

Introduction to Perforce for Users

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Introduction

- Introductions
- Class Schedule
- GUI vs. CLI
- About the Exercises
- The meaning of *live* (P4V Demonstrations)

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Course Contents (1 Day)

- Overview
- Help!
- Basic File Operations
- File Reporting and Revision Specifiers
- Changelist Management
- Workspace Management
- Handling File Conflicts
- Branching and Integration
- Streams
- Labels (optional)
- Job Tracking (optional)

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Introduction to Perforce for Users

Overview

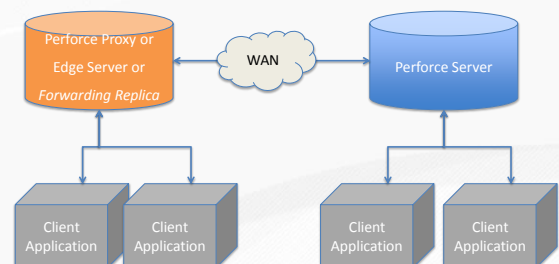
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Overview

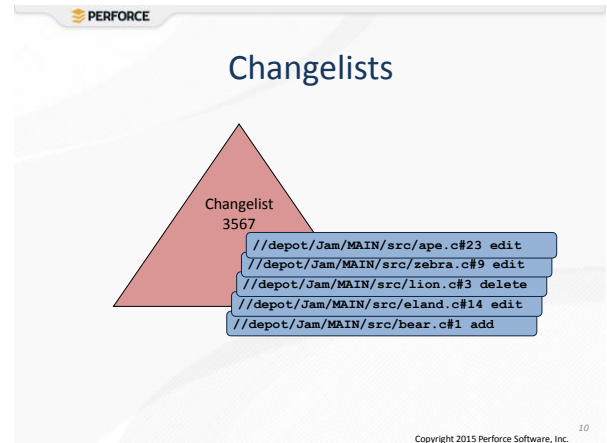
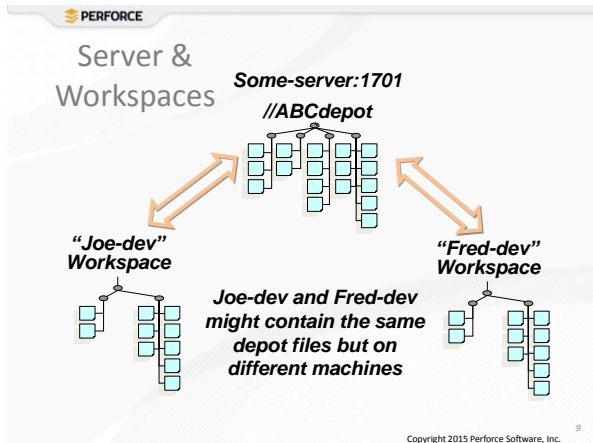
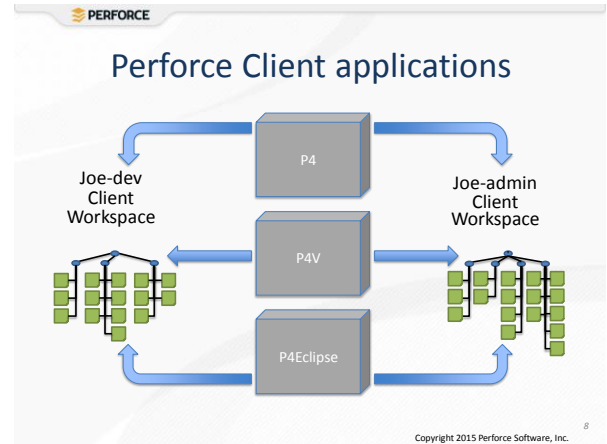
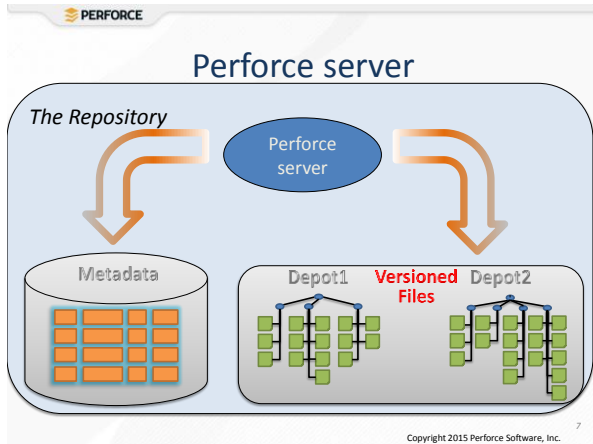
- Client/Server Model
- Server
- Client Programs
- Changelists
- Terminology: Client...
- Connecting to Perforce

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Perforce Client-Server model



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Terminology - Client ...


- Client machine
- Client programs
- Client workspaces

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Connecting to the server *Live*

- Basic connection - specify
 - <Server-machine>:<port-number>
 - Username
 - Workspace (optional)
- You may be prompted for password

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Commands in this Chapter

- Connecting to Perforce


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Help!


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Help!

- P4V Help Files
- Online Perforce Documentation
- E-mail Perforce
- Perforce Forums / Community
- P4Blog / Newsletter


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Getting help in P4V *live*

- Task oriented context sensitive help
- Getting started with P4V manual
- Showing system information

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Documentation on Perforce's web site

Support > Documentation

- Introducing Perforce
- Getting Started with P4V
- P4/P4V Cheat Sheet
- Perforce Command Reference
- Perforce System Administrator's Guide
- Release Notes
- Knowledge Base
- White Papers

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Help via E-mail and other sources

- E-mail Perforce at:
 - support@perforce.com
 - sales@perforce.com
 - consulting@perforce.com
- Perforce Community
 - www.perforce.com/community
 - Forums / Blog / Ideas
 - Exchange ideas with other Perforce users

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Customize P4V

live

- General settings
- Editor choices
- Diff applications
- Merge applications
- File content font selection

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New Actions in this Chapter

- **Help** →
 - **P4V Help**
 - **Getting Started with P4V**
 - **System Info**

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Basic File Operations

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Basic Operations

- Populating a Client Workspace (Get Latest Revision)
- Editing, Adding and Deleting Files
- Renaming/Moving Files
- Reverting Files
- Assessing Current Status
- Submitting Changes

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Get latest revision of files

live



Get latest revision

- Select Depot or Workspace tree
- Select desired folder or files
- Selected files are transferred to your workspace from the server
- Files are read-only by default

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Editing workspace files

live




Check out...

