INTERSYSTEMS LEARNING SERVICES

InterSystems Change Control

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InterSystems WorldWide Response Center
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ICC 400: Introduction to CCR Transport

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Objectives

- Understand benefits of CCR Transport including when and how to use it properly.
- Define CCR Client Tools and describe their purpose.
- Identify automatic vs manual parts of CCR Transport.

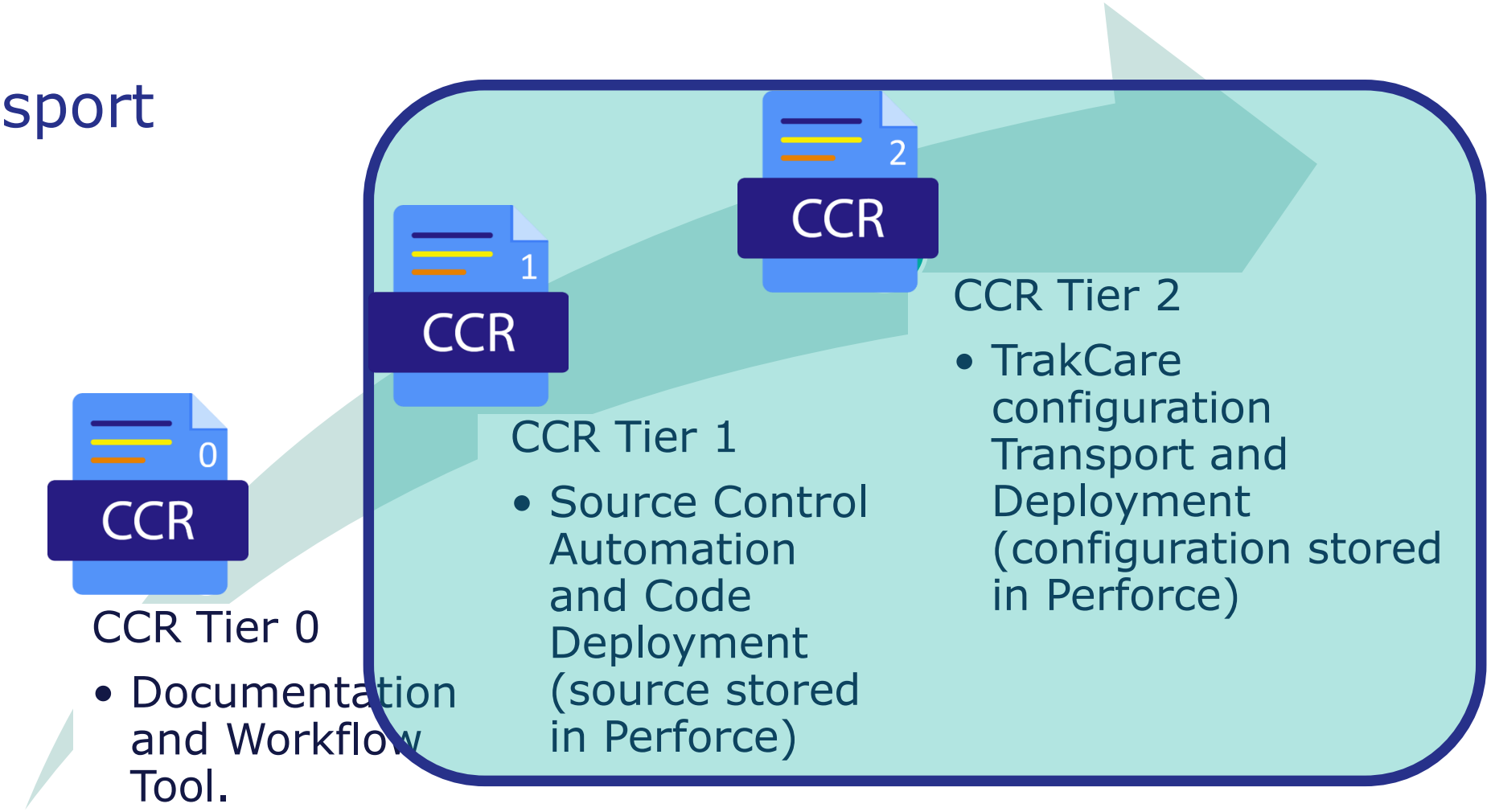
Objectives (cont.)

- Explain role and communication between:
  - Client environment.
  - CCR server.
  - Perforce Helix Server.
- Describe use of source workspace.

Part 1: CCR Transport:
Getting Items from Here to There

Review: CCR Usage Tiers

- CCR Transport applies to:



CCR Transport: The Fundamentals

- Framework used to move items to or from environments.
- Only applies to Tier 1 and Tier 2 CCRs.
- Stores all items in central Perforce Helix Server.
- Depends on:
  - Namespace configured using Configure^%buildccr utility.
  - Outbound access to ccr.intersystems.com and login.intersystems.com on port 443.
    - CCR never requires direct inbound access.
  - Users having proper understanding of how to use CCR Transport.

CCR Transport: The Fundamentals (cont.)

- Only InterSystems employees require direct access to Perforce for advanced debugging.

