



INTERSYSTEMS LEARNING SERVICES

# InterSystems Change Control



# **InterSystems Change Control**

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# ICC 440: CCR Transport – System Topology



# Objectives

- Explain the flexibility available in configuring System flows appropriate for a particular site or implementation phase.
- Demonstrate the process by which environments and secondary environments can be added to or removed from a System workflow.
- Identify the benefits of a BASE-Only or a BASE/TEST workflow for specific phases of a project.
- Explain how linked Systems are useful for upgrades or follow-on implementation phases.



# Part 1: Changing System Workflow



# Review: Environment Workflow Options

- System workflow can be tailored to include only the Relevant environments.
- BASE-only or LIVE-only workflows are supported.
- Workflows with 2 or more environments must include BASE.
- Must update Perforce branches when changing included environments for Tier 1 and Tier 2 Systems.
  - Create new Perforce branch for new environments via integration.
    - This must be handled by an InterSystems employee.
  - Clone new environments from an existing environment.



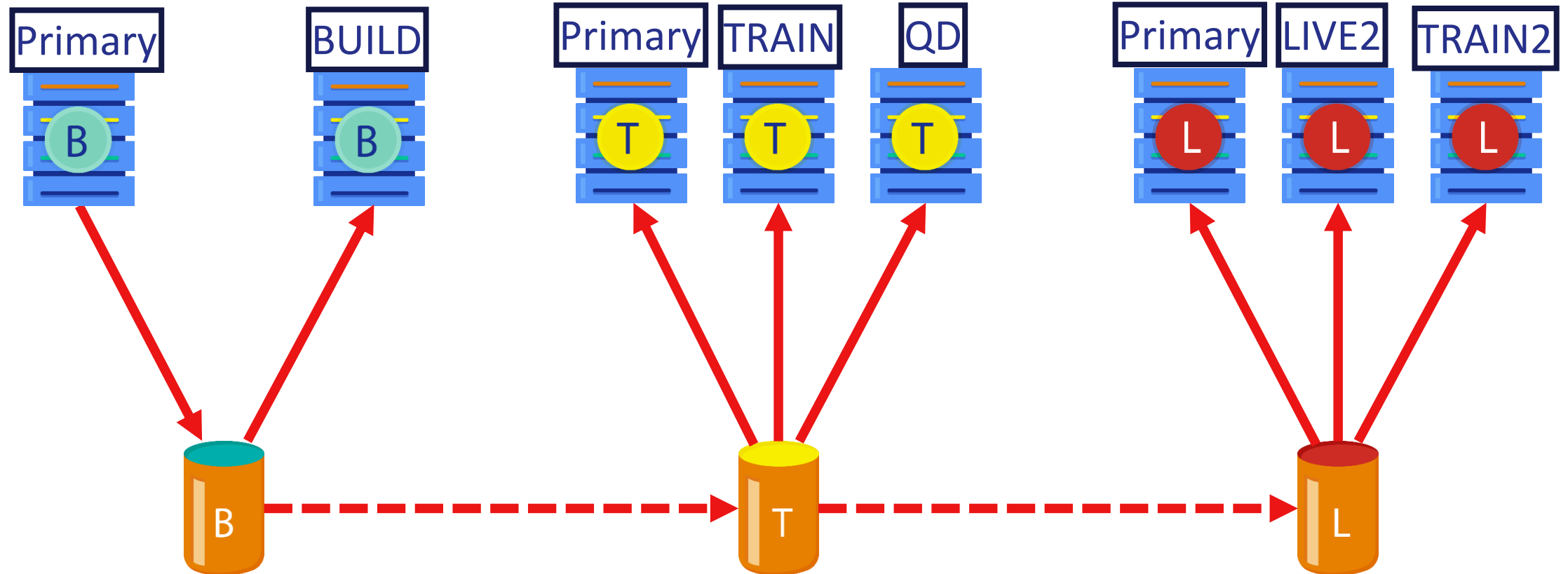
# Secondary Environments

- Additional environments to receive changes at same time as corresponding primary environment.
  - Any primary environment can have 1+ secondary environments.
- Secondary environments for BASE require deployment of ItemSet during In\_BASE state.
  - Automatically created when submit changes if require ItemSet setting true.





