



INTERSYSTEMS LEARNING SERVICES

InterSystems Change Control



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ICC 630: CCR Tier 2 – Debugging and Advanced Topics



Objectives

- Explain an advanced understanding of TCC and ElementXML.
- Discuss the complex data structures used in TCC.
- Debug and resolve advanced issues encountered with TCC.
- Implement CCR for TrakCare Analytics.



Part 1: TCC Background and Review



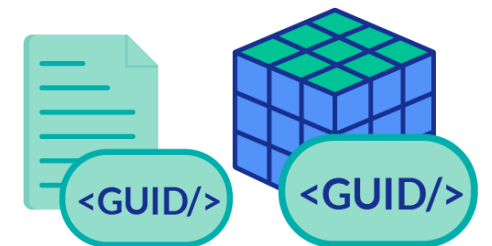
TrakCare Architecture

- TrakCare is made of many Persistent classes, split into packages.
 - User.* - older classes; 75% of stored info; Covers code table and Transactional Data.
 - epr.* - Clinical data configuration; security groups; worklist and epr configuration; 15% of data.
 - websys.* - System data; screen layouts and translations; workflows; reports; 10% of data.
 - There are close to 1000 classes considered to be “Configuration” which are controlled by TCC.



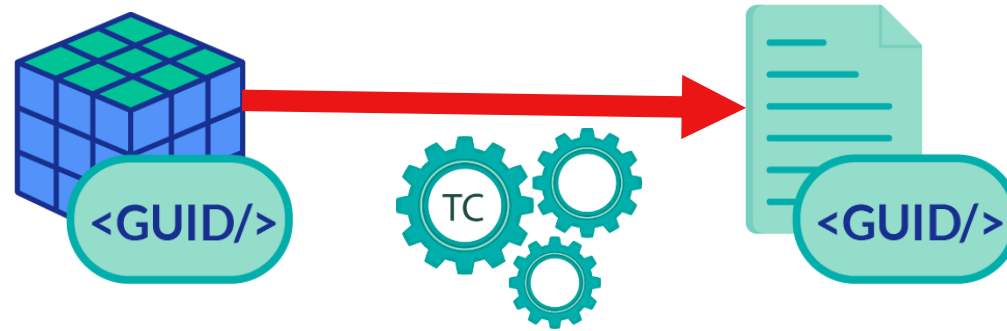
TrakCare Architecture (cont.)

- Each of these classes stores properties which correspond to fields on the page.
- Classes can have any number of properties (some classes have 100+).
 - TCC provides a standardized export format for these properties.



Review: ElementXML

- All TrakCare configuration is exported via TCC in ElementXML format.



- Every piece of exportable configuration must have a GUID assigned to it.
 - GUIDs (Globally Unique Identifiers) must be consistent across all environments in a System.



Review: ElementXML (cont.)

- An ElementXML document imported into TrakCare will create one or more rows of TrakCare configuration.
 - GUIDs are used in ElementXML documents to point to referenced configuration.
 - If referenced GUIDs are not present then TCC will not load the ElementXML document.



How To: View ElementXML

- ElementXML can be viewed:
 - Before upload: Use view or diff links on Bundle & Upload page.
 - After upload: Use view, diff or history links under [show Submitted Changes] on CCR.

Bundle & Upload ItemSet

Select the Uncommitted Changes to Bundled into an ItemSet. Then, fill in the fields at the bottom to upload the ItemSet to the CCR Server and submit the selected changes into Performe.

Changed By Me
CCR

Select All

| Select | Updated Time | CCR | Changed By | Action | Given Name | Internal Name | View | Diff | Undo |
|-------------------------------------|---------------------|----------|-------------|--------|--|--------------------------------|------|------|------|
| <input checked="" type="checkbox"/> | 2019-07-22 12:28:33 | ISCU0001 | TrakLogon01 | add | /User/CTCareProv/test 002C9A2C-1C8A-42CD-8B0B-95DA35EA06EF | \$lb("2291","User.CTCareProv") | View | Diff | Undo |

```
Changelist: 3320680 Check-in: bspead 2018-06-03 08:30:14  
ISCU0336 - Widget Organization  
Initial Widget list  
add //custom_ccrs/us/ISCU/TESTSYS/BASE/data/WidgetList.txt (1) view / diff / history
```



ElementXML – Additional Details

- One change in the web UI should generally mean one line changed on XML.
- Each simple property occupies one line on the export.
 - Each line consists of <Open Tag>Content</CloseTag>.
- Complex properties are exported sequentially, and their properties are exported using the same rules.
 - The Open and Close tags occupy their own lines, and do not mix with content.
 - This allows the Perforce diff to operate.



Example – simple change in XML

- Updated Date From:

Change Control Session

Change Key

Update

ChangeControl.Session 0.000658 (secs), 1611 (lines), 46 (globals)

Allergen

| | |
|-------------------|---|
| Code | <input type="text" value="259281008"/> |
| Description | <input type="text" value="1,1,1-Trichloro-2-propanol"/> |
| Snomed CT Code | <input type="text"/> |
| Allergen Category | <input type="text" value="Drug allergen or pseudoall"/> |
| Date From | <input type="text" value="01-01-1952"/> |
| Date To | <input type="text"/> |
| Code Table Tags | <input type="text"/> |
| Owner | <input type="text" value="Site"/> |

Update

[Delete Selected](#)

Quick Diff

File: D:\Perforce\SHARED_DIBBLER_CCR\custom_ccrs\au\TRAK\TEST\BASE\misc\User\PACA
Original File: D:\Perforce\SHARED_DIBBLER_CCR\custom_ccrs\au\TRAK\TEST\BASE\misc\Us

[show files](#)
[additional options](#)

(Please be patient as diffs can be computationally intensive)

Key: **added** ~~deleted~~ (diff time: 0.001s)

```
<?xml version="1.0" encoding="UTF-8"?>
<Export>
  <User.PACAllergy GUID="24CCE39C-650D-11E3-B1D9-5056803C2400">
    <ALGCode>259281008</ALGCode>
    <ALGDateFrom>1952-01-01</ALGDateFrom>
    <ALGDesc>1,1,1-Trichloro-2-propanol</ALGDesc>
    <ALGTypeDR>EBC45E78-6510-11E3-B1D9-5056803C2400</ALGTypeDR>
    <ALGCodeTranslated>259281008</ALGCodeTranslated>
    <ALGDescTranslated>1,1,1-Trichloro-2-propanol</ALGDescTranslated>
  </User.PACAllergy>
  <Information GUID="24CCE39C-650D-11E3-B1D9-5056803C2400">
    <Id>2060</Id>
    <ClassName>User.PACAllergy</ClassName>
    <Description>1,1,1-Trichloro-2-propanol</Description>
    <Content>
      <Class Version="//trak/main/DEV/cIs/User/PACAllergy.xml#19">User.PACAllergy</Class>
    </Content>
  </Information>
</Export>
```



Quiz: Change Validity

Question:

This shows a valid change. True or False?

```
<User.OECOrderAdminStatus GUID="CA41377A-4898-11E2-B7A0-5056803BE100">  
  <STATCode>PRD</STATCode>  
  <STATDesc>Patient Refused</STATDesc>  
  <STATBill>NY</STATBill>  
  <STATDeductStock>N</STATDeductStock>  
  <STATIVCompleted>N</STATIVCompleted>  
  <STATCanAdminSkinTest>N</STATCanAdminSkinTest>  
  <STATIcon>../images/webemr/cross_red.png</STATIcon>  
  <STATDateFrom>2000-01-01</STATDateFrom>  
  <STATResolveNotReq>N</STATResolveNotReq>  
  <STATSecondSignature>N</STATSecondSignature>  
  <STATSystemAdminStatus>NOT</STATSystemAdminStatus>  
</User.OECOrderAdminStatus>
```

Answer:
True.

The screenshot displays the 'Change Control Session' interface. At the top, there is a 'Change Key' field containing 'TRAK1701' and an 'Update' button. Below this, a table lists various attributes for the change. The 'Code' is 'PRD', the 'Description' is 'Patient Refused', and the 'System Administration Status' is 'Not Administered'. The 'DateFrom' is '01-01-2000'. A red circle highlights the 'Bill Flag' checkbox, which is checked. Other attributes like 'Administration Workflow Decision', 'DateTo', 'Bill Flag', 'Stock Flag', 'Resolve Not Required', 'IV Completed Status', 'Can Admin Skin Test', 'Suppression of Second Signature', 'Colour', 'Icon', 'Late Administered Icon', and 'Code Table Tags' are also visible. A 'Delete Selected' button is located at the bottom right.



Quiz: Change Validity

Question: This shows a valid change. True or False?

```
<?xml version="1.0" encoding="UTF-8"?>
<Export>
  <User.PHCIngredient GUID="E68A5C21-1FE6-4D40-9A35-BE64B5778D12">
    <INGRCode>3354</INGRCode>
    <INGRDesc>abatacept</INGRDesc>
    <INGRAAllowDuplicate>554</INGRAAllowDuplicate>
  </User.PHCIngredient>
  <Information GUID="E68A5C21-1FE6-4D40-9A35-BE64B5778D12">
    <Id>2101</Id>
    <ClassName>User.PHCIngredient</ClassName>
    <Description>abatacept</Description>
    <Content>
      <Class Version="//trak/main/DEV/cls/User/PHCIngredient.xml#19">User.PHCIngredient</Class>
    </Content>
  </Information>
</Export>
```

Answer:

False.

The change in the XML doesn't match the entry on the screen.