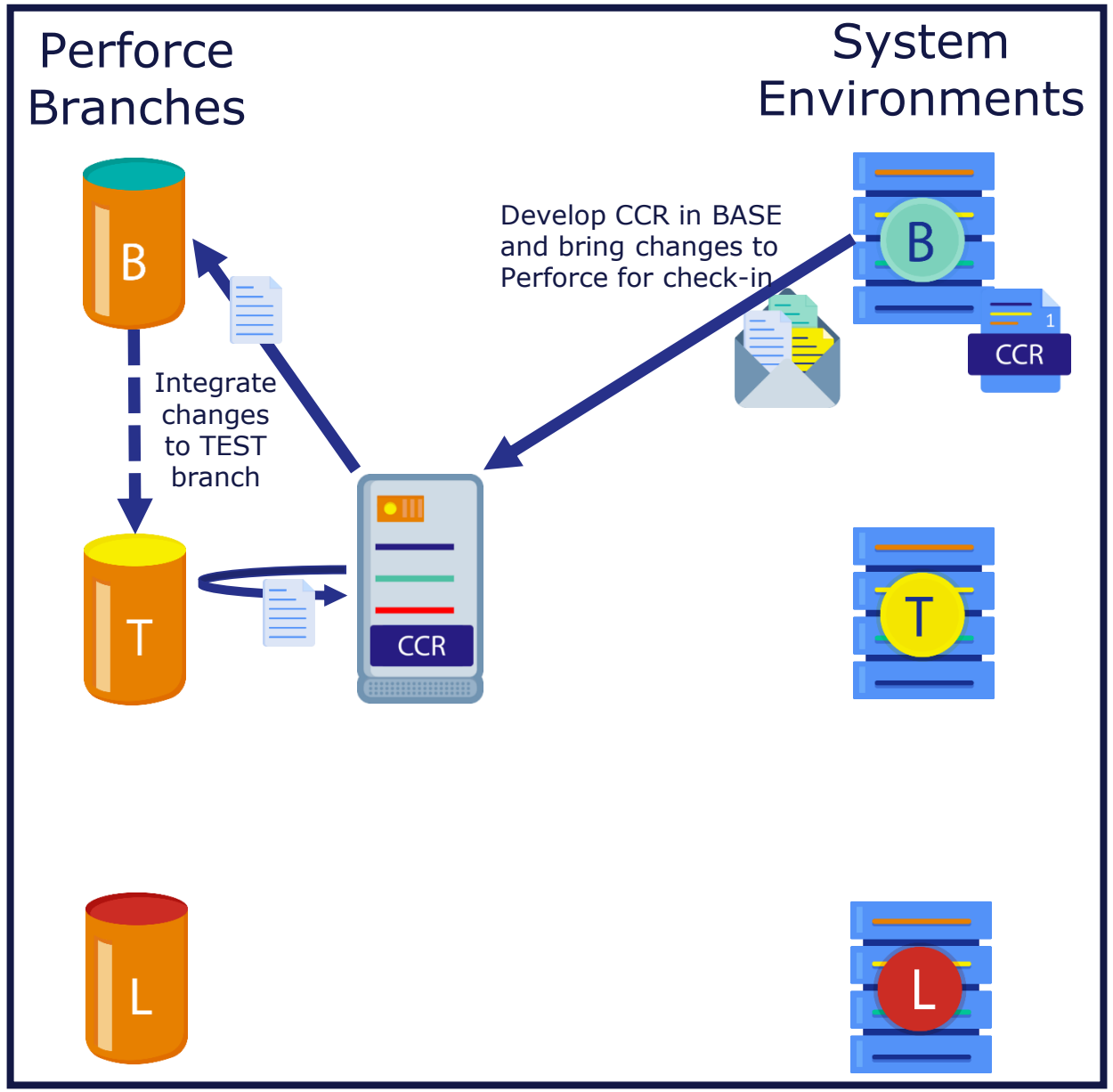
CCR Transport Terminology

- Item: Individual representation of part of an application.
  - Examples include individual:
    - Class definitions.
    - Routines.
    - Rows of a table.

- ItemSet: File that combines one or more Items along with metadata for transporting Items.
  - Think of it like an envelope for sending mail.
  - Only used for transport purposes, not persisting change.

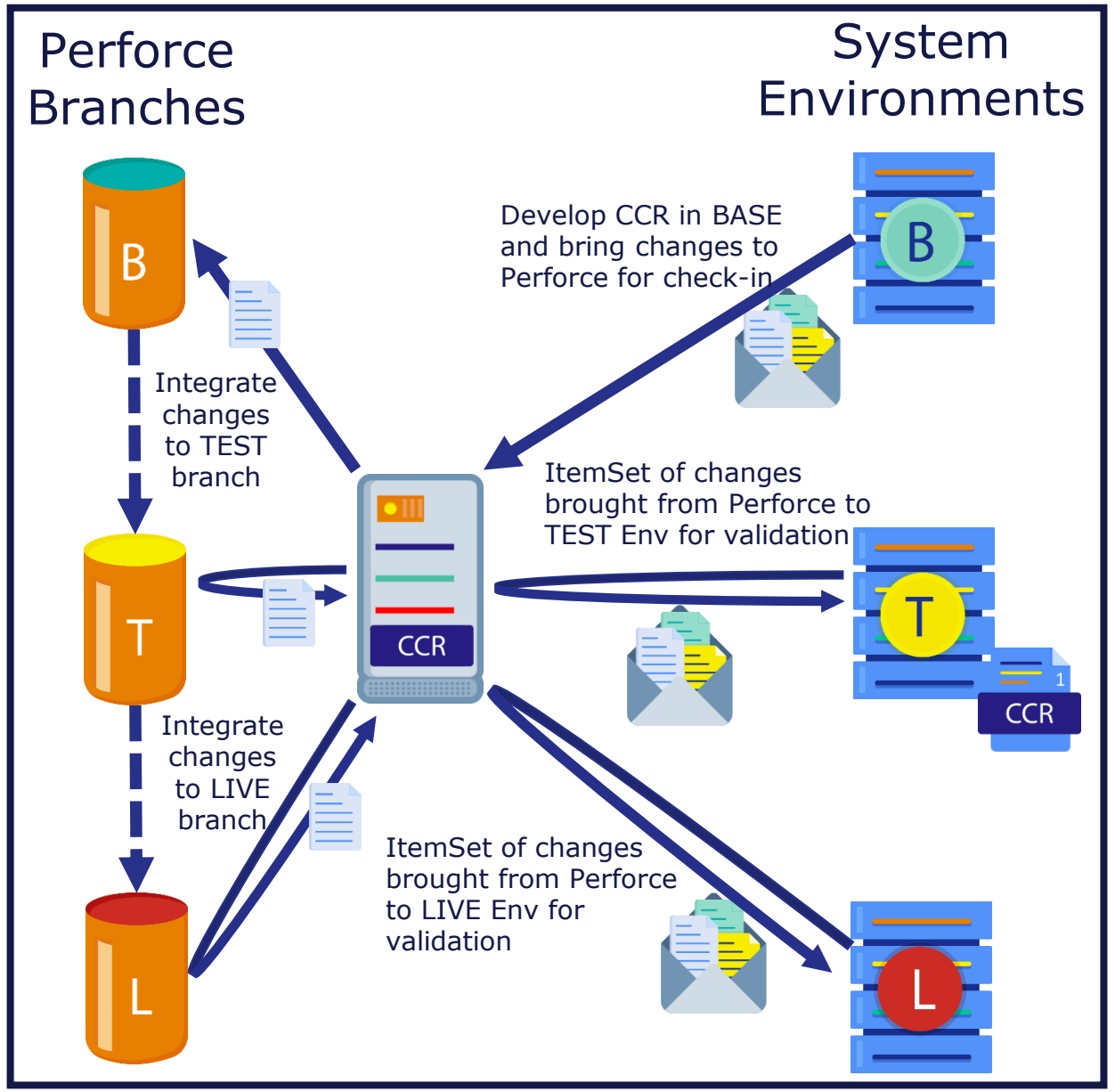
CCR Transport Workflow

1. Create CCR to document change.
2. Make changes in BASE.
3. Send changes to Perforce via ItemSet.
4. CCR workflow triggers integration of changes from BASE to TEST branch in Perforce.



