



INTERSYSTEMS LEARNING SERVICES

InterSystems Change Control



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ICC 430: CCR Transport – Client Configuration



Objectives

- Understand how to respond to prompts from Configure^%buildccr.
- Maintain CCR Client Tools.
- Map Configuration globals.
- User permission requirements.
- Secondary BASE environments.
- ECP configuration.



Part 1: Introduction to CCR Client Configuration

Updates to CCR

- 2 different code bases.
 - Centralized CCR application.
 - CCR client tool code in each environment.
- Updates to centralized CCR application instantly available.
 - Anything in CCR UI.
- Client tool updates implemented with Tier 1 CCR.
 - Updates may include:
 - Bug fixes.
 - New features in client-side UI such as bundle and upload process.



CCR Client Tools

- Stored in IRISLIB or CACHELIB database of all products.
 - Shared among all namespaces (environments) in installation.
- Set of classes and routines.
 - %Studio.SourceControl package.
- ^%buildccr.
 - Primary configuration routine.
- Provides GUI and APIs for communicating with CCR.
- Can update without upgrading product version.



Maintaining CCR Client Tools

- Always update CCR Client Tools through same System.
 - Maintains accurate version history in Perforce.
 - After configuring, progress Client Tool update CCR to baseline tools and receive any recent updates.
 - Configure system for %SYS namespace or HSCUSTOM namespace.
 - Also use for instance wide changes such as memory allocations.
- Check version using `do Version^%buildccr.`
- Reload tools after in-place upgrade.
 - Upgrade introduced outdated client tools because IRISLIB/CACHELIB replaced.
 - `Do ReloadTools^%buildccr.`



How To: Update CCR Client Tools

1. Go to appropriate System Details page.
2. Click Update Client Tools button.
 - Can only be actioned by Perforce users.
 - Integrates current client tools to BASE branch of System.
 - Creates a CCR in In_BASE state with:
 - Prefilled documentation for process.
 - Changelist from integration attached.
 - ItemSet ready for deployment to BASE.



How To: Update CCR Client Tools (cont.)

3. Progress generated CCR through normal workflow.

- Execute prefilled implementation plan and testing plan in all environments at appropriate times in workflow.
- Document and perform peer reviews as with any other Tier 1 CCR.



Quiz: Updating CCR Client Tools

Question:

Which of the following is true about updating CCR Client Tools via the System Details page? Select all that apply.

- A. Automatically creates a CCR which documents how to update the client tools.
- B. Will integrate the head revision of these files into the LIVE branch for that System.
- C. Can only be actioned by a Perforce user.
- D. Requires a Perforce user to be logged in.



Quiz: Updating CCR Client Tools (cont.)

Answer:

- A. Automatically creates a CCR which documents how to update the client tools.
- C. Can only be actioned by a Perforce user.
- D. Requires a Perforce user to be logged in.

It will integrate the head revision of these files into the BASE branch for that System, therefore B is incorrect.



CCR Client Configuration

- Each environment in Tier 1 or 2 system requires configuration.
- Configure as connected or disconnected.
- Accurate configuration critical to ensure:
 - Correct procedure enforcement.
 - Appropriate use of Perforce structures.
 - Proper behaviour of CCR Transport.



CCR Client Configuration (cont.)

- CCR client configuration steps:
 - Create a CCR to document responses to configuration prompts.
 - Run `Configure^%buildccr` routine in BASE.
 - Progress CCR record and run `Configure^%buildccr` in for each environment in each phase.



