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InterSystems Change Control

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ICC 420: CCR Transport – Items and ItemSets

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Objectives

- Identify information and actions available in Perforce details section of CCR.
- Describe how changes are moved between Perforce branches.
- Identify contents of ItemSets.
- Explain the use of the source workspace.
- Identify purpose of baselining.
- Identify actions that require a Perforce account.

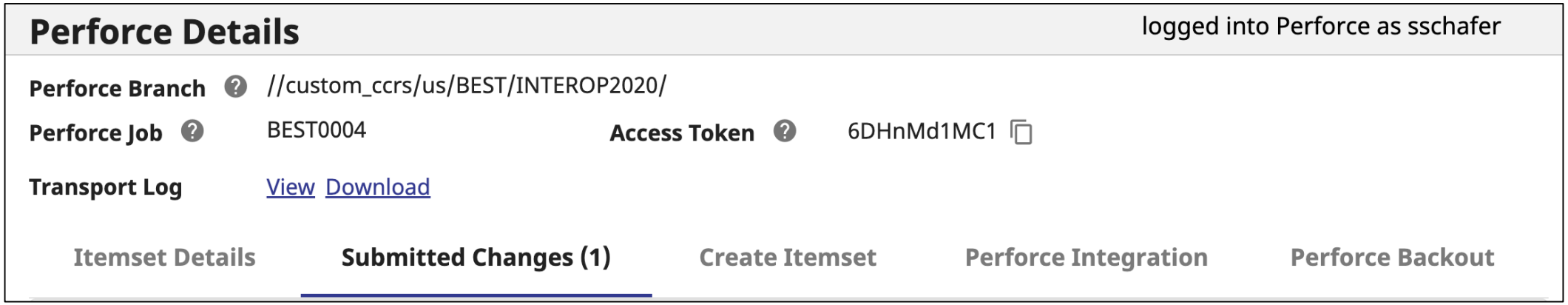
Part 1: Perforce and the CCR Record

Review: Perforce Users

- All CCR users who need CCR to take actions in Perforce on their behalf must have Perforce username and password.
  - Including non-InterSystems users.

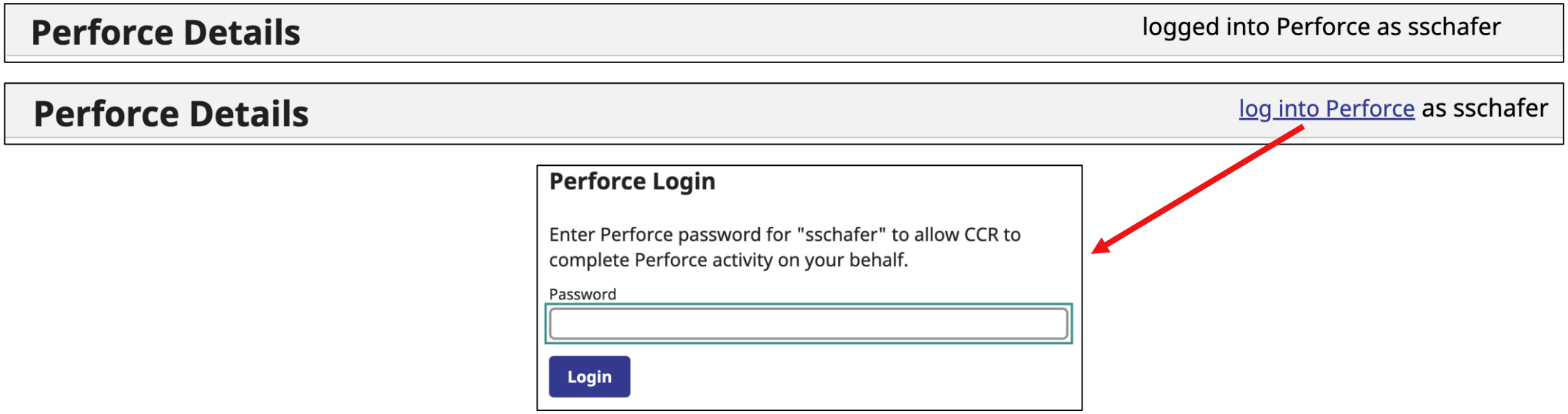
Perforce Details Section

- Contains CCR Transport information and actions.
  - Perforce login status.
  - Access Token.
  - Transport Log.
  - ItemSets.
  - Submitted Changes.
  - Perforce actions and ItemSet creation.