CCR Transport Workflow

5. CCR delivers changes to TEST environment via ItemSet.
6. CCR workflow triggers integration of changes from TEST to LIVE branch in Perforce.
7. CCR delivers changes to LIVE environment via ItemSet.



Quiz: CCR Transport Delivery

Question:

What is the name of the container used to transport changes from the CCR server to an environment?

A. Changelist.

B. ItemSet.

C. DiffChunk.

D. Item.

E. SnailMail.

Quiz: CCR Transport Delivery (cont.)

Answer:

B. ItemSet.

An ItemSet is an XML file containing 1 or more Items along with metadata related to the CCR.

Part 2: CCR Client Tools

CCR Client Tools – An Introduction

- Library of code that comes with all InterSystems products.
  - 7 classes and 2 routines.
- Enables namespaces to act as clients to CCR.
- Stored in IRISLIB database.
  - Shared with all namespaces in instance.

CCR Client Tools – An Introduction (cont.)

- Can and should update without waiting for instance upgrade.
  - Low risk, easy, and mostly automated by progressing auto-generated Tier 1 CCR.
  - Updates include bug fixes and enhancements.
- Slides discussing new features in client tools refer to date added.
  - Environment has that feature if updated client tools since listed date.

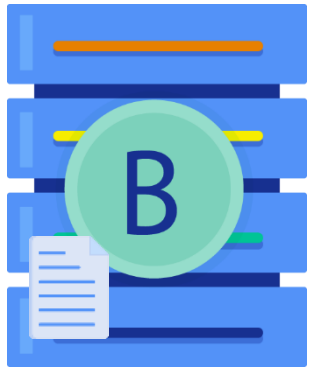
Part 3: CCR Transport Architecture

Source Workspace

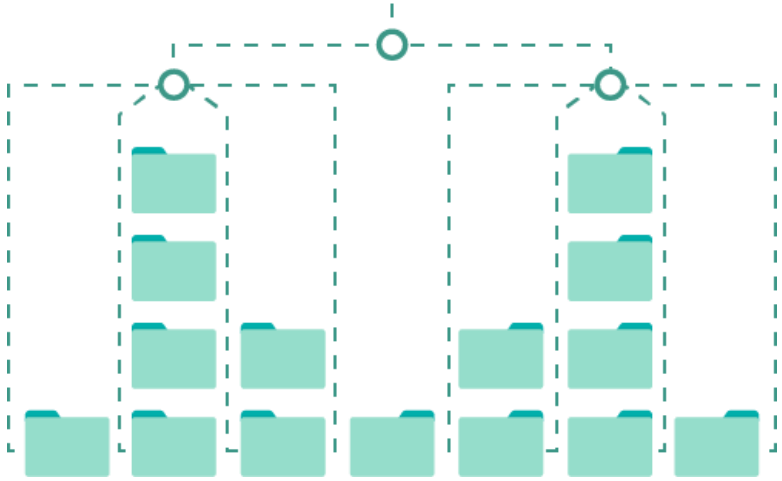
- Source workspace key component of CCR Transport functionality.
- Directory in filesystem of each environment.
- Folder structure under source workspace same as Perforce branch.
- Typically, files in source workspace updated by:
  - CCR Client Tools for Tier 1 changes.
  - TCC for Tier 2 changes.

