



INTERSYSTEMS LEARNING SERVICES

InterSystems Change Control



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ICC 460: CCR Transport – Perforce Debugging & Advanced Topics



Objectives

- Be able to use p4V and Swarm to make changes directly to items on the Perforce server.
- Define view paths and how they are used within Perforce.
- Describe Perforce command line interface variables, how they are used and setup.
- Explain how Perforce references files during synchronisation.
- Illustrate how Perforce prevents conflicts using locks.



Objectives (cont.)

- Setup Perforce notifications to monitor specific branches.
- Demonstrate how to move a changelist to a new CCR using Swarm and P4V.
- Explain how to refresh Perforce branches.
- Demonstrate how to backout changes using Perforce.
- Fix integration history.



Part 1: Advanced Perforce Concepts



View Paths

- View path: `//depotMapping/... //targetMapping/...`
 - Examples:
 - A Client Workspace View Path between a depot and a client:
`//MYDEPOT/MyApp/MAIN/... //MYDEPOT_MyApp_MAIN_Dev/...`
 - A Branch View Path between two depot codelines:
`//MYDEPOT/MyApp/MAIN/....//MYDEPOT/MyApp/BRANCHES/1.0.0/...`
- Overlay & Exclusions – used to remove or add specific locations to a View Path.
 - `+//mapping3/... //mapping4/...`
 - `-//mapping3/... //mapping5/...`



View Paths (cont.)

- Special characters for View Paths: space, *, ..., %, @, #.
 - Perforce wildcards – avoid in filenames.
 - Use ASCII code or quote.



CLI: P4 Session Variables

- To use the CLI (Command Line Interface) it is a good idea to set up your CLI variables:
 - P4CONFIG = p4config.txt (Windows) ; .p4 (UNIX).
 - P4PORT=server:port.
 - P4CLIENT=clientName.
 - P4USER=lanID.
 - P4CHARSET= utf8 (Optional).
- If not logged, must issue “p4 login” command first.
- Always check where you are connected with “p4 info” before issuing commands by the CLI.



CLI: Perforce Session

- Hierarchy of elements defining your P4 environment and command settings:
 - On the command line, using flags.
 - In a configuration file, if P4CONFIG is set.
 - User environment variables (on UNIX or Windows).
 - System environment variables (on Windows, system-wide environment variables are not necessarily the same thing as user environment variables).



CLI: Perforce Session (cont.)

- Hierarchy of elements defining your P4 environment and command settings:
 - On Windows, in the Perforce User Registry:
 - `p4 set setting=value.`
 - On Windows, in the Perforce System Registry:
 - `p4 set -s setting=value.`
- You can check your environment variables with “p4 set” before issuing commands with the CLI.



Working on Files: Synchronizing

- p4 sync.
- @, # are the wildcards to use to specify versions:
 - @ = relative reference.
 - changelist.
 - date.
 - Label.
 - etc...
 - # = hard reference (specific revision).
 - Useful for fetching specific revision of one file.
 - Not very useful for group of files.
 - #head specifies the 'latest' revision.



Preventing Conflicts: Lock

- Optimistic locking.
 - Use Lock command in P4V.
 - Prevents other user checking in the file before you check in the file.
- Pessimistic locking.
 - Handled on the server via specific filetypes.
 - Prevents other user from checking out the file before you check in the file.
 - It is helpful to use pessimistic for certain files types, e.g. PPT and XLS files which can't be merged.
 - Contact Tech Services if there is a specific file type for which you want pessimistic locking in your depot.



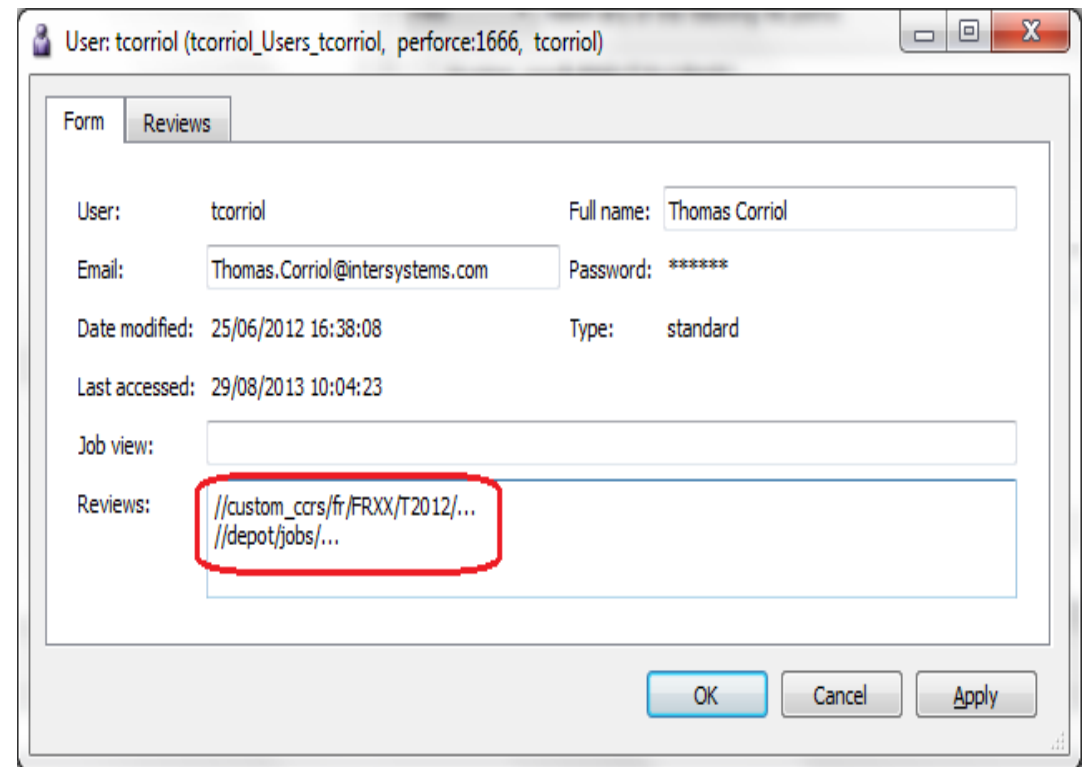
Performing Very Large Branching Virtually

- There are some cases where a large number of files need to be branched to a new location.
 - E.g., populating environment branches after a CCR Baseline, or making a new Project Branch for a product.
- By default, all files get synced to the local workspace as part of an integration, which can be very time consuming.
 - Especially on remote connections.
- To branch large volumes of files from depot to depot without syncing them locally:
 - Use the -v switch for p4 integrate, which will perform the branching virtually and will be much faster.