Logging into Perforce via CCR

- CCR assumes same username in Perforce.
- CCR attempts to use same password for Perforce on logging into CCR.
  - If Perforce and CCR password different, must supply Perforce password to CCR.
- Perforce Details section of every CCR shows login status.



Username Not a Perforce User Error

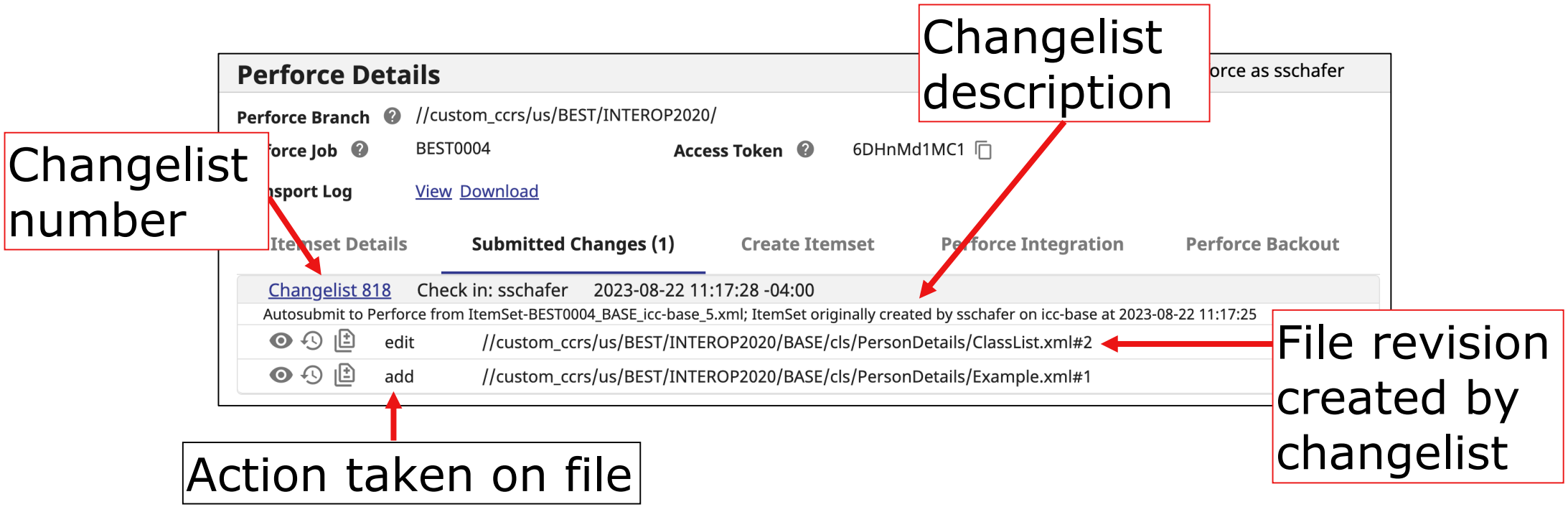
- New CCR users might see message “user is not a Perforce user”.
  - CCR regularly queries Perforce to determine which users are also Perforce users.
  - InterSystems employees can force resynchronization of Perforce users.
    - Menu > Refresh Perforce Users.

Terminology: Changelist

- Changelist = Perforce term for an atomic set of changes in 1 transaction.
  - All changelists have a numerical ID.
- CCR submits all items in an ItemSet as one changelist tagged with CCR ID.
  - Does not submit ItemSet to Perforce; submits items in ItemSet.
- authorizeAndStartMoveToTEST integrates all changelists tagged with that CCR ID from BASE to TEST branch.
  - Submits integration as one changelist tagged with CCR ID.

Viewing Submitted Changes

- Click Submitted Changes tab to view all changelists in Perforce associated with this CCR.