- or
- Check out and open...
- Make local files writeable
- Optionally, open files in editor
- Other users can see which files you have checked out

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Adding new files *live*

 **Mark for Add...**

- Save new files in your workspace tree
- Select the Workspace tree
- Refresh P4V and navigate to your files
- Optional:
 - Change Filetype...
 - Add file type modifiers
 - Change base file type

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Deleting files *live*

 **Mark for Delete...**

- Select files for deletion on the server
- Marked files are removed from workspace

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Renaming/moving *live*

• **Rename/Move...**

- Rename a file or move to another server folder
- New file name is marked for move/add
- Old file name is marked for move/delete

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Reverting workspace files *live*


• **Revert**

- Discard action on marked files
- Edits overwritten
- Deleted files copied to workspace
- Files marked for add unmarked

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Assessing work in progress *live*

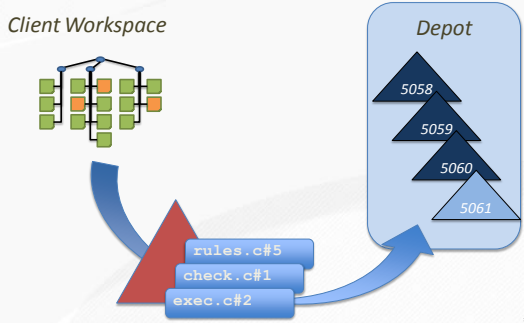
 Pending changelist tab

- Which files are you working on?
- **Diff Against Have Revision**
- What changes have you made?

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Submitting a changelist



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Submitting a changelist

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Submit...

- Opens the submit dialog
- Enter a description for the default changelist
- Submit
 - Completes the submit action
 - Files are transferred to the server

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New Actions in this Chapter

- Context-click →
 - Get Latest Revision
 - Check Out
 - Mark for Add
 - Mark for Delete
 - Rename/Move
 - Revert
 - Diff Against Have Revision
 - Submit
- Marked files show in pending changelist

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File Information / Reporting
Underlying principles and P4V
implementation

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File Reporting

- Finding files
- Wildcards for filenames
- Revision specifiers
- Showing file and folder history
- Comparing and diffing files and folders

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Searching for files

live

Find File...

- List files matching search pattern
- **Show In**
 - Depot Tree
 - Workspace Tree
 - File browser
 - Pending Changelist

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Supported Wildcards

- P4V vs CLI
- Two types

```
p4 sync ...
p4 sync //depot/Jam/MAIN/...
p4 sync //depot/Jam/R1.0/... .txt
p4 sync //depot/Jam/MAIN/doc/J*
p4 sync //depot/Jam/MAIN/src/*
```

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Revision Specifiers – CLI/API syntax

Type	Syntax
Revision number	#7
Changelist number	@30
Workspace name	@sams_ws
Label name	@rlos_label
Date	@2012/03/01
Latest revision	#head
Have revision	#have
Non-existent revision	#none or #0

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What are Revision Specifiers?

- Identify a file or group of files

Changelist	@5123	@5179	@5234	@5259	@5310
file1	#1	#2		#3	#4
file2		#1	#2		#3
file3	#1			#2	

- A changelist specifier can refer to:
 - The set of files contained in the changelist
 - A point in time in the life of your repository (like a label)

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Why use Revision Specifiers?

- Restrict the scope of a command; for example:
 - Sync to a particular revision


```
p4 sync //depot/Jam/MAIN/rules.h#12
```
 - List files updated up to a known changelist

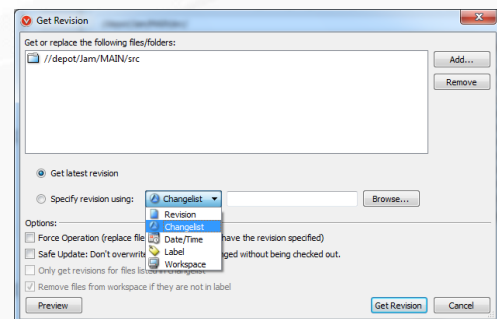

```
p4 files //depot/Jam/...@5234
```
 - List changes submitted up to a known date


```
p4 changes //depot/Jam/MAIN/...@2012/04/21
```

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Revision Specifiers - P4V



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Revision Specifiers - CLI

```
p4 sync utils.c#2
p4 sync utils.c@431
p4 sync @431
p4 sync ...@431
p4 changes //depot/Jamgraph/DEV/gizmo/*.c@431
p4 sync @janslabel
p4 files //depot/Acme-api/...#have
p4 sync //depot/notes/....txt
p4 sync #none
p4 sync util.c@2014/05/29
p4 files //depot/Jam/...@2014/05/29:15:37:00
```

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Revision ranges – CLI only


- Limiting commands to a revision range:

```
p4 changes abc.c@20,@32
p4 changes xyz.c@rel1,@rel2
p4 files //depot/api/...@431,@431
p4 files //depot/api/...@=431
```


- Some commands accept revision ranges:

```
p4 changes    p4 integ    p4 sync
p4 jobs       p4 files     p4 print
p4 fixes
```

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Displaying file properties *live*

 **Files in Folder**


- Display file information

Details


Checked Out By

Preview

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Displaying file history *live*