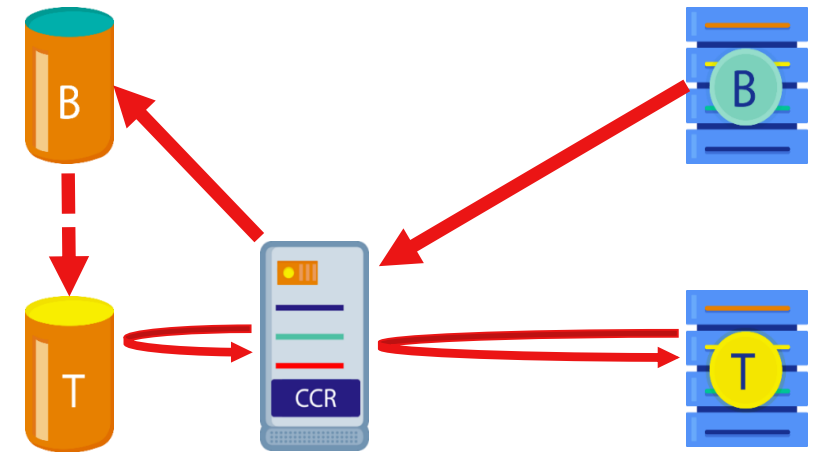
Review: Connected vs. Disconnected

- Clients can be configured as connected or disconnected.
- Connected environment.
 - Communicates directly with the InterSystems Perforce server.
 - Must be within the InterSystems firewall.
 - Uses the p4 client to issue commands to Perforce.
- A Disconnected environment.
 - No direct access to Perforce.
 - Uses CCR server as a proxy to submit changes to Perforce.
 - Uses ItemSets for moving items to and from CCR server.
 - Can be within or outside the InterSystems network.
 - All customer environments.



Review: Changes in non-BASE

- 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.



Connected vs Disconnected

- Connected BASE when possible.
 - Better diffing tools.
 - Possible for each developer to have their own BASE.
 - See ICC440 for BASE development options.
- TEST, UAT, LIVE disconnected.
 - No good reason to be connected and easy to deploy ItemSets.



Quiz: CCR Client Configuration

Question:

It is recommended that LIVE environments are configured as 'Connected'. True or False?

Answer:

False.

All changes will be moved to LIVE environments via ItemSets even if they are on the InterSystems network.



Quiz: CCR Client Configuration

Question:

Locked LIVE environments must be unlocked to deploy ItemSets. True or False?

Answer:

False.



Part 2: Creating a CCR To Configure the Client



Creating the CCR Record

- Create organization and System in CCR.
 - See ICC320.
- Create Tier 0 CCR.
- Suggested documentation:
 - Title: Configuration of CCR Client Tools.
 - Description: Initial configuration of CCR Client Tools for environments in this System.
 - Type-SubType: Application Customization - <Product>.
 - CCR Tier: 0 - Documentation Only.



Creating the CCR Record (cont.)

- Suggested documentation:
 - Modified Items: source control and CCR Client Settings for <namespace>.
 - Impacted Areas: behavior of Studio, Atelier, and Management Portal source control hooks.



CCR Documentation: In_BASE

- Implementation plan.
 - < Specify responses to Configure^%buildccr >.
- Backout plan.
 - If part way through running routine, interrupt routine.
- Testing plan.
 1. Capture output of Summary^%buildccr.
 2. Test download/upload of ItemSets by progressing a Client Tool Update.



Part 3: Configuring CCR Client Tools



Configuring CCR Client Tools

1. Open Terminal session on target instance.
2. Switch to namespace to be configured.
3. Enter `do Configure^%buildccr`.



Configure ^%buildccr prompts

- **Perforce Root.**
 - Location on file system where source workspace structures will be built.
 - Example: C:\Source.
- **Perforce Branch.**
 - Copy paste from Perforce Details pane of CCR documenting configuration process.
 - Example: //custom_ccrs/us/ISCU/TESTSYS/.
- **CCR environment.**
 - Type character corresponding to environment type:
 - **B** for BASE / **T** for TEST / **U** for UAT / **L** for LIVE.



Configure ^%buildccr prompts (cont.)

```
Setting up global ^Sources ...  
Please enter the following:  
Perforce Root: [C:\Perforce\  
Perforce Branch (as specified in the CCR Record or System definition): [//custom  
_ccrs/us/ISCX/TESTSYS/] //custom_ccrs/us/ISCX/TESTSYS/  
CCR Environment - (B)ASE/(T)EST/(U)AT/(L)IVE: [B] B
```



Prompts for Non-BASE Environments

- Lock environment.
 - Disables check out and add to source control functionality to prevent editing any item in source control.
 - **Always respond yes.**
- If respond yes to lock, prompts whether to Admin Lock.
 - Admin lock removes information in UI on how to unlock environment.
 - Most users should not even know how to unlock environment.
 - Unlocking environment causes missing changes because Perforce no longer source of truth.
 - Best practice: yes.