Perforce Notifications via “Reviews”

- Changelists notifications via email can be set up to ‘watch’ a specific branch.
 - Allows specific branches to be ‘monitored.’
 - Configurable by user.
 - Menu “Connection > Edit Current User...”
 - Put a branch under “Reviews.”



The screenshot shows the 'Edit Current User' dialog box with the 'Reviews' tab selected. The dialog box contains the following fields and values:

Field	Value
User:	tcorriol
Full name:	Thomas Corriol
Email:	Thomas.Corriol@intersystems.com
Password:	*****
Date modified:	25/06/2012 16:38:08
Type:	standard
Last accessed:	29/08/2013 10:04:23
Job view:	
Reviews:	//custom_ccrs/fr/FRXX/T2012/... //depot/jobs/...

The 'Reviews' field is highlighted with a red rectangle. At the bottom of the dialog box are three buttons: OK, Cancel, and Apply.



Perforce Notifications via “Reviews” (cont.)

- Changelists notifications via email can be set up to ‘watch’ a specific branch.
 - When a changelist is submitted against a branch, an email gets sent immediately with:
 - User.
 - Changelist description.
 - Files impacted.
 - Job.
 - “//depot/jobs” to get jobs notification (you will get ALL of them).
 - Metadata is not protected, and shared on a Server.



Quiz: Advanced Perforce Concepts

Question:

If the Perforce system default for check-outs is optimistic locking, both John and Sandy can checkout the same file.
True or False?

Answer: True.

If Sandy wants to prevent John or anyone else from checking out the file, she should use the lock command after checking out the file.



Part 2:

Moving a Cancelled Changelist to a new CCR



Moving a Changelist from One CCR to Another

- There are some cases where a changelist needs to be moved from one CCR to another:
 - An ItemSet was uploaded against the wrong CCR by accident.
 - A CCR was cancelled by mistake (and the changelists were not backed out) and the user wishes to attach the changelist to a new CCR to progress the change.
- Review: changelists are associated with CCRs via Perforce jobs.



Moving a Changelist from One CCR to Another (cont.)

- Jobs can be edited on submitted changelists via:
 - Swarm.
 - p4V.
- Adding a new job (which references a CCR) can be done only by InterSystems employees as it requires direct access to Perforce.
 - Customers should contact InterSystems Support for assistance in moving a changelist.



Using Swarm to Change a Job on a changelist

- Click the changelist number on the CCR that you need to move, then it will open it up in Swarm (using your Perforce credentials).
- Add the correct CCR number by clicking the “Add Job” hyperlink.
- Remove the link to the incorrect one by clicking the X beside it.



Using p4V to Change a Job on a Changelist

- Steps:

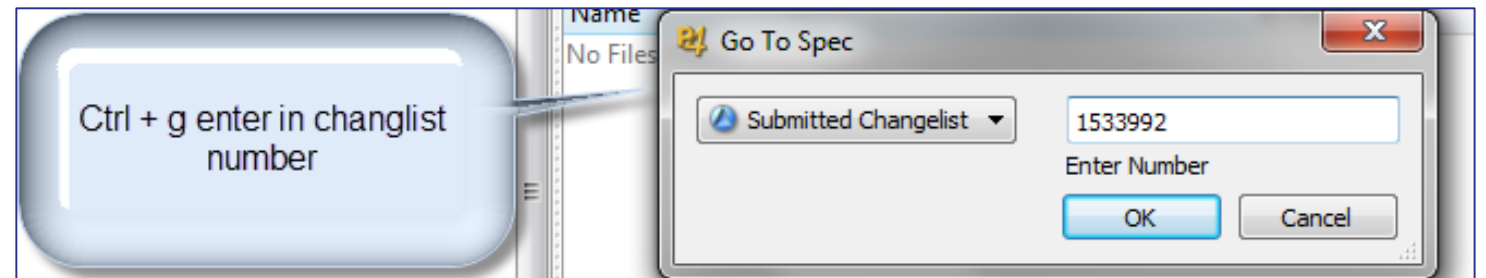
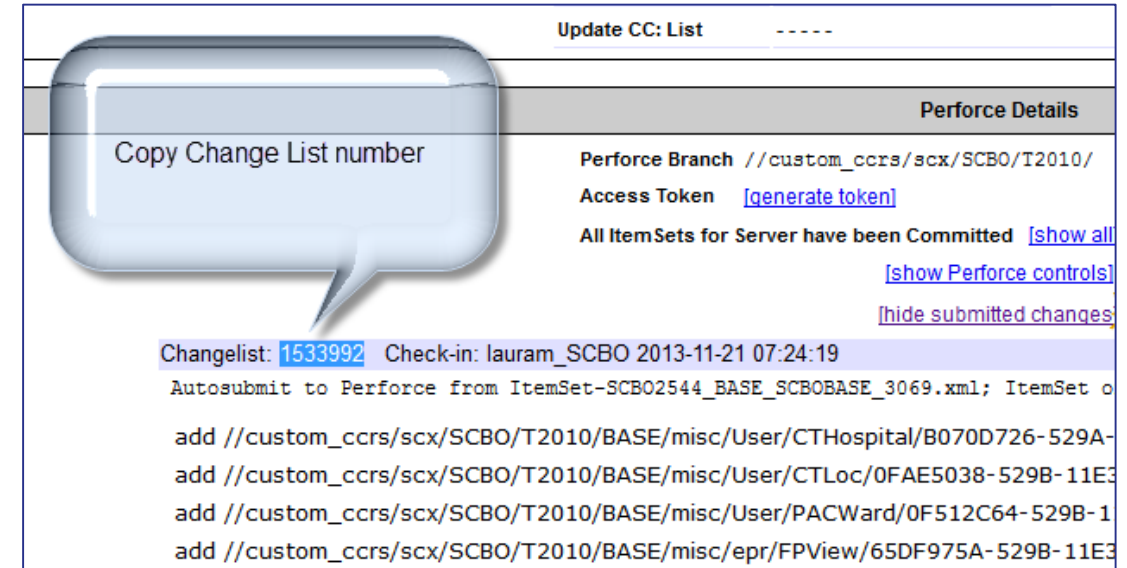
1. Log into CCR online application.
2. Ensure that the new CCR is in a phase of In_BASE.
3. Open the CCR with which the changelist is currently associated.
4. Select Show Submitted Changes hyperlink within the Perforce Details Section.