 **File History**

- List summary of each submitted revision
- Use drag-and-drop for showing file diffs


Details

Integrations

Labels

Preview

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Displaying revision graph *live*

Revision Graph

- View a file's history graphically
- View file differences
- Display file information


Details

Integrations

Labels

Preview

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Displaying Time-lapse View *live*

Time-lapse View

- Recently added lines color-coded
- Lifetimes of adjacent chunks of text
- Which user made the change?
- Find text in a file
- View a single revision, incremental diffs or a range of revisions

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Removing workspace files *live*


Remove from workspace

- Delete local files under Perforce control
- Leave marked files untouched

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Displaying folder history *live*

 **Folder History**

- Drag-and-drop changelists to view **Folder Diff**

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Using the Diff dialog *live*

 **Diff Against...**

- Select files or folders in the server
- Use a revision specification

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File types

- Base file types:

text	symlink	unicode	utf16
binary	apple	resource	
- Workspace storage attributes

<i>+x</i> - <i>executable</i>	<i>+ko</i> - <i>RCS keyword (old style)</i>
<i>+w</i> - <i>always writable</i>	<i>+l</i> - <i>exclusive open</i>
<i>+k</i> - <i>RCS keyword</i>	<i>+m</i> - <i>sync vs. submit modtime</i>
- Server storage attributes

<i>+S</i> - <i>latest revision</i>	<i>+D</i> - <i>deltas</i>
<i>+C</i> - <i>compressed</i>	<i>+F</i> - <i>full file</i>
- See **Command Reference Guide** for definitive explanation

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New Actions in this Chapter

- **Edit** → Find File
- **View** → Files in Folder
- **Context Click** →
 - *Get Revision*
 - *Revision Graph*
 - *Remove from Workspace*
 - *Diff Against*
 - *Change Filetype*
 - *File History*
 - *Time-lapse View*
 - *Folder History*
- **Tree Filter** pull-down menus

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Changelist Management

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Changelist Management

- Managing pending changelists
- Shelving opened files
- Showing changelist detail

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Multiple Pending Changelists

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Working with multiple changelists *live*

Pending Changelists

- Organize your work
- Rearrange files before submitting
- Add to the description

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Shelving opened files *live*

Shelve Files...

- Transfer edited files to a “shelved” changelist on the server
- Revert checked out files
- Clear previously shelved files

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Working with shelved files *live*

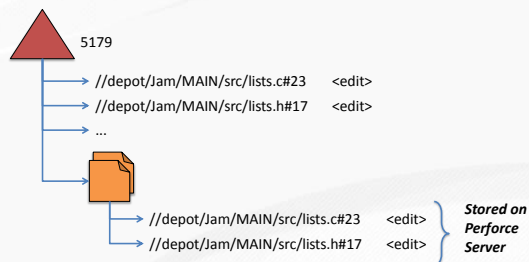
Shelved files are available to other users

- Unshelve and open for edit
- View file differences
- Transfer ownership
- Shelved changelists can be updated
- Owners can delete shelved changelists

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Shelved Changes



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Filtering changelists

Pending or Submitted Changelists

- Filter by:
 - Folder or file path
 - User name
 - Workspace name

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New Actions in this Chapter

- File → New → Pending Changelist
- Drag and drop files among changelists
- Context click →
 - Edit Pending Changelist <nnn>
 - Submit
 - Shelve Files
- View → Submitted changelists
- Context click →
 - View Submitted Changelist <nnn> →
 - Show File Diffs
 - Filter Submitted Changelists

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Workspace Management

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Setting up a Workspace

- Creating a Workspace
- Setting Workspace View Mappings
- Referencing Files
- Configuring Workspaces and Connections

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What is a workspace?

- View into a Perforce Server
- Local files in the workspace are managed by Perforce
- Uniquely identified by its name (**P4CLIENT**)

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Why have multiple workspaces?

- Project/Branch oriented
- Better performance
 - For both you and your colleagues!

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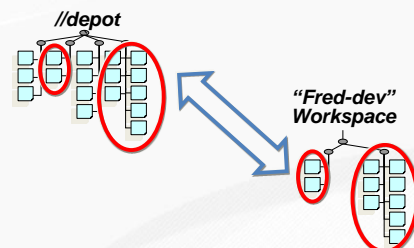
What does a workspace need?

- Name
 - Uniquely identifies the workspace
- Root
 - The workspace's root directory on your client machine
- View
 - Maps areas of a Perforce Server to client workspace

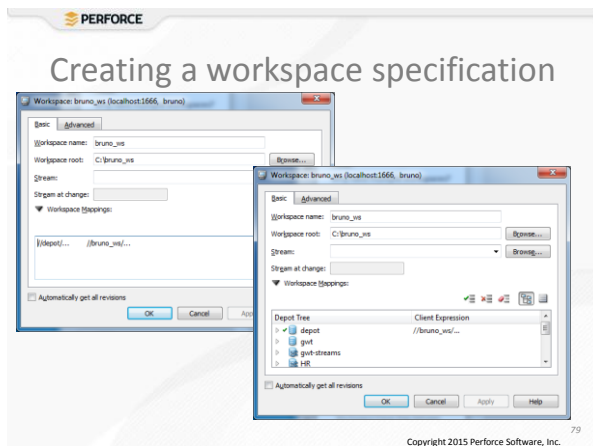
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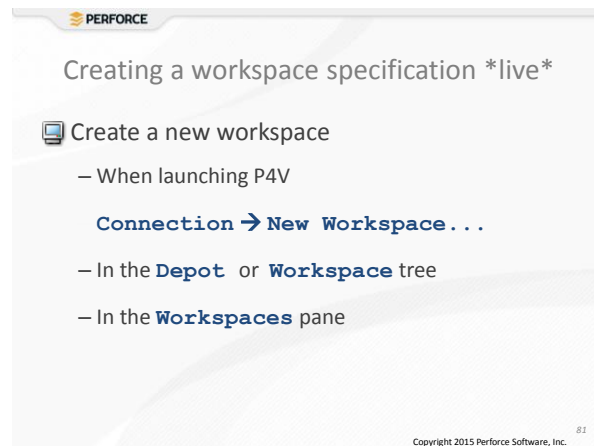
Workspace Views map between server and local file system