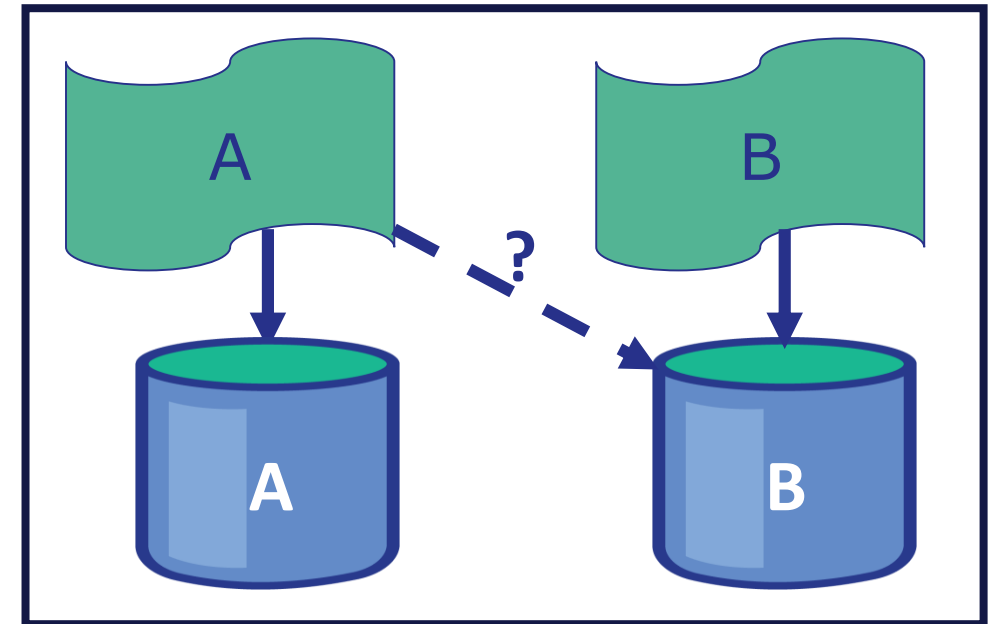
Configure ^%buildccr Prompts (cont.)

- Add or Change any CSP mappings.
 - Usually respond no.
- Automatically tag with Perforce version.
 - Adds SrcVer parameter when saving class definition if it does not exist.
 - Indicates branch and revision of class retrieved from Perforce.
 - Best Practice: yes.



Configure ^%buildccr Prompts (cont.)

- Ensure mapped items cannot be changed in other namespaces.
 - Concurrency control risks.
- Treat items mapped from other databases as read-only in Studio.
 - Also applies to Management Portal pages with hooks.
 - Yes = can only edit items in default database(s) of namespace.
 - Best practice:
 - Tier 1 = yes.
 - Tier 2 = probably no.
- Use separate Systems for namespace A and B.



Configure ^%buildccr Prompts (cont.)

- Keep history of changes.
 - Determines whether to maintain or delete metadata for changes.
 - Username, time stamp, filename, and more.
 - Metadata stored in %Studio_SourceControl.Change table.
 - Does not maintain copies of changes items or what was changed; only metadata.
 - Yes = set committed field for that change to true, with timestamp.
 - No = committed changes deleted from change table.
 - Best practice: yes because can be useful in debugging.
 - Consider setting up task to purge %Studio_SourceControl.Change table.



Configure ^%buildccr prompts (cont.)

- Will this namespace ever communicate directly with the ISC Perforce server?
 - (Y)es if want connected mode.
 - (N)o if want disconnected mode.
 - Remember:
 - All customers work with disconnected.
 - Almost all non-BASE environments are disconnected.



