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| **[http://yuukou.wmin.ac.uk/install/readme_files/image012.jpg](http://project5.cpc.wmin.ac.uk/availability/index.php?campus=NCS&xdeparment=true&plasma=true)** |
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| System description  Date: April 2006  Demo: <http://project5.cpc.wmin.ac.uk/availability/index.php?campus=NCS&xdeparment=true&plasma=true> |

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| **System objective:** |
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| Yuukou, from the Japanese *Yuukou* that means ***validity (an), availability, effectiveness***, is a system that collects authentication information from LDAP servers in order to understand and build the resource infrastructure and its usability. The system architecture uses a simple learning process to deduct and keep the structure up-to-date with a minimum initial setting up. Yuukou is been created to show the usability of computing labs and keeps its historical information at the University of Westminster, Cavendish IT Services, London (www.wmin.ac.uk). |

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| **System architecture** |
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| The system is been divided in two main sections (Figure 1) i) a module that retrieves user authentication information from an LDAP server and uses the system parameters to store and update the system architecture and user status in a relational database ii) a set of web pages that present the data collected to the end user.    http://yuukou.wmin.ac.uk/install/readme_files/image013.gif  Figure 1: Yuukou architecture |

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| **System internal description and technology** |
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| 1. System restrictions:  –         Only resources where the user’s authentication is done against a LDAP server can be measured by Yuukou, given that the only source of information is retrieved from there.  –         Computing labs needs to follow either of this rules:  o        IP patter: All its resources are in a limited fixed IP range, ie from 10.2.1.100 to 10.2.1.120  o        DNS name patter: All it resources have a fix ip with a DNS name that follows this pattern: STARTNAME%ENDNAME, i.e. lab2pc1.wmin.ac.uk, lab2pc1.wmin.ac.uk, lab2pc1.wmin.ac.uk where STARTNAME= lab2pc and ENDNAME=.wmin.ac.uk.    2. Technology Requirements:  –         Perl V5 or later with the following packages installed DBI; DBI::Transaction; Net::LDAP; Net::LDAP::Util qw( ldap\_explode\_dn); Net::DNS; Net::Inet; NetAddr::IP; Net::IP; Date::Manip;  –         Mysql with InnoDB Storage engine ( a transaction-safe (ACID compliant) storage engine)  –         A web server with php support    3. System internal description:    3.1 System tables:  –        [yuukou\_campuses](http://project5.cpc.wmin.ac.uk/mysql/current/tbl_properties_structure.php?lang=en-utf-8&server=1&collation_connection=utf8_general_ci&db=yuukou&table=yuukpu_campuses): In this table a list of campuses needs to be added  –         [yuukou\_departments](http://project5.cpc.wmin.ac.uk/mysql/current/tbl_properties_structure.php?lang=en-utf-8&server=1&collation_connection=utf8_general_ci&db=yuukou&table=yuukpu_campuses): In this table a list of deparments or IT services in charge of the computing rooms needs to be added  –         [yuukou\_rooms](http://project5.cpc.wmin.ac.uk/mysql/current/tbl_properties_structure.php?lang=en-utf-8&server=1&collation_connection=utf8_general_ci&db=yuukou&table=yuukou_rooms) : This table keeps the computing room description with special attention to the fieds:  a.       ip\_start:the very first ip number used in this lab (null if this labs follows a DNS name pather)  b.       ip\_end the last ip number used in this lab (null if this labs follows a DNS name pather)  c.       hostname: The STARTNAME of the DNS patter.  d.       Domainname: The ENDNAME of the DNS patter.    3.2) Yuukou Robot description  The Yuukou robot module can be used for two purposes, as described in its usage:  Yuukou/bin> perl yuukou.pl  Usage: perl roboto.pl [D|I]  where 'D' updates the login data from the ldap server (Suggestion: run it every 5 minutes)  and 'I' updates the resource status (Suggestion: run it every 30 minute  –         The ‘D’ option does the following  o        Queries the LDAP server with a timeout of 3 minutes  o        Retrieves all current user authentication information from the server  o        Creates a resource table with the IP used for that user (If the IP is in use, that means that a resource with that IP exits and is alive)  o        If the IP exits, then the last time when the resource has been alive is updated.  –         The ‘I’ option does the following  o        Checks and verify the range of IPs in the Rooms table  o        Updates the resource status regarding the last alive date           If in 7 days (it can be changed) the resource has not been used, the resource status is changed to “Warning”           If in 12 days (it can be changed) the resource has not been used, the resource status is changed to “Down”           If in 30 days (it can be changed) the resource has not been used, the resource is deleted from the table    3.3) Yuukou Public and Private web pages description  A number of web pages presents the information that the robots has been building from the LDAP servers taking into account the rooms, departments and campus data:  –         Public pages  o        A full page with all campuses and computing room current usability  o        A page per campus with computing room current usability  o        A page per campus and department with computing room current usability  o        Any of those previous pages using a different set of fonts to be shown in a big plasma screen.    