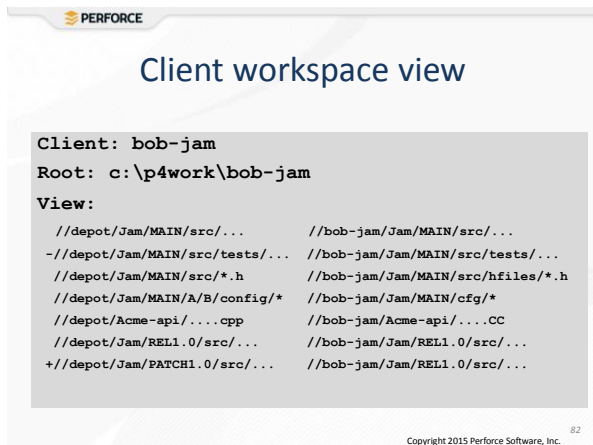
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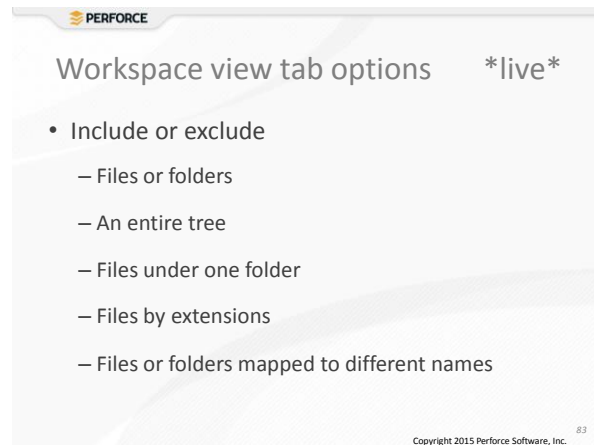
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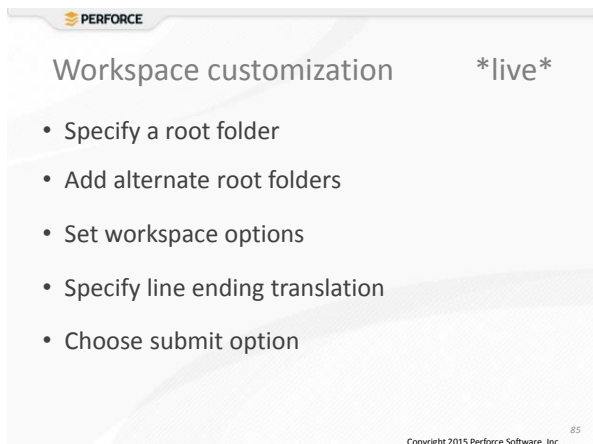
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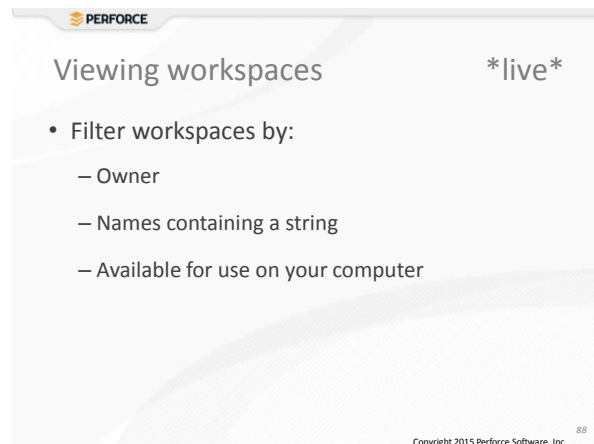
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Copying workspaces *live*

- Clone a workspace's
 - Options
 - View
 - Submit Options
 - Line Endings


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New Actions in this Chapter

- Open Connection → New → Workspace
- Details → Form/View tabs
- Connection →
 - Edit Current Workspace
 - New Workspace
- View → Workspaces →
 - Name contains: Filter
 - Context click → Create Workspace from <workspacename>


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Handling File Conflicts


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Handling File Conflicts

- File Conflicts
- Resolving Conflicts
- Conflicting Diffs
- Reporting Actions


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Classic conflict scenario

- Two users edit the same file
- First user submits
- Second user gets latest revision
- Resolve is 'scheduled'