# Secondary Environments (cont.)



# Secondary BASE Options

- Secondary BASE environments cannot identify whether items checked out on primary.
- Secondary environments should be either:
  - Read-only.
  - Disabled for upload.
    - Can checkout items but cannot upload changes.
  - See ICC430 for how to configure.



# Secondary BASE Upload Disabled Workflow

1. Checkout item in secondary BASE to test possible change.
2. Use Undo Checkout action in secondary BASE.
  - Cannot deploy ItemSets containing items checked out in target environment.
3. Make and upload change in primary BASE.
4. Deploy ItemSet to all BASE environments.
5. Test in other BASE environments.
6. Progress CCR normally.



# Deploying to Secondary Environments

1. Make sure popups allowed by browser.
2. Log into Management Portal of all environments.
3. Click [Deploy to All Rqd] ItemSet deployment link.
  - New browser tab for primary environment and each secondary.
  - All tabs automatically close if deployment successful.
  - If not logged into environment, tab stays open with login page.
  - Error in deployment causes tab to remain open and turn red.



# Secondary Environment Require ItemSet

- Be very careful if Require ItemSet system configuration setting cleared.



# Secondary Environment Require ItemSet (cont.)

- Example of what could go wrong with Require ItemSet false (cleared):
  - Tier 1 CCR changes 1 line of code.
    - User accidentally does not deploy class to secondary environment because Require ItemSets is false.
  - Later, Tier 1 CCR changes a different line of code, unrelated.
    - Unknowingly deploys both changed lines to secondary environment.

Primary environment



Secondary environment



# Secondary Environment Require ItemSet (cont.)

- Example of what could go wrong with Require ItemSet false (cleared):
  - Tier 1 CCR adds class definition B and edits preexisting class A to be dependent on B.
  - User accidentally does not deploy class to secondary environment because Require ItemSets is false.



# Secondary Environment Require ItemSet (cont.)

- Example of what could go wrong with Require ItemSet false (cleared):
  - Later, Tier 1 CCR edits class definition A (unrelated to previous change).
    - Can't deploy this change to secondary environment because class A still dependent on class B.

Secondary environment





# TRAIN Environments

- Often a project will require a TRAIN environment dedicated for End User Training.
  - This is separate from TEST to avoid collisions between testers and trainers.
  - Normally it is desirable for the configuration on TRAIN to mirror that of TEST.
- Option 1: Periodically refresh TRAIN from TEST (or LIVE).
  - Pros: Precise control over TRAIN contents and timing of updates.
  - Cons: Time intensive and long delay before new configuration available for training; requires Tech resource for refresh.



# TRAIN Environments (cont.)

- Option 2: Configure TRAIN as a secondary environment for TEST.
  - Pros: TRAIN always up to date (ItemSets pushed to TRAIN and TEST simultaneously); does not require Tech resource.
  - Cons: Manual changes must be done in TEST and TRAIN; Configuration not ready for training use will be in TRAIN.



# Quiz: Changing System Workflow

## Question:

A system can be configured to only use TEST and LIVE environments. True or False?

Answer: False.

Any system with 2 or more environments must include BASE.



# Part 2: Selecting a BASE Topology



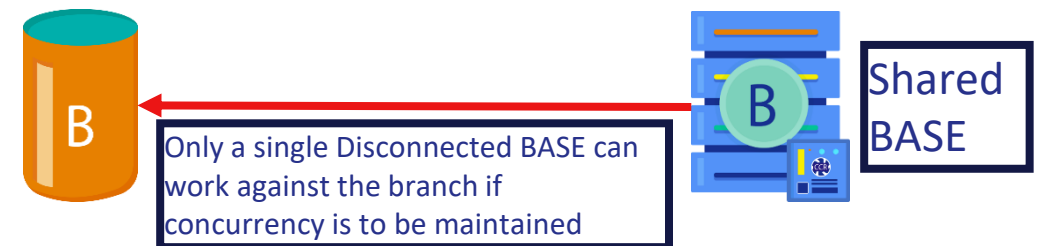
# Supported Strategies for BASE

- Concurrency of source must always be considered.
- Concurrency differs whether working in Disconnected or Connected mode.