Source Workspace

Database of
BASE instance



File system of
BASE machine

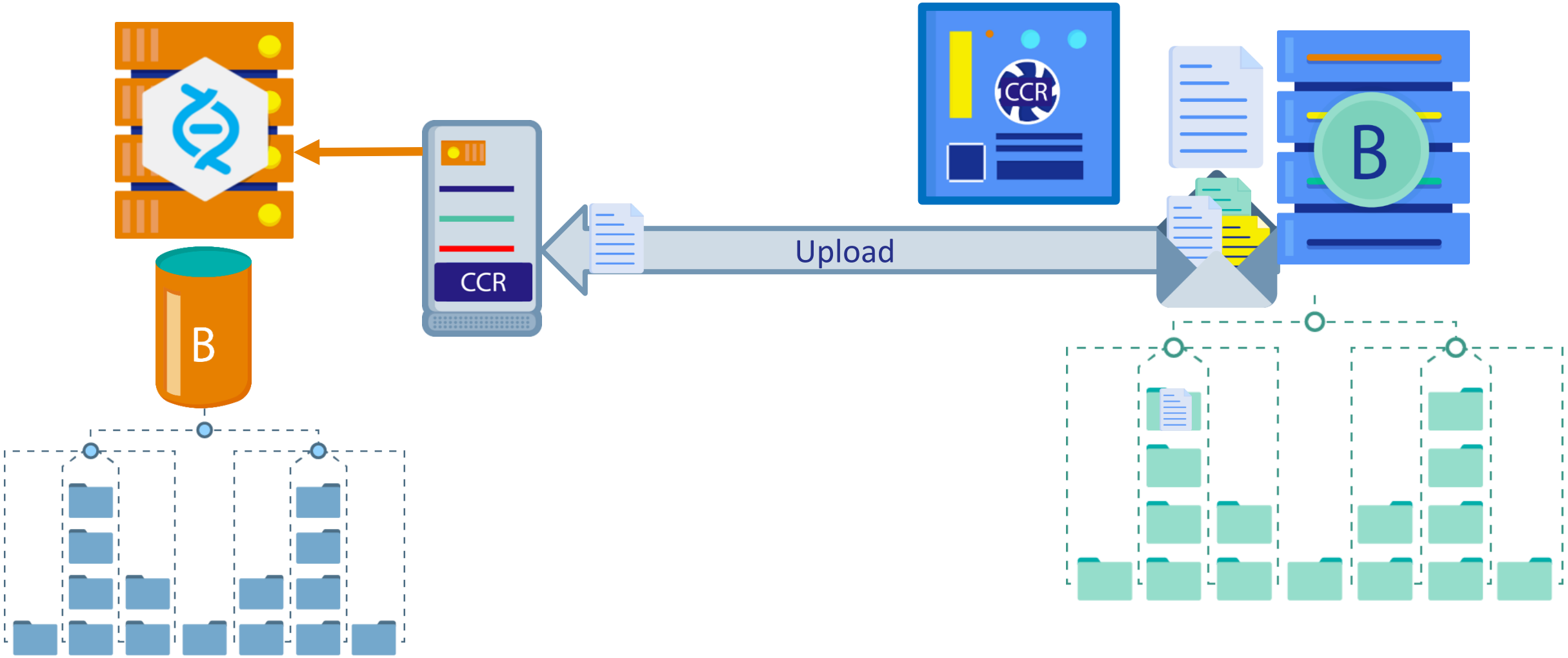


Connected vs Disconnected Mode

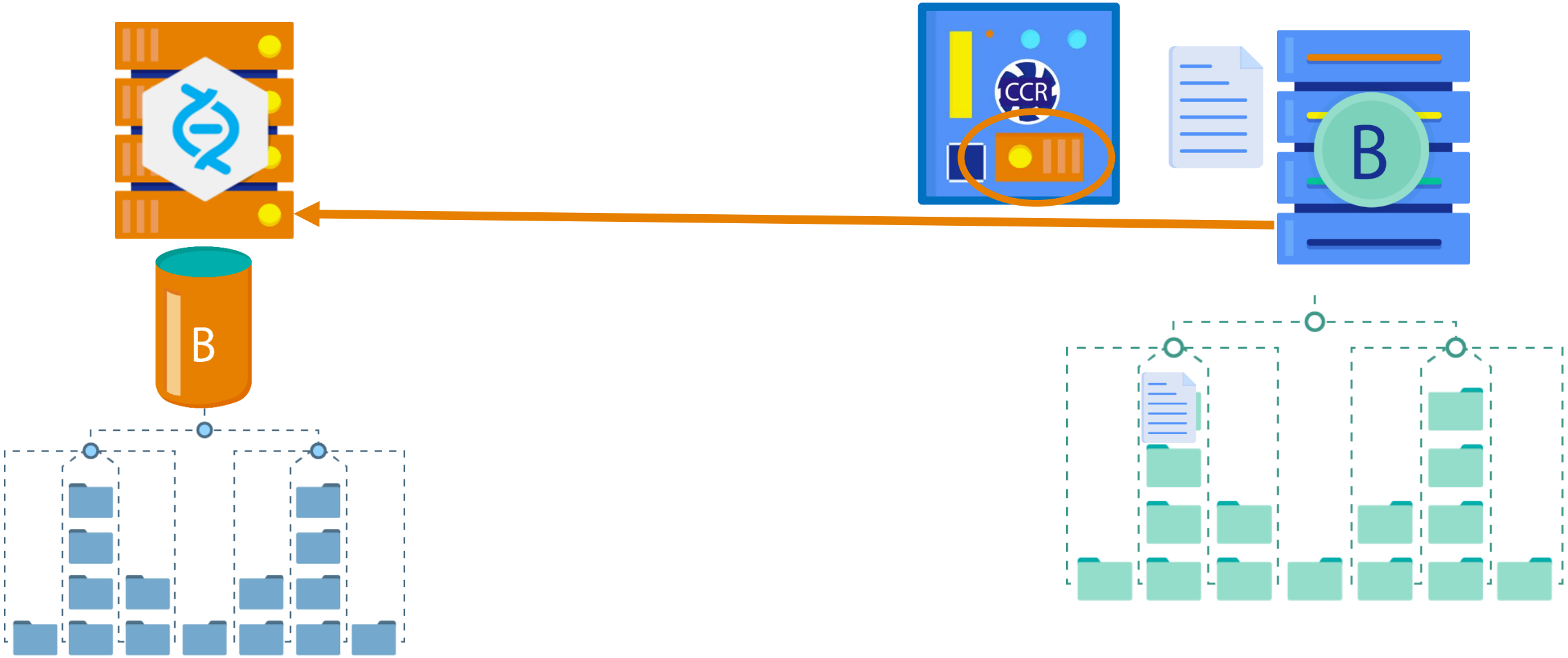
- Disconnected CCR Client.
  - BASE located outside of the InterSystems network.
  - CCR Client Tools use ItemSets to move source to/from Perforce.
  - TEST, UAT and LIVE are typically configured as Disconnected regardless of location.

- Connected CCR Client.
  - BASE located inside of the InterSystems network.
  - This allows the CCR Client Tools to communicate with the Perforce Helix Server Directly without using ItemSets.
    - Communication occurs via the p4 Client.
  - Typical configuration for InterSystems internal applications.