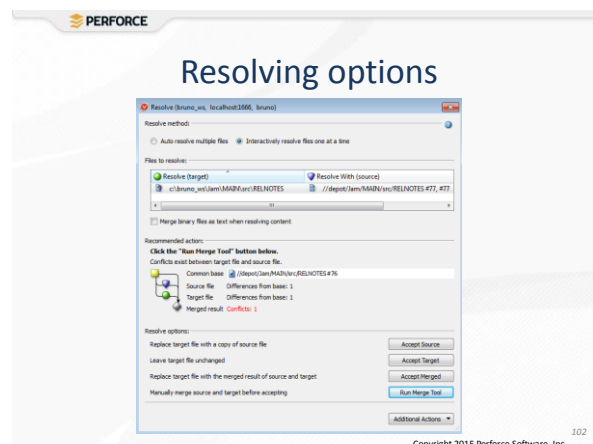
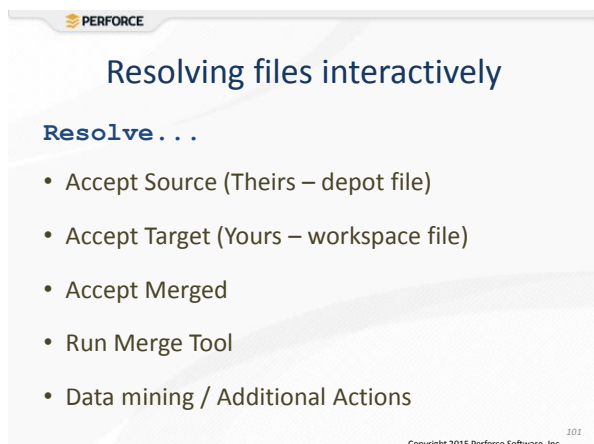
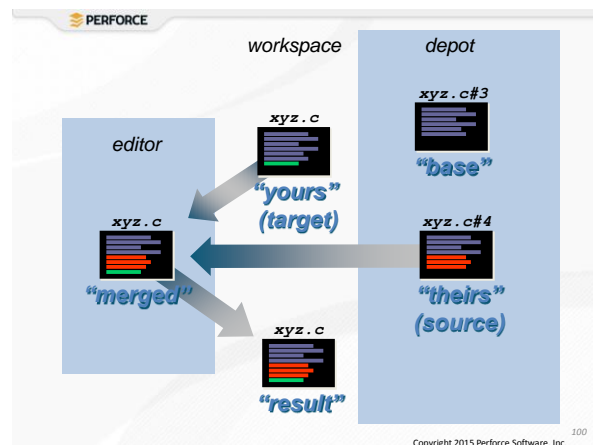
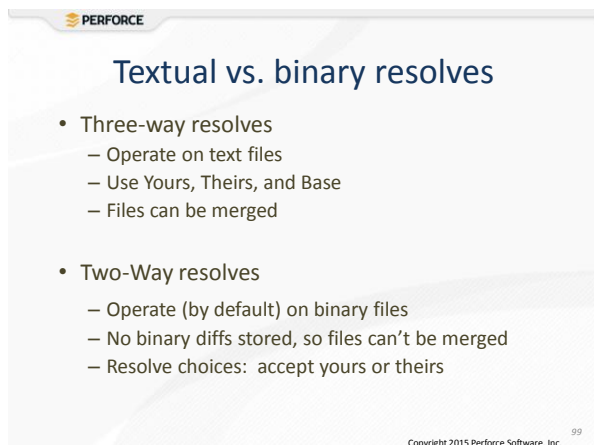
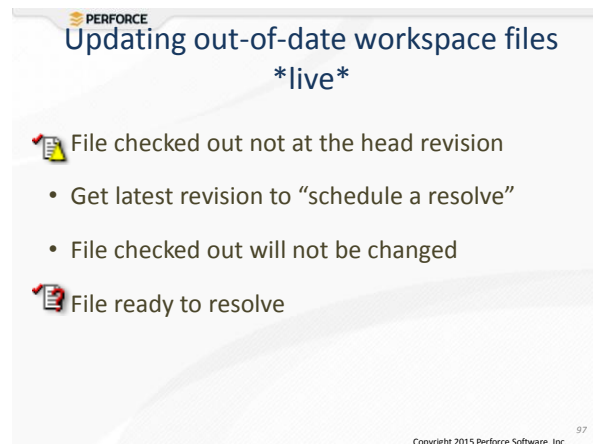
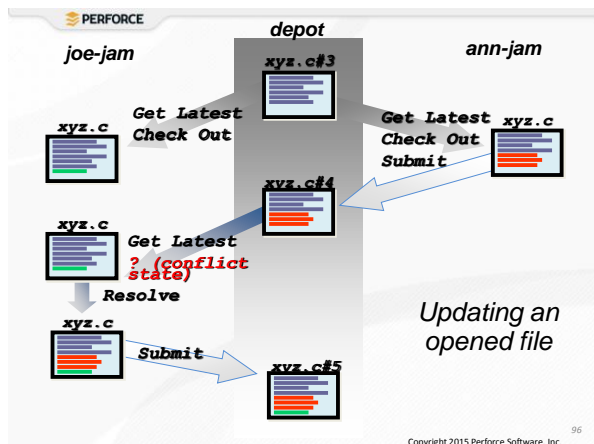
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Other conflict scenarios

- File conflicts
 - Submitting a change to an out-of-date file
 - Re-syncing an opened file that is out-of-date
 - Moving to an existing file
 - Unshelving onto an opened file
- *Integration conflicts*

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Diff chunk types

yours

- Unique diff chunk in client file only

theirs

- Unique diff chunk in depot file only

both

- Unique diff chunk common to depot and client file

conflicting

- Unique diff chunk conflicting between depot, client and base.

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Diff Chunks – Easy 3-way Merge

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Diff Chunks – 3-way Merge conflicts

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Merging files using P4Merge

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Locking files *live*

Lock

- Other users cannot submit until you submit or unlock the file
- Exclusive lock filetype prevents other users even checking out

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Recovering a deleted file *live*

Show deleted depot files

Rollback...

Submit...

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Reconciling offline work *live*

- Mark files for:
 - add
 - edit
 - delete

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New Actions in this Chapter

- Context click →
- Get Latest Revision
- Resolve →
 - Open File
 - Diff
 - Run Merge Tool
- Lock
- View → Submitted Changelists →

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Classic Branching and Integration
Branching Files and Propagating
Changes
(and Branch Mappings)

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Branching and integration

- Terminology
- Why branch?
- Integration steps – creating
- Integration steps – propagating

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Terminology

- Branch
 - (noun) A set of related files (a.k.a. codeline), created as a copy of its parent
 - (noun) A branch mapping (in P4V)
 - (verb) To create a new codeline (branch)
- Integrate
 - To create a new branch/codeline (Branch Files...)
 - To propagate changes between existing branches/codelines (Merge/Integrate... or Copy...)

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Some branching patterns

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Why branch?

