CWeb – RESTful interface for VistA environment

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Prerequisites

1) Cache installation

Downloading the trial version of Cache

From Intersystems:

https://download.intersystems.com/download/register.csp

Installation of Cache

Follow instructions to install in default location like

C:\InterSystems\Cache\

or in the location you prefer for any reason

2) VistA installation

Downloading FOIA instance

Get the latest FOIA instance of VistA from

http://foia-vista.osehra.org/

select DBA_VistA_FOIA_System_Files/

and then the latest file similar to

DBA_VISTA_FOIA_20160617-CACHEv2014.zip

unzip the file

Unzip the file. To the separate folder in your PC. Note: the size of the file is > 4 GB

Adding VistA database to your Cache instance

Use the following links to familiarize yourself with he process:

https://community.intersystems.com/product-documentation/cach%C3%A9-system-administration-guide%C2%A0%C2%A0%E2%96%B6%C2%A0%C2%A0configuring-cach%C3%A9%C2%A0%C2%A0%E2%96%B6%C2%A0%C2%A0local-databases

https://community.intersystems.com/video/management-portal-namespaces-and-databases

Create the local database (with the existing file you downloaded) :

Use the folder in which you unzipped cache.dat file downloaded from http://foia-vista.osehra.org/

in the option:

Management portal → System administration → Configuration → System Configuration → Local databases

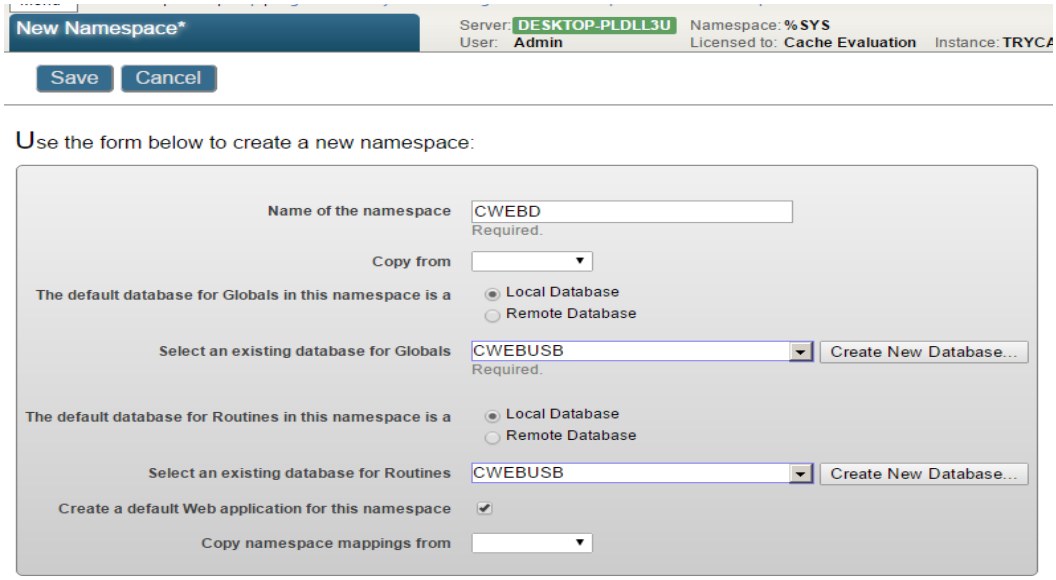
Click on "Create new database" and follow the wizard

Create the new namespace:

Use the option:

Management portal → System administration → Configuration → System Configuration → Namespaces

Click on "Create new namespace" and follow the wizard. In the example below, I am creating the namespace "CWEBD" with the use of previously created local database "CWEBUSB" (I select it from the dropdown list) for both Globals and Routines (this is because the VistA database contain both in one database) :