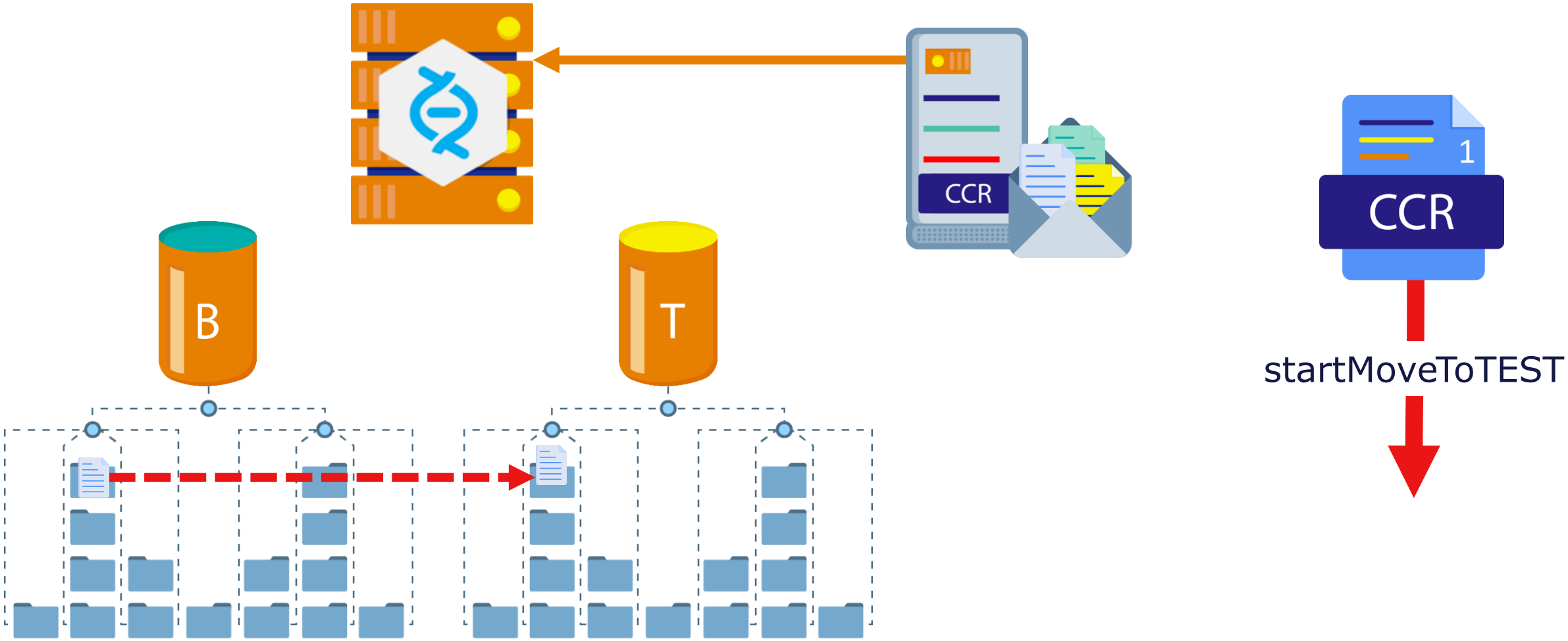
Transport Walkthrough: Sending Items from **Disconnected** BASE



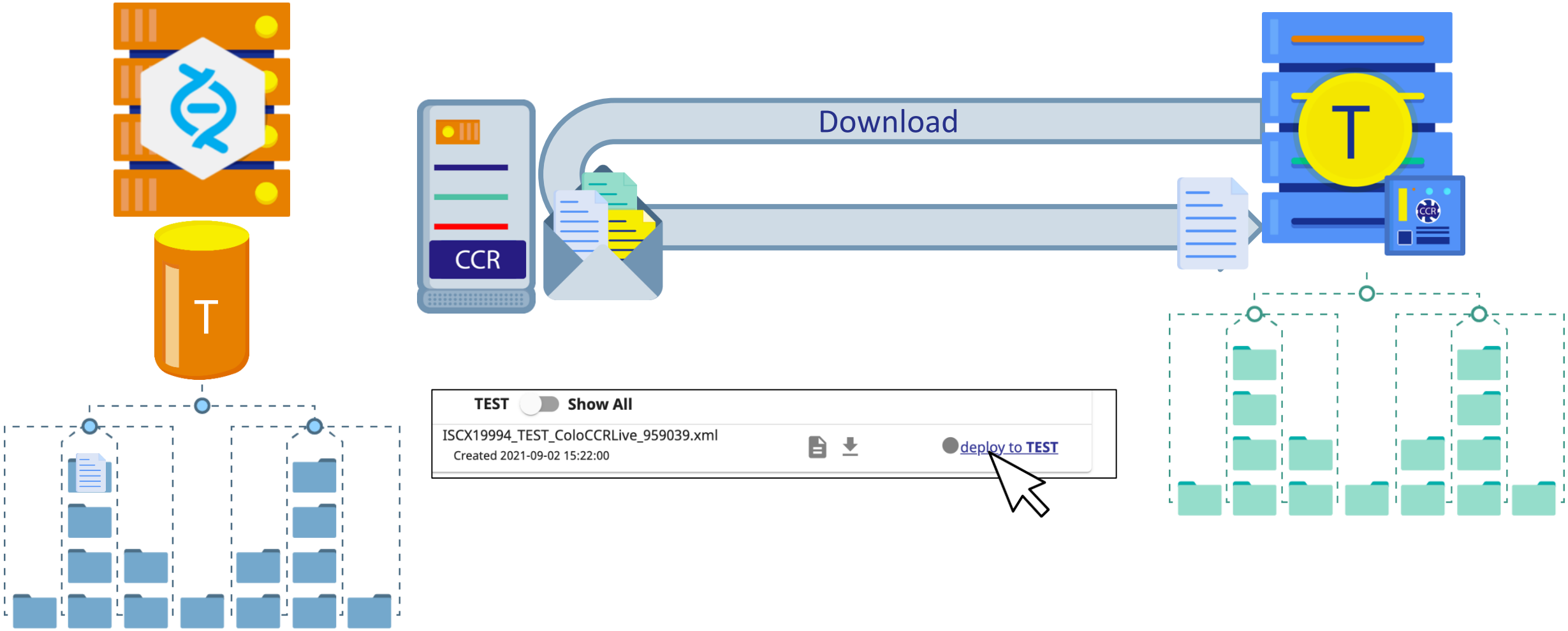
Transport Walkthrough: Sending Items from **Connected** BASE



