**Accessing data in the CUD web service.**

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*These instructions are for accessing the web service with*

1. *a REST interface batch file*

*or*

1. *A PowerShell query*

*Both requesting xml on Windows server 2008 R2.*

Other interface types and format types can be requested and are mentioned in this document

1. **The REST interface on the CUD web service**

This interface enables CUD to be queried in real time using whatever query you specify and returning the attributes which you request. The format the data is returned in can be one of:

* delimited text (including CSV),
* XML
* JSON.

To use it you need to have a web client that is capable of authenticating to the CUD server using Kerberos.

This is possible on \*nix using curl where it has been compiled with kerberos support.

For windows platforms the CUD Client for Windows is at <https://sharepoint.nexus.ox.ac.uk/sites/SSP/interfaces/SITS%20Student%20Data%20Feed/CudClient.zip> (this includes templates for configuration and some documentation)

* 1. Request Access for CUD Via an Interface

The procedure is to request personal access to the CUD Web User Interface, plus service access to other interfaces as requested initially or subsequently.

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| * + 1. **For people who have no access to CUD UI**   Use the following email template replacing elements in <> with your details:  To: [sysdev@it.ox.ac.uk](mailto:sysdev@it.ox.ac.uk)  Subject: Request for access to CUD UI  Please supply access to CUD as follows:  Name: <your name>  SSO username: <your username>  Unit: <Unit of the University with which you are affiliated>  ITSS: Y/N  Reason for access (required if not ITSS):  ITSS should be answered Y/N depending on whether you appear in the ITSS register  If you are not on the ITSS register you must provide a Reason for access - why you are requesting access, including the purpose CUD data will be put to |

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| **1.1.2. Once you have access to the CUD UI**  You can request access to an additional service interface using the following email template:  To: [sysdev@it.ox.ac.uk](mailto:sysdev@it.ox.ac.uk)  Subject: Request for access to CUD interface  Please supply service access to CUD as follows:  Name: <your name>  ITSS: Y/N  Reason for access (required if not ITSS):  ITSS Managers:  Machine FQDN: Interface requested:  ITSS should be answered Y/N depending on whether you appear in the ITSS register.  If you are not on the ITSS register you must provide a Reason for access - why you are requesting access, including the purpose CUD data will be put to  ITSS Managers is a list of members of ITSS with /itss principals (e.g. unit0001/itss) who should be given access to download kerberos principals or other credentials generated as a result of this request. At least one must be provided  Machine FQDN is the fully qualified network name of the server or service which will be using the interface, e.g. host.oucs.ox.ac.uk |

Interface requested should be one or more of:

* + **REST**
  + SOAP query or SOAP push
  + SQL Push
  + LDAP query or LDAP push

If your request is for REST, SOAP query or LDAP query and GSSAPI+Kerberos authentication is not supported by the software which will be used to access CUD, please include this information in Interface requested

You will be sent confirmation that the principal requested has been created and a link to the cud client.

* 1. Preparation

Download and install Java from [http://www.java.com](http://www.java.com/)

Download and install PuTTY from http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

Download and install WinSCP from http://winscp.net/eng/download.php

Download and install Notepad++ from http://notepad-plus-plus.org/

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| Create a folder on the C:\ Drive (or the drive you wish to run this from) to hold:  • <your named> - KEYTAB file  • login.conf - CONF File  • krb5.conf - CONF File  • NegotiateRestClient.jar – Executable Jar File |

This folder will also hold your:

• Batch Files

• Archive Folder

Batch file and archiving will be covered in section *1.7 Running test queries & 2 Further Batch file Scripts*

It will also be the destination folder for your xml.

* 1. Generate and Download a Keytab for the principal you have requested

You should be aware that the keytab generated is password equivalent for the service principal, it is completely equivalent to a password file and needs to be treated as highly sensitive.

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| Your [linux.ox.ac.uk](http://linux.ox.ac.uk) account may need activating first.  For help on this please go to:  <https://help.it.ox.ac.uk/services/linux/index>  *(Note: If you have forgotten your password or it has become out-of-date, you need to contact* [*sysdev@it.ox.ac.uk*](mailto:sysdev@it.ox.ac.uk)*.)*   1. Run the PuTTY exe 2. Input “linux.ox.ac.uk” to the Host Name 3. Open 4. Input the following   $ mkdir  $ chmod 700 cud  kadmin -p <your username>[/itss@OX.AC.UK](mailto:/itss@OX.AC.UK)  kadmin: ktadd -k <path to save keytab> cud/<FQDN of the host>@OX.AC.UK  kadmin: exit |