Using p4V to Change a Job on a Changelist (cont.)

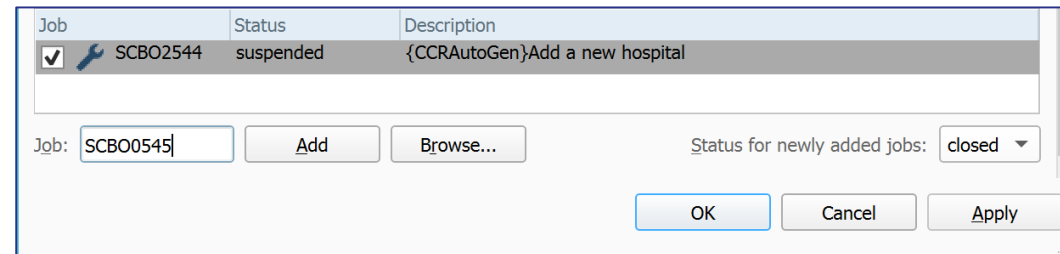
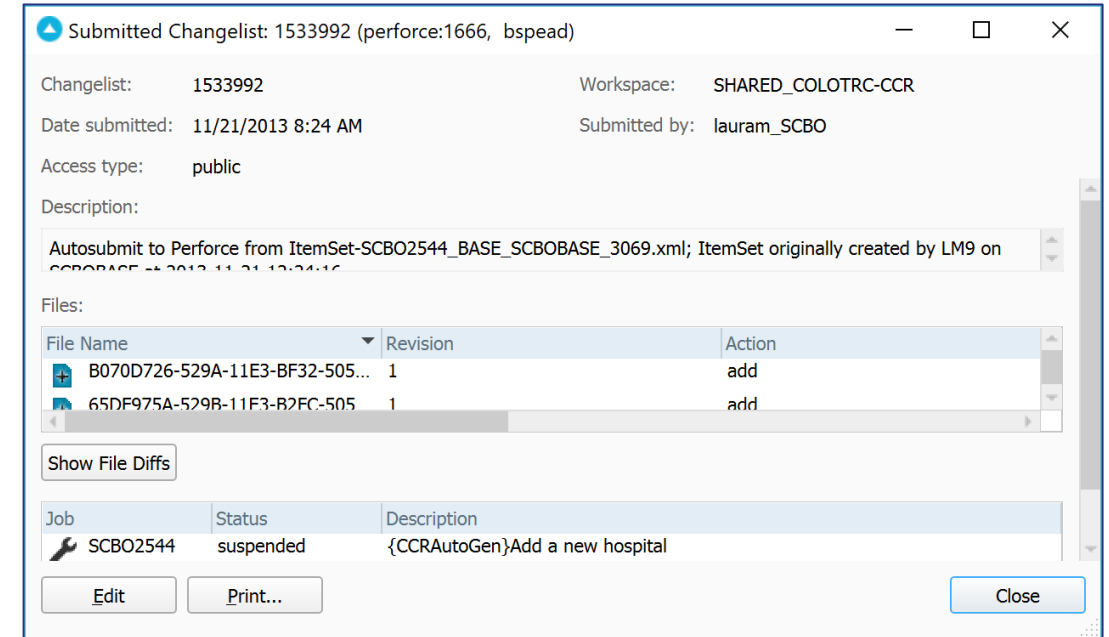
- Steps:

5. Copy the changelist Number.
6. Log into p4V.
7. Open the changelist (CTRL+G).
8. Paste the changelist number.
9. Click on OK.



Using p4V to Change a Job on a Changelist (cont.)

- Steps:
 10. Click Edit.
 11. Enter new CCR number in Job field.
 12. Click Add.
 13. Confirm the job is now listed.
 14. Right-click the old job > Remove from changelist.
 15. Click OK.



Using p4V to Change a Job on a Changelist (cont.)

- Steps:

16. Return to new CCR and refresh page.

17. Verify changelist now appears under [show Submitted Changes].

18. Progress CCR according to normal workflow.

[\[hide submitted changes\]](#)

Changelist: 1533992 Check-in: lauram_SCBO 2013-11-21 07:24:19

Autosubmit to Perforce from ItemSet-SCBO2544_BASE_SCBOBASE_3069.xml; ItemSet originally created by LM9 on SCBOBASE at 2013-11-21 12:24:16

add //custom_ccrs/scx/SCBO/T2010/BASE/misc/User/CTHospital/B070D726-529A-11E3-BF32-5056A8569F00.xml (1) [view](#) / [diff](#) / [history](#)

add //custom_ccrs/scx/SCBO/T2010/BASE/misc/User/CTLoc/0FAE5038-529B-11E3-B8DF-5056A8569F00.xml (1) [view](#) / [diff](#) / [history](#)

add //custom_ccrs/scx/SCBO/T2010/BASE/misc/User/PACWard/0F512C64-529B-11E3-B8DF-5056A8569F00.xml (1) [view](#) / [diff](#) / [history](#)

add //custom_ccrs/scx/SCBO/T2010/BASE/misc/epr/FPView/65DF975A-529B-11E3-B2FC-5056A8569F00.xml (1) [view](#) / [diff](#) / [history](#)



Quiz: Moving Cancelled Changelist to a New CCR

Question:

Moving a cancelled changelist to a new CCR requires re-submitting content in a new changelist with the new CCR number. True or False?

Answer: False.

You are merely updating the same changelist with the new job number. You are not re-submitting the changes.