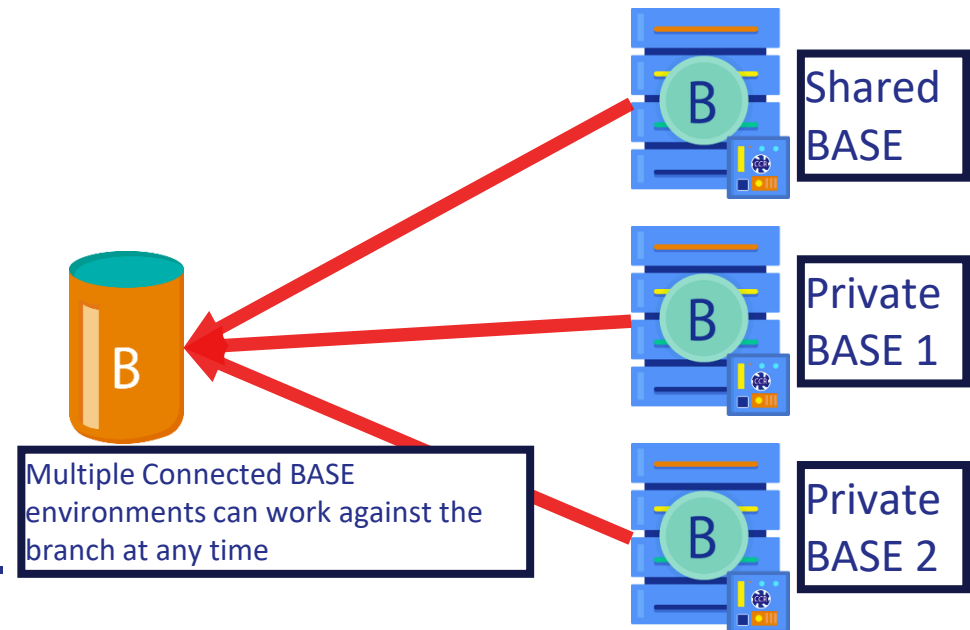
# Supported Strategies for BASE (cont.)

- **Disconnected** clients manage concurrency locally via CCR Client Tools.
  - Check-out is recorded as item being Read/Write, and owner recorded in %Studio\_SourceControl.Change.
  - Only **one** Disconnected BASE can be used to submit changes against the branch.
  - No way to control concurrency between multiple instances.
  - If require multiple BASE environments for functional testing (e.g., several HS Edge servers):
    - Designate one as Master for all editing.
    - Lock others to only accept changes via BASE ItemSets.