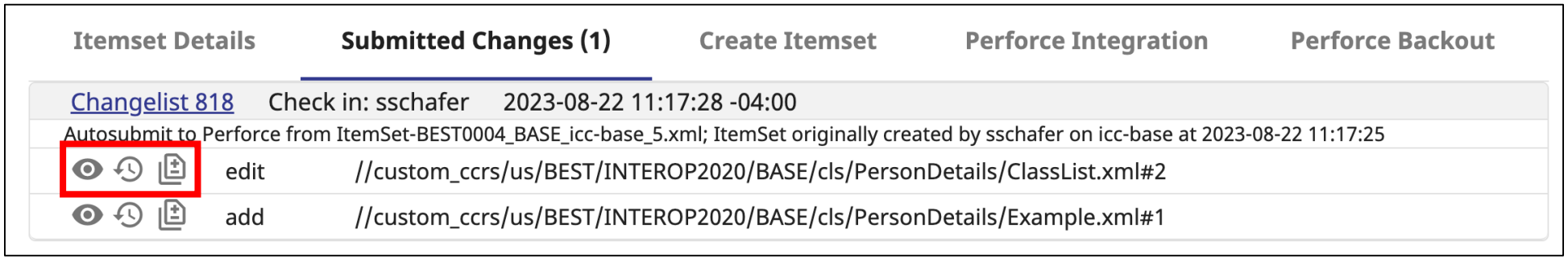


Viewing Submitted Changes (cont.)

- Changelist number.
  - Links to Swarm (InterSystems employees only).
- Action taken on file options:
  - Add, edit, delete, branch, integrate, undo.
- Notice no information about ItemSets.
  - ItemSets effectively disposable once used for transport.

Actions Under View Submitted Changes

- View.
  - Show entire contents of the item at that revision.
  - Links to page where able to diff against any revision.
- History.
  - Shows color coded list of revisions to item.
- Diff.
  - Show diff chunks changed at that revision.



CCR Transport: Errors

- Errors with Perforce or ItemSets appear in Perforce Details.
- Never ignore orange or red messages in Perforce Details.
  - CCR may allow progression of change despite error messages.
    - Does not mean should progress CCR.
    - Flexibility to progress despite error necessary in some **rare** situations.
- Ignoring errors without fully understanding and resolving has caused crises.

Quiz: Perforce Details Section

Question:

Which one of the following is NEVER shown in the Perforce Details section of a CCR?

A. View Transport Log link.

B. Log into Perforce link.

C. List of submitted changes.

D. Access Token.

E. Link to directly edit item.

Quiz: Perforce Details Section

Answer:

E. Link to directly edit item.

There is no way to directly edit an item in the Perforce Details section.

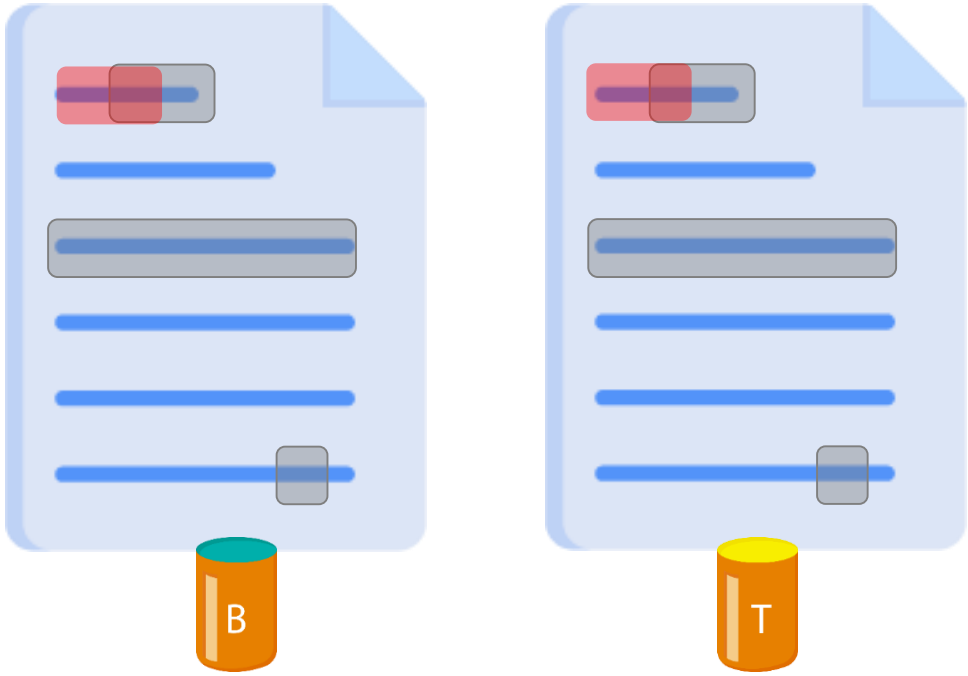
Part 2: Moving Changes Between Perforce Branches