Update

ChangeControl.Session 0.000627 (secs), 1622 (lines), 40 (globals)

Ingredient

| | |
|-----------------------------|-----------|
| Code | 3354 |
| Description | abatacept |
| Check Duplicates | |
| Maximum Dose | 123 ✓ |
| Maximum Dose UOM | |
| Universal Conversion Factor | |
| Code Table Tags | |

Owner: Site

Update

PHCIngredient.Edit 0.044688 (secs), 156542 (lines), 8990 (globals)



Part 2: Export Information Section



Information Section (T2011+)

- Each ElementXML export contains an Information section.
 - This is not processed by the XML parser at all.
 - It is there for your benefit only.

```
<Information GUID="A9A2EFDC-D74F-11E6-9ADC-7F0F75D06854">
  <Id>5</Id>
  <ClassName>User.OECSchema</ClassName>
  <Description>NHSE-ChemotherapyDrugs</Description>
  <Content>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchema.xml#1">User.OECSchema</Class>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchemaGroup.xml#1">User.OECSchemaGroup</Class>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchemaGroupItem.xml#1">User.OECSchemaGroupItem</Class>
  </Content>
</Information>
```



Information Section (cont.)

- The information section is generated from the export process and includes:
 - Id: Row ID of the record when exported.
 - ClassName: Class of object exported.
 - Description: Description property (if present).
 - Content: All classes (including children), and the exact version of the TrakCare class.



Information Section (cont.)

- Why is this useful?

```
<Information GUID="A9A2EFDC-D74F-11E6-9ADC-7F0F75D06854">
  <Id>5</Id>
  <ClassName>User.OECSchema</ClassName>
  <Description>NHSE-ChemotherapyDrugs</Description>
  <Content>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchema.xml#1">User.OECSchema</Class>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchemaGroup.xml#1">User.OECSchemaGroup</Class>
    <Class Version="//trak/main/releases/T2016.2/0/ENXX/cls/User/OECSchemaGroupItem.xml#1">User.OECSchemaGroupItem</Class>
  </Content>
</Information>
```

- It enables you to track if any JIRAs have been subsequently released to fix any bugs you see.



Information Section (cont.)

- Able to tell if the export was from a different version of TrakCare than you are importing to.
 - Which can explain erroneous behavior if the download fails.
- You can tell whether the export took place before a recent patch, and the change just hasn't been moved.
- Possible to see all invoked classes and their exact versions and use Perforce client to see if there are any subsequent changes.



Quiz: Information Section

Question:

Which of the following is true about the information section of ElementXML? Select all that apply.

- A. The Information Section contains configuration information.
- B. The information section is processed by the XML parser.
- C. The information section is useful during debugging and troubleshooting errors.



Quiz: Information Section (cont.)

Answer:

C. The information section is useful during debugging and troubleshooting errors.

It enables you to track exactly whether any JIRAs have been subsequently released to fix any bugs you see.



Part 3: Complex Data



Review Complex data - References

- When linking a different table or type, we should always export it as a GUID reference.
- Why would we not use code or description?
 - Code or description can change which would mess up referential integrity of pointers in the exports.
- If you see a corruption when moving configuration, check the format of the export.
 - References to other classes should ALWAYS use GUID references.
 - These issues can be intermittent, as the Row IDs may match between environments.
 - The risk increases as time passes from your last refresh.



Complex data - Children

- Code tables can group related configuration as Child tables.
- These will typically appear as a link, or table on the code table page.
- Children are typically exported with the parent object. This can cause:
 1. Large export files, which can cause performance issues.
 2. Locking contention, editing a child will lock the parent and all other children.
 3. Additional GUID synchronisation requirements.



Complex data – Children (cont.)

- Child objects can have Child objects.
- Questionnaires have many possible layers of Child objects.

Questionnaires

Code **Group**

Description

Inactive

Owner

Review Date

Snomed CT Code

ICD Code

ICPC-2 Code

Filter By Chapter Purpose

Save & Close **View Layout** **Copy** **Delete**

Exclude Advance SOAP Security

Exclude Calculated Report Fields from Generation

Generate

Generate DeepSee Cube

Generate ZEN Report

Only Default Answers From Same Episode

Days Offset For Default Of Last Answer

Author

Authority

AuthorityText

Deprecated

Deprecated Reason

API Flag

Created: 25-10-2017 19:48
SSUserDefWindowCT.Edit 0.004623 (secs), 11097 (lines), 499 (globals)

New

| Code | Description | Control Type | Default Last Q&A | Inactive | Display Answer | Cumulative View | Significant Answer |
|------|--------------------------------------|--------------|------------------|----------|----------------|-----------------|--------------------|
| 01 | Am I a Child Object? | Checkbox | | | | | |
| 02 | Child Objects don't have to be links | Date | | | | | |

SSUserDefWindowControls.List 0.002207 (secs), 6184 (lines), 129 (globals)

```
<?xml version="1.0" encoding="UTF-8"?>
<Export>
  <User.SSUserDefWindow GUID="431C6B76-1C2A-412C-8AC5-CD764497273A">
    <ChildSSUserDefWindowControls>
      <SSUserDefWindowControls GUID="0B0FBC82-DA60-4EE2-8F2F-6EFB97C48368">
        <CONControlType>CheckBox</CONControlType>
        <CONText>Am I a Child Object?</CONText>
        <CONNoLongerUsedFlag>N</CONNoLongerUsedFlag>
        <CONCode>01</CONCode>
        <CONDefaultLastQnAns>N</CONDefaultLastQnAns>
        <CONDisplayAnswer>N</CONDisplayAnswer>
        <CONSingleOption>N</CONSingleOption>
        <CONAdminAccessRequired>N</CONAdminAccessRequired>
        <CONDisplayCumulView>N</CONDisplayCumulView>
        <CONQPropName>Q01</CONQPropName>
        <CONCreateDate>2017-10-25</CONCreateDate>
        <CONCreateTime>19:48:57Z</CONCreateTime>
        <CONControlGroupMainControl>N</CONControlGroupMainControl>
        <CONDisplayOnly>N</CONDisplayOnly>
        <CONDeprecated>N</CONDeprecated>
        <CONAlwaysDisplayItemIfBlank>N</CONAlwaysDisplayItemIfBlank>
      </SSUserDefWindowControls>
    </ChildSSUserDefWindowControls>
  </User.SSUserDefWindow>
</Export>
```



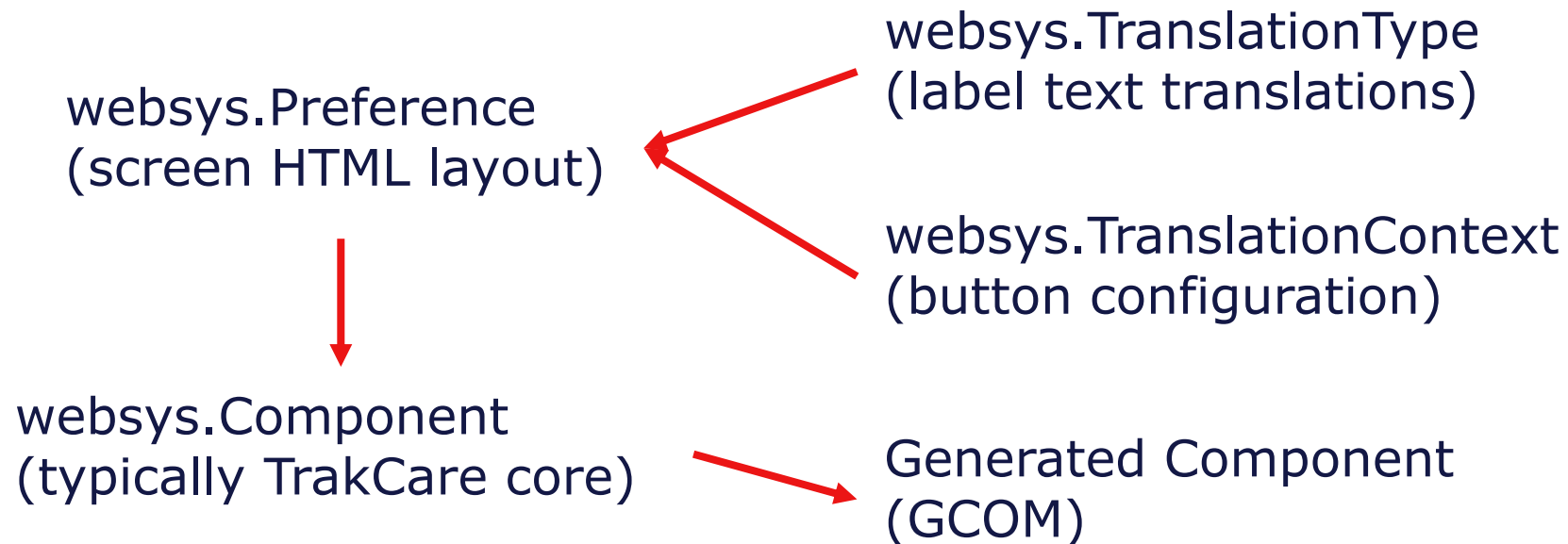
Complex data – Children (cont.)

- Each child object has a GUID.
- These need to be consistent between environments.
- Conflicts can occur at a child level, but will report only as a failure at the parent.
- All child GUIDs should consistently refer to a parent.



Complex data – Special Cases

- Layouts – TrakCare UI (Responsive UI handles this differently).
- Layouts are compiled routines based on various other pieces of configuration, for a defined context.



Complex data – Special Cases (cont.)

- If no configuration exists at the current Save Level/Context for a layout, it will look at a higher level.
- A change to any piece of a layout should trigger a rebuild of the layout.
 - The source data is ONLY used to build the GCOM.
 - Deleting the TranslationType will not remove translations, until the next regenerate of the layout.
 - Translation* objects are difficult to change once saved, since their ID Key is based on data they contain.



Complex data – Special Cases (cont.)

- Typically it is necessary to delete and recreate these in the event of errors.
 - NOTE: This is a special case where this is recommended. Deleting and recreating an object results in a new object with a new GUID which in most other scenarios causes inconsistencies.



Quiz: Complex data

Question:

GUIDs should always be used when referencing other objects.
True or False?

Answer:

True.

References to other classes should **ALWAYS** use GUID references.