* 1. Move Keytab file to C:\ Drive

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| 1. Run WinSCP 2. Input as follows      1. Copy Keytab file to desktop 2. Cut and paste Keytab file to the C:\ Drive file you have created 3. This should remove the Keytab file from linux.ox.ac.uk, for security purposes you should remove it from this location, you can do this by running:   {{{  rm <path to keytab>  }}} |

* 1. Copy the supplied files to the C:\Drive:

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| The following files have been supplied at <https://sharepoint.nexus.ox.ac.uk/sites/SSP/interfaces/SITS%20Student%20Data%20Feed/CudClient.zip>, save these to the C:\Drive folder you have created:   * login.conf - CONF File * krb5.conf - CONF File * NegotiateRestClient.jar – Executable Jar File |

* 1. Edit the login.conf to suite your own environment

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| Substitute example.keytab and example.unit.ox.ac.uk to the name of your keytab file and your principal: *(I use Notepad++)*  gssnegotiate-keytab-client {  com.sun.security.auth.module.Krb5LoginModule required  useKeyTab=true  keyTab="example.keytab"  principal="cud/example.unit.ox.ac.uk";  };  com.sun.security.jgss.login {  com.sun.security.auth.module.Krb5LoginModule required  useKeyTab=true  keyTab="example.keytab"  principal="cud/example.unit.ox.ac.uk";  };  com.sun.security.jgss.initiate {  com.sun.security.auth.module.Krb5LoginModule required  useKeyTab=true  keyTab="example.keytab"  principal="cud/example.unit.ox.ac.uk";  };  com.sun.security.jgss.accept {  com.sun.security.auth.module.Krb5LoginModule required  useKeyTab=true  keyTab="example.keytab"  principal="cud/example.unit.ox.ac.uk";  }; |

* 1. – Running test queries

Producing a single record in a csv

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| **Test 1**  1. Open Notepad++  2. Enter the following query (enter your username at sso\_username):  *java -Djava.security.krb5.conf=krb5.conf -jar NegotiateRestClient.jar -c login.conf -m gssnegotiate-keytab-client -G -u https://ws.cud.ox.ac.uk/cudws/rest/search -d "q=cud\:cas\:sso\_username:****<your username>****&format=csv&history=n" -o test.csv*  3. Save as a Batch File. In the C:\Drive folder you have created.  4. Execute the batch file  This should produce a csv with basic data e.g. oxford email, sysis, affiliations, which should be saved to the same folder that holds your batch and keytab files.  If this has worked you can now query CUD DB for test data. |

Producing an xml file with multiple records

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| **Test 2**  For the purposes of importing data, I shall be using an SQL database and importing to this from XML.  1. Open Notepad++  2. Enter the following query (enter your college’s code under current\_affiliation):  java -Djava.security.krb5.conf=krb5.conf -jar NegotiateRestClient.jar -c login.conf -m gssnegotiate-keytab-client -G -u https://ws.cud.ox.ac.uk/cudws/rest/search -d "q=cud\:cas\:current\_affiliation:<loactioncode>+AND+cud\:uas\:universitycard\_comp\_date\_ts:[NOW+TO+\*]&format=xml&history=n" -o test.xml  3. Save as a Batch File In the C:\Drive folder you have created.  4. Execute the batch file  You should now have a complete xml of all those people with a current\_affiliation matching your parameter and with a current university card, which should be saved to the same folder that holds your batch and keytab files. |

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| **Important**  When querying it is important to note the following:   1. Members may be affiliated to your college/department under one or more affiliation code, you need to ensure you have queried CUD with all the relevant affiliation codes for your institute in both Current & Scoped Affiliation. 2. Applicants with offers will not have a “Current Card”. If you require these members in your interface, your query needs to reflect the lack of card. |

For instructions on how to automate this batch query please see section 3 *Task Schedules* of this document.

1.8 Querying using CUD Web UI Query reference

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| 1. Open the CUD Web UI at:   <https://ui.cud.ox.ac.uk/cudui/>   1. Select “Simple Searching” 2. Login 3. Generate & Save your query 4. At the bottom of the screen under the Query name will be a Query reference. The format will be *Query:yourusername+datetime*   1. Open Notepad++  2. Enter the following query entering the <query reference> from the web UI  *java -Djava.security.krb5.conf=krb5.conf -jar NegotiateRestClient.jar -c login.conf -m gssnegotiate-keytab-client -G -u https://ws.cud.ox.ac.uk/cudws/rest/search -d "q=*<Queryreference>*&format=xml&history=n" -o WebUIQ.xml*  3. Save as a Batch File. In the C:\Drive folder you have created.  4. Execute the batch file  This should produce a csv with basic data e.g. oxford email, sysis, affiliations, which should be saved to the same folder that holds your batch and keytab files.  If this has worked you can now query CUD DB for test data. |

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| **Important**  When querying it is important to note the following:   1. Members may be affiliated to your college/department under one or more affiliation code, you need to ensure you have queried CUD with all the relevant affiliation codes for your institute in both Current & Scoped Affiliation. 2. Applicants with offers will not have a “Current Card”. If you require these members in your interface, your query needs to reflect the lack of card. |

For instructions on how to automate this batch query please see section 3 *Task Schedules* of this document.