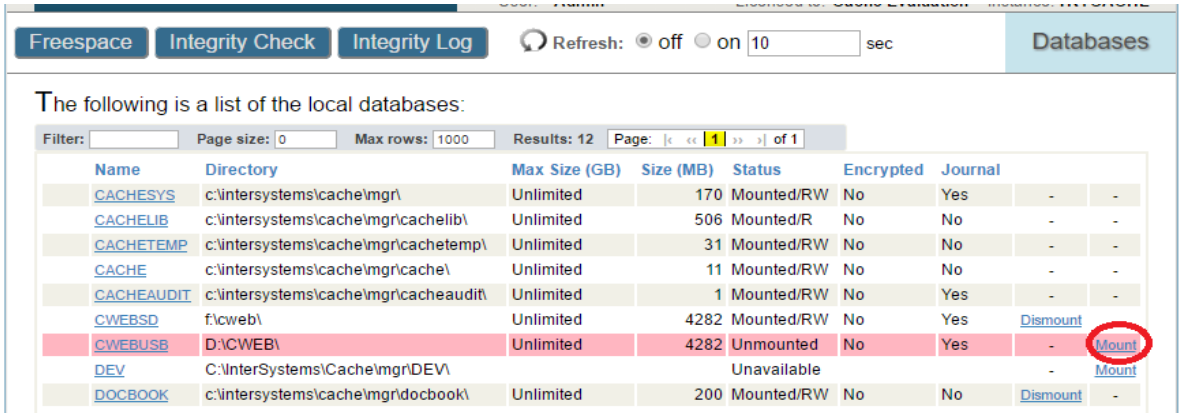


Mounting :

Mount the database to your namespace in the option :

Management portal → System → Databases

Click on "Mount" for your database

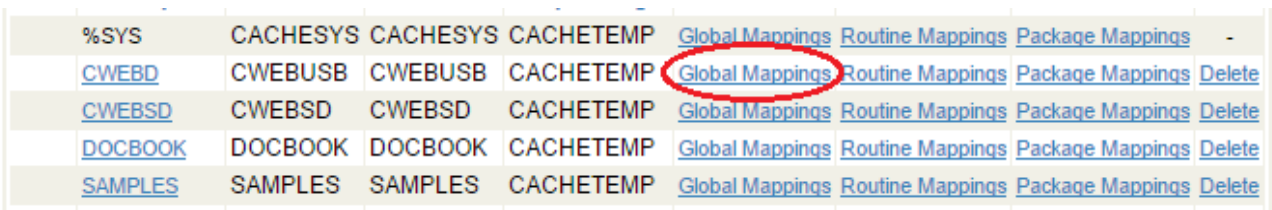


Mapping:

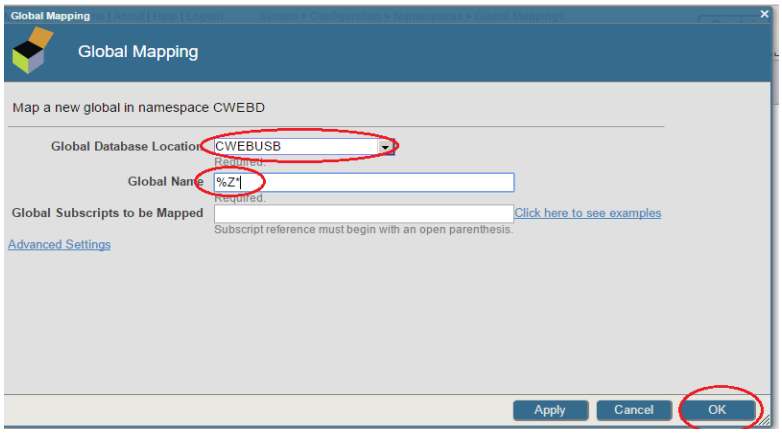
In the option

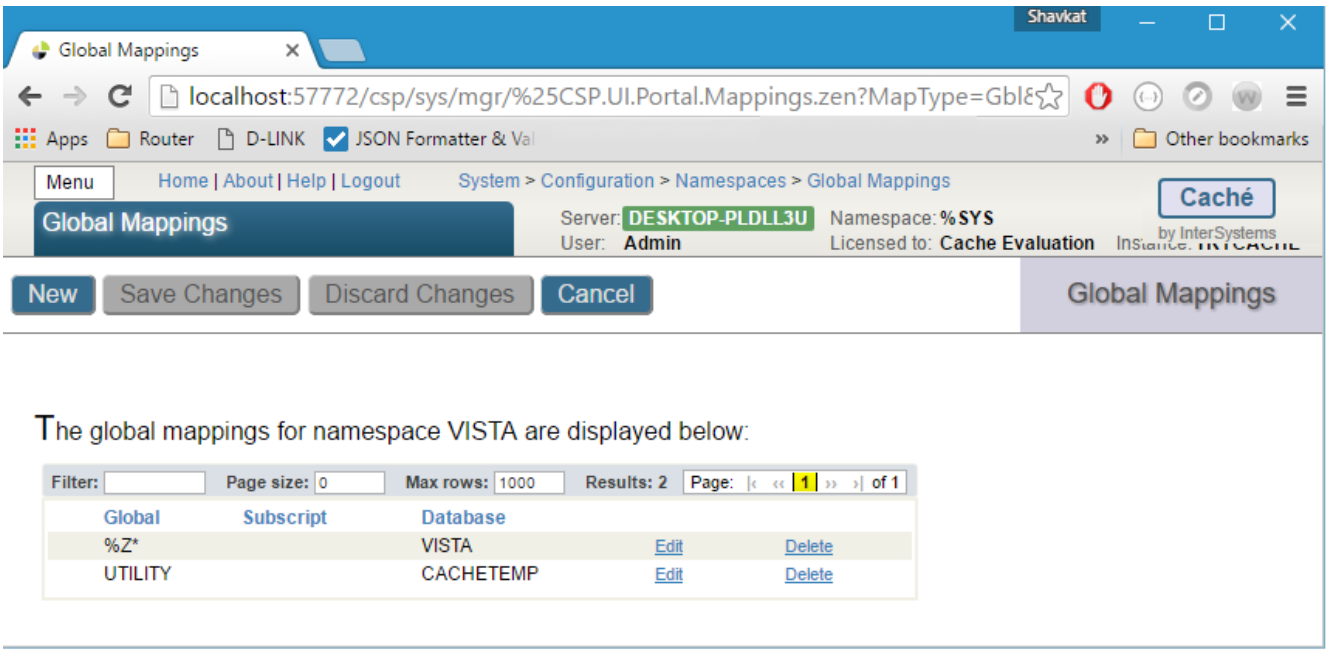
Management portal → System administration → Configuration → System Configuration → Namespaces

Click on Global mapping to map globals:

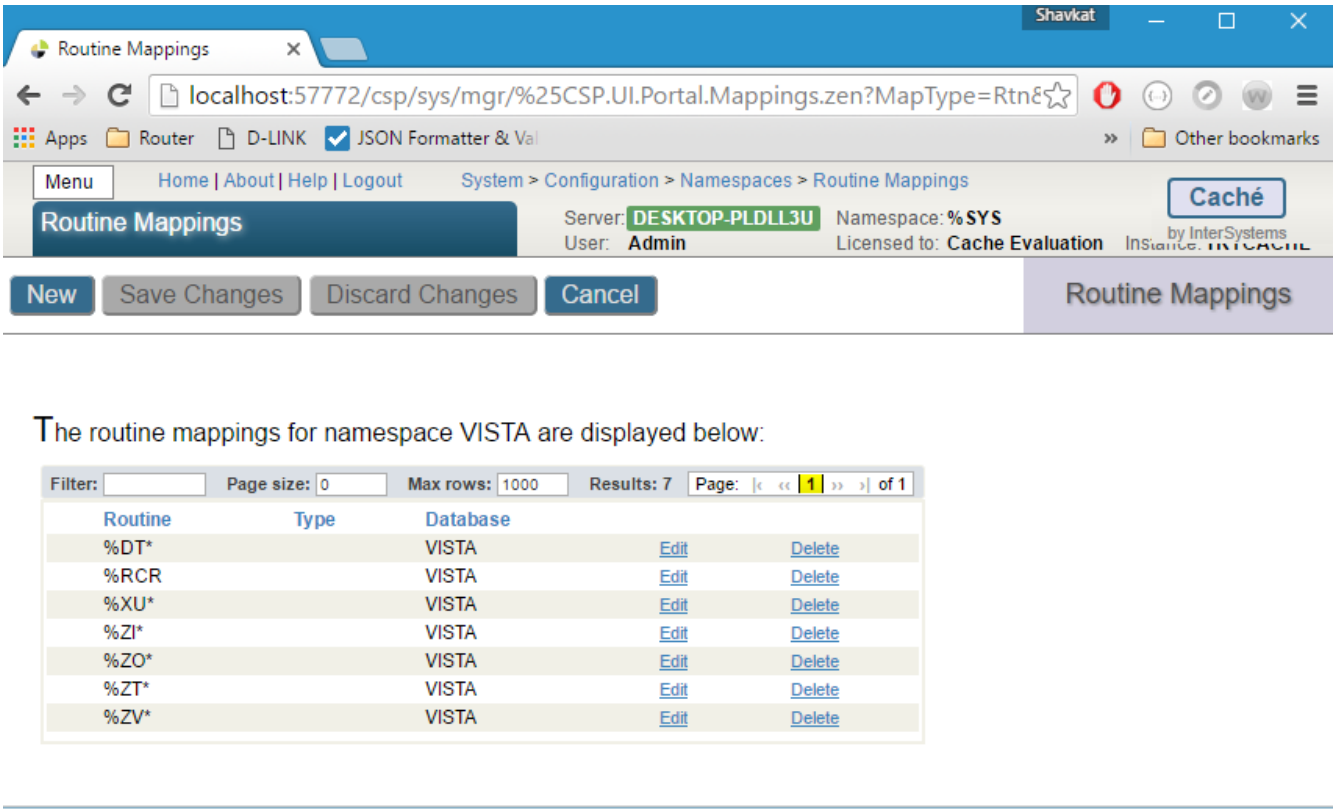


then click on NEW and enter information by following examples below:





and routines:



Testing VistA database

1) Go to the terminal

2) login to you cache instance
3) change the namespace to the namespace you created for VistA

   Note: try to restart your Cache server if you cannot find the new namespace
4) login as the VistA user

3) Web server installation

MS Visual Studio

Download the Community Free version from

https://www.visualstudio.com/en-us/downloads/download-visual-studio-vs.aspx

Install it using defaults

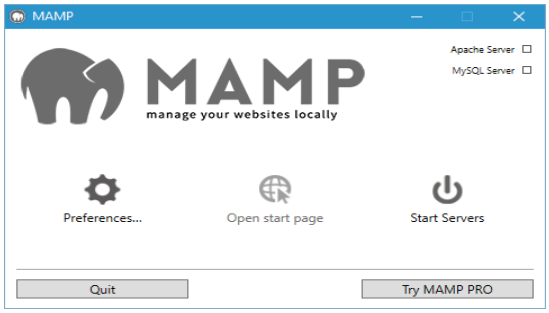
MAMP

Download the web server from

https://www.mamp.info/en/downloads/

Installation is very easy and straightforward.

Restart the computer and try to start the server:



Note: you might need to adjust Windows Firewall settings

Using Cache server as a web server

Cache server works as web server and can serve HTTP requests.

The Cweb provides the test CSP page as a part of the package as an example how you can use to test your restful interfaces within the Cache itself.