Part 4: Questionnaires



Questionnaires

- Questionnaires are the most problematic configuration for TCC!
- A questionnaire is a very complex object, with nested layers of Children, all of which can refer to other tables.
- Questionnaires also generate other configuration, some of which is exported and some is not.
 - A component is generated and exported so that layout configuration can reference it.
 - However, the loaded configuration is not used, it is always regenerated.
 - Dictionary entries are generated for translation.
 - At least one layout save is generated.
 - A Caché class is generated to store the data.



Questionnaires (cont.)

- A questionnaire has many moving parts.
- If any are not moved with the initial load of a questionnaire, they will be generated on download.
- This will create “new” objects, which will be guaranteed to cause future GUID conflicts.
- It is important to verify that all configuration is progressed when creating a questionnaire.
 - Repair is tedious and time consuming, especially when the error is made in Edition.



Questionnaires (cont.)

- Why does TCC export the component, if it is going to generate the content again?
 - To maintain GUID synchronisation.
 - Layouts refer to the component, so it needs parity on all environments.
 - This also means it has all of the complexity of layout management when managing questionnaires.



Questionnaire Configuration

- A typical questionnaire should create all of the following configuration.
 - SSUserDefWindow – this is the questionnaire configuration.
 - SSUserDefWinGroup (optional) – questionnaire’s group.
 - websys.Component – the component code generated from the questionnaire configuration.
 - websys.Preferance – the default screen layout.
 - websys.TranslationContext – the default control setup on the layout.
 - websys.TranslationType (optional) – text label translations.
 - websys.Dictionary – a dictionary file to allow system level translations.



Quiz: TrakCare Configuration

Question:

What are the most complex configuration object to export in TrakCare?

- A. Tables.
- B. Layouts.
- C. Questionnaires.
- D. Worklists.

Answer:

C. Questionnaires.



Quiz: Perforce and TCC

Question:

Perforce gets updated with structural changes to TCC's ElementXML in TrakCare. True or False?

Answer:

False.

Perforce doesn't know anything about the content.



Part 5: Missing GUID Advanced Topics



GUID Without Change History

- There may be no change history if the object was not created on that System.
- Check up through the Edition model.
 - Configuration may come through an Edition patch, check that patch levels match.



Missing GUID Complications

- Missing GUIDs are usually very simple to resolve.
- Poor planning can lead to GUID deadlock.
 - This typically happens with very large changes, or changes left for a long period of time.
 - Example:
 - CCR A implements an item that CCR B's questionnaire references.
 - CCR B implements a Chart Profile which references the item from CCR A.
- To resolve this, the CCRs must be merged, with the CCR merge function.

[home](#) [help](#) [merge](#) [clone](#) [edit](#) [reassign](#) [changeSpec](#) [cancel](#) **Next Transition(s):** [markValidationFailed](#) [markUATComplete](#)



Quiz: Missing GUIDs

Question:

What information can you infer from looking at just a GUID?

- A. The type of object associated with the GUID.
- B. The source environment of the GUID.
- C. The Edition.
- D. No inference can be made from just a GUID.

Answer:

- D. No inference can be made from just a GUID.



Exercise ICC630-1 through ICC630-7

Create a CCR & Debug



Quiz: Perforce Integration conflict

Question: To cancel a CCR all you need to do is click Cancel.
True or False?

Answer:

False.

You also need to backout the changes from the CCR and download the ItemSets to remove it. **Do not** leave a car crash in the lane you wish to drive down in the future.



Part 6: TCC Debugging – Incorrect Configuration



Imported configuration incorrect

- TrakCare and TCC are not perfect. There are bugs.
- Bugs can happen during export.
 - Class not marked as XMLConfigItem.
 - Field changes not captured.
 - References not exported as GUID.
 - Encoding issues (XML/HTML encoding, \$lb).
 - Child record marked as XMLConfigItem.



Imported configuration incorrect (cont.)

- Bugs can happen during import.
 - Inappropriate data constraints.
 - Complex fields not processed correctly.
 - Zero node pointers not updating.
 - Generation not triggered (questionnaires, layouts).
- It is also possible that the CCR does not have a full version of the changes.
 - Remember, each CCR moves diff chunks through.
 - The CCR in question may be reliant on another CCR's changes.
 - Use the History button to check.



Export Bugs

- Each instance of this will present differently.
 - This was a very common problem in the early days of CCR adoption.
 - Development are now focused on ensuring TCC support is appropriate when creating new functionality.
 - We are likely to see issues on new functionality, but also older functionality which hasn't been used with change control (Stock is a good example of this).
 - These should be reproduced in TEST, and raised as a critical JIRA.
 - JIRA should have the component "Change Control."
-



Export Bugs – Missing Property

- The easiest (but relatively uncommon) issue to diagnose is the failure to export a property.
- To reproduce:
 1. Open a change session.
 2. Make the change to that field only.
 3. Open Bundle and Upload and perform a Diff to see the changes.
 4. If no change is present in the XML (it will highlight), then there is an issue with the field export.
- Ensure a JIRA is logged with “Change Control” as one of the selected components.
 - Include documentation of the steps to replicate.



Export Bugs – Row IDs

- The more common failure is that an external reference is exposed as a Row Id instead of a GUID.
 - This is more common for Collection types, as they require extra code to export.
 - These issues can fly under the radar if the environments are well aligned for RowIDs.



Export Bugs – Row IDs (cont.)

- The process is very similar to the previous:
 1. Open a change session, and make the change.
 2. Check the Diff.
 3. If you see numbers or text instead of a GUID in the changed field, this is a bug.
- This should also be raised as a critical JIRA (Component = “Change Control”).



Export bugs - Ownership

- The Edition model introduced the concept of ownership of tables and records.
- The owner can be defined as SYS, REGION, SITE. This controls what can be edited and exported from each environment. It is possible to set a table to allow ownership from all 3 levels, but each individual entry is also subject to ownership.



Export bugs – Ownership (cont.)

- This means a table owned by SYS and SITE, can have entries belonging to each owner.
 - There will be no Region entries in this table.
 - SYS can only be edited in a Global Edition env, SITE ownership of the table allows creation and maintenance of SITE entries only.



Export bugs – Ownership (cont.)

- Ownership is typically simple, each code table row will define a user directly.
- Table ownership is defined in CT_EditionManagement.
- Some configuration inherits their ownership from referenced objects.



Export bugs – Ownership (cont.)

- Questionnaires.
 - Layouts, refer to components, refer to the questionnaire which defines ownership.
 - The layout is also saved at a Save Level, and this is factored into the rules.
 - It is logically impossible to export a SITE level save from Edition.
- This process is new, and while stable, has not been bug-free.



Import bugs - Generation

- Some configuration generated related configuration when saved.
 - Questionnaires (component, storage class).
 - Order items (Keywords).
 - Layout configuration (GCOM code).
- The XML Load should automatically trigger any additional processing.
- This is an infrequently occurring issue, and will generally require technical input.



Import bugs - Constraints

- Development guidelines state that most data validation should be applied at the Application layer.
- Data constraints can cause issues with downloads of linked data.
- Example: Sequenced configuration in Lab (ref: TC-115317).
 - A constraint on the sequence number prevented these being reordered.
 - Import sequence 1 conflicted with existing sequence 1, which is now sequence 3.



Import bugs – Constraints (cont.)

- These errors should be reproduced in TEST-LIVE, and raised as a JIRA with change control selected as one of the components.



Quiz: Debugging Incorrect configuration

Question:

Which of the following would result in bugs during import of configuration?

- A. Class not marked as XMLConfigItem.
- B. References not exported as GUID.
- C. Encoding issues (XML/HTML encoding, \$lb).
- D. Complex fields not processed correctly.

Answer:

All of the above.



Quiz: Debugging Incorrect configuration

Question:

The Edition model introduced the concept of ownership of tables and records. What are the different defined owners in this model? Select all that apply.

- A. System.
- B. Region.
- C. Site.
- D. None of the above.



Quiz: Debugging Incorrect configuration (cont.)

Answer:

A. System.

B. Region.

C. Site.



Part 7: TCC Debugging - Key not Unique



Key not Unique Index Resolution

- **CCR Error:**

- ERROR #5001: Unable to load file
/trak/sclo/UAT/DATAFILES/perforce/custom_ccrs/scx/LUHT/T20
12/UAT/misc/websys/Preferences/PAWaitingListInquiry.List/A
90DCD56-2B51-11E3-AC06-590A8ECE23D5.xml.
- > ERROR #5001: Unable to save item
\$lb("", "websys.Preferences"), A90DCD56-2B51-11E3-AC06-
590A8ECE23D5.
- > ERROR #5808: Key not unique: Index.

- **Cause of the Error:**

- Workflow Context no longer exists within the application which the preferences are assigned to.



Key not Unique Index Resolution (cont.)

- Investigation steps:
 - Find GUID's and RowID's in BASE and UAT using FIND GUID within the TrakCare.
 1. Open System Management Portal.
 2. Run the following SQL Statement within SMP for BASE and UAT:
 - Select %GUID,* from Websys.Preferences where %ID in (Enter in your row ID's).
 3. Ensure they match in both environments.



CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:

4. Then run the following SQL query in both environments:

- Select %GUID, * from websys.WorkFlow where %Id in (your row ID's which you find within the AppKeyContext from your previous query).
- NOTE: no rows return means they have been deleted.

Enter the SQL query you wish to execute in namespace SCLO-BASE-T2012 using the form below.

Execute Query Show Query Plan Query History Query Builder Display: Logical Mode Max Rows: 1000

```
--Select %GUID, * from websys.PReferences where %Id in (2134,2140,2131,2141,2132)
select %GUID, * from websys.WorkFlow where %Id in (50243,50216,50217)
```

The results of executing the SQL query are shown below. [Last update: 2013-10-03 14:00:47.753](#)

SQLCODE: 100 Row count: 0 Performance: 0.001 seconds 14 global references Routine: %sqlcq.SCLOdBASEdT2012.cls2890

| # | %GUID | ID | CycleSelection | Deprecated | DisplayWorkFlow | JumpToList | Loop | Name | ReasonDeprecated | ShortDescription | UpdateDate | UpdateTime | UpdateUser | WorkFlowItems |
|----------|-------|----|----------------|------------|-----------------|------------|------|------|------------------|------------------|------------|------------|------------|---------------|
| Complete | | | | | | | | | | | | | | |

Enter the SQL query you wish to execute in namespace SCLO-UAT-T2012 using the form below.