Prompts for Connected Mode: Initialize Perforce Credentials

- Would you like to do this now?
 - Yes.
- Will more than one person be developing in this instance?
- Please enter the following:
 - Perforce Username?
 - Perforce Password?
- Perforce workspace?
 - Must first create workspace using p4v.



Prompts for Connected Mode: Initialize Perforce Credentials (cont.)

- Do you want to use a Perforce Alt Directory?
- Always sync the head revision of a file prior to check-out?
 - In other words: always edit latest revision (as opposed to revision currently in environment).
 - Best practice: yes.



Configure ^%buildccr prompts (cont.)

- Will you be importing/exporting ItemSets from this namespace?
 - Always respond Yes.
 - Creates /itemsetsourcelink CSP Application for use in CCR Transport if it does not exist.
 - Creates (if necessary) and initializes ItemSetClient SSL configuration.
- Configuration summary displayed.
 - Copy-paste to Testing Steps Taken in XXX field.



Result of Configure^%buildccr

- Environment configured to use CCR.
- Within Studio, when create new item, will be prompted to add to source control.
- After baselining, existing items must be checked out in BASE for editing.
- In non-BASE environments, only able to edit items in source control through CCR process.
- Studio will automatically import and export items added to source control in the proper format and into the proper directory structure.



Quiz: Configure^%buildccr

Question:

Which of the following is a prompt when configuring client tools for BASE? Select all that apply.

- A. Whether the instance will communicate directly with Perforce.
 - B. The location on the file system where the workspace structures will be built.
 - C. Whether classes will be automatically tagged with Perforce version.
 - D. Whether to keep a history of changes.
 - E. Whether to treat items mapped from other databases as read-only in Studio.
-



Quiz: Configure^%buildccr

Answer:

All of the above.



Part 4: Progressing the Client Configuration CCR



Progressing the CCR Record

- Progress CCR to next phase and run `Configure^%buildccr` for all environments in each phase.
- At any time, the following command will show the current CCR configuration information for a particular namespace:
 - `do Summary^%buildccr.`



Summary^%buildccr

- Environment Details: "Org", "System", "Environment."
- Studio Source Control Class: Version #, SrcVer Auto-insert, Mapped Item Lock.
- Studio Source Control UI: Version # and \$Id.
- Change Class: Version#, \$Id, Maintain History.
- ItemSet Class: Version#, \$Id.
- ItemSetSourceLink (for Export/Import of ItemSets): CSP Application Name and Path.
- ItemSet WebService Class: Version #, \$Id.
- ItemSet SSL Configuration.



Summary^%buildccr (cont.)

- Perforce Details:
 - Perforce Root: e.g. C:\Perforce\.
 - Current Perforce Branch: e.g. C:\Perforce\custom_ccrs\us\ISCX\TESTSYS\BASE\.
 - CSP Application Mappings for Perforce.
 - Perforce Connectivity State.
 - Development mode: e.g. Single-User.



Summary^%buildccr (cont.)

- Perforce Details:
 - Credentials:
 - Perforce Username.
 - Perforce Password.
 - Perforce Workspace.
 - Perforce Directory.
 - Perforce AutoSync: e.g. Enabled.



Part 5: Other ^%buildccr options



Other ^%buildccr options

3. do Download^%buildccr - Download an ItemSet from CCR Server.
4. do Load^%buildccr - Load ItemSet contents into environment.
5. do Bundle^%buildccr - Bundle uncommitted changes into an ItemSet.
6. do Upload^%buildccr - Upload a created ItemSet to CCR Server.



Other ^%buildccr options

- 7. `do DisplayUncommitted^%buildccr` - Display list of local uncommitted changes.
- 8. `do ItemSetLog^%buildccr` - find and display the log for an ItemSet.
- 9. `do Version^%buildccr` - report version of CCR client classes.
- 10. `do Refresh^%buildccr` - refreshes namespace from sources on disk.
- 11. `do ReloadTools^%buildccr` - reloads CCR Client Tools from local disk.