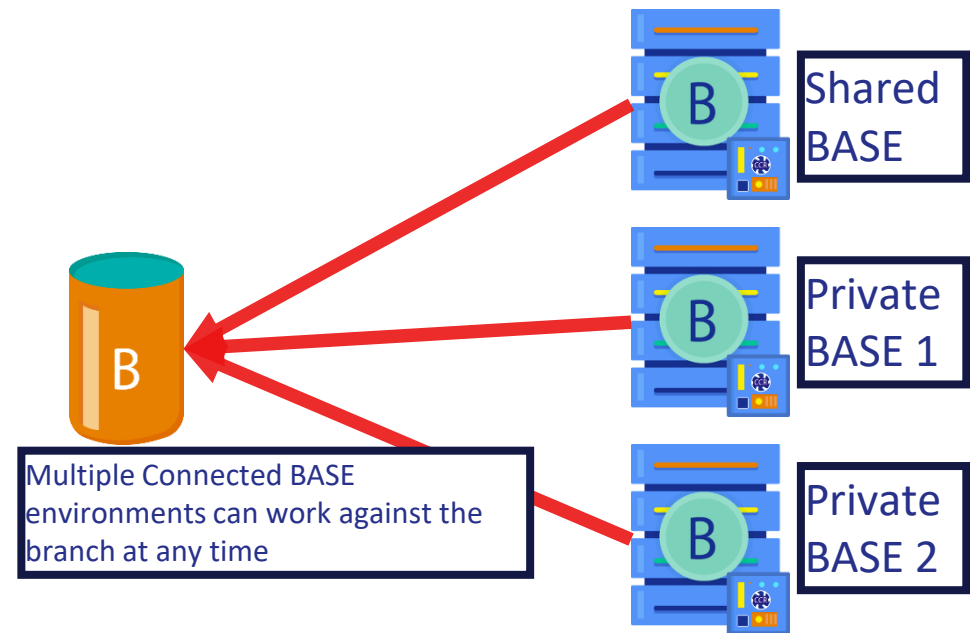
# Connected Clients for BASE

- Perforce server manages concurrency.
  - Perforce tracks what version has been checked out by whom.
  - Requires merging before check-in if a newer version submitted by another user.
- Any combination of the following is supported:
  - Shared BASE used by multiple developers.
    - Only one user can check out a file on shared BASE at a time.
    - That file can be checked out by other Connected BASEs.
  - Private BASE used by a single developer.



# Connected Clients for BASE (cont.)

- If multiple Connected BASE environments, ensure all BASEs receive all changes.
  - Scripted CCR Refresh can be used, or...
  - ItemSet deployment to all BASE environments.





# Quiz: Selecting a BASE Topology

## Question:

To protect data integrity in Connected mode, you should only have 1 shared BASE environment. True or False?

Answer: False.

In Connected mode you can safely have more than 1 BASE environment because the Perforce server can maintain concurrency.

In Disconnected mode, you should only have 1 shared BASE environment.

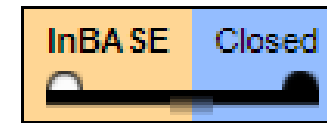


# Part 3: Implementation-Specific Workflows



# BASE-Only Workflows

- Early in implementation projects, only use BASE environment.
  - No need to “promote” changes to a LIVE environment.
- Allows use of:
  - CCR to document changes.
  - Perforce for roll-back or recovery.
  - An abbreviated workflow to speed up the CCR lifecycle and cut down on paperwork.
    - Can be as short as only the In\_BASE state (after which the CCR is Closed).
    - If peer review is turned on, then the BASE-Only CCRs would pass through BASE\_Pending\_Peer\_Review prior to Closed.



# BASE-Only Workflows (cont.)

- Configure by only selecting "BASE" under "Advanced Controls" on System Details page.
- Add environments (e.g., TEST) to workflow as the project progresses.

Workflow Flags:

[\[hide Advanced controls\]](#)

Bypass Peer Reviews:

Peer Review BASE Only:

**BASE:**

TEST:

UAT:

LIVE:

System is Deprecated:



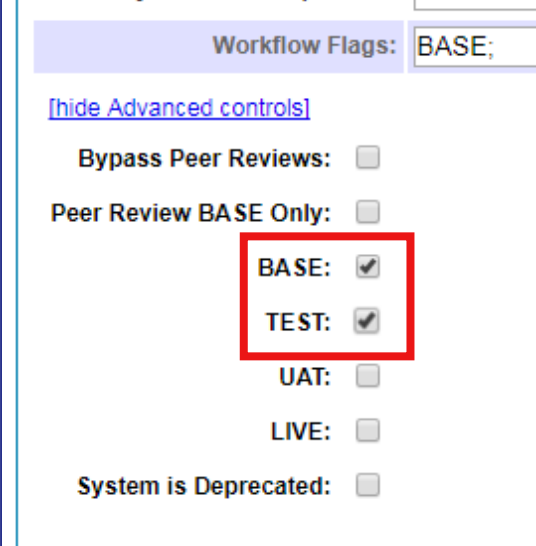
# BASE/TEST Workflows

- Add TEST environment prior to project entering Validation.
  - Clone BASE environment and Perforce branch.
- Promotion of changes via CCR Transport must be exercised during validation activities.
  - After a CCR moved to TEST\_Complete, the last transition is "authorizeClosure."



# BASE/TEST Workflows (cont.)

- Configured by selecting the “BASE” and “TEST” under “Advanced Controls” on System Details page.
- Add LIVE to workflow towards end of project:
  1. First, ensure that any CCRs in the TEST phase are closed out.
  2. Move the source and configuration from TEST to LIVE.
  3. Integrate the TEST branch in Perforce to a new LIVE branch.
  4. Enable the “LIVE” environment in the CCR workflow.