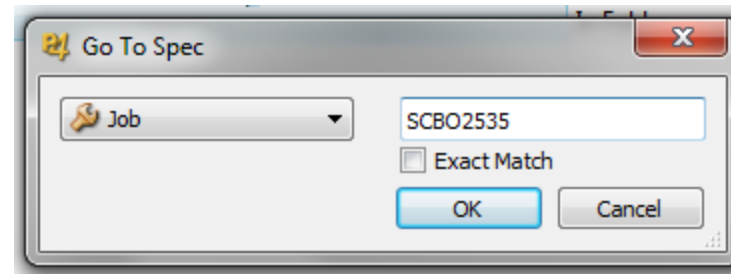


Part 3: Back out Changes Using Perforce



Backout Changes using Perforce

- Only way backout some (rather than all) of the changelists submitted while In_BASE:
 1. Log into Perforce.
 2. Search > Go To...
 - Keyboard shortcut: Ctrl + G.
 3. Choose job.
 4. Enter your CCR number.
 5. Click OK.



Backout changes using Perforce (cont.)

- Only way backout some (rather than all) of the changelists submitted while In_BASE:
 6. Right-click > Undo Changes in Changelist #####.
 7. Pending changelist: New.
 8. Click Save to Changelist.
 9. Repeat for each changelist that should be backed out.
 - Note: May need to submit changelist per instructions on next slide before backing out another changelist. Necessary when backing out multiple changelists on same file.



Backout changes using Perforce (cont.)

- Only way backout some (rather than all) of the changelists submitted while In_BASE:
 10. Select the Pending Change List Tab.
 11. Right-click changelist with the backout > Submit.
 12. Add in the changelist description.
 13. Enter job number (CCR number).
 14. Click Add.
 15. Click Submit.



Backout changes using Perforce (cont.)

- Only way backout some (rather than all of the changelists submitted while In_BASE:

16. Open the CCR.

17. Show Perforce controls.

18. Click [show controls] for Create ItemSet.

19. Select Target environment: BASE.

20. Deploy ItemSet.

Perforce Details		
Performance Branch	//custom_ccrs/scx/SCBO/T2010/	Performance Job SCBO2535
Access Token	[generate token]	Performance Log [view log]
Current ItemSet for Client	SCBO2535_UAT_ColoTRC-CCR_201505(ID=201505) (2014-01-07 06:14:18) [details] [itemset XML]	
All ItemSets for Server have been Committed [show all]		
[hide Performance controls]		
Performance Integration	[show controls]	
Performance Backout	[show controls]	
Create ItemSet	[show controls]	
[show submitted changes]		

Access Token	[generate token]	Performance Log	[view log]
Current ItemSet for Client	SCBO2535_UAT_ColoTRC-CCR_188670(ID=188670) (2013-11-15 09:06:55) [details] [itemset XML]		
All ItemSets for Server have been Committed [show all]			
[hide Performance controls]			
Performance Integration	[show controls]		
Performance Backout	[show controls]		
Create ItemSet	Target Environment: BASE [Create]		
ItemSets are created from Perforce Changelists. Click [show submitted changes] for a preview			
[hide controls]			
[hide submitted changes]			



Quiz: Backing Out Changes

Question:

It is possible to backout changes from within the CCR application. True or False?

Answer: True.

Frequently, changes can be backed out from within the CCR application when cancelling a CCR.

If it's not possible, make sure to follow the previous steps to backout using Perforce.



Part 4: Resolving merge conflicts in P4V



Resolving merge conflicts in P4V

- Sometimes you will see integration errors when moving a CCR to the next phase.

performer-sandbox:1999

Perforce Details

logged into Perforce as 'agoldmin'

Perforce Activity

ERROR: Critical error occurred. Aborting ItemSet creation. (PID:13908)

Perforce Branch

//custom_ccrs/_common/zTest/us/ISCX/TrakTest/

Perforce Job

devISCX0003-USE7470agoldmin

Access Token

[\[generate token\]](#)

Transport Log

[\[view log\]](#)

[\[show Perforce controls\]](#)

[\[show submitted changes \(1\)\]](#)



Resolving merge conflicts in P4V (cont.)

- You can check the Transport Log for details of the error.

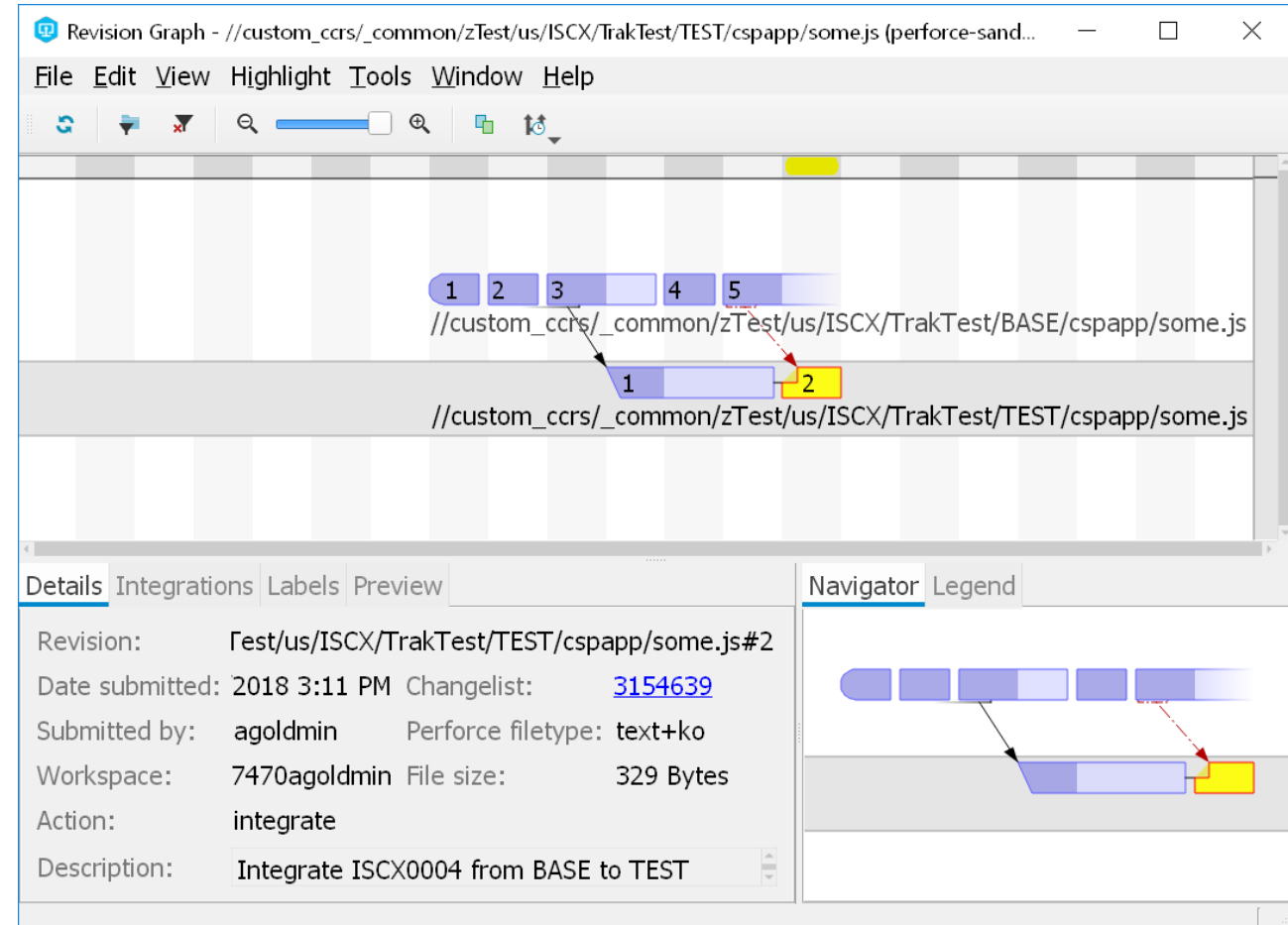
```
Diff chunks: 1 yours + 1 theirs + 0 both + 1 conflicting  
//USE7470agoldmin/custom_ccrs/_common/zTest/us/ISCX/TrakTest/TEST/cspapp/some.js - resolve skipped.  
ERROR #5001: ERROR: cannot resolve conflicts, unable to perform automatic integration.  
Identifying possible source(s) of conflict
```