1. **Further Batch file Scripts**
   1. Move XML file to Archive folder and rename

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| This Script will move the XML file you are pulling from CUD to a new Folder, I have named this folder “Archive XML” It will then rename the file to today’s date.  I have created the “Archive XML” folder in the Folder which contains the XML I am moving  1. Open Notepad++  2. Enter the following script:  *move /-y "<filename>.xml" "<Archive XML\"*  *cd "Archive XML"*  *rename "<filename>.xml" %date:~-4,4%%date:~-7,2%%date:~-10,2%.xml*  3. Save as a Batch File In the C:\Drive folder you have created which contains the xml file  you are pulling from CUD.  4. Execute the batch file.  The XML file should now be in the “Archive XML” Folder under today’s date (Format YYYYMMDD) |

* 1. Delete files older than a number of days.

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| This Script will delete files from the archive folder older than a certain number of days. For <pathfile> enter the path to the Archive folder you have created. I have selected to remove files older than 10 days.   1. Open Notepad++ 2. Enter the following script:   *forfiles /p "<pathfile>" /s /d -10 /c "cmd /c del @file : date >= 10 days >NUL"*   1. Execute the batch file.   The XML file should now be in the “Archive XML” Folder under today’s date (Format YYYYMMDD) |

1. **PowerShell Scripts**

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| The Web Service can also be queried using a PowerShell script. The template scripts can be found at:   1. CUD Web Service Pull only   <https://downloads.oucs.ox.ac.uk/sysdev/cud/cudwspullonly.ps1>  This queries the CUD WS and provides an XML file (csv & JSON available)   1. CUD Web Service pull XML and transform   <https://downloads.oucs.ox.ac.uk/sysdev/cud/cudwspulltransform.ps1>  This queries the CUD WS and provides an XML file and then transforms that file to more a user-friendly XML format.  In order to carry out the transformation you will need to save the XSL file “CUD\_XML\_Transform” which can be found here:  <https://downloads.oucs.ox.ac.uk/sysdev/cud/CUD_XML_Transform.xsl>  Sample queries include for both of these templates include:   1. all current card holders 2. all current card holders and applicants. |

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| **Important**  When querying it is important to note the following:   1. Members may be affiliated to your college/department under one or more affiliation code, you need to ensure you have queried CUD with all the relevant affiliation codes for your institute in both Current & Scoped Affiliation. 2. Applicants with offers will not have a “Current Card”. If you require these members in your interface, your query needs to reflect the lack of card. |

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| **Important**  When querying it is important to note the following:   1. If you are using the “pull only” template script, you need to save the PowerShell script in the same location as your .keytab, .conf, and .jar files. 2. If you are using the “transform” template script, you need to save the PowerShell script AND the XSL in the same location as your .keytab, .conf, and .jar files. 3. Unless you have explicitly set your server to allow PS scripts to run, you may need to do so, or you may need to employ a bypass script to overcome your server settings. |