Part 6: Additional Client Configuration Considerations



Unix® and Linux Source Workspace Ownership

- Files and folders must be owned by user running Management Portal and Studio processes.
 - Usually irisusr or cacheusr.



Minimum User Permissions for CCR Transport

- SQL Select on %Studio_SourceControl.Change table.
 - BASE only.
- Read on %DB_IRISLIB or %DB_CACHELIB.
- Read on %DB_IRISSYS or %DB_CACHESYS.
- Read/Write on resource protecting default database(s) for namespace.



Minimum User Permissions for CCR Transport (cont.)

- Appropriate privileges for making the change.
 - For example, use on %Development resource required to make changes in Studio.
- Create role for privileges specific to using CCR Transport to ensure anyone using CCR has appropriate privileges.



Secondary BASE Environments

- Cannot have multiple disconnected BASE environments able to submit changes to Perforce.
 - User A checks out item X from BASE1.
 - User B checks out item X from BASE2.
 - No concurrency control across environments, therefore checkout successful.
 - User A bundles and uploads their version of item X.
 - User B bundles and uploads their version of item X.
 - Item does not contain user A's changes.
 - Current revision of item no longer contains user A's changes.



Secondary BASE Environments (cont.)

- To lock secondary BASE environments:

```
do ##class(%Studio.SourceControl.ISC).Lock(1) .
```

- Argument of 1 admin locks.



Secondary BASE Environments (cont.)

- If want to be able to make changes in secondary BASE environments for testing,

set

```
^SYS("SourceControl","ItemSetConfig","NoUpload")=1.
```

- In this case, do not lock environment.
- NoUpload flag disables uploading changes to CCR.
- Does not mean want secondary environments always different.
 - Only for testing before developing change in primary BASE environment.
 - Always use undo checkout to revert changes.
- When an item is checked out, cannot deploy ItemSets containing that item to that environment.



Mapping out Configuration Globals

- CCR client configuration globals control behaviour for namespace.
- Some sites prefer to have configuration globals in separate database.
 - Facilitates data refresh on testing environments.



Mapping out Configuration Globals (cont.)

- Globals to map:
 - ^Sources.
 - ^SYS("SourceControl").
 - ^SYS("SourceControlClass").
 - ^SYS("ChangeControlClass").
 - TrakCare environments only.
- ^%SYS("SourceControl") also used but do not map.



Mapping out Logging and History Globals

- Logs and change history should not be mapped.
 - Do not want to maintain during refresh.
 - Should be carried over from source of refresh.
- Logging and history globals include:
 - ^Studio.SourceControl.Change*.
 - ^Studio.SourceControl.ItemSet*.



Part 7: Configuring CCR for ECP Deployments



Complexity of CCR for ECP Deployments

- 2 ways each node must be able to communicate:
 - CCR client configuration, Logging and Storage globals.
 - Concurrency control.
 - Source workspace in file system of 1 node.
- When items are checked out:
 - Checkout information is stored in the %Studio.SourceControl.Change table.
 - Exported files (stored in Perforce workspace) are changed between read-only and read/write.