Items and Diff Chunks

- Diff chunk = sections of file that differs from previous revision.
  - Insert, update, or delete.
- Perforce identifies and records diff chunks.
- Enables independently moving different CCRs editing different sections of item.

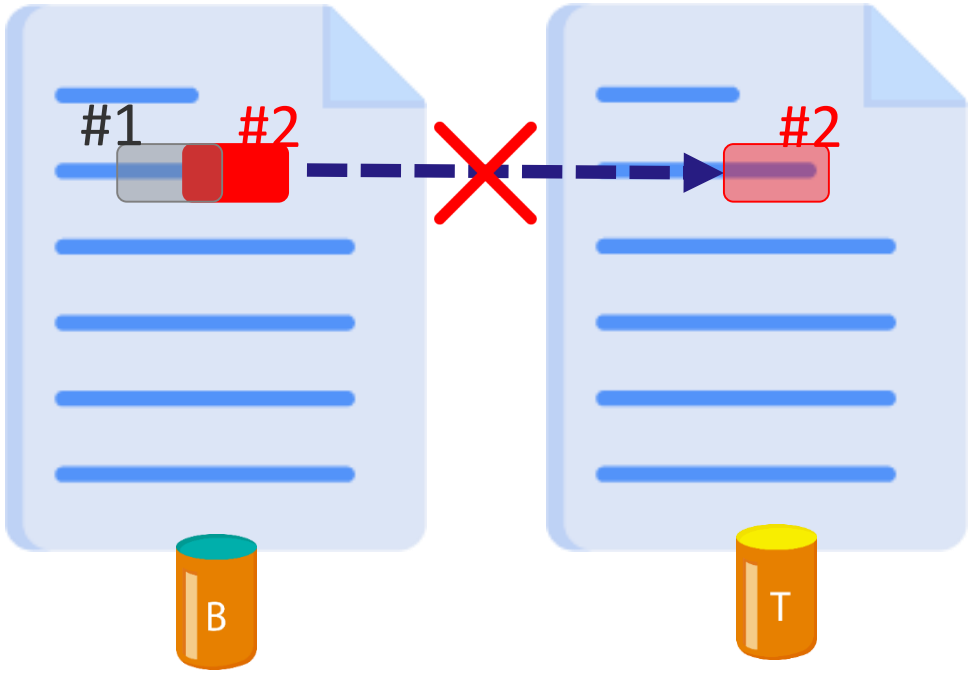
Moving Diff Chunks Between Branches

- Integrations only move diff chunks associated with that CCR record.
  - Exception: entire file copied if does not exist in target branch.
- Integration successful if base for each diff chunk in source item exists in target item.



Merge Conflicts

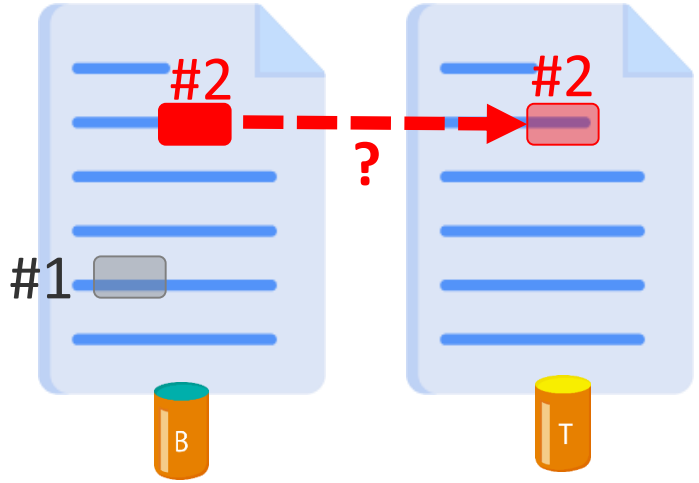
- Integration fails with merge conflict error when base for any diff chunk in source item does not exist in target environment.