Execute Query Show Query Plan Query History Query Builder Display: Logical Mode Max Rows: 1000

```
--Select %GUID, * from websys.PReferences where %Id in (2134,2140,2131,2141,2132)
select %GUID, * from websys.WorkFlow where %Id in (50243,50216,50217)
```

The results of executing the SQL query are shown below. [Last update: 2013-10-03 14:00:58.454](#)

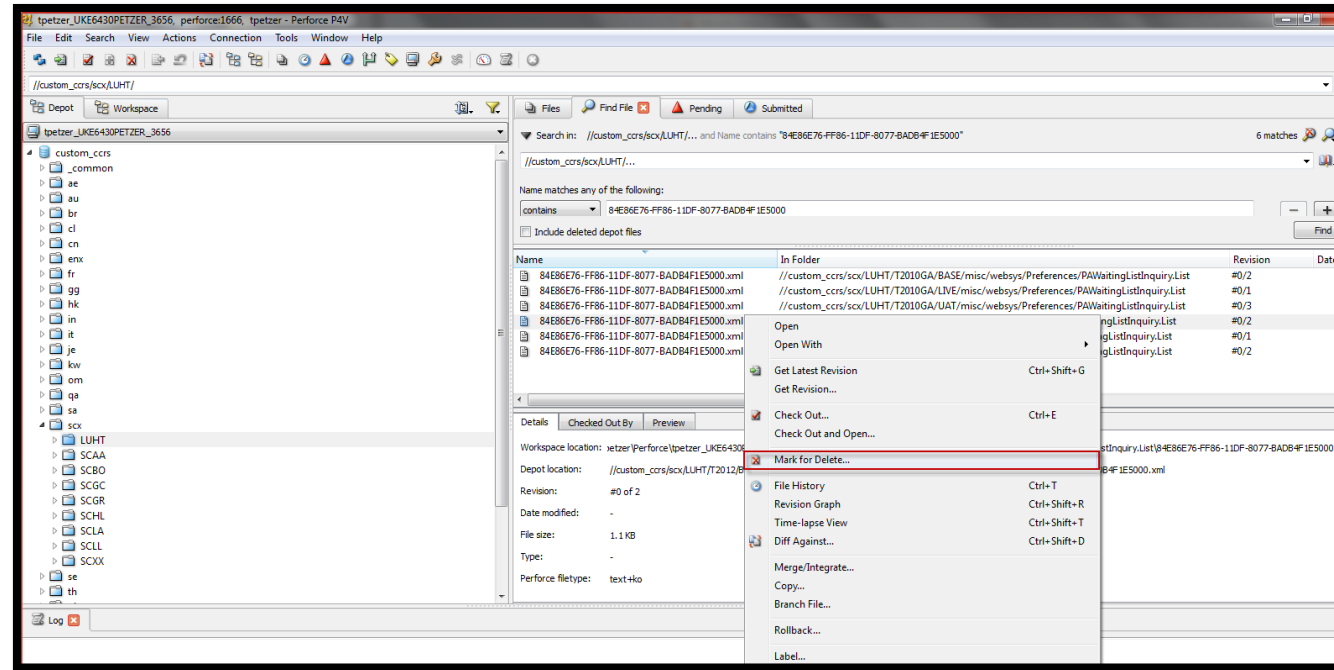
SQLCODE: 100 Row count: 0 Performance: 0.000 seconds 6 global references Routine: %sqlcq.SCLOdUATdT2012.cls584

| # | %GUID | ID | CycleSelection | Deprecated | DisplayWorkFlow | JumpToList | Loop | Name | ReasonDeprecated | ShortDescription | UpdateDate | UpdateTime | UpdateUser | WorkFlowItems |
|----------|-------|----|----------------|------------|-----------------|------------|------|------|------------------|------------------|------------|------------|------------|---------------|
| Complete | | | | | | | | | | | | | | |



CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:
 5. Login Into Perforce.
 6. Ensure you are in Depot tab.
 7. Select your Client.
 8. Within Find File > Find your first GUID.
 9. Right Click > Mark for Delete.



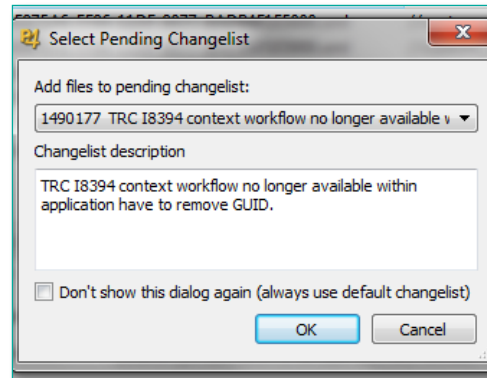
CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:

- 10. Select New Pending Change List.

- 11. Add your TRC number and details of why you are deleting the GUID's.

- 12. Click on OK.



- 13. Repeat this process for the rest of the GUID's you need to delete.

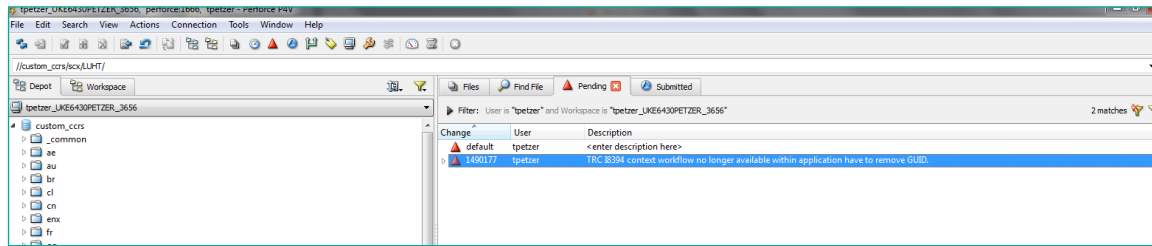
- This time, select the pre-existing changelist instead of New that you have created above for each.



CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:

14. Once all the GUID's have been marked for Delete Select your Pending Tab.



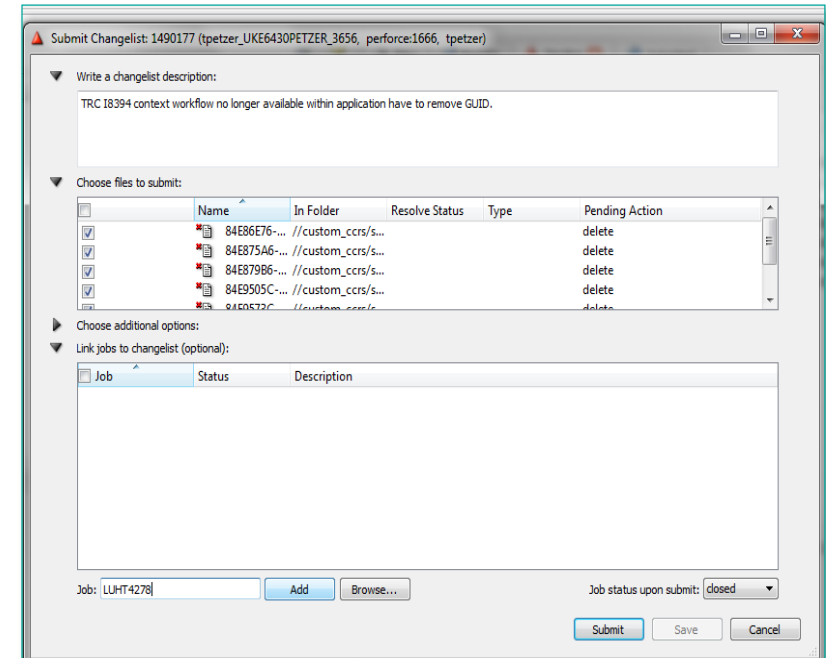
15. Your changelist will appear within the list.

16. Right click > Select Submit.

17. Add in the CCR number to the Job field.

18. Click on Add.

19. Click on Submit.



CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:
 19. Return to CCR Online application.
 20. Your new change list of deletes will appear under show Submitted changes.

```
Performe Details logged into Performe as 'tp  
  
Performe Branch //custom_ccrs/scx/LUHT/T2012/ Performe Job LUHT4278  
Access Token \[generate token\] Performe Log \[view log\]  
Current ItemSet LUHT4278_UAT_ColoTRC-CCR_175316(ID=175316) (2013-10-02 12:37:52) \[details\] \[itemset XML\]  
for Client \[show all\]  
All ItemSets for Server have been Committed \[show all\]  
\[show Performe controls\]  
\[hide submitted changes\]  
  
Changelist: 1490191 Check-in: tpetzer 2013-10-03 09:24:12  
TRC I8394 context workflow no longer available within application have to remove GUID.  
  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E86E76-FF86-11DF-8077-BADB4F1E5000.xml (3) view / diff / history  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E875A6-FF86-11DF-8077-BADB4F1E5000.xml (3) view / diff / history  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E879B6-FF86-11DF-8077-BADB4F1E5000.xml (3) view / diff / history  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E9505C-FF86-11DF-8077-BADB4F1E5000.xml (3) view / diff / history  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E9573C-FF86-11DF-8077-BADB4F1E5000.xml (3) view / diff / history  
delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/A90DCD56-2B51-11E3-AC06-590A8ECE23D5.xml (2) view / diff / history  
  
Changelist: 1486899 Check-in: sandram_LUHT 2013-10-02 12:37:48  
{CCRAutoGen} LUHT4278 - Patient Display (PAWaitingListInquiry.List) ? Remove specific fields and columns;  
Integrating Changelists for LUHT4278 from BASE to UAT  
  
integrate //custom_ccrs/scx/LUHT/T2012/UAT/misc/websys/Preferences/PAWaitingListInquiry.List/84E804EA-FF86-11DF-8077-BADB4F1E5000.xml (2) view / diff / history  
integrate //custom_ccrs/scx/LUHT/T2012/UAT/misc/websys/Preferences/PAWaitingListInquiry.List/84E8112E-FF86-11DF-8077-BADB4F1E5000.xml (2) view / diff / history  
integrate //custom_ccrs/scx/LUHT/T2012/UAT/misc/websys/Preferences/PAWaitingListInquiry.List/84E816CE-FF86-11DF-8077-BADB4F1E5000.xml (2) view / diff / history
```



CCR - Key not Unique Index Resolution (cont.)