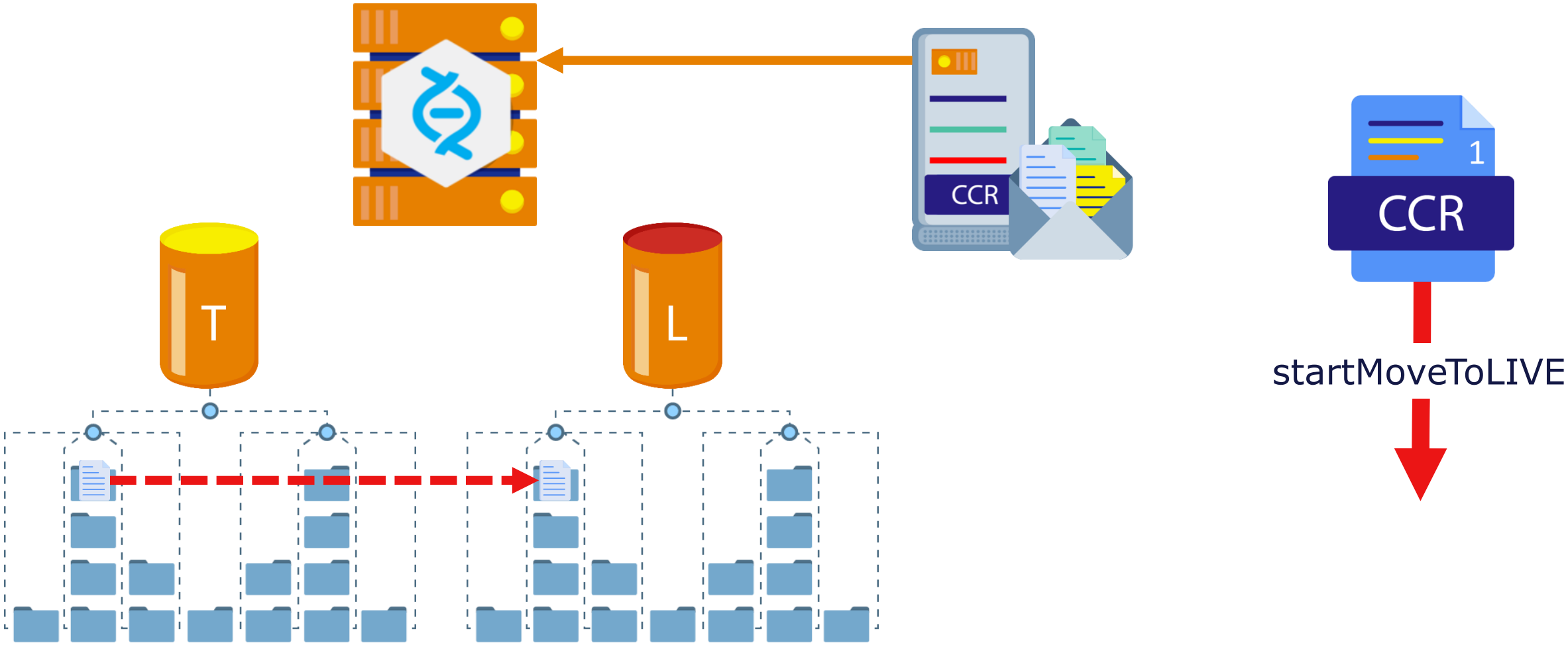
Transport Walkthrough: Integrating from BASE to TEST



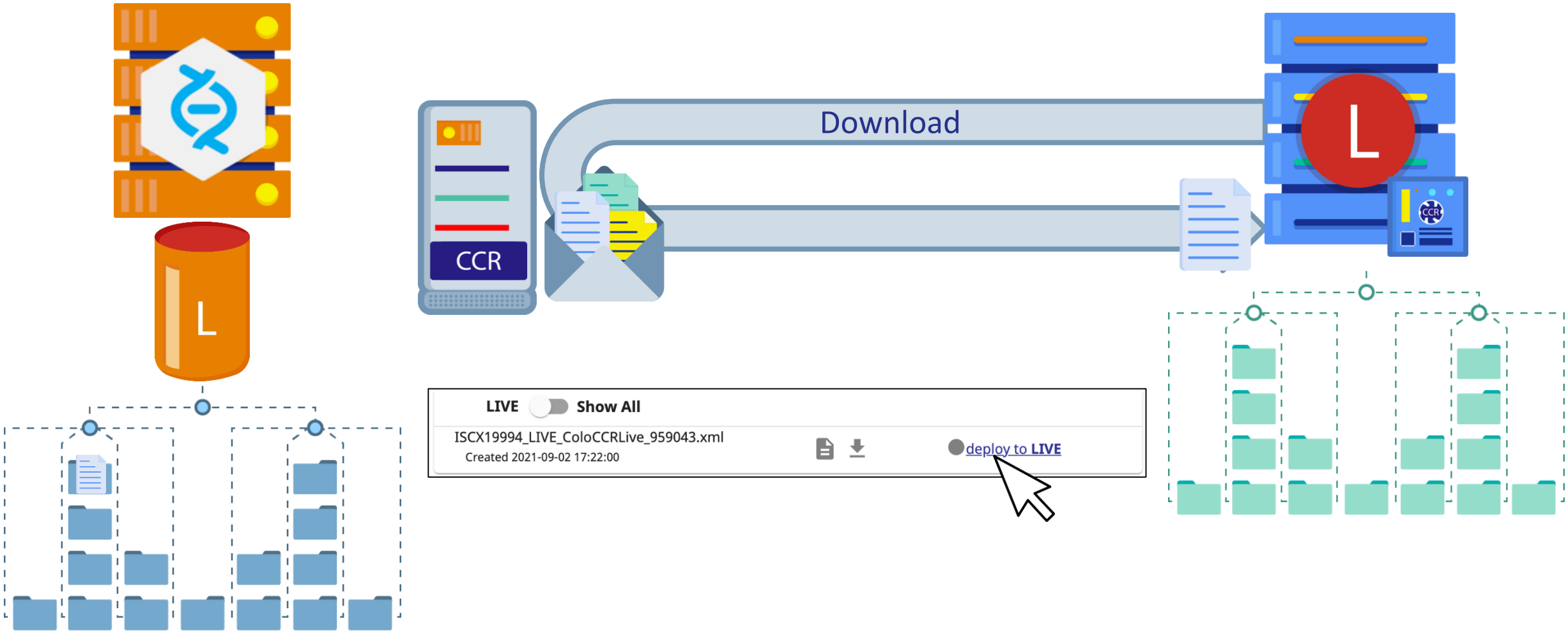
Transport Walkthrough: Sending Items To TEST