- Conflicting policies
- Task oriented development
- Discussed in more detail in:
High-Level SCM Best Practices
<http://www.perforce.com/sites/default/files/pdf/high-level-perforce-best-practices.pdf>

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Creating a branch

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Creating a new branch **live**

- **Branch Files...** specifying source and target
- **Submit...**

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Propagating changes across branches

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Propagating changes **live**

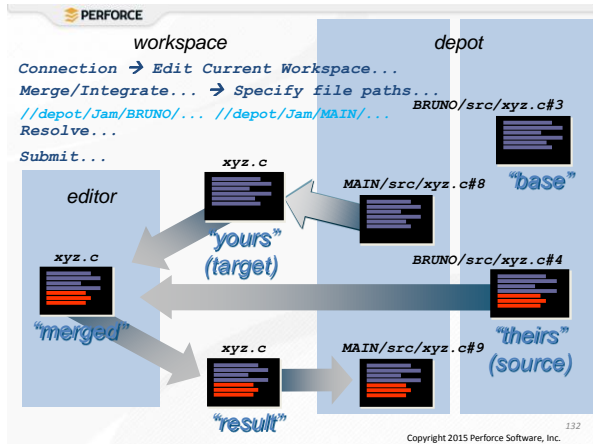
- The target branch must be mapped in the current workspace view – we are changing those files!
- **Merge/Integrate...**
- **Resolve...**
- **Submit...**

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Resolving for merge/integrate

- *Theirs* = Source
- *Yours* = Target (the one being changed by merge)
- *Base* = Closest common ancestor

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Integrating using branch mappings

- Branch mappings store source/target pairs
- Integrate using branch mappings
 - Create new branch or Save
 - Re-use to propagate changes

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Creating branch mappings

New Branch Mapping...

Branch Mapping: Jam-ROBERT Last accessed:

Date modified: Owner: bruno

Description: Created by bruno.

Options: ☐ locked

View: /depot/Jam/MAIN/... /depot/Jam/ROBERT/...

OK Cancel Apply

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Integrating using branch specifications*live*

- Merge/Integrate...
- Choose branch spec
- Resolve... when propagating changes
- Submit...

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Automatic Resolving

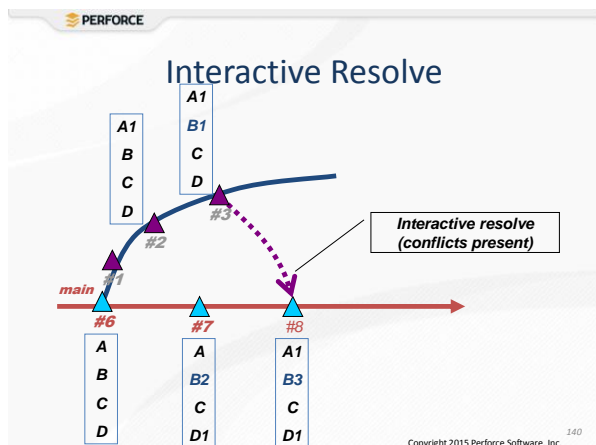
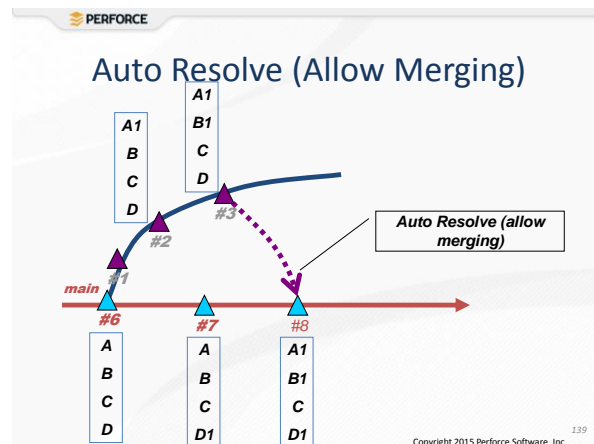
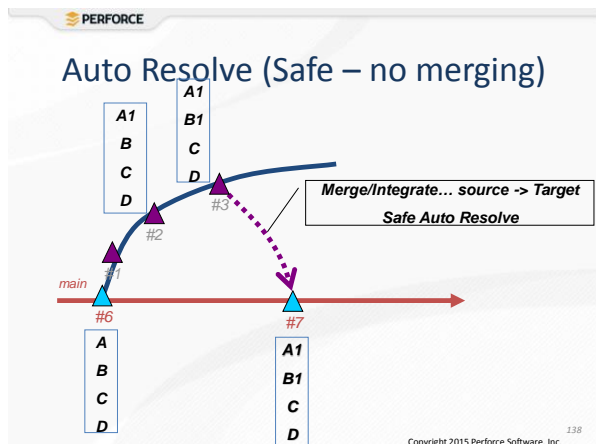
Automatic Resolve Options

Resolve...

- Safe Automatic (no merging)
- Automatic (merging allowed)
- Interactive (conflicts present)

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Automatic Resolve Options

Recommended every time

- Safe Automatic (50 - 80%)
- Automatic (35 - 15%)
- Interactive (15 - 0%)

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Selective integrations ***live***

- Use any revision specification to limit the range of integration
- Integrate up to or only specific revisions
- Select **Advanced Options...** and store selections

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New Actions in this Chapter, Part 2

- Context click → Branch Files → Specify target
- Context click → Merge/Integrate → Specify target
- Context click → Merge/Integrate → Save Branch Mapping
- Context click → Merge/Integrate → Select branch mapping
- Resolve...
- Context click →
 - Integrate... →
 - Specify source and target files →
 - Limit the range of the integration:
 - Advanced Options

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Using Streams

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Streams

- Introduction
- Creating a stream
- Populating a stream
- Working in a stream
- Streams views

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Introduction

- Intelligent branching
- Policies govern workflow
- Control the flow of change
- 1:1 relationship
- All are decedents of the mainline
- Defined relationship to its parent...
...not to its children