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| **VERY Important**  If you are using the Powershell Script template which pulls the xml file all current card holders and applicants. You will need to request access to the SITS data items separately. This request will have to be approved by your units information custodian, the format for requesting additional data items is:  *Note: this only covers SITS data, any requirement for data other than that from SITS will need to be added.*  To: [sysdev@it.ox.ac.uk](mailto:sysdev@it.ox.ac.uk) Subject: Request for additional CUD attributes  Body: Please supply access to additional CUD attributes as follows:  Name: <ITSS Name>  SSO: <ITSS SSO>  Service Principal: <your service principal>  Additional attributes requested:   |  |  | | --- | --- | | cud:fk:sits\_student\_code  cud:uas\_sits:alt\_email  cud:uas\_sits:application\_college\_codes  cud:uas\_sits:application\_dept\_codes  cud:uas\_sits:award\_aim  cud:uas\_sits:birth\_ctry\_cd  cud:uas\_sits:birth\_ctry\_name  cud:uas\_sits:birth\_iso\_ctry\_ct  cud:uas\_sits:birth\_s\_ctry\_name  cud:uas\_sits:cntry\_of\_leg\_residency  cud:uas\_sits:co\_owning\_dept\_code  cud:uas\_sits:college\_cd [3]  cud:uas\_sits:contributing\_dept\_code  cud:uas\_sits:course\_block  cud:uas\_sits:course\_join\_status  cud:uas\_sits:course\_status  cud:uas\_sits:crs\_end\_dt  cud:uas\_sits:crs\_exp\_end\_dt  cud:uas\_sits:crs\_level  cud:uas\_sits:crs\_start\_dt  cud:uas\_sits:deceased  cud:uas\_sits:degree\_class\_cd  cud:uas\_sits:dept\_cd [3]  cud:uas\_sits:dept\_name  cud:uas\_sits:div\_cd  cud:uas\_sits:div\_desc  cud:uas\_sits:dob  cud:uas\_sits:dom\_cd  cud:uas\_sits:dom\_hesa\_cd  cud:uas\_sits:dom\_name  cud:uas\_sits:finalist  cud:uas\_sits:frnm1  cud:uas\_sits:frnm2  cud:uas\_sits:frnm3  cud:uas\_sits:gnd | cud:uas\_sits:gnd\_name  cud:uas\_sits:initials  cud:uas\_sits:known\_as  cud:uas\_sits:middle\_names  cud:uas\_sits:mobile\_phone\_no  cud:uas\_sits:mode\_of\_attendance  cud:uas\_sits:oss\_code [1]  cud:uas\_sits:ox\_email  cud:uas\_sits:ox\_sso  cud:uas\_sits:ox\_unicard  cud:uas\_sits:prev\_name  cud:uas\_sits:prev\_surnm  cud:uas\_sits:prev\_surnm\_eff\_dt  cud:uas\_sits:primary\_email  cud:uas\_sits:primary\_phone\_no  cud:uas\_sits:residency\_status  cud:uas\_sits:rout\_cd  cud:uas\_sits:rout\_name  cud:uas\_sits:scj\_status\_cd  cud:uas\_sits:scj\_status\_name  cud:uas\_sits:suffix  cud:uas\_sits:surnm  cud:uas\_sits:titl\_cd  cud:uas\_sits:unit\_set\_cd  cud:uas\_sits:addresses  cud:uas\_sits:applicant  cud:uas\_sits:contact\_details  cud:uas\_sits:external\_ids  cud:uas\_sits:nationalities  cud:uas\_sits:qualifications  cud:uas\_sits:student  cud:uas:universitycard\_start\_date  cud:uas:universitycard\_comp\_date  cud:uas:universitycard\_mifare\_id  cud:uas:universitycard\_paxton\_id |   ITSS: Y  Reason for access:  You can group the items under a specific reason, rather than have to give a reason for each individual item |

1. **Task Schedules**

You can automate the batch file you have created to Query CUD using Windows Task Scheduler. You can also move this file to a different “archive” folder and rename it automatically; and delete files older than a certain number of days (10 in the example given here)

These instructions apply to Windows Server 2008 R2.

* 1. **Automating Batch Files**

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| 1. Start Menu 🡺 All Programs 🡺 Adminitrative Tools 🡺 Task Scheduler 2. Select “Task Scheduler Library”      1. Select “Create Basic Task…” 2. Insert “Name:” for task e.g. CUDQuery *(Add description if you require)* 3. Next 4. Select trigger *(recommended daily)* 5. Next 6. Input schedule “Start” date and time, and “Recur every:”      1. Next 2. Select action Start a program 3. Next 4. Browse to the Batch File you have created and saved on the C:\ drive      1. Add path file to Batch file in “Start in” field. 2. Next 3. Select the “Open the Properties dialog….” Option      1. Finish      1. The CUD Query should now be in your Library. |

1. **Query Syntax Help**

=cudQuery String Syntax (q=)

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SPACES (+)

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Escape qualifiers (\)

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q=cud\:cas\:lastname:<Bloggs>

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ALL Records (\*) NO NULLS

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q=cud\:cas\:lastname:<Bloggs>+AND+cud\:cas\:current\_affiliation:\*

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AND (AND)

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q=cud\:cas\:lastname:<Bloggs>+AND+cud\:cas\:current\_affiliation:<abcd>

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OR (OR)

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q=cud\:cas\:lastname:<Bloggs>+OR+cud\:cas\:current\_affiliation:<abcd>

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NOT (-)

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q=cud\:cas\:lastname:<Bloggs>+AND+-cud\:cas\:current\_affiliation:<abcd>

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DATE QUERY (Future dates)

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q=cud\:cas\:current\_affiliation:<abcd>+AND+cud\:uas\:universitycard\_comp\_date\_ts:[NOW+TO+\*]