Quiz: Merge Conflicts

Question:

The following will cause a merge conflict. Change #1 is made but not progressed before #2 is made and progressed to TEST. True or False?



Answer: False.

Since change #2 does not overlap with #1, change #2 can successfully progress to TEST without #1.

Part 3: Understanding ItemSets

ItemSet Contents

- ItemSets contain:
  - Metadata.
  - Complete copies of each item.
    - Not just diff chunks!

ItemSet for Server vs ItemSet for Client

- CCR record lists ItemSets for server and ItemSets for client.
- ItemSets for server = submitted to CCR from BASE Environment.
  - Hidden if successfully committed to Perforce.
- ItemSets for client = ItemSets generated by CCR to deploy to Environments.
  - Hidden if successfully deployed to all required environments.
- Toggle to view hidden ItemSets.

ItemSets for Client Status

- Undeployed.
  - Have not attempted to deploy ItemSet.
- Deployed.
  - No further action required.
- Error.
  - Must fix an issue before progressing CCR.
- Downloaded.
  - Sent to environment filesystem but not loaded into namespace.

ItemSets for Client Status: Stale ItemSet

- ItemSets expire after 24 hours.
  - Helps prevent deploying ItemSets with old versions of items.
- Click Refresh Itemset button to generate new ItemSet based on latest version of items.

Quiz: ItemSet Contents

Question:

ItemSets contain metadata and diff chunks of items (rather than the full item) associated with a specific CCR.

True or False?

Answer: False

Diff chunks associated with a CCR are integrated to a target branch and merged in to create a new revision of an item and associate those revisions with the CCR (via a new changelist). ItemSets contain all of the new revisions (complete files) of the items for that CCR.

Part 4: CCR Source Workspace

Source Workspace Read/Write File Settings

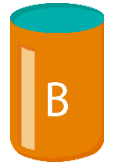
- Read/Write setting of files part of concurrency control framework.
  - Do not change read/write setting of any files.
  - Read only = not checked out.
  - Read/Write = checked out.

CCR Branches

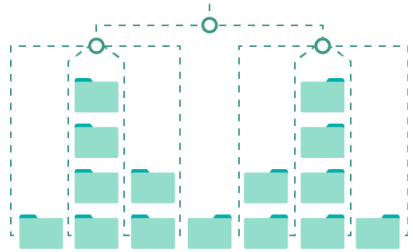
- Branch = folder location for items stored within Perforce:
  - //custom_ccrs/<Cc>/<Site>/<Sys>/<Env>/.
    - custom_ccrs – top level for CCR apps.
    - <Cc> – Country code.
    - <Site> – Site code.
    - <Sys> – System code.
    - <Env> – BASE/TEST/UAT/LIVE.

CCR Branches (cont.)

- Example BASE branch for the CCR application:
  - //custom_ccrs/us/ISCX/CCR/BASE/.



- Source workspace on the Environment is of the same structure:
  - \source\custom_ccrs\us\ISCX\CCR\BASE\.



Tier 1 Branch Subfolders

- Items automatically exported to appropriate subfolders of source workspace and imported on ItemSet delivery by CCR Client Tools based on item type:
  - cls/ (class files).
  - cspapp/ (web files e.g. JavaScript, CSP, CSS).
  - inc/ (include files).
  - prj/ (project files).
  - rtn/ (routines).
  - rul/ (Interoperability Message Rules).

Tier 1 Branch Subfolders (cont.)

- Items automatically exported to appropriate subfolders of source workspace and imported on ItemSet delivery by CCR Client Tools based on item type:
  - lut/ (Interoperability Lookup Tables).
  - schema/hl7/ (HLv2 Custom Schemas).
  - ds/ (Business Intelligence dashboard definitions).
- Other subfolders can be created at will (e.g. “/java”).
  - Write custom ImplementCCR routine or CCR Event Handler for automation.