Transport Walkthrough: Integrating from TEST to LIVE

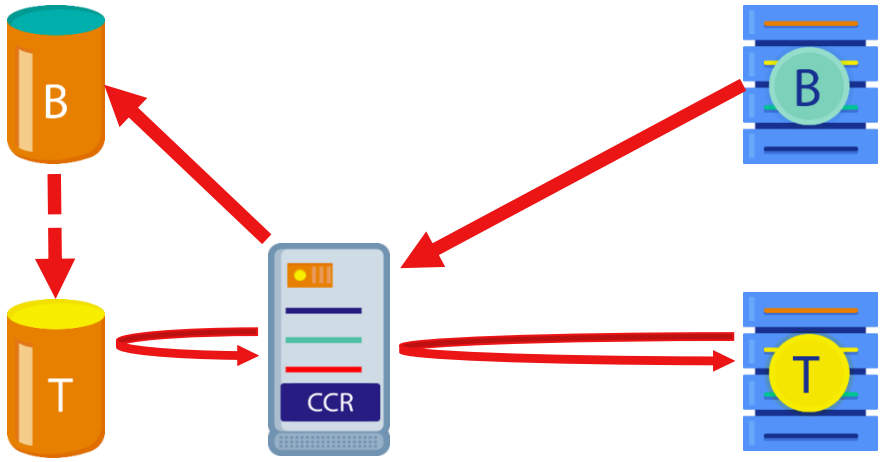


Transport Walkthrough: Sending Items To LIVE



Danger: Changes to non-BASE Environments

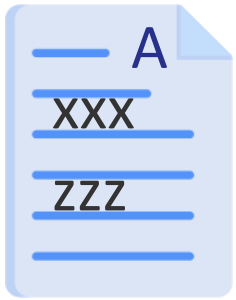
- All changes to controlled items must originate in BASE.
  - Exception: LIVE-only workflows.
- Never make changes to controlled items directly in TEST/UAT/LIVE environment.
  - Perforce must be the source of truth.
  - CCR Transport always uses complete copies of items in Perforce.
- Proper configuration locks TEST/UAT/LIVE from changes outside CCR workflow.



Always Deploy ItemSets

- Many high-risk problems can be caused by not deploying an ItemSet.
- Tier 1 CCR updates item A but does not deploy to LIVE.
- Later, another CCR also updates item A.
- Both changes now in LIVE.

Perforce LIVE branch



LIVE Environment

Quiz: Deployment

Question:

Performing the ‘startMoveToTEST’ transition on a CCR will automatically cause the item(s) to be deployed via an ItemSet to the TEST environment. True or False?

Answer:

False.

startMoveToTEST will automatically cause the changes to be *integrated* to the TEST branch, and an ItemSet to be *created*, but downloading the ItemSet is a user action.

Quiz: Deployment

Question:

When is it appropriate to NOT deploy an ItemSet?

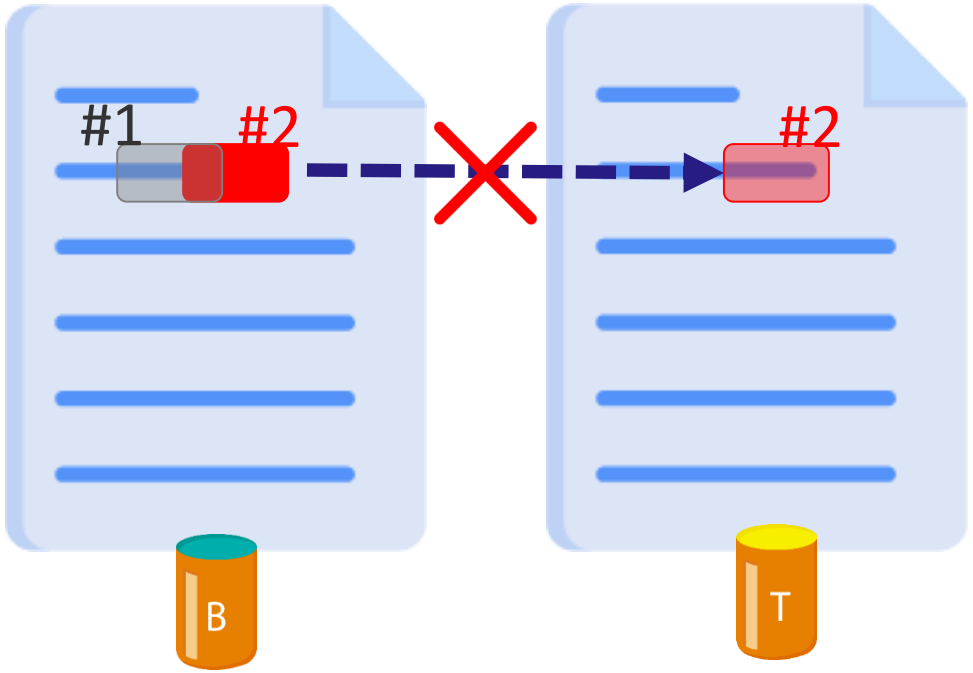
A. Never.
B. If part of the testing plan fails.
C. When backing out a change.
D. If you are not a Perforce user.
E. If there is a prerequisite CCR.

Quiz: Deployment (cont.)

Answer: A.
Always deploy an ItemSet to keep environments in sync with the state of Perforce.
B is wrong because deploy ItemSet happens before starting testing. C is wrong because backout happens in Perforce then need to deploy ItemSets to update environments. D is wrong because deploying ItemSets does not require interaction with Perforce (assuming ItemSet already generated). E is wrong because would not be able to perform authorizeAndStartMoveToXXXX transition and thus no ItemSet is created.