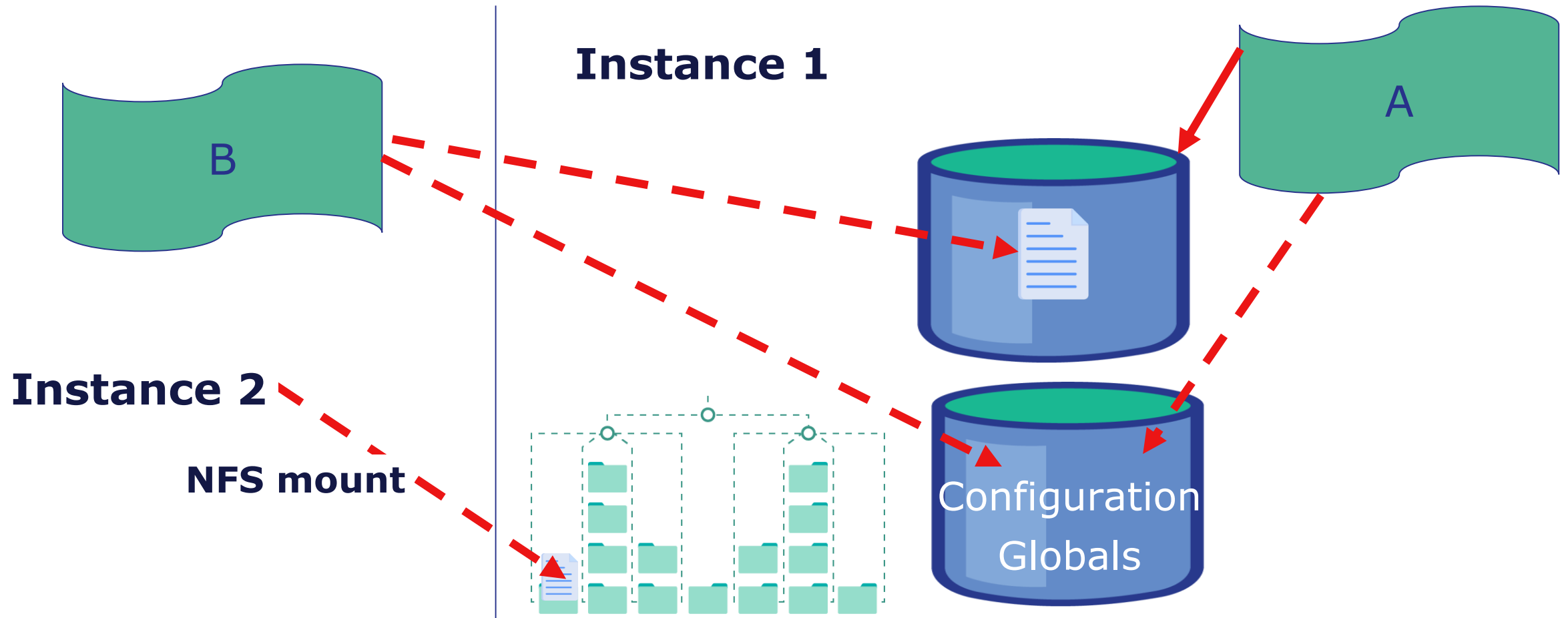


Complexity of CCR for ECP Deployments (cont.)