http://yuukou.wmin.ac.uk/install/readme_files/image004.jpg  Figure 2: Yuukou public page screenshot showing a campus and department computing lab usability    –         Private pages (always under construction)  o        Ldap user validation (username and password)  o        The same pages that you can get in the public web pages with           List of Down resources           A windows that shows as a mouse over action the user ID, name, picture, login date and time.           An option to add some comments about that user (in order to keep lab behaviour records)           A different user colours that shows the user lab behaviour and records           Links to computing lab statistics    http://yuukou.wmin.ac.uk/install/readme_files/image006.jpg  Figure 3: Yuukou admin page screenshot showing a user data  http://yuukou.wmin.ac.uk/install/readme_files/image014.jpg  Figure 4: Yuukou admin page screenshot showing a user lab behaviour    4. System initial setup:  –         Database setup  o        Create a mysql database (ie yuukou)  o        Select that database and execute the script ./install/yuukoudatabase.sql in order to create the database structure.  o        Manually populate: (See “3. System internal description-> 3.1 System tables”for more information)           yuukpu\_departments           yuukpu\_campuses           yuukou\_rooms  o        Create user yuukou\_frontpage (read access to yuukou tables) and yuukou\_robot (full access to yuukou tables)           Change yuukou\_robot credentials in availability/yuukou/bin/yuukou.pl (sub open\_dbi)           Change yuukou\_frontpage credentials in /packages/availability/admin/include/database\_functions.inc.php  o        Modify the crontab schedule:           0,5,10,15,20,25,30,35,40,45,50,55 \* \* \* \* perl /availability/yuukou/bin/yuukou.pl D >> /availability/yuukou/logs/yuukou.out &2>&1           0,30 \* \* \* \* perl /availability/yuukou/bin/yuukou.pl I >> /availability/yuukou/logs/yuukou.out &2>&1           1 1 \* \* \* /availability/backup/bin/yuukoubackup.sh >> /availability/backup/logs/backupyuukou.out &2>&1  4. Backup:  –         Database  o        The crontab is been set with the line  1 1 \* \* \* /availability/backup/bin/yuukoubackup.sh >> /availability/backup/logs/backupyuukou.out &2>&1  –         System  o        /availability/\* needs to be backup up every day after 2AM  5. Recovery:  –         Database  o        If the crontab is been set properly, the database is backup up everyday day at 1:01AM. The output is sent to /availability/backup/data in two daily files:           yuukoubackupCore-YYY-MM-DD-WeekdayX.sql.bz2 where all the tables but [yuukou\_login\_data\_log](http://yuukou.wmin.ac.uk/mysql/current/tbl_properties_structure.php?db=yuukou&table=yuukou_login_data_log) is backed up           yuukoubackupLoginLog--WeekdayX.sql.bz2 where [yuukou\_login\_data\_log](http://yuukou.wmin.ac.uk/mysql/current/tbl_properties_structure.php?db=yuukou&table=yuukou_login_data_log) is backed up  o        In order to recover the database,  o        a new database needs to be created,  o        The latest yuukoubackupCore-YYY-MM-DD-WeekdayX.sql.bz2 needs to be uploaded  o        The latest yuukoubackupLoginLog--WeekdayX.sql.bz2 needs to be uploaded  o        A user yuukou\_frontpage (read access to yuukou tables) and yuukou\_robot (full access to yuukou tables) needs to be created           yuukou\_robot credentials needs to be added in availability/yuukou/bin/yuukou.pl (sub open\_dbi)           yuukou\_frontpage credentials needs to be added in /packages/availability/admin/include/database\_functions.inc.php  –         System  o        Recover the complete / availability/\* files into the new location  o        Manually run           perl /availability/yuukou/bin/yuukou.pl  The output has to be  Usage: perl roboto.pl [D|I]  where 'D' updates the login data from the ldap server (Suggestion: run it every 5 minutes)  and 'I' updates the resource status (Suggestion: run it every 30 minutes) needs to be           perl /availability/yuukou/bin/yuukou.pl I (No output if everything is ok)           perl /availability/yuukou/bin/yuukou.pl D (No output if everything is ok)  –         Finally  o        Modify the crontab schedule as described in 4. System initial setup:  6. Troubleshooting:  –         The “Updated at” time is not showing a recent time/date  o        Double check that the crontab is set up properly  o        Run perl /availability/yuukou/bin/yuukou.pl I and see if the time is updated now  o        See availability/yuukou/logs/ yuukou.out to see if any error has happened (The most typical error is “2006-5-11 12:58:15 LDAP: 3 - Timelimit exceeded” that means that the LDAP server is not answering the perl module queries in 3 minutes)  –         The system is running slow  o        Delete all the “TOBEDELETED” resources that are listed in the table yuukou\_resources. (ie delete from yuukou\_resources where status = ‘TOBEDELETED’  o        Check if all tables in both databases (yuukou and plasmas) are ok using the mysql command CHECK TABLE table\_name  o        In case of finding a corrupted table, repair it using the mysql command REPAIR TABLE table\_name |