- This will tell you both what the error was, and which file caused the problem.



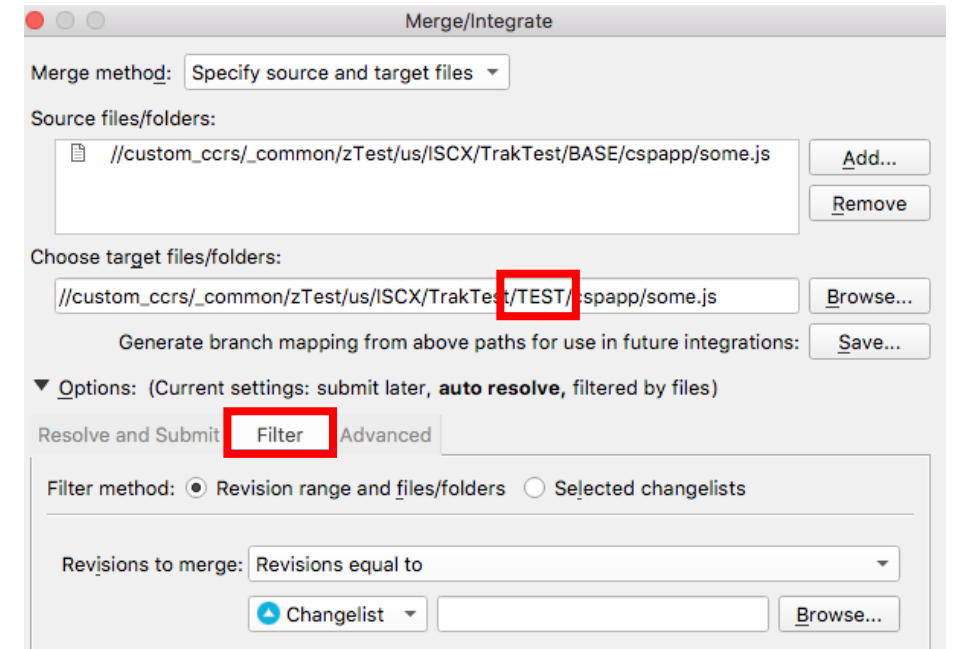
Resolving merge conflicts in P4V (cont.)

- Looking at the file's integration history can be helpful to understand why there are conflicts.
- In this example, revision 5 needed to progress without revision 4.
 - Screenshot shows the state after manual integration.



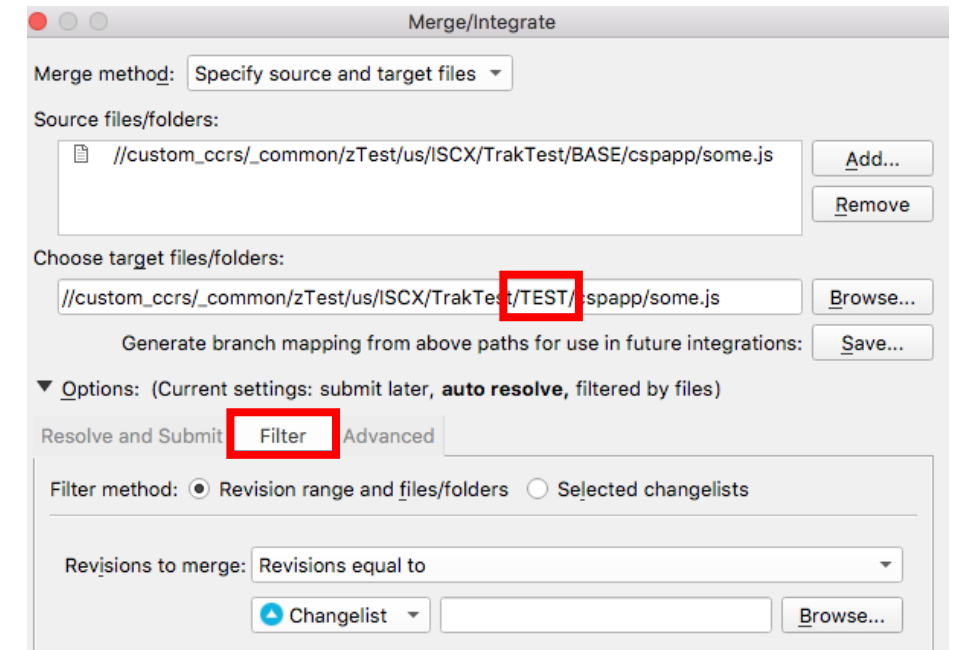
Resolving merge conflicts in P4V (cont.)