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Stream relations

- Controlled flow of change

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Stream Types

'release'
Highly stable
(merge 'down' to parent, typically no copy 'up')

'mainline'
Stable per your policy
(merge 'down' to dev, copy 'up' from dev)
(merge 'down' from release, copy 'up' to release)

'development'
Unstable
(merge 'down' from parent, copy 'up' to parent)

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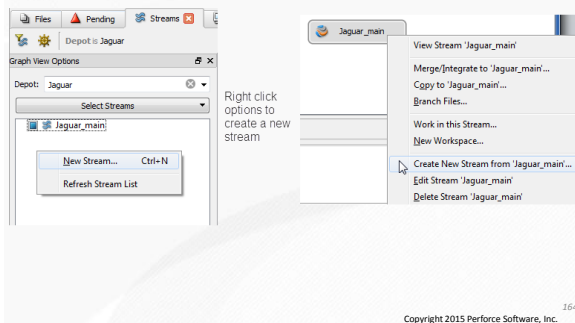
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The Merge-down, Copy-up paradigm

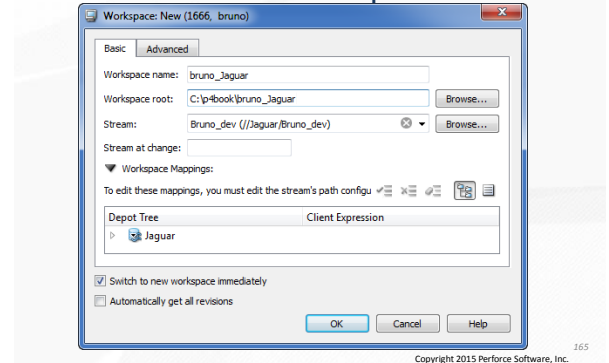
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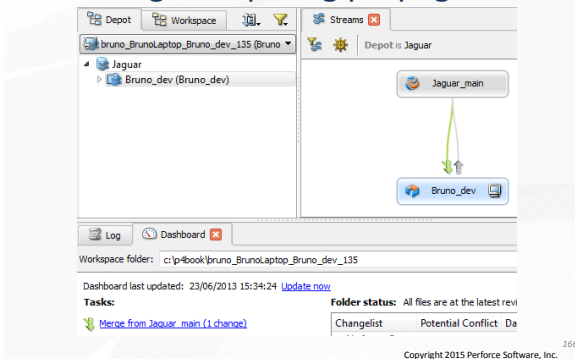
Creating a stream



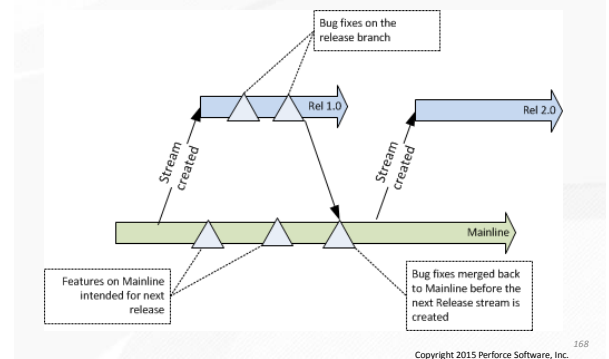
Stream workspaces



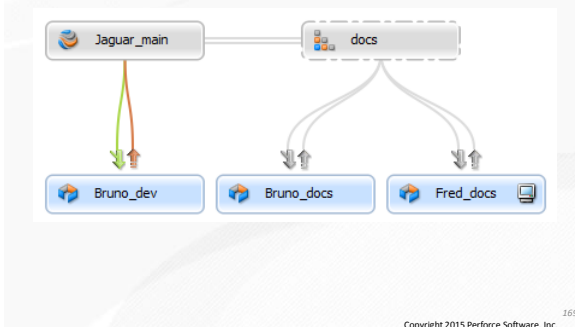
Changes requiring propagation



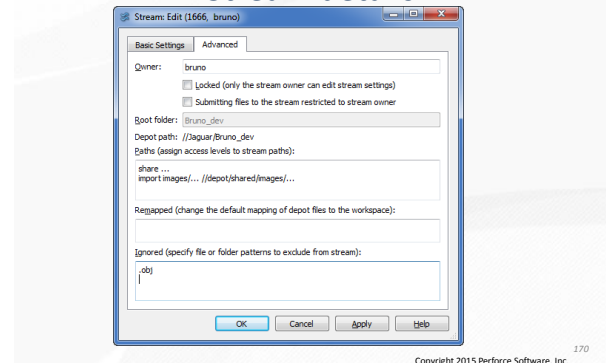
Release streams

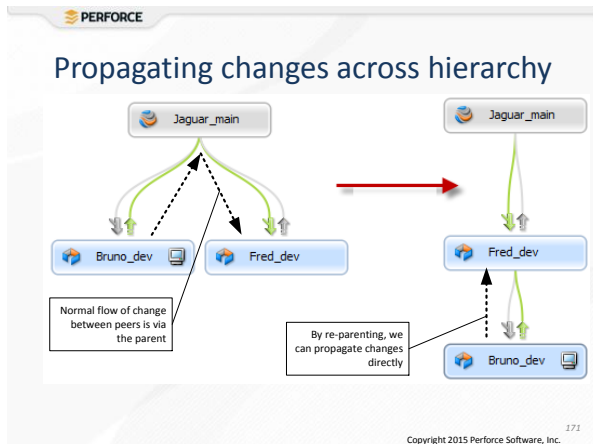


Virtual streams



Stream details





- New Actions in this Chapter**
- **File** → **New** → **Stream**
 - **Merge/Integrate**
 - **Copy**
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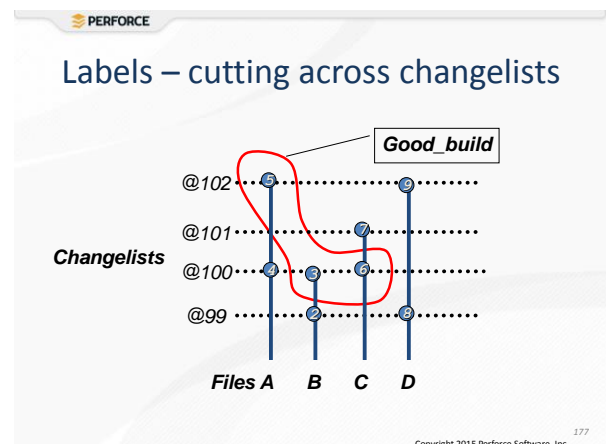
Introduction to Perforce for Users