- Investigation steps:
 21. Select Show Perforce Controls hyperlink.
 22. Select Show Controls for Perforce Integration.
 23. Ensure the Preview checkbox is unchecked.
 24. Click Integrate.
 25. The new ItemSet is now available for the user to download into their environment.

The screenshot displays the 'Perforce Details' page for job LUHT4278. It includes fields for 'Performance Branch', 'Access Token', 'Current ItemSet for Client', and 'All ItemSets for Server'. The 'Performance Integration' section shows 'Source Environment' set to 'BASE' and 'Target Environment' set to 'UAT', with an 'Integrate' button and a 'Preview Only' checkbox. Below this, there is explanatory text about changelists and a 'hide controls' link. The 'Performance Backout' and 'Create ItemSet' sections also have 'show controls' links. A 'hide submitted changes' link is located above a table of deleted files. The table lists several files with their paths and GUIDs, each with 'view', 'diff', and 'history' links. The last row of the table is highlighted in blue.

| File Path | GUID | Count | View | Diff | History |
|---|------|-----------------------|------|------|---------|
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E86E76-FF86-11DF-8077-BADB4F1E5000.xml | (3) | view / diff / history | | | |
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E875A6-FF86-11DF-8077-BADB4F1E5000.xml | (3) | view / diff / history | | | |
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E879B6-FF86-11DF-8077-BADB4F1E5000.xml | (3) | view / diff / history | | | |
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E9505C-FF86-11DF-8077-BADB4F1E5000.xml | (3) | view / diff / history | | | |
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/84E9573C-FF86-11DF-8077-BADB4F1E5000.xml | (3) | view / diff / history | | | |
| delete //custom_ccrs/scx/LUHT/T2012/BASE/misc/websys/Preferences/PAWaitingListInquiry.List/A90DCD56-2B51-11E3-AC06-590A8ECE23D5.xml | (2) | view / diff / history | | | |



Part 8: TCC Debugging – Additional issues



Changes are not appearing in the bundle queue

- Check the CCR exclusion list to ensure that the class has not been excluded from CCR.
- Check to make sure that you haven't uploaded the changes to the incorrect CCR number.
- Network errors or invalid tokens blocking the changes uploading to CCR.



Changes will not undo within the bundle queue

- It is suggested that undo within TrakCare should be attempted with caution as not all items can easily be “undone”. If you are going to attempt it, then try the following:
 - Ensure any changes you want to remove are not used within TrakCare, e.g., a new location is not being used by a patient you added for testing. If it is, then it cannot be undone as its still in use.
 - Undo in the reverse order.



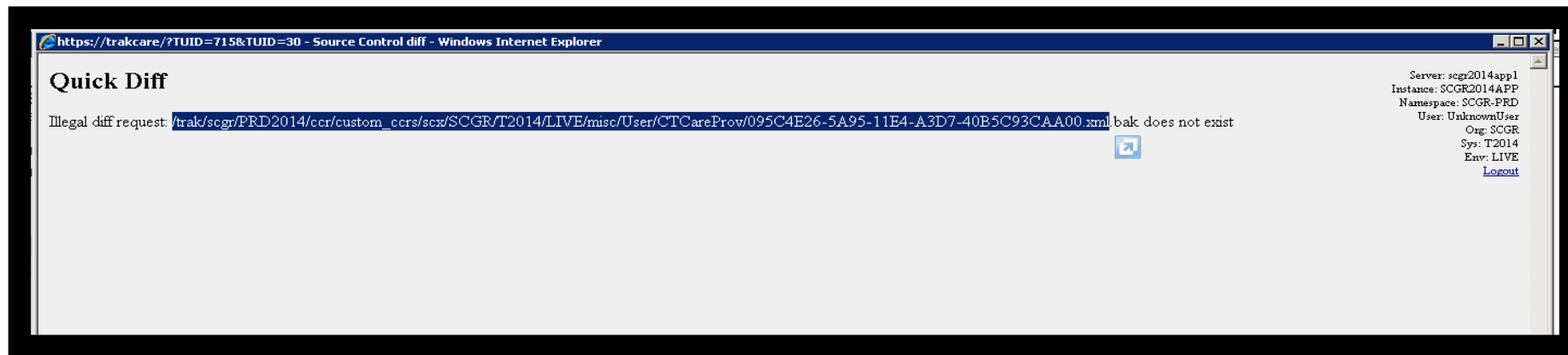
Changes will not undo within the bundle queue (cont.)

- If you do run into issues its likely that it is down to a parent table being undone before child table or the changes are undone in the incorrect order.
 - First try adding an active CCR session with the same CCR number.



Changes will not undo within the bundle queue (cont.)

- Resolution if this fails:
 - Check the diff to see if it states illegal diff:



- This can be down to a .bak file not being generated when the change was made. The .bak file is the file that is used to revert the changes, in this case it has nothing to revert back to which is why the undo failed.



Changes will not undo within the bundle queue (cont.)

- Resolution if this fails:
 - Attempt to upload the changes to a CCR, then cancel and backout that CCR and download the new Itemset to remove changes. This is the preferred approach for multiple changes.



Quiz: Debugging Incorrect configuration

Question:

Which is the best way to undo changes from a bundle list?

- A. Delete the changes from the change control table.
- B. Undo in reverse order in the bundle list.
- C. Undo in any order, as it doesn't make any difference.
- D. Upload to the CCR and follow the backout process.



Quiz: Debugging Incorrect configuration

Answer:

B. Undo in reverse order in the bundle list.

If you can, but recommended approach is:

D. Upload to the CCR and follow the backout process.



Part 9: Analytics



TrakCare Analytics – T2018

- TrakCare Analytics fully supports change control from T2018.
- Both SYS and Editions manage change control now via JIRA.
- Clients (extended analytics license) can manage change control via CCR.
- Process involves:
 - Configuration exported via new User Portal page.
 - Generates classes which appear in bundle queue.
 - Bundle and upload to promote to next environment.



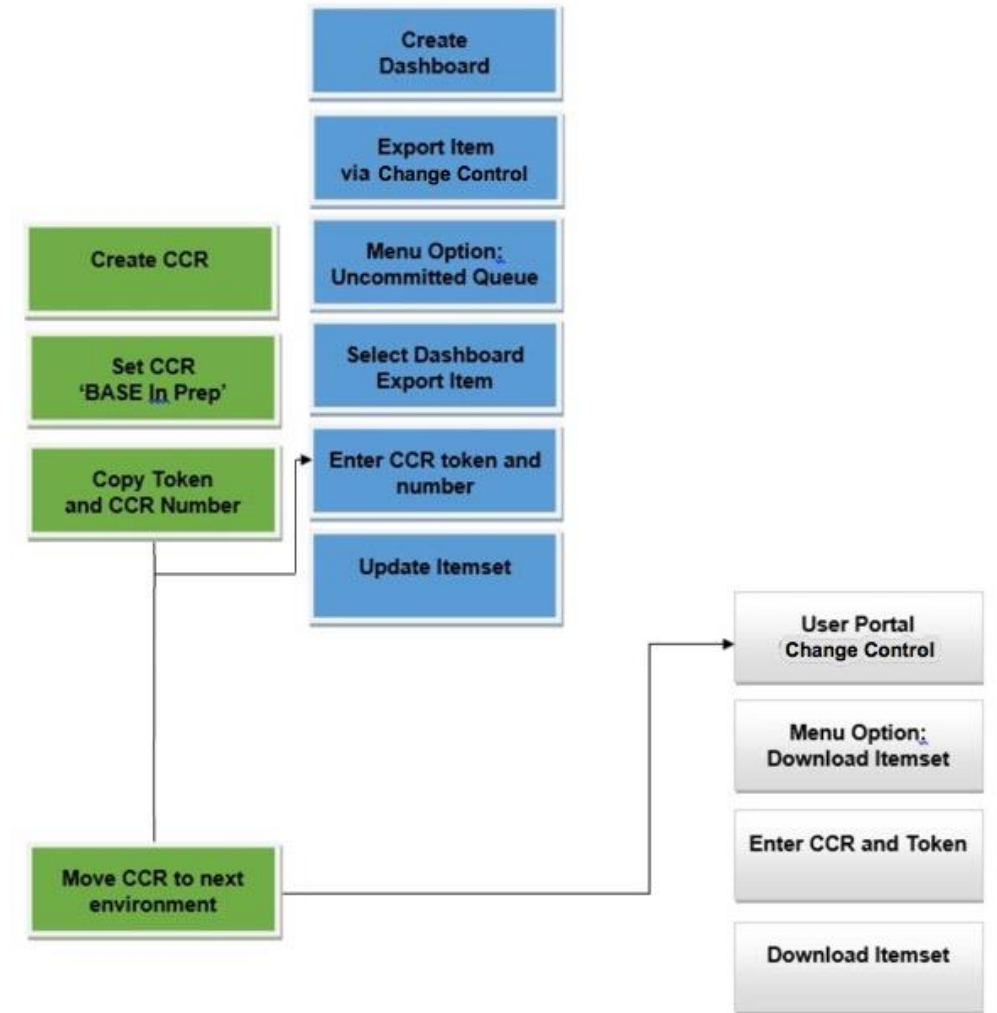
TrakCare Analytics – T2018 (cont.)

