1. Tried to find keywords in codes. (ex, return value of talbe\_gacl\_acl(write, view, addonly, etc), but couldn’t find. So tried to find the part where they import the data table.
2. Searched file name(gacl\_acl), and found function ‘add\_object\_section’ in gacl\_api.class.php file.

And they save talbe values in $object\_sections\_table (depends on object type, ex ) aro, aco, axo, acl, it saves into $object\_sections\_table regardless of its type)

1. Searched $object\_sections\_table to how they use values inside this table found it saves into $query
2. Realized this file is setting up acl values(add, remove, or modify), not use them
3. Read through all the codes from start(except frontend)
4. Found README file on gacl/test\_suite.
5. Found synopsis of gacl

if ( $gacl->acl\_check( <ACO Section VALUE>, <Access Control Object VALUE> , <ARO Section VALUE>, <Access Request Object VALUE> ) ) {

echo "Access Granted!";

} else {

echo "Access Denied!";

}

1. Got some more information from README
   1. Tried to find acl\_check function in function
   2. More info in <http://phpgacl.sourceforge.net/>
      1. ACO(Access Control Objects) =  control what access is available to "requesters"
      2. User definable "Access Request Objects" (ARO). These are objects which request access from an "Access Control Object"
      3. "Access eXtension Objects" (AXO) grained permissions on each individual item in your application
      4. We can use AXO, ARO with ‘Allow’, ‘Deny’ option such as

|- Staff ( ALLOW [View Own - Projects], ALLOW [Add - Projects], ALLOW [Edit Own - Projects] )

| |- Facilitators ( DENY [Add - Projects] )

1. Found first acl\_check in gacl/admin/templates\_c/acl\_admin.php, but it is the part it uses to determine user is admin or not
2. Realized that every files in gacl/admin/templates\_c start with acl\_check(there is no definition, and it also has

require\_once('gacl\_admin.inc.php');, so I tried to find require\_once(‘gacl\_admin.inc.php’)

1. require\_once(dirname(\_\_FILE\_\_).'/../gacl.class.php');

require\_once(dirname(\_\_FILE\_\_).'/../gacl\_api.class.php');

require\_once(dirname(\_\_FILE\_\_).'/gacl\_admin\_api.class.php');

found these lines and opend it one by one

1. there is a function definition about acl\_check() in gacl.class.php

realized that acl\_check() function is not returning its acl value, and it just determines it is acl or not.(by using array named ‘$acl\_result’) and returns only ‘allow’ column.

1. right under acl\_check() function, I found acl\_return\_value.
2. It saves gacl\_acl values in $acl\_result array and returns only ‘return\_value’ column
3. I learned that variable with $ can be used as global variable, so I started to find $acl\_result array and acl\_return\_value() function, and acl\_check

Because my hypothesis was

* + 1. It will use acl\_check(‘admin’, \*) to check its role
    2. It will use acl\_return\_value() to match with strings such as ‘admin’, or ‘physicians’

1. While searching for the functions and values, found view\_action() function in controllers/C\_Document.class.php
2. It uses acl\_check(‘admin’, ‘super’) to determine user is administrator or not, and gives authority
3. But it only checks admin or not, but I need who can access to each category. I found that we can determine it by acl\_check, so I started again with controllers(I searched that controller contains main operating codes)
4. There was no access classifying codes.
5. I tried to look through codes from start again focused on acl\_check
6. Found that acl\_check(‘squads’) and acl\_check(‘encounters’) in patient\_file/encounter/diagnosis.php
7. Also found acl\_check(‘admin’) in patientfile/encounter/forms, and it gives authority to make new patient only to admin.
8. In patient\_file/history/edit\_billnote.php, there is acl\_check(‘acct’, ‘bill’, ‘’, ‘write’) which gives authority to edit bill note only to ‘accountant’ to write
9. In patient\_file/history/history.php, history\_full, history\_save.php, it has acl\_check(‘patients’, \*, \* write), which makes only patient can write.
10. There is acl\_check(‘admin’, ‘super’) in transaction/delete.php which gives authority to delete row of data only to administrator.
11. In conclusion, OpenEMR saves user’s authorities in gacl\_aco\_sections, and table\_gacl\_acl\_sections. Import those table data in $object\_sections\_table, and check the authority by using function acl\_check(values, \*, authority) (ex, admin, squad… for values, write, view, … for authority)