Integration Rules for Special Subdirectories

- All items checked into source branch, except directories noted below, are integrated to target.
- /internal subdirectory never integrated to LIVE.
  - Use case: unit test files, sample data.
- /backup subdirectory never integrated.
  - Use case: System Default Settings.

Quiz: Source Workspace

Question:

Which of the following best describes the structure of the source workspace?

A. A directory structure containing numbered copies of each item, corresponding to different version of that item.

B. A collection of XML snippet files containing the ‘diff chunk’ of each edit submitted by users.

C. A file-based replicate of the Perforce branch for that environment, containing the same structures and the content of the ‘head’ revisions of the items.

Quiz: Source Workspace

Answer:

C. A file-based replicate of the Perforce branch for that environment, containing the same structures and the content of the ‘head’ revisions of the items.

For TEST and LIVE, the local workspace should always exactly match those branches; for BASE it should match the BASE branch except for items actively being edited.

Part 5: The Importance of Baselining

What is Baselining?

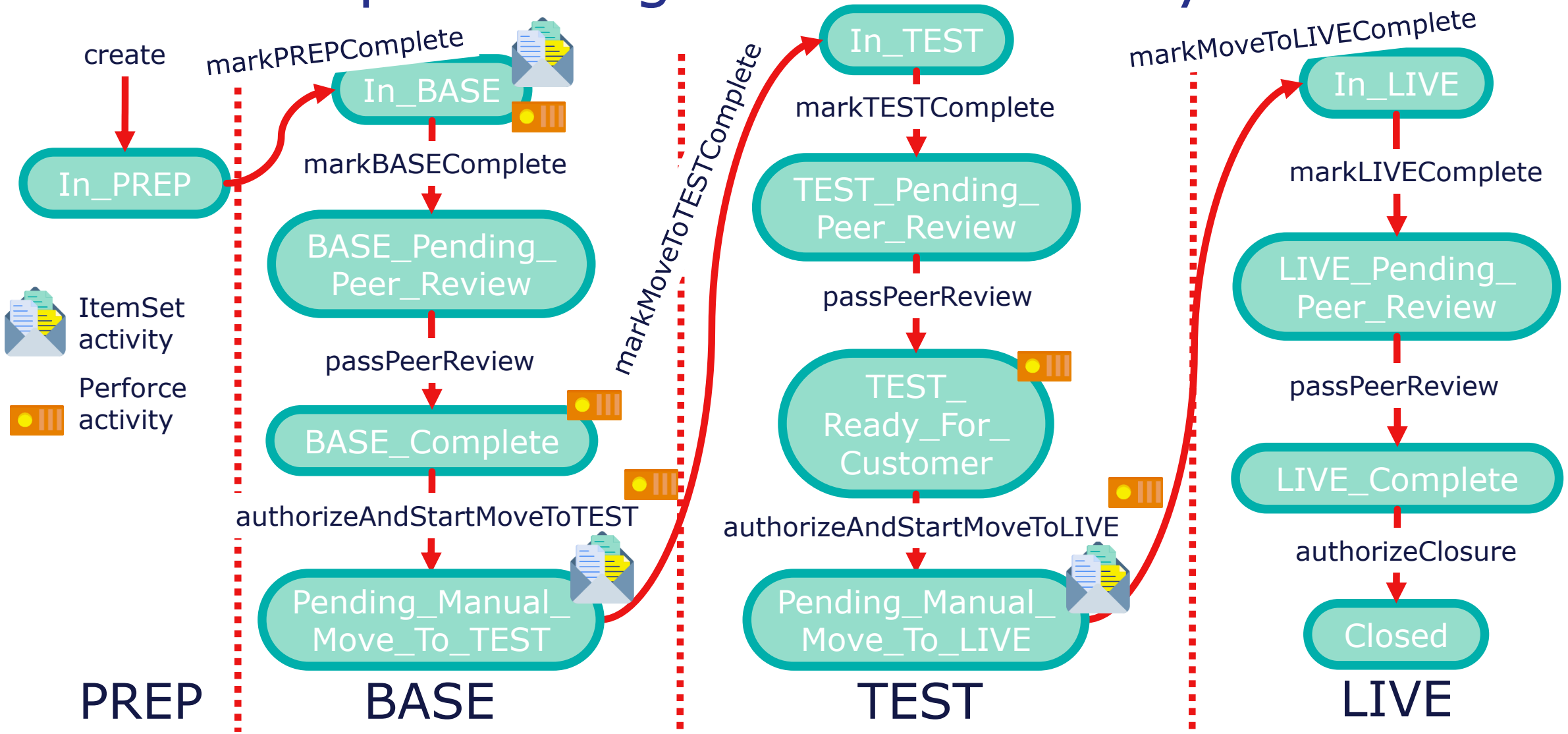
- Synchronizes Perforce and environments.
- InterSystems employee usually involved in process.
  - Tier 1 baselines sometimes require direct Perforce access.
  - Tier 2 baselines require direct Perforce access.