- All DeepSee configuration is exposed as classes which supports.
 - Tier 1 CCR process.
 - Tier 1 baseline.



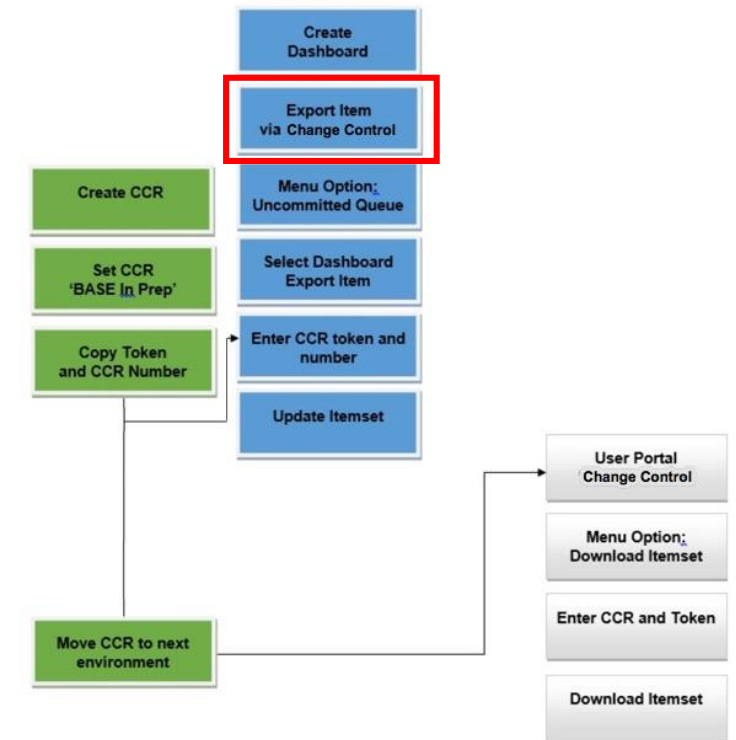
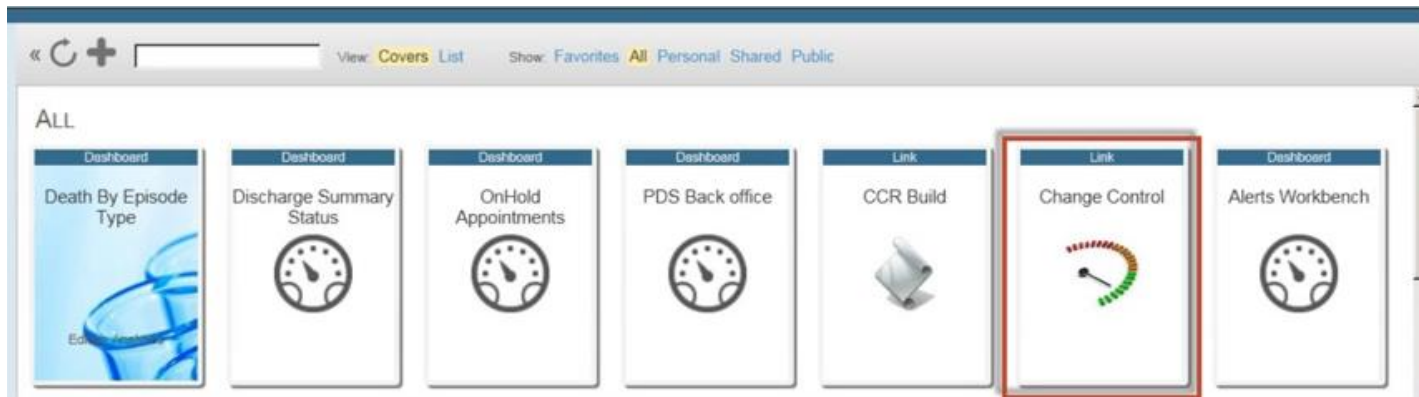
TrakCare Analytics – T2018

- Workflow process.
 - Create CCR.
 - Separate CCR System to TrakCare.
 - Create/Amend Analytics Configuration.
 - Export and move through CCR.



TrakCare Analytics – T2018 (cont.)

- Access DeepSee User Portal on Management Portal.
- Click on 'Change Control' menu.



TrakCare Analytics – T2018

- Select type from radio buttons.
- Select items from table to export.
- Click Export button – status shown.

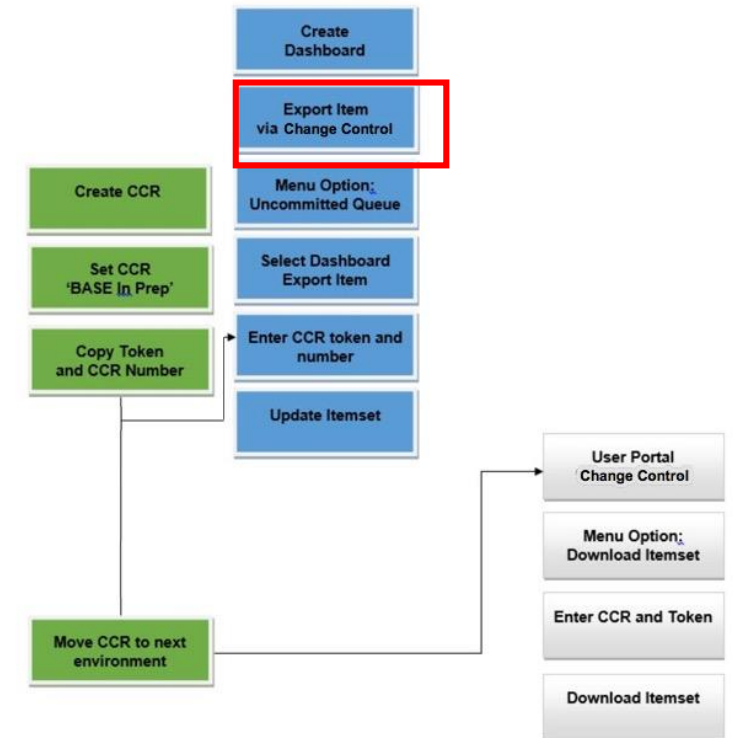
Menu Home | About | Help | Logout User Portal > Edition Analytics Change Control Edition Analytics Change Control Server: GlobalEdition User: jgoody

Status: Started building deepsee components: 10%

Export Items

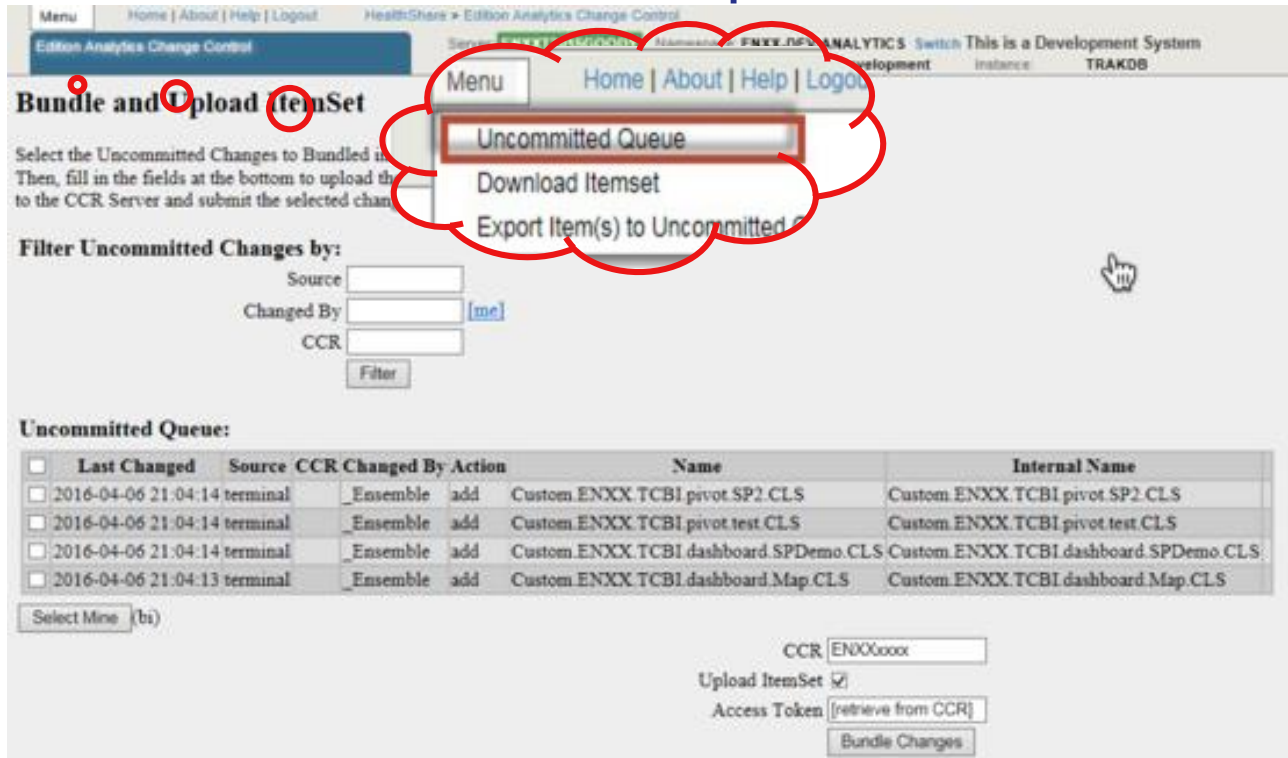
Options: Dashboard/Pivot Runtime variables Pivot variables Term Lists

| Name | Description | Value |
|--|---|-----------------|
| <input type="checkbox"/> ENXX Unify DMExcludePathways | | "DM" |
| <input checked="" type="checkbox"/> ENXX Unify ED Care Weekly Location Filter | Emergency Care Weekly Situation Location Filter | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Friends FFEmergency Discharge Condition Filter | | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Friends FFEmergency Ward Filter | Friends and Family: Emergency Location Filter X | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Friends FFIP Month Filter | Friends and Family: Inpatient Month Filter | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Friends FFIP Ward Filter | Friends and Family: Inpatient Ward Filter | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Friends FFMaternity Ward Filter | Friends and Family: Maternity Ward Filter | ##class(web...) |
| <input type="checkbox"/> ENXX Unify Local Default Day | Default Day | ##class(web...) |