- Find the conflicting file(s) in question in the workspace view in P4V and select “Merge/Integrate” from the context menu.
 - NOTE – this manual step is only for conflicting files; after correcting them by hand use the CCR Integration Tool to manually integrate the remainder of the files.



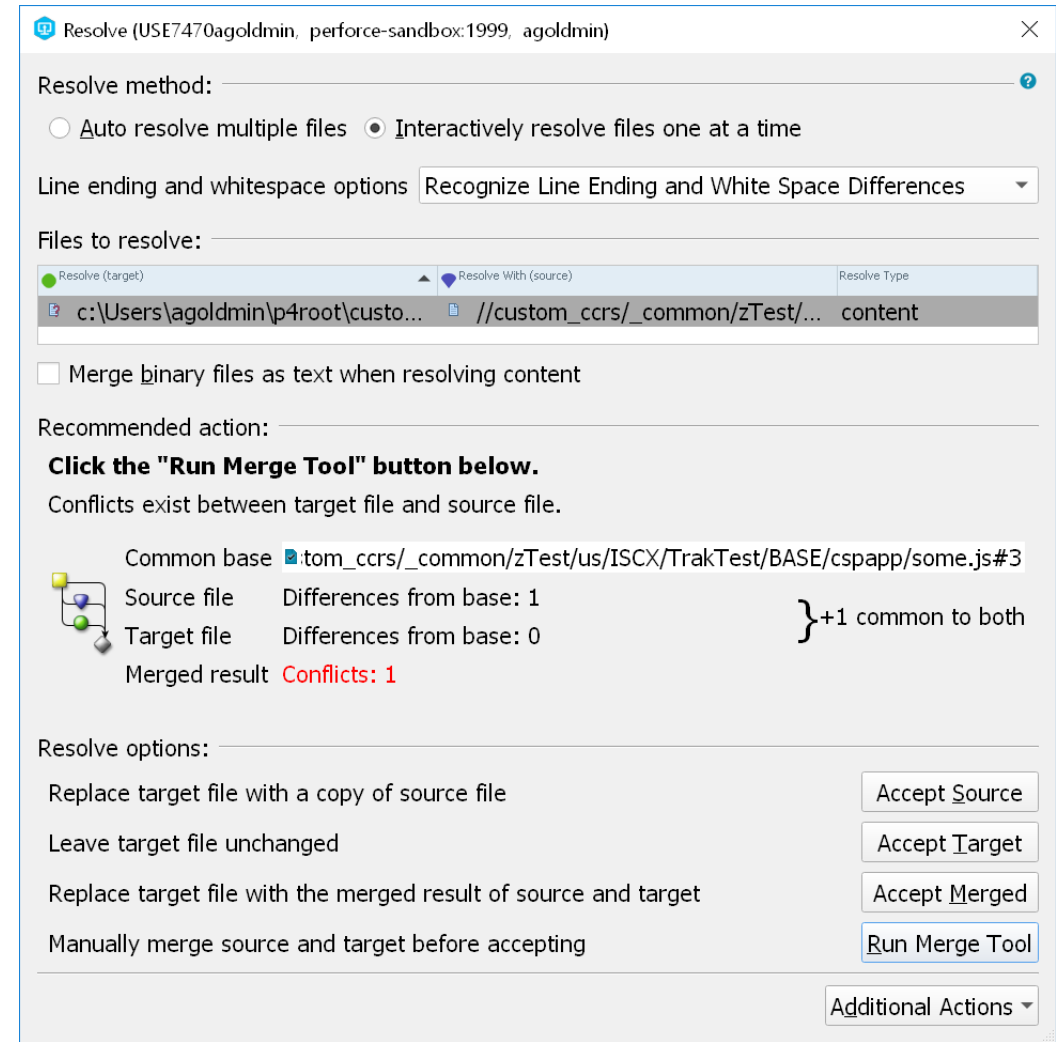
Resolving merge conflicts in P4V (cont.)

- Make sure the target path is set to the corresponding file in the TEST branch.
 - Target is **case sensitive** (i.e. 'TEST' not 'test').
- On "Filter" tab, select just the changelists you want to integrate.
- NOTE: After finishing the merge, the merged file(s) will need to be resolved before they can be submitted.



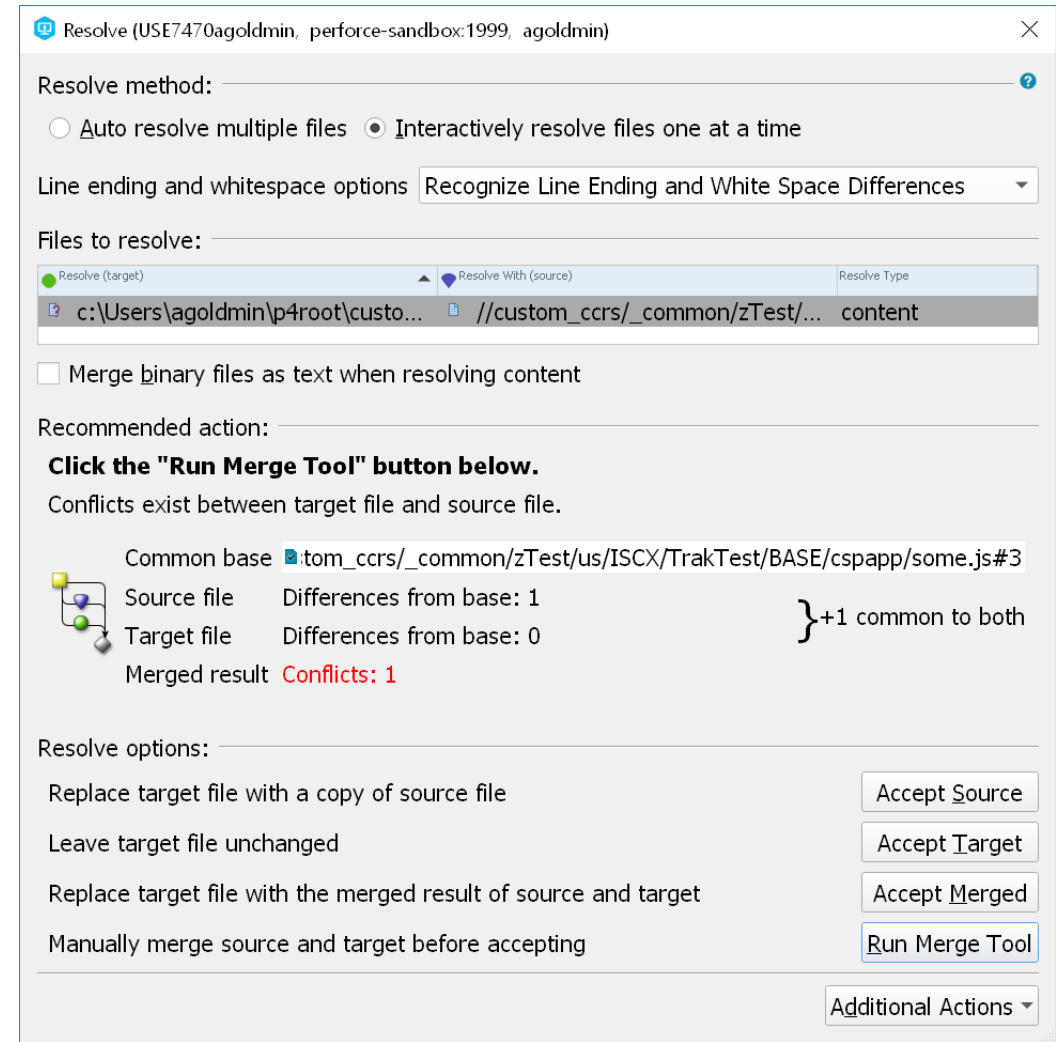
Resolving merge conflicts in P4V (cont.)

