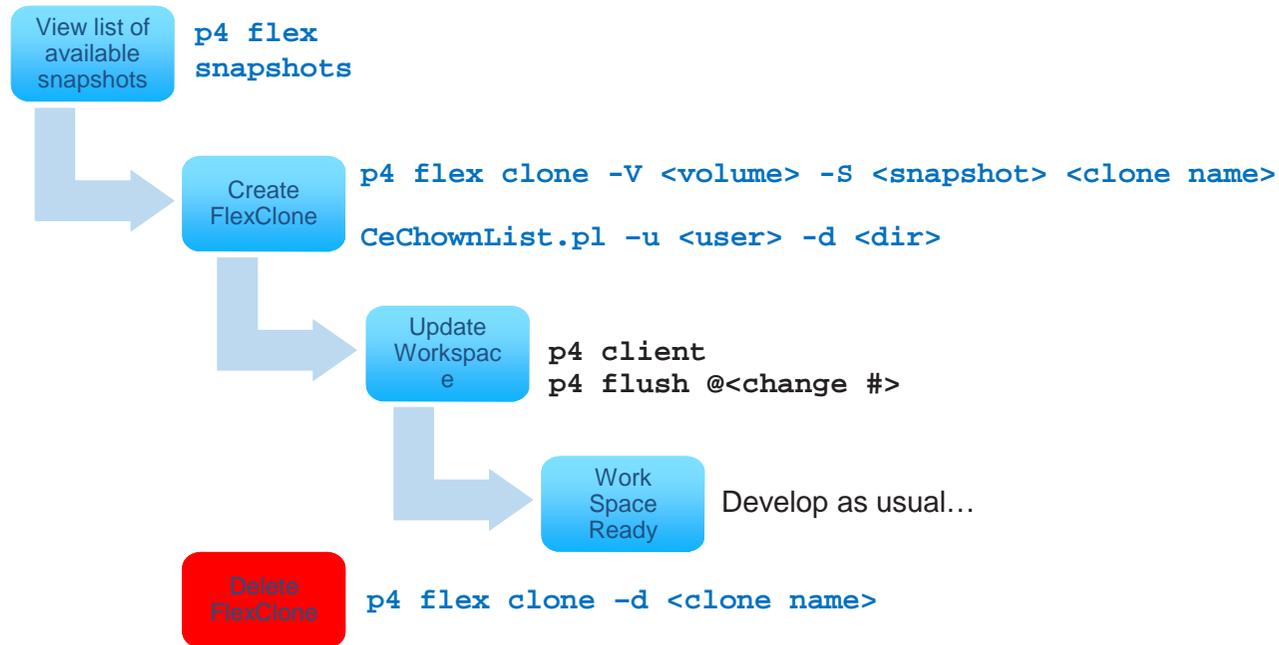
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General Workflow

User's clones created at snapshot on the Volume

Volume   snapshot 1   snapshot 2   snapshot 3

Bob

clone at
snapshot 1

Joe

clone at
snapshot 3
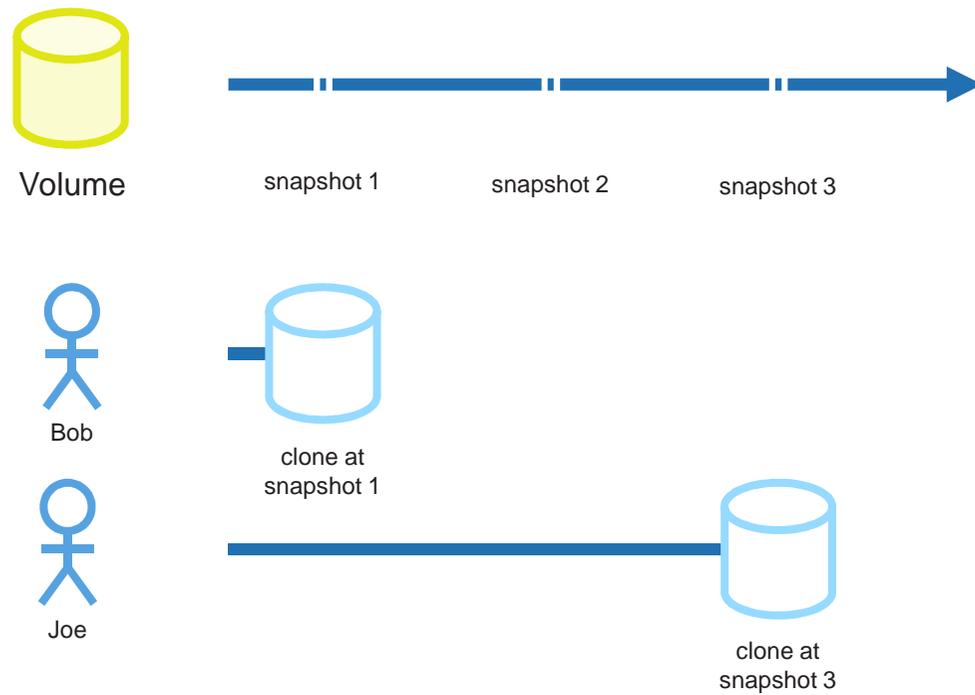
NetApp Advantage with p4flex for Developer

Summary

- Instantaneous workspace creation and deletion
  - Reduced Checkout and Build Times
  - More productive developers
  - No additional resource overhead

- Improved Code Quality with more testing
  - Accelerating test cycles and processes
  - Dev and Test with more real datasets/Databases to perform unit tests
  - Faster deployment to QA and Production

- Reducing infrastructure costs
  - Network IO savings
  - Storage space savings
  - Reduce compute resources

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MERGE2016
THE PERFORCE CONFERENCE

Demo: https://forums.netapp.com/docs/DOC-29884

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