Merge Conflicts

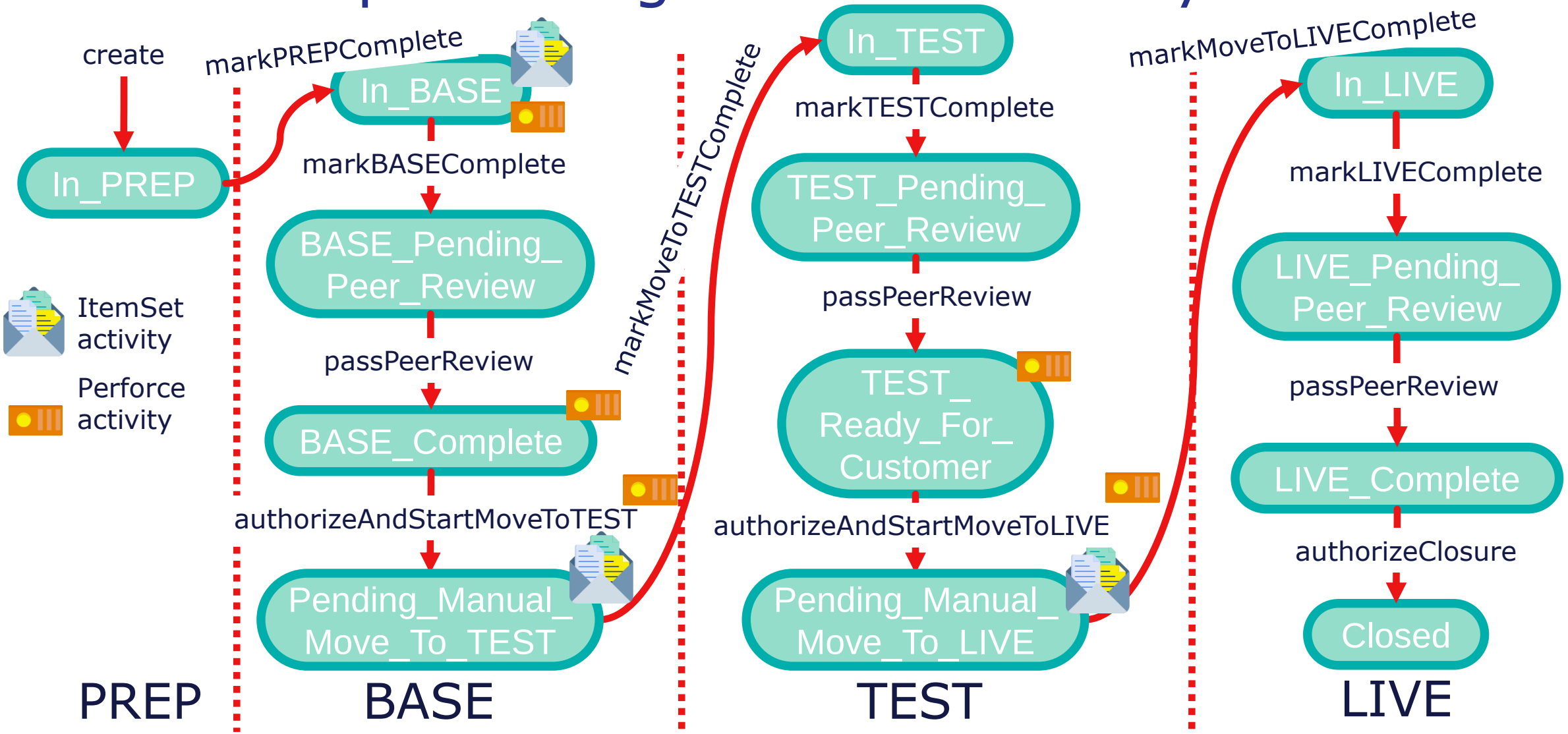
- Integration fails with merge conflict error when base for any diff chunk in source item does not exist in target environment.



Preview Integrations

- Preview integrations predict merge conflicts between Perforce branches.
- Does not commit changes to target branch.
- CCR does preview integrations between branch for current phase and branch for upcoming phase upon entering:
  - BASE_Complete.
  - TEST_Ready_For_Customer.
  - UAT_Ready_For_Customer.

CCR Transport along the CCR Journey…



CCR Transport Locations Explained

- In_BASE.
  - Initial ItemSet upload and CCR submit to Perforce.
  - No ItemSet activity in Connected BASE environments.
- BASE_Complete, TEST_Ready_For_Customer.
  - Preview integration in Perforce if user that performed passPeerReview transition logged into Perforce.
- authorizeAndStartMoveToTest, authorizeAndStartMoveToLive.
  - ItemSet created in Perforce, then manually deployed to environment.

CCR Transport Best Practices

- If you are unsure or run into an error: get assistance!
- Ensure baselining done properly when CCR first enabled.
  - Completed with help from InterSystems.
  - All existing items exported from an environment and submitted to Perforce.

CCR Transport Best Practices (cont.)

- Limit scope of individual CCRs.
- Progress CCR through workflow as quickly as safely as possible.
  - Stalled CCRs often block the work of others.
- Upload changes from BASE as soon as possible.
- Progress CCRs in order of configuration changes made.
- For cancel transition, ensure changes completely backed out and ItemSets deployed.

Improperly Cancelled CCR Causes Crises

- Only cancel CCR if change no longer needed.
  - Example: started creating configuration for new user but new user does not end up joining.
  - Cancel **never** solution for errors in change progression (such as merge conflicts).
- Always backout cancelled CCR.
  - Backed out of Perforce branch.
  - ItemSets deployed to all affected environments.

Improperly Cancelled CCR Causes Crises (cont.)

- Clean up merge conflicts.
  - Cancelling CCR with errors and recreating CCR is equivalent to leaving a crashed car on highway, getting into a new car and driving down same lane.
  - You have only made the original problem worse!

Quiz: Backing Out

Question:

Running the cancel transition is sufficient to reset everything if you ran into an issue and want to try again. True or False?

Answer:

False. Never cancel a CCR as a way of resolving an issue or to try to reset and try again. It will cause more problems and confusion.

If need to cancel, still need to complete the backout process. See ICC450 for details.

CCR Transport: The Audience

- Some of the other courses focused on CCR Transport (ICC4nn) are important prerequisites to CCR Tier 1 and CCR Tier 2 training.
- Courses dealing with direct Perforce interaction are only applicable to CCR users with access to the inside of the InterSystems network.

CCR Transport: The Audience (cont.)

- Additional CCR Transport material relates to:
  - Use of Perforce (applicable to InterSystems employees only).
  - The ins and outs of ItemSets.
  - Configuring CCR clients to send/receive changes from the CCR server.
  - Options for System Topology (number of environments, how they might share source, etc.).
  - Release management.
- While most would be helpful for anyone involved in Tier 1 or Tier 2 CCRs, some courses are for a more technical audience (e.g. Perforce and Debugging material).

Areas for Further Study for CCR Transport

- ICC410 – Perforce Basics.
- ICC420 – ItemSets.
- ICC430 – CCR Client Configuration.
- ICC440 – System Topology.
  - Environment Flow Options.
  - Secondary Environments.
  - Multi-Phase Implementation Strategy.

Areas for Further Study for CCR Transport (cont.)

- ICC450 – Backouts without using P4V and debugging.
- ICC460 – Debugging techniques for InterSystems employees and advanced Perforce concepts.
- ICC470 – Release Management.

Summary

- What are the key points for this module?