- Find the file in the target branch and select "Resolve" from the context menu.
- You will see a summary of the changes in the source and target files and options to resolve the merge.



Resolving merge conflicts in P4V (cont.)

- Run the merge tool to see a view of the file contents in the various versions of the file so that you can decide how best to merge.
- This requires some knowledge of what the contents of the file mean to ensure that the result makes sense.



Resolving merge conflicts in P4V (cont.)

- Click the “Save” icon once the merge is complete.
- When prompted about replacing the item in your workspace with the merged file, answer “Yes.”
- Now the change is ready to be submitted to Perforce.
 - **Don’t forget to attach the Perforce job (i.e the CCR ID) to the changelist so that CCR can see the changelist and include it in the ItemSet.**



Resolving merge conflicts in P4V (cont.)

- If there are other files that didn't have a conflict, they can be auto-integrated with the CCR Perforce Tools.
- Make sure an ItemSet is created; deploy it and continue moving the CCR forward.



Quiz: Resolving Merge Conflicts

Question:

If the integration of one file in the CCR needs to be merged by hand, then all files in that CCR must be manually merged as well. True or False?

Answer: False.

Only the conflicting file must be manually merged; once the conflicting file is integrated, the other files can be integrated using the Perforce tools on the CCR.



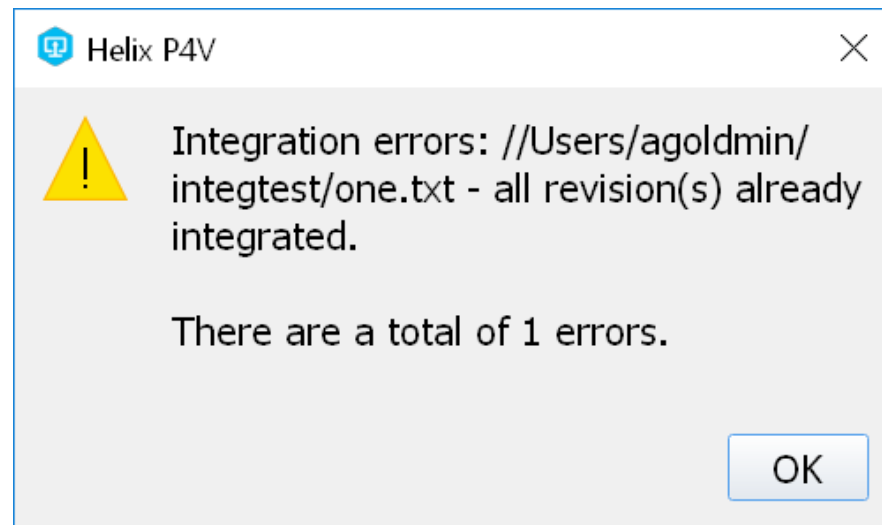
Part 5:

Fixing integration history with p4 integrate -f



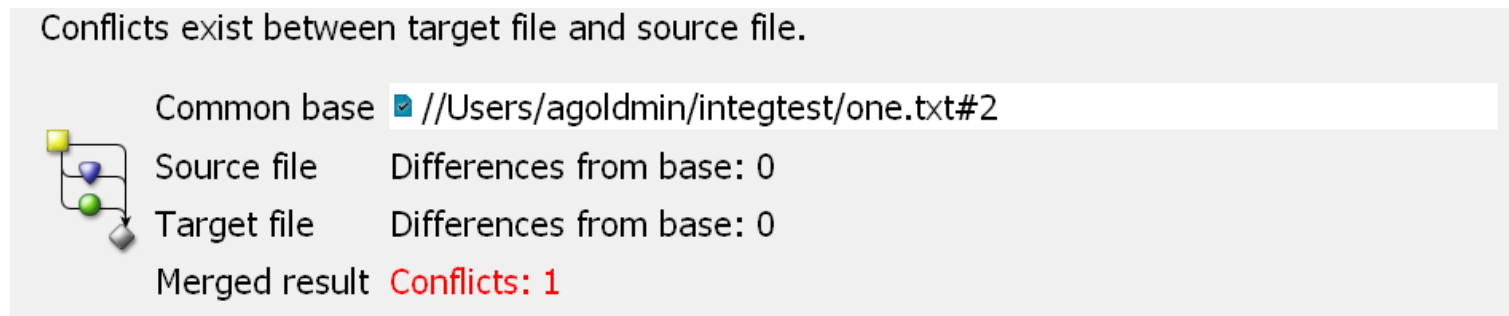
Fixing integration history with integrate -f

- Sometimes there are mistakes in p4 integrations.
 - E.g. resolving “accept target” instead of “accept source”.
 - Or integrating from the wrong source.



Fixing integration history with integrate -f (cont.)

- Perforce won't let you integrate the same change twice into the same file.
- Possibly more changes were checked into the source file, causing merge conflicts.



