NBIA Feature CTP Description

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Document Approvals

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# Introduction

CTP is a stand-alone program that provides all the processing features of a MIRC site for clinical trials in a highly configurable and extensible application. In NBIA application, Data submission is completed by using CTP application with FieldSender.

# Summary of Feature

CTP has the following key features:

1. Single-click installation.
2. Support for multiple pipelines.
3. Processing pipelines supporting multiple configurable stages.
4. Support for multiple quarantines for data objects which are rejected during processing.
5. Pre-defined implementations for key components:
   * HTTP Import
   * DICOM Import
   * DICOM Anonymizer
   * XML Anonymizer
   * File Storage
   * Database Export
   * HTTP Export
   * DICOM Export
   * FTP Export
6. Web-based monitoring of the application's status, including:
   * configuration
   * logs
   * quarantines
   * status

# Architectural Diagram



**Figure 3.1 CTP Client Use Case**

When a user sends DICOM file to CTP client through HTTP/DICOM PACS server, the CTP client will receive the file through HttpImportService/DicomImportService. HttpImportService/DicomImportService passes it to DicomAnonymizer/XmlAnonymizer to filter the patient information, such as patent ID, patient age, and etc (depends on how to set up DicomAnonymizer/XmlAnonymizer). Then IDMap service keeps maps for patient ID and anonymized patient ID, so later, in case, the submitter wants to get real patient information based on anonymized patient information. After ID Map service, anonymized patient ID will be stored in DatabaseVerifier process for the submitter to verify the import results after submission completed. Eventually, the DICOM file is sent to CTP server through HttpExportService.

Database verifier has two functionalities, 1) store the information of submitted DICOM file, 2) After submission, Database verifier can send anonymized patient ID to CTP server, and request CTP server to verify the status of submission. Therefore, the submitter can easily find out if submission is successful or not.



**Figure 3.2 CTP Server Use Case**

When CTP server receives the DICOM file from CTP client through HttpImportService, the HttpImportService passes the file to FileStorageService, and storage service will extract image data from DICOM file and generate a JPEG file. Then FileStorageService saves both files (DICOM file and JPEG file) into NBIA file system. After processing DICOM file, the FileStorageService passes DICOM object to DatabaseExportService, Database Adapter extracts DICOM header information and saves them into NBIA database. Finally, the DicomAnonymizer will anonymize DICOM file in NBIA file system by removing all private group information, such as group 13 and storage the DICOM file back to NBIA File system.

CTP client code and CTP server code are the same, the difference between CTP client and CTP server is the pipeline configuration in CTP. As you can see above, the CTP client contains,

* Import service
* Anonymizer service
* IDMap service
* Database verifier
* Export service

And CTP server contains,

* Import service
* File storage service
* Database export service
* Anonymize service

The following Class Diagram indicates all classes and interfaces relationship for CTP,



**Figure 3.3 CTP Class Diagram**

In this class diagram, not all of CTP classes are listed. It only lists most of classes that CTP is using for NBIA application.

# Change Example 1

When new version of CTP is ready, NBIA needs to integrate it for NBIA data submission. The following instruction indicates how to do it.

**Obtain CTP source code and executable files from RSNA website.**

* Grab the source code for CTP from JP's CVS repository  
  ***CVS information:***  
  Protocol: Password server (:pserver)  
  Server: mirc.rsna.org  
  Port: 2401  
  Repository folder: /RSNA  
  User name: cvs-reader  
  Password: cvs-reader  
  Module: MIRC-Development  
  ***CTP Version:***  
  Contact John Perry to get right source code version (such as X38) and also right CTP.jar (NBIA DB Adapter library) version.  
  Note, usually CTP.jar is inside CTP-installation.jar file. You need to unzip CTP-installation.jar in order to obtain CTP.jar.
* Check in CTP.jar and CTP-installer.jar into ivy (Ask Eric for instruction)
* Modify your ivx.xml under ncia-ctp directory, make sure the CTP version is matched with ivy CTP version
* Modify build.xml under ncia-ctp directory
  + Change CTP.jar and CTP-installer.jar file version in classpath. (quick way to do it is searching CTP.jar and CTP-installer.jar)
  + Change tempX?? directory to tempX(version) on ant build properties.
* Run ant build : ant build:all on dev tier and check result to see there is any errors.
* Run ant build : ant deploy:local:install to deploy CTP on dev tier
* Run Regression sanity test.
  + Tasks
    - Submit image files
    - using DB verifier to verify the submission
    - make all images visible
    - search them through NBIA application
* Run performance test
  + Submit a large amount of images (3000 files?)
  + Submit a large amount of images through multiple clients

**Eclipse set up**

After you upgrade CTP new version, you need to change your eclipse setting by removing old ctp version from build path and add new CTP version into build path.

Keep your CTP source into T: drive. So later, you can use these source codes for debugging.

# Change Example 2

No further example.