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Radiopaedia Uploader

Instructions Manual

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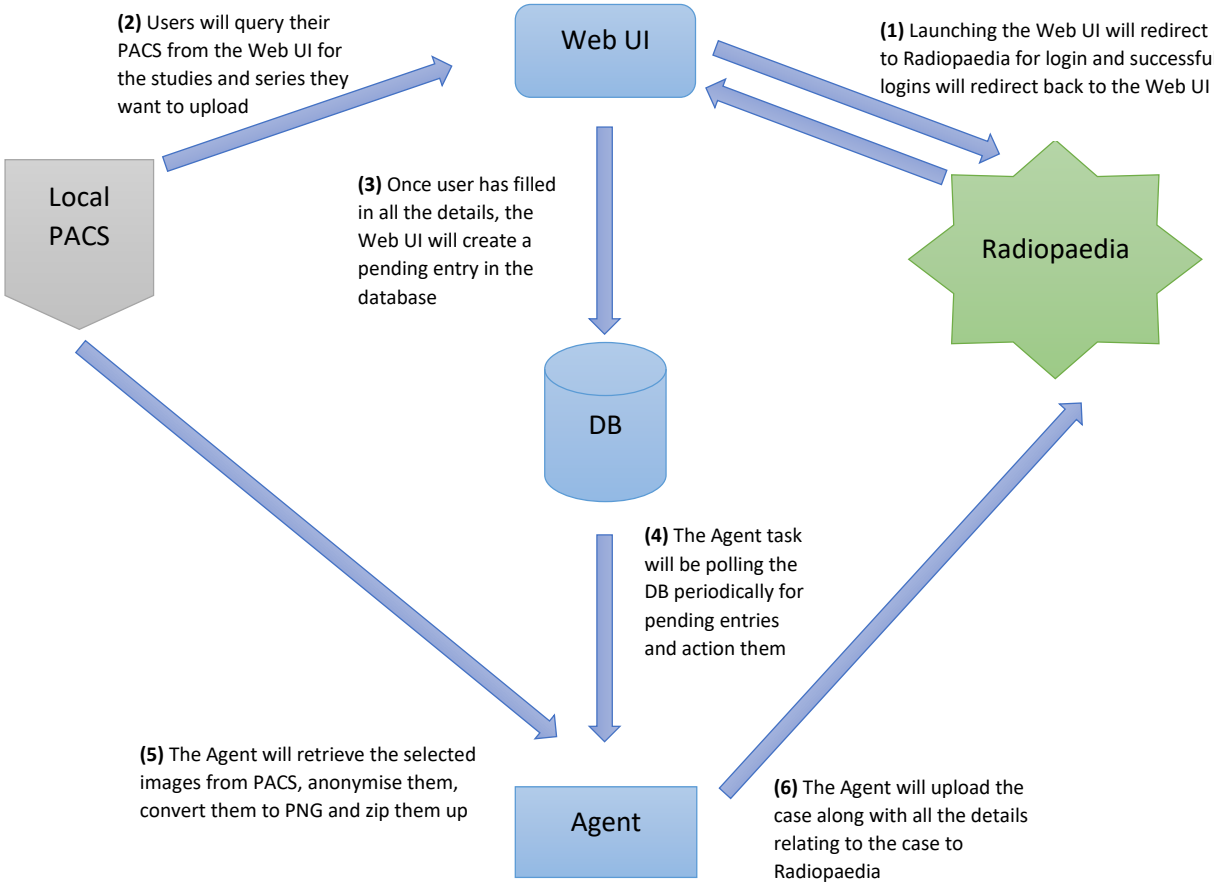
System Overview

The system allows users to upload images from their local PACS to Radiopaedia while giving users the ability to fill out the Radiopaedia cases and study information.

The Uploader system has two distinct components (three if including database) that interact with each other.



Programming/Source Code Details

The source files for the system can be found on GitHub as two public project; one for the Web UI and the other for the Agent.

Web UI: https://github.com/radiopaedia/uploader-web/

Agent: https://github.com/radiopaedia/uploader-agent/

Both projects are open sourced and licensed under the MIT License agreement. This allows you to freely make changes to the source code to suit your needs but must also allow others to do the same.

Development Information

The system was written using Microsoft Visual Studio 2015 Community Edition which is a free IDE and both the Web UI and Agent is built on the Dot Net Framework (targeted version 4.5.2).

Both components of the system use many free/open source plugins and libraries.