Fixing integration history with integrate -f (cont.)

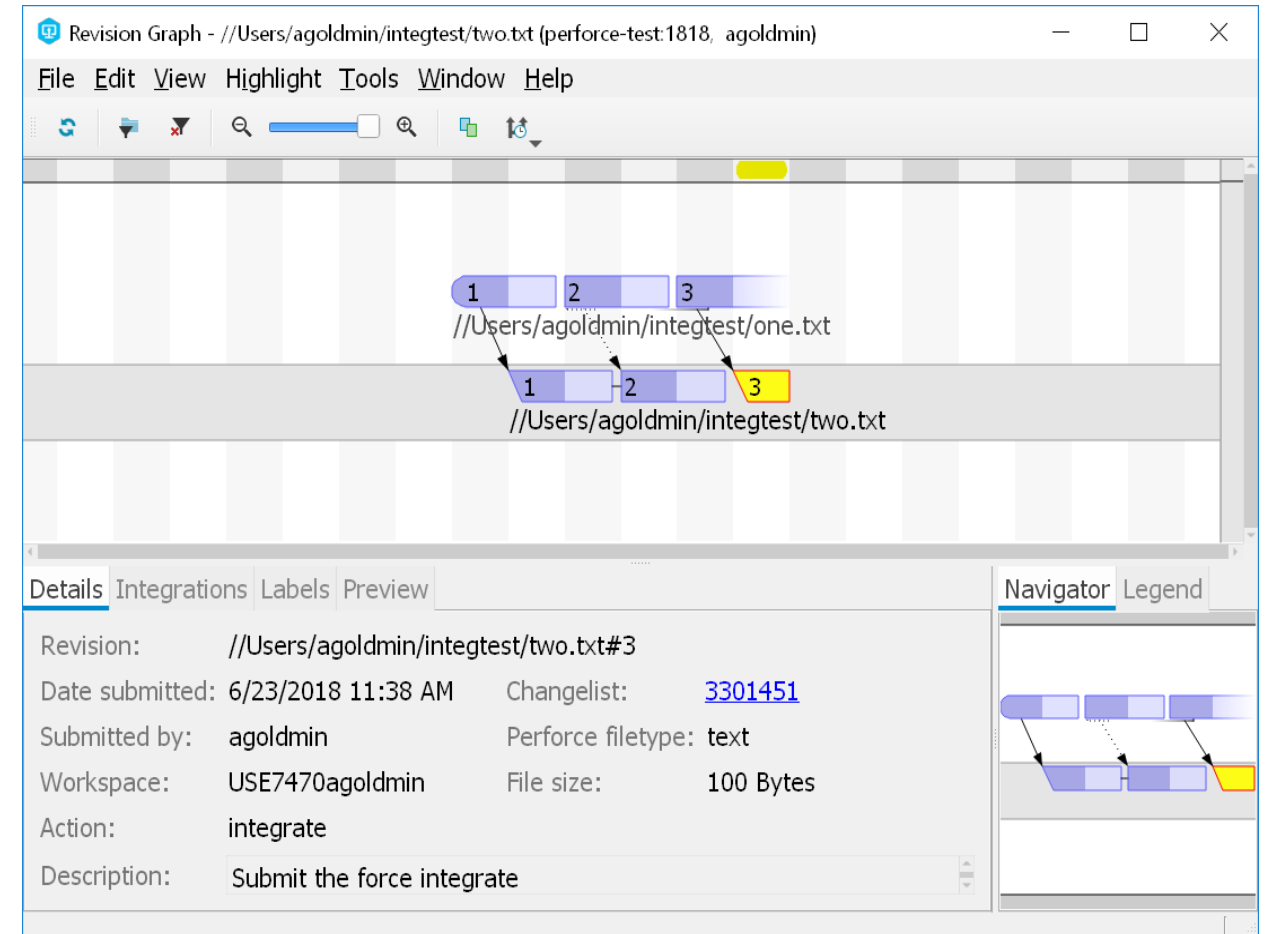
- “p4 integrate -f” can help if you have a version of the file you want to copy forward to all branches.
- It will copy all the file contents and use it as a basis for all future integration history.

The screenshot shows the 'Merge/Integrate' dialog box. It has a title bar with a close button. The 'Merge method' is set to 'Specify source and target files'. Under 'Source files/folders', there is a text field containing '//Users/agoldmin/integtest/one.txt' and buttons for 'Add...' and 'Remove'. Under 'Choose target files/folders', there is a text field containing '//Users/agoldmin/integtest/two.txt' and a 'Browse...' button. Below that is a 'Generate branch mapping from above paths for use in future integrations:' section with a 'Save...' button. The 'Options' section is expanded, showing 'Current settings: submit later, **auto resolve**, filtered by files, **force merge**'. There are tabs for 'Resolve and Submit', 'Filter', and 'Advanced'. The 'Advanced' tab is selected. It contains four checkboxes: 'Do not copy newly branched target files to workspace (-v)', 'Try to integrate changes when source deleted and re-added (-Di)', 'Force integration on all revisions, disregarding integration history (-f)' (which is checked and highlighted with a red box), and 'Do not get latest revision of selected files (-h)'.



Fixing integration history with integrate -f (cont.)

- Results in Revision Graph like this:
- Note the diagonal corner on two.txt#3.
- The integration from one.txt#3 overwrites two.txt#2.



Part 6: Perforce Refresh



Perforce Refresh

- Refreshing the Perforce branches based on contents of LIVE:
 - To ensure that all configuration matches in each Perforce branch.
 - Clears integration history to prevent merge conflicts.
 - Can be done during working hours as it will have no impact on performance for users.
 - Before refresh ensure that:
 - Source Control Hooks (Tier 1) and/or Change Control Hooks (Tier 2) have been Locked.
 - Progress all CCR's to terminal state (Closed, Merged, or Cancelled).



Perforce Refresh (cont.)

- Refreshing the Perforce branches based on contents of LIVE:
 - Perforce refresh done as part of rebaseline.
 - See rebaselining in ICC520 for details on how to perform refresh as part of rebaseline.



Quiz: Perforce Refresh

Question:

A Perforce refresh should be done during off hours because it can affect performance for the client. True or False?

Answer: False.



Summary

- What are the key points for this module?