Why is Baselining Important?

- Establishes starting point in Perforce.
- Editing item that was never added to Perforce means:
  - Cannot diff change.
    - Perforce does not have previous revision.
  - Cannot backout.
    - Would delete entire item.
- Establishes clean integration history.
  - Bad practices lead to diff chunks inconsistent between environments.

Part 6: Actions Requiring Perforce Account

CCR Transport along the CCR Journey…



Actions in CCR that Require Perforce User

- Creating and deploying ItemSets to environments does not require Perforce account.
- Actions that require being logged into Perforce.
  - Clicking startMoveToXXXX transition on Tier 1 or Tier 2 CCRs.
  - Manually triggering integration or backout through Perforce Details section of CCR.
  - Integration previews.

Actions in CCR that Require Perforce User (cont.)

- Behavior when attempting action but not logged into Perforce via CCR.
  - Users with no Perforce account blocked from performing action.
  - Users with Perforce account but not logged in via CCR:
    - [Log into Perforce] field flashes and turns yellow.
  - Exception:
    - Previews in CCR workflow will be bypassed if user not logged into Perforce.

Uploading ItemSet from environment to CCR

- If user does not have Perforce account:
  - ItemSet queued on CCR server.
  - Entire queue for an organization committed to Perforce when either:
    - Any user logged into Perforce uploads an ItemSet.
    - Any user logged into Perforce clicks [commit queue] link next to uncommitted ItemSet in CCR record.
  - When queue committed, all changelists reference user who caused queue to clear.

Quiz: Perforce Account Required

Question:

Only a Perforce user can perform a ‘startMoveTo’ transition for Tier 0, 1, and 2 CCRs. True or False?

Answer: False.

Tier 0 CCRs do not trigger any changes in Perforce therefore no Perforce usernames are required.

Quiz: Perforce Account Required 2

Question:

Which of the following actions require being logged into Perforce?

A. Viewing submitted changes.

B. Deploying an ItemSet.

C. Performing a passPeerReview transition.

D. Performing the authorizeAndStartMoveToTEST transition.

Quiz: Perforce Account Required 2

Answer:

D. Performing the authorizeAndStartMoveToTEST transition.

The authorizeAndStartMoveToTEST transition must perform the integration from BASE to TEST in Perforce in order to successfully complete. The passPeerReview transition will bypass the preview integration if you are not logged into Perforce.

Part 7: Advanced Information

CCR Client Tools – What is included?

- %Studio.SourceControl.* classes.
  - ISC.cls - Source control hooks class; controls Atelier/Studio behavior.
  - UI.cls - User interface for CCR actions (ItemSets bundling, loading, etc.).
  - Change.cls - Persistent record of “who did what?” (aka uncommitted queue).
  - ItemSet.cls - Persistent class for ItemSets.
  - ItemSetWS.cls - Web service client for moving ItemSets to/from CCR server.
  - CCREventHandler.cls - Abstract super-class for creating custom CCR event handlers for your application (aka “build hooks”).

CCR Client Tools – What is included? (cont.)

- Routines.
  - %buildccr.mac - Command Line interface for CCR configuration, etc.
  - %buildccrRefresh.mac - Logic for refreshing namespace from source workspace.