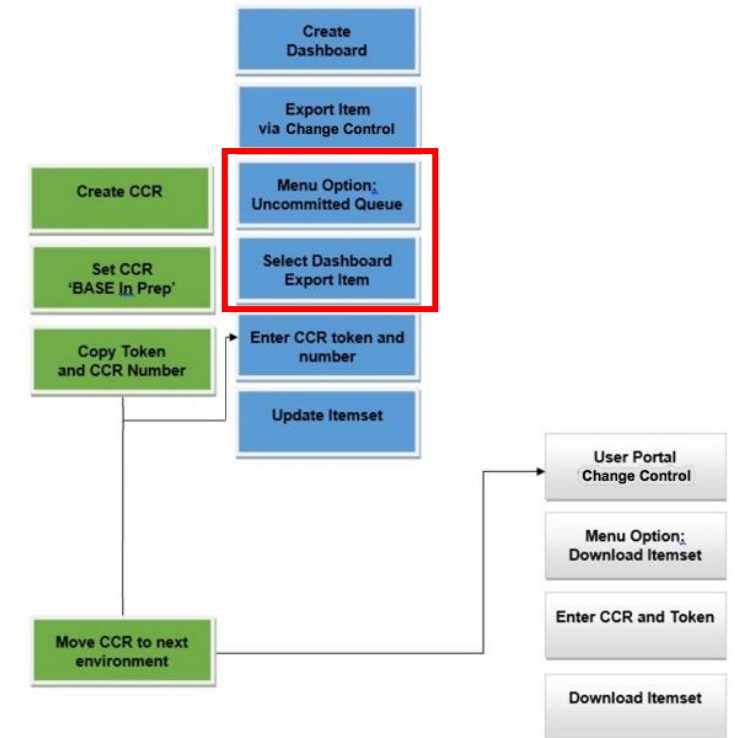


TrakCare Analytics – T2018

- Select 'Uncommitted queue' from menu.



- Select items to bundle to CCR.



TrakCare Analytics – T2018

- Enter CCR and access token.

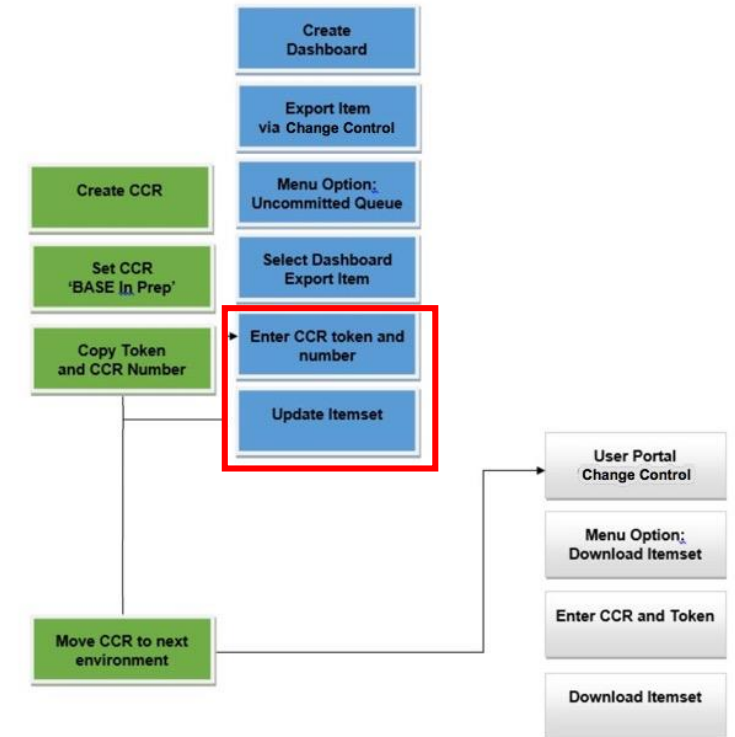
CCR

Upload ItemSet

Access Token

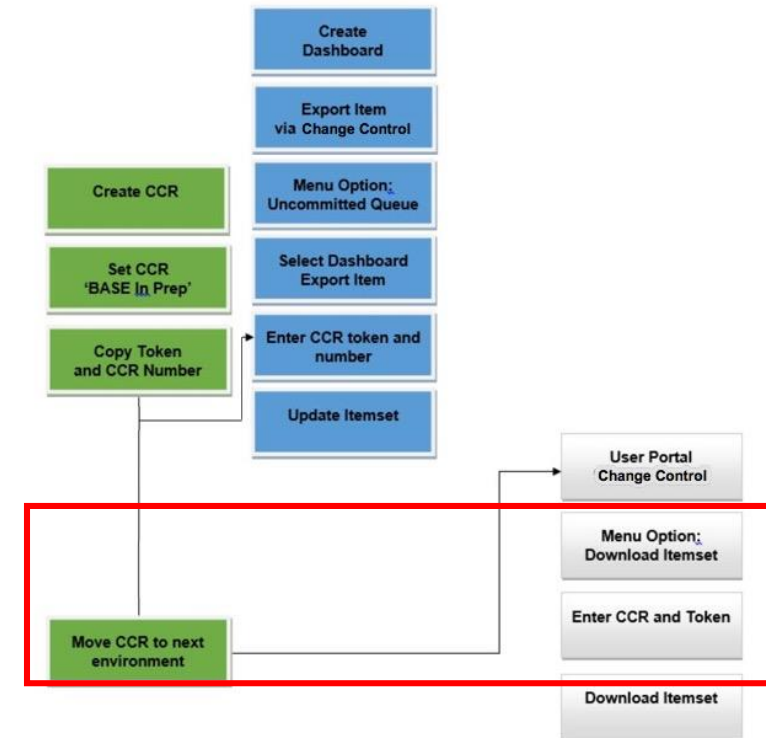
- Click 'Bundle Changes.'

```
Upload ItemSet Results  
  
***** ItemSet Upload() Method *****  
Attempting to upload ItemSet to CCR Server for ENXX0032...  
ItemSet Upload Summary:  
ItemSet File: /perforce/ENXXT2015GOODY/ItemSets/Export/ENXX/ENXX0032_BASE_ENXXT2015GOODY_48.xml  
Upload Status: Success!  
  
***** ItemSet Upload() Method Complete *****
```



TrakCare Analytics – T2018

- Log on to Management Portal for next environment.
- Access DeepSee User Portal page.
- Click on 'Change Control' link.
- From Menu select 'Download Itemset.'



TrakCare Analytics – T2018

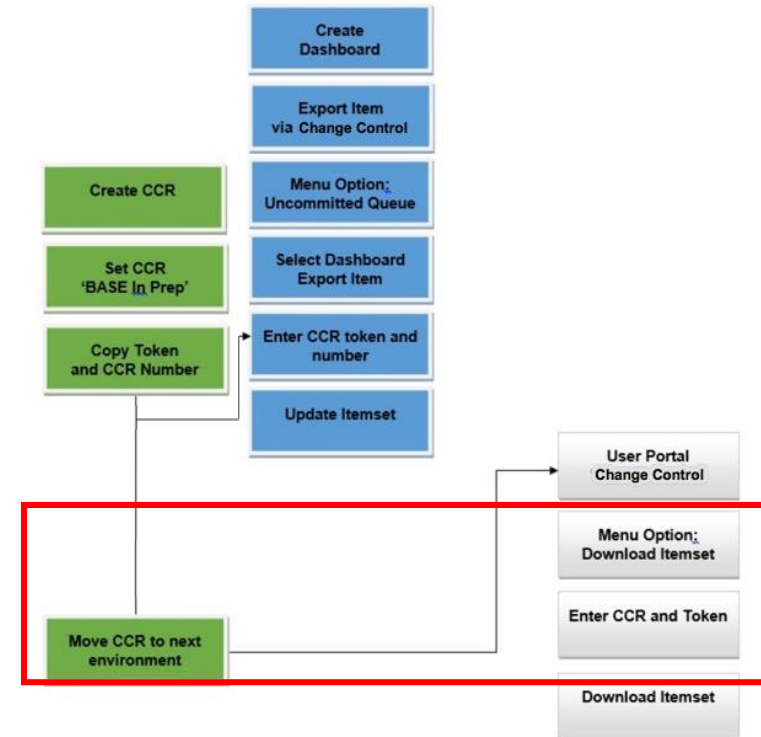
- Enter CCR number and token and click 'List ItemSets.'

Download ItemSet

Fill in the fields to download the latest ItemSet for a given CCR and load it into this namespace.

CCR

Access Token



TrakCare Analytics – T2018

- Click link to download ItemSet.