Web plugins:

- JQuery v1.11.3 (included in the source files)
- Bootstrap v3.3.6 (included in the source files)
- PURL v2.3.1 (included in the source files)
- JS Date v1.0 Alpha-1 (included in the source files)
- Toastr (included in the source files)
- fancyBox v2.1.5 (included in the source files)
- Cropper v2.3.2 (included in the source files)
- DataTables 1.10.11 (included in the source files)

Dot Net Libraries:

- ClearCanvas DICOM libraries **(need to compile your own)**
- PetaPoco v5.1.153 (included as NuGet package)
- Newtonsoft.Json v8.0.3 (included as NuGet package)
- DotNetZip v1.9.8 (included as NuGet package)
- Grapevine v3.1.0 (included as NuGet package)
- Topshelf v4.0.1 (included as NuGet package)

ClearCanvas Libraries

The ClearCanvas libraries are used for all DICOM related tasks. As there is no ClearCanvas NuGet package it cannot be included with the source files and the libraries must be compiled separately.

The DLL files needed are:

- BilinearInterpolation.dll
- ClearCanvas.Common.dll
- ClearCanvas.Desktop.dll
- ClearCanvas.Dicom.Codec.Jpeg.dll
- ClearCanvas.Dicom.Codec.Rle.dll
- ClearCanvas.Dicom.dll
- ClearCanvas.ImageViewer.Common.dll
- ClearCanvas.ImageViewer.Common.dll
- ClearCanvas.ImageViewer.Configuration.dll
- ClearCanvas.ImageViewer.Core.Functions.dll
- ClearCanvas.ImageViewer.dll
- ClearCanvas.ImageViewer.Tools.Standard.dll
- ClearCanvas.Utilities.Manifest.dll
- log4net.dll

Once these files are compiled, copy them to the root directory of Agent (or the Debug directory if still working on source files) and copy to the “bin” directory of the Web UI.

Installation Instructions

Installing the system requires intermediate general knowledge of IT, Windows and MSSQL.

Recommended Hardware

- CPU: Intel Core i5/i7 (4th Generation onwards)
- RAM: 4GB for 32 bit compiled/8GB for 64 bit compiled
- Hard Drive: at least 50GB useable storage preferably on SSD hard drive
- Video Card: a dedicated video card will greatly improve the DICOM to PNG conversion and optimization process

Required Software

- Microsoft SQL Server Express 2014: this has some limitations such as the number of CPU cores it can use which is not a factor for this system's tasks and also a 10GB database size limit – approximately 10,000,000 upload cases to reach this limit
- Microsoft Dot Net Framework 4.5.2
- Microsoft Windows Operating System: Windows 7, Windows 10, Windows Server 2012, Windows Server 2012 R2
- Microsoft Internet Information Services version 7 or greater

Setting up database

- Install Microsoft SQL Server: using all default settings except for the authentication method. Change the authentication method from the "Windows Authentication" default to "Mixed Mode" then create a new SQL password for the "sa" user
- Once SQL Server is installed open up the SQL Configuration Manager. Expand SQL Server Network Configuration and select Protocols for MSSQLSERVER, change TCP/IP protocol to be enabled
- Log into the SQL Server using SQL Management Studio.
    - Create a new user for the app, the default username/password is: appuser/rapiuploader
    - Create a new database, the default name of the database is: Radiopaedia
    - Assign the appuser user dataread and datawrite permissions to the Radiopaedia database
    - Run the SQL script from https://github.com/radiopaedia/uploader-agent/blob/master/CreateTables.sql to create the tables

Install Agent

- Open an elevated Command Prompt and navigate to the Agent directory
- Run the command “UploaderAgentConsole.exe install” this will install the Agent as a Windows Service
- Edit the “UploaderAgentConsole.exe.config” file and change the Connection String for the database to your database setup
- Start the Agent from Windows Services Console or by running “UploaderAgentConsole.exe start”

Install Web UI

- Copy the compiled Web UI files to a directory
- Open Windows Internet Information Services and create a new website linking the path to the above directory
- Convert the above web site to an application making sure to use the Dot Net Framework v4 as the application pool
- Create a self-signed certificate on the IIS root and assign it to the new web application this will turn it to a HTTPS web site

Radiopaedia API Registration

- Go to Radiopaedia API portal and create a new application
- Enter the local web address of your new web site as the redirect URI
- Enable the “cases” and “users” scopes for the application
- This should now generate a Client ID and Client Secret for your application

Local PACS Setup

As each PACS is different, you may need to add a new AE to your PACS in order for it to query your PACS. Make a note of this new AE as you will use it to configure the system. Make sure that this new AE has the ability to query/retrieve.

Configure Web UI

- Edit the Web.config file in the Web UI directory, change the Connection String to the database you’ve created similar to the step done for the Agent
- Navigate to the EditPacs.html of the web site
    - Enter the details of your API (Client ID/Client Secret/Redirect URI)
    - Enter the AE details you’ve created and enabled on your PACS

Support

You may contact me (Andy Le) over email andy.le@mh.org.au for any further help.

Thanks

- A.Prof Frank Gaillard: Founder/Editor in Chief Radiopaedia.org. Frank came up with the idea for this project and have been extremely supportive and influential in its development. None of this would be possible without Frank's drive and support.
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- Chris D'Aloisio: started the Radiopaedia API development and worked with me to understand the fundamental ins and outs