Labels

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- ## About Labels
- Labels vs. Changelist Numbers
 - Creating a Label
 - Tagging Files With a Label
 - Locking a Label
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- ## Labels vs. changelist numbers
- *User-determined file set*
 - *Can be changed*
 - *Meaningful names*
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Creating a label specification *live*

Labels

- Add a description
- Select which files or paths can be tagged
- Can exclude files or paths

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Tagging files with a label *live*

- Tag files using a revision specification
- Tag workspace file revisions
- Display the list of files tagged by a label

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Use automatic labels *live*

- Less data stored on your server
- Create a mnemonic between a changelist and a label name.

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Updating labels *live*

- A label can be removed from files
- A label can be updated with different file revisions
- A label can be updated with additional files

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Getting tagged file revisions *live*

- Examine the list of files tagged by the label
- Check workspace view
- **Get Revision...** and use the label name to specify the revisions

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Showing labels *live*

- Show all label specifications
- Filter by:
 - Folder or file name
 - Owner
 - String in label name

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Locking a label

live

- Prevent changing the list of files tagged by a label
- The owner can unlock a label

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New Actions in this Chapter

- File → New → Label
- Context click →
 - Label →
 - Apply selected label to files →
 - Add a revision specifier
 - Remove selected label from files
 - Get Revision
 - Show the List of Files
- Select label → Edit Label <labelname>
- View → Labels

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Introduction to Perforce for Users

Job Tracking

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Job Tracking

- Perforce Jobs
- Creating a Job
- Searching Jobs
- Linking Jobs to Changelists
- Job Fix Reporting

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Perforce jobs

- Perforce's defect tracking system
- Textual descriptions of unit of work
- Can be customized
- Can integrate with external defect tracker

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Creating a job


live



Jobs

- Add the job description and save the form
- Edit to add more information


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Listing jobs *live*

- List all jobs
- Filter by:
 - Bookmark
 - Keywords
 - Folder or file name
 - Filters are stored for future use


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Job search examples

```
filter email
status|email
status=open user=edk
date>=1998/07/14
description=filter*
r2.1 beta.exe doesn't
```


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Linking jobs to changelists *live*


 **Users**

- Add to the Job View: filter
- Jobs added automatically to default changelist
- Add a job to any numbered changelist

 **Pending**

 **Submitted**


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Job fix reporting *live*

- View the job status in the **Jobs** pane
- View a job to list associated changelists
- View a changelist to list associated jobs


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New Actions in this Chapter

- **File** → **New** → **Job**
- **View** →
 - **Jobs** →
 - Context click on job →
 - **Edit**
 - **Linked changelists display**
 - **Enter search string**
 - **Pending/Submitted Changelists** → **Expand changelist** to see jobs
- **Connection** → **Edit Current User**
- Context click → **Edit Pending/Submitted Changelist <nnn>** → **Add/Browse for jobs**

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Introduction to Perforce for Users

Code Review - Swarm

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Section Contents

- Background to code review
- Overview and details of Swarm

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Build quality in

- Find bugs early
- Share knowledge within the team
 - Code tends to be neater, better documented, and better organized
- Consistency in design and implementation
- Better security considerations

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Code Collaboration to the Rescue



- **Better Code**
- **Pain-free Integrations**
- **Faster Deploys**


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Perforce Swarm

- Comprehensive code collaboration platform
- Flexible, integrates with your tool chain
- Seamless interaction via Perforce or Git
- Built for continuous delivery

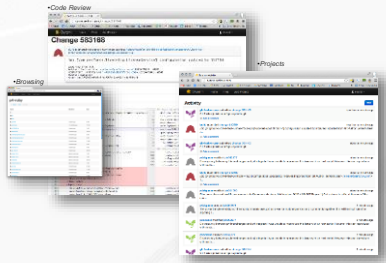


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Swarm Highlights



- Real-time code collaboration and review
- Inline comments and diff
- Integrates with rest of lifecycle
 - Bugs
 - Build
 - Code Analysis
- Supports Git and P4V users
- User Extensible
- Leverages Perforce versioning engine

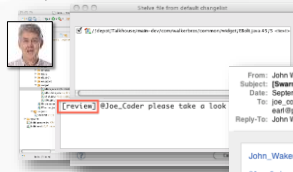
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Request a Code Review from within Perforce Versioning Engine...

•Request Review



•Review Notification

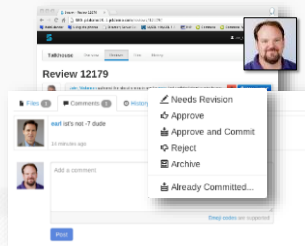


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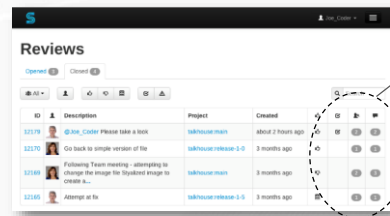
Review, Comment, Approve...

- Link from email or within Swarm
- Comments
 - Inline in the “diff” view
 - See other comments
- Approve, Reject, etc.
 - Notification of status change



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Status Dashboard



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Perforce Highlights

FAST

Easy to learn

Superior technical support

Cross-platform compatibility

Atomic change transactions

Powerful integration algorithm

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The End

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