ItemSet Download


ItemSet Selection

Select an ItemSet for Download

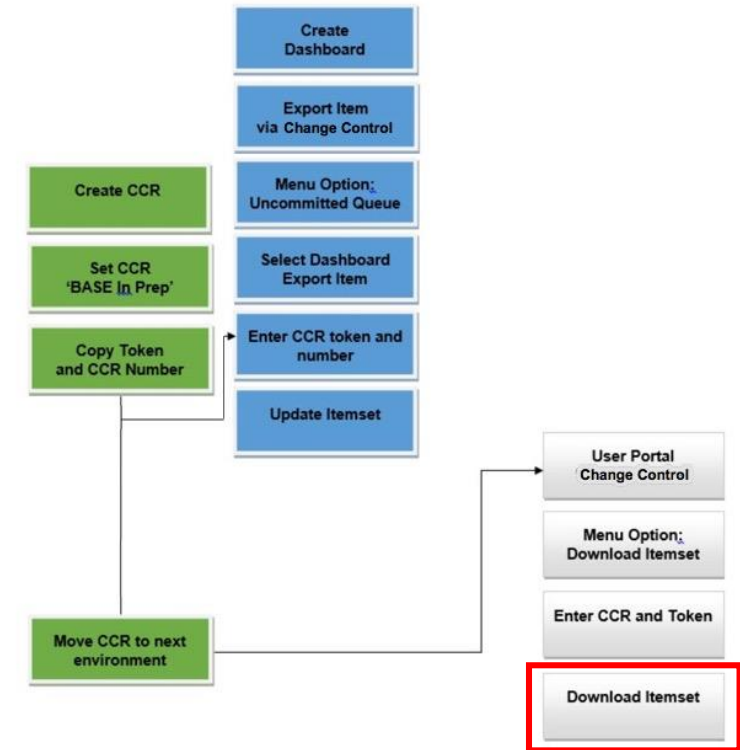

| ID | Name | Timestamp | |
|--------|----------------------------------|---------------------|--------------------------|
| 410946 | ENXX0032_BASE_ColoTRC-CCR_410946 | 2016-04-01 07:48:22 | download |

- Once downloaded changes now in environment.

Before loading:



After loading:

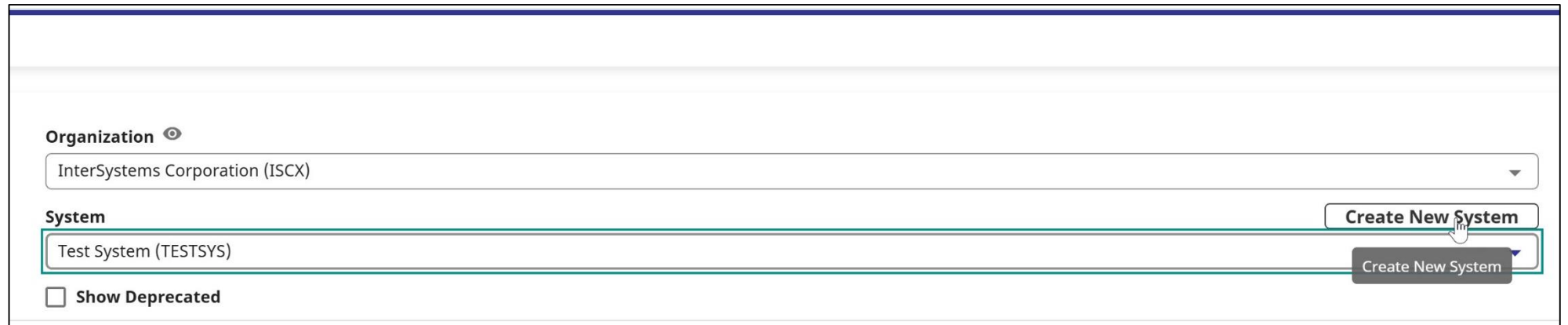
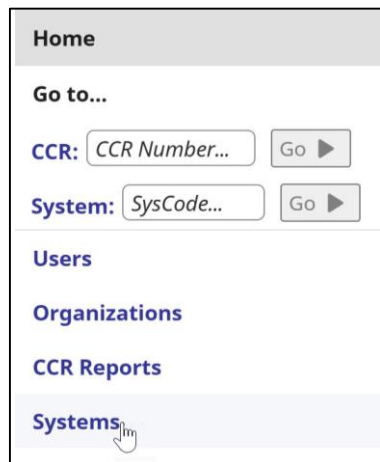


Part 10: Configure TrakCare Change Control



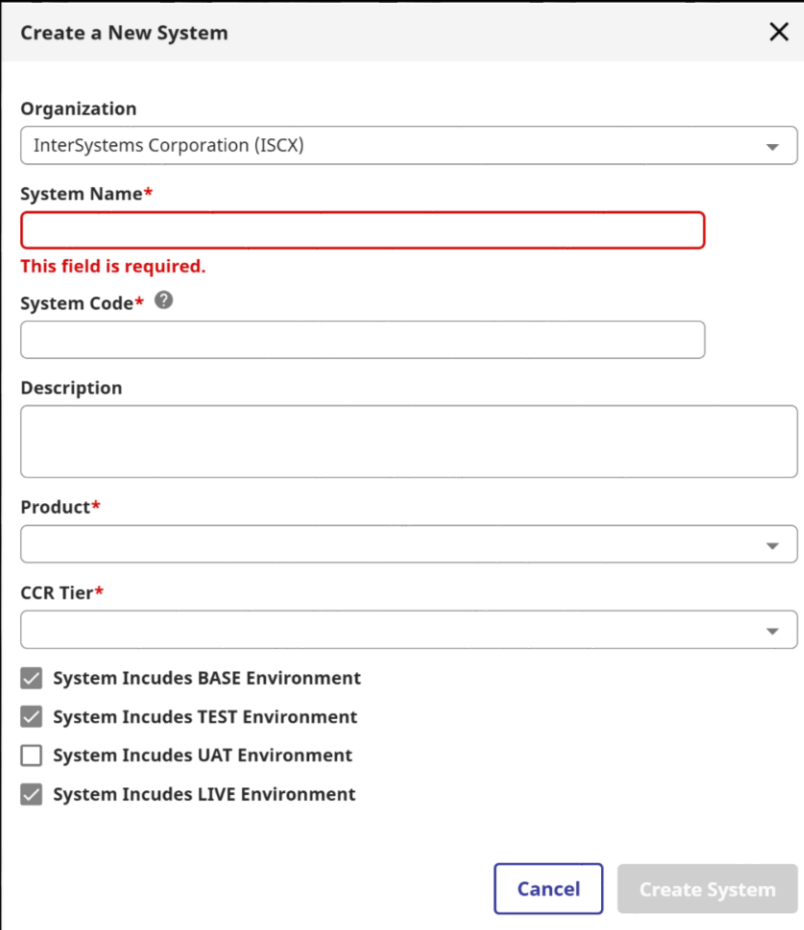
CCR Setup: Create CCR System

- Go to main menu > Systems.
- Choose Organization.
- Click Create New System button.



CCR Setup continued

- Complete fields:
 - System Name.
 - System Code.
 - Description.
 - Product.
 - CCR Tier.
- Select Environments System includes.
- Click Create System.



Create a New System [X]

Organization
InterSystems Corporation (ISCX) [v]

System Name*
[Red border] [Empty]
This field is required.

System Code* [?] [Empty]

Description
[Empty]

Product* [Empty]

CCR Tier* [Empty]

System Includes BASE Environment
 System Includes TEST Environment
 System Includes UAT Environment
 System Includes LIVE Environment

[Cancel] [Create System]



Configuring CCR Client Tools

- Open Terminal session or Putty on target instance.
- Switch to namespace to be configured.
- Enter `do Configure^%buildccr.`

```
^%buildccr routine help
Select a line label to run:
1) do Configure^%buildccr      - set up CCR client configuration details
2) do Summary^%buildccr        - display CCR client configuration details
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
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
Press any other key to quit...
```



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

```
Setting up global ^Sources ...
Please enter the following:
Perforce Root: [C:\Perforce\]
Perforce Branch (as specified in the CCR Record or System definition): [//custom
_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.



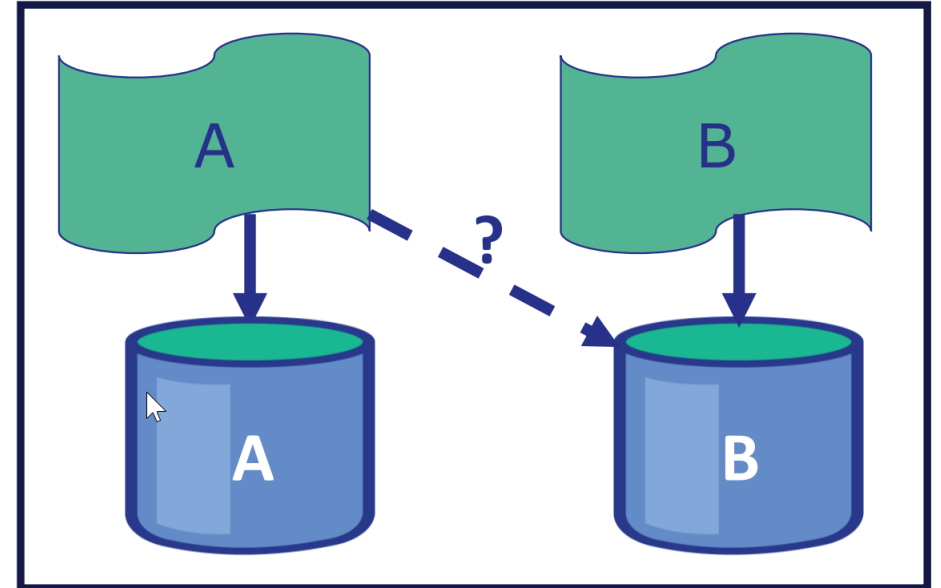
Configure ^%buildccr Prompts (cont.)

- 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.
- 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 in disconnected mode.



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.
-



Tier 2 CCR Exclusion List

- Check the CCR Exclusion List.
- Within terminal run:
 - Do ^SSADMIN
 - Select option 5 (Change Control).
 - Select option 3 (Manage Exclusion List).
 - If this is blank then get the standard set of exclusion items for each environment from [TrakCare Exclusion List](#).

```
Classes Excluded From CCR : epr.CannedText, User.ARCItemKeywords, User.CFSM, User.CFSystemFileDefinit
User.CTProvince, User.CTTestCode, User.CTZip, User.MRCClinicalPathways, User.ORCOperation, User.PACCL
User.PACCounterType, User.PACNonGovOrg, User.RBResource, websys.Configuration, User.SSHL7, User.SSInt
1. Add Class to Exclusion List
2. Remove Class from Exclusion List
Q. Quit
Option [1-2] ? Q
```



Summary

- What are the key points for this module?