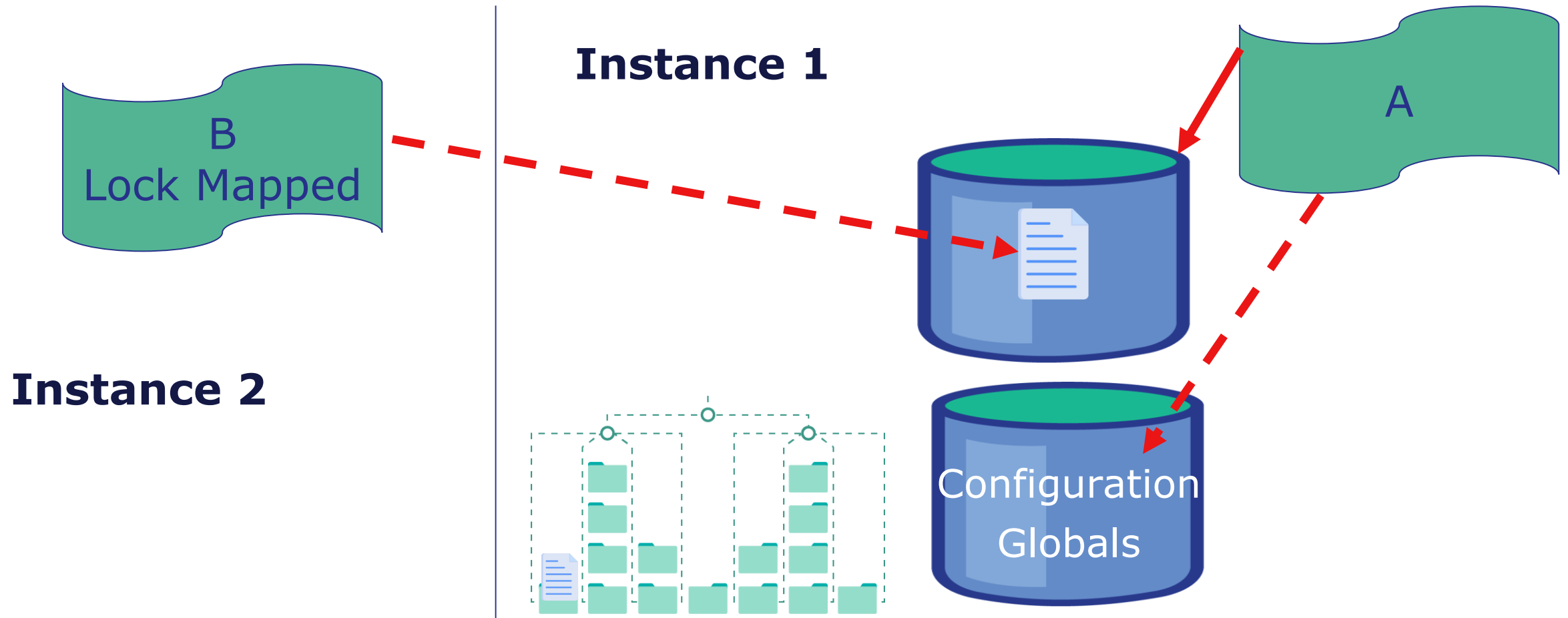
- Any instance running CCR client logic must have access to both of these in order to function properly.
 - Alternatively, nodes that cannot access this information must be locked.



Configuring CCR for ECP Deployments (choice 1)



Configuring CCR for ECP Deployments (choice 2)



Configuring CCR for ECP Deployments (cont.)

- Architecturally there are two options for using CCR in an ECP configuration:
 - Create a single DB on the DB Server which contains all CCR globals and create an NFS mount point which all nodes can use as the shared Perforce workspace.
 - NOTE: Even with a mapped set of configuration globals, `Configure^%buildccr` must be run in each instance at least once to initialize the SSL configuration required to use the CCR Web Services.
 - Only allow changes to be made on a single instance in the ECP cluster.
 - Usually the data server.



Configuring CCR for ECP Deployments (cont.)

- NFS mount considered weak point, detracting from robust ECP architecture.



Configuring CCR for ECP Deployments (cont.)

- Therefore, preferred architecture for LIVE is to have single point of entry for manual changes. Typically consists of:
 - Standalone VM running Apache.
 - Directs requests directly to DB server as front end for changes made via Ensemble, InterSystems IRIS™ Integration, HealthShare, or TrakCare.
 - Policy mandate that all Studio connections must be made directly to data server.
 - Application servers also require separate database of configuration globals.
 - If BASE, configure as locked using `do ##class(%Studio.SourceControl.ISC).Lock(1) .`



Quiz: Additional Client Configuration Considerations

Question:

CCR client configuration globals should be mapped to SYSCONFIG. True or False?

Answer:

True.

They should be mapped to SYSCONFIG in order to be retained during a refresh.



Quiz: Additional Client Configuration Considerations

Question:

CCR client logging and storage globals should be retained after a refresh. True or False?

Answer:

False.

Logs and change history from the refresh source should be reflected on the target after the refresh.



Quiz: Additional Client Configuration Considerations

Question: Which of the following is true about configuring CCR for ECP deployments? Select all that apply.

- A. Requires additional configuration to ensure various pieces of the architecture stay in sync.
- B. CCR client configuration and logging and storage globals need to communicate between nodes.
- C. Different nodes require access to Perforce workspace file system (stored in the root node of ^Sources).
- D. Any instance running CCR client logic must have access to information about checked out items.



Quiz: Additional Client Configuration Considerations (cont.)

Answer:

All of the above.



Summary

- What are the key points for this module?