The screenshot shows the 'Workflow Flags' section of a system configuration page. At the top, a purple header contains the text 'Workflow Flags: BASE;'. Below this is a link '[hide Advanced controls]'. The configuration options are as follows:

- Bypass Peer Reviews:
- Peer Review BASE Only:
- BASE:  (highlighted with a red box)
- TEST:  (highlighted with a red box)
- UAT:
- LIVE:
- System is Deprecated:



# CCR for Multi-Phase Implementations

- Multi-phase implementations need to allow next phase configuration changes separately from required Business As Usual (BAU) changes.
- Next phase work should be done in its own system to reduce collisions.
  - Clone the current (BAU) system.



# CCR for Multi-Phase Implementations (cont.)

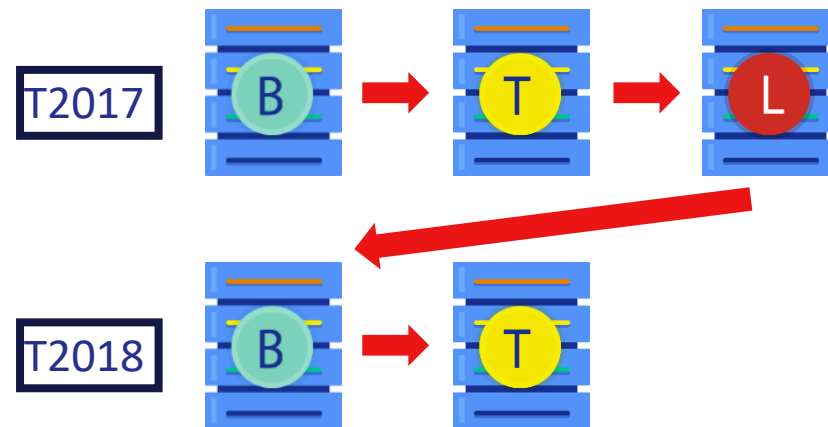
- Commonly used for upgrades by InterSystems Support.
  - E.g. T2015 System handles BAU changes while T2017 System used to validate and make changes to the upgraded version.
    - BAU CCRs in T2015 are cloned T2015/LIVE > T2017/BASE so they are present in T2017 for go-live.
- Phased Projects can use the same approach.
  - E.g. if phase 1 was T2017, then phase 2 can be a System cloned from T2017 called 'T2018.'
    - BAU changes are on T2017 and are cloned to T2018, while phase 2 changes only touch T2018.
    - If phase 2 were to be planned for the same version then 'T2017P2' could be used as a name.





# CCR for Multi-Phase Implementations (cont.)

- Example change flow for an upgrade or phase through linked Systems:



# CCR for Multi-Phase Implementations (cont.)

- T2018/BASE is made from cloning the T2017/BASE environment, and populating Perforce branch from T2017/LIVE.
  - This allows CCRs to be cloned from T2017/LIVE to T2018/BASE with automated integration.
- If upgrading T2017/LIVE at cut-over time, T2018 can be BASE-Only or BASE/TEST.
  - If configuration will be moved at cut-over then T2018/LIVE should be part of workflow as well.



# Quiz: Implementation-Specific Workflows

## Question:

Select all that apply. A BASE only workflow with peer review should be used...

- A. Early in the project when there are no live users.
- B. Early in the project to document changes for future uses.
- C. When a change needs to be expedited to a LIVE system.
- D. When no documentation is needed



# Quiz: Implementation-Specific Workflows (cont.)

Answer:

- A. Early in the project when there are no live users.
- B. Early in the project to document changes for future uses.

BASE-only workflow is not a feature used to bypass the current workflow in a BASE-TEST-LIVE system.

BASE-only workflows still use CCRs to document changes!



# Quiz: Implementation-Specific Workflows

Question:

Use secondary environments for multi-phase projects.

True or False?

Answer: False.

Secondary environments contain the same code as their primary environments and only receive code pushed to the primary.

Multi-phased projects can clone a 2nd System from the BAU System in order to keep the new phase isolated.



# Summary

- What are they key points for this module?