ItemSet Logs

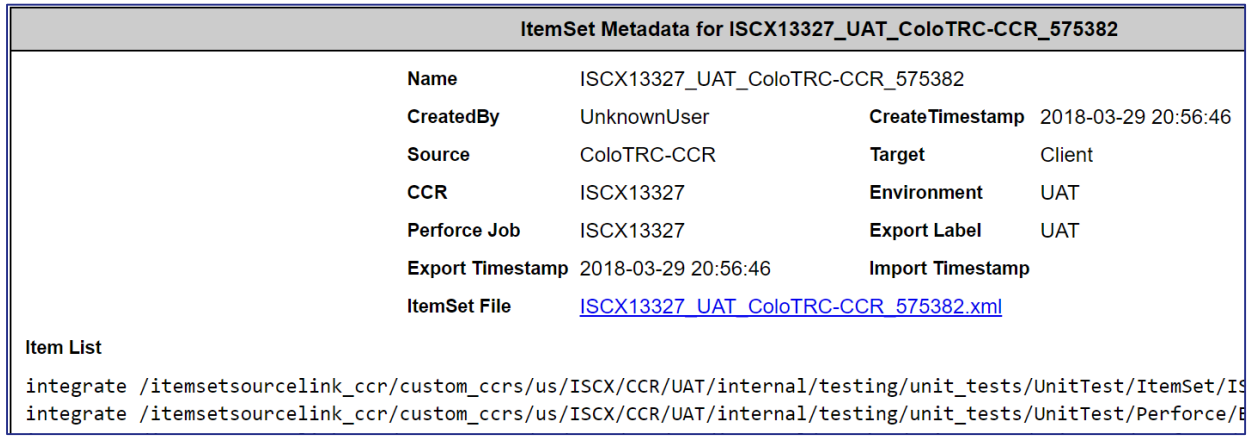
- All ItemSet activity in environment logged.
- Logs accessible via Perforce Details on CCR record.
- If log fails to upload to CCR, access in InterSystems command prompt of environment.
  - Do ItemSetLog^%buildccr.

View ItemSet information

- = View ItemSet activity log.
  - Logged activitity specific to this ItemSet.
- = Download file locally.

ItemSet Structure

- Click the [details] link by an ItemSet to see the following:
  - Name (a concatenation of CCR ID, environment, source server name, ItemSet ID).
  - Target (server or client).
  - Source server name.
  - CCR / Perforce job.
  - Environment.
  - Item List (includes action).
  - Payload.
    - UTF8 encoded XML block of all content for items in the ItemSet.



ItemSet Metadata for ISCX13327_UAT_ColoTRC-CCR_575382

Name	ISCX13327_UAT_ColoTRC-CCR_575382		
CreatedBy	UnknownUser	**CreateTimestamp**	2018-03-29 20:56:46
Source	ColoTRC-CCR	**Target**	Client
CCR	ISCX13327	**Environment**	UAT
Perforce Job	ISCX13327	**Export Label**	UAT
Export Timestamp	2018-03-29 20:56:46	**Import Timestamp**	
ItemSet File	ISCX13327_UAT_ColoTRC-CCR_575382.xml		

Item List

```
integrate /itemsetsourcelink_ccr/custom_ccrs/us/ISCX/CCR/UAT/internal/testing/unit_tests/UnitTest/ItemSet/IS
integrate /itemsetsourcelink_ccr/custom_ccrs/us/ISCX/CCR/UAT/internal/testing/unit_tests/UnitTest/Perforce/E
```

Source Workspace and ItemSets

- Creation of an ItemSet on client.
  - Items copied from workspace into ItemSet Payload XML file created in /<Workspace>/ItemSets/Export/<SiteCode>/ directory.
    - Payload file has the same filename as the ItemSet but with a “p” at the end.
  - ItemSet file containing Payload plus metadata created in same location.
  - Items marked as read-only in workspace following ItemSet creation.
- Loading of an ItemSet from server.
  - ItemSet downloaded from CCR server and deposited into /<Workspace>/ItemSets/Import/<SiteCode>/.
  - Payload file extracted from ItemSet.
  - Items extracted from Payload file and deposited in workspace branch locations.
    - Existing files marked Read/Write and then overwritten with contents of ItemSet Payload.

Summary

- What are the key points for this module?