Installation steps

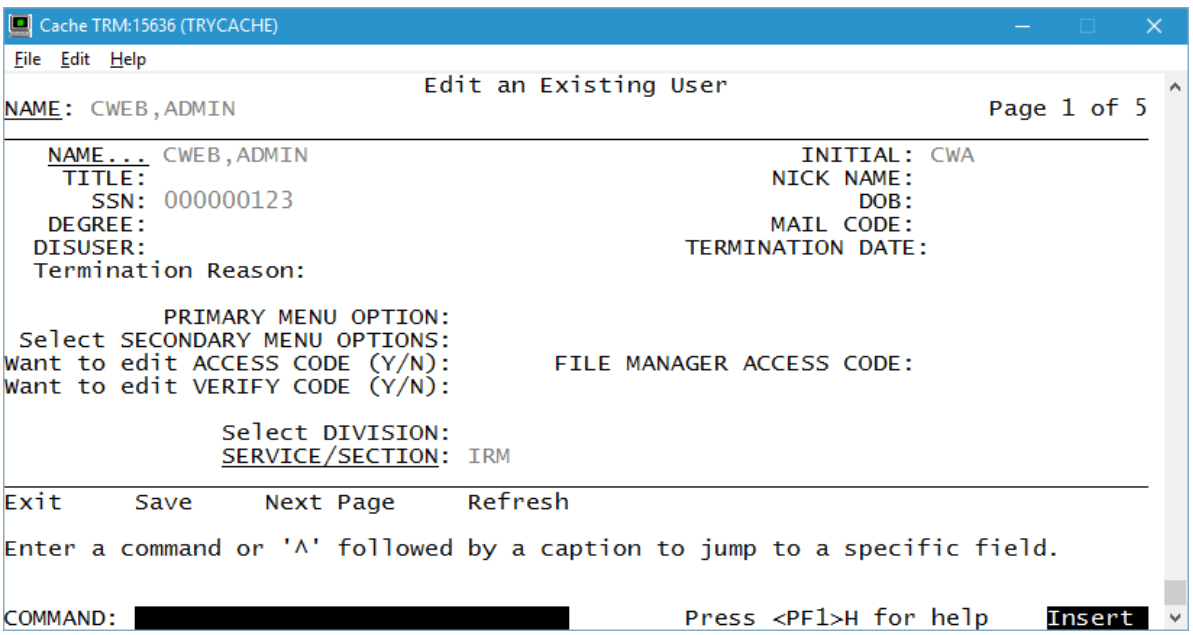
1) *Create the admin user*

1) Use Systems Manager Menu → User Management → Add a New User to the System to create admin user “CWEB,ADMIN”

   Notes:

   Answer Y for “Want to edit ACCESS CODE” and “Want to edit VERIFY CODE” questions to enter these two codes, write them down so you have it handy.

   Enter “IRM” for the mandatory field SERVICE/SECTION



assign the admin keys

XUPROGMODE

XUPROG

XUMGR

after saving data (Save) and exiting (Exit) the screen above OR you can do it separately in the fileman as it is shown below:

```
CWEBD>D P^DI



VA FileMan 22.0
```

```
Select OPTION: 1  ENTER OR EDIT FILE ENTRIES



INPUT TO WHAT FILE: 200  NEW PERSON       (60 entries)
EDIT WHICH FIELD: ALL// KEYS
    1   KEYS    (multiple)
    2   KEYSTROKES FROM LM WP
CHOOSE 1-2: 1  KEYS  (multiple)
  EDIT WHICH KEYS SUB-FIELD: ALL//
THEN EDIT FIELD:



Select NEW PERSON NAME: CWEB,ADMIN       CWA
Select KEY: XUPROG
    1   XUPROG
    2   XUPROGMODE
CHOOSE 1-2: 1  XUPROG
  REVIEW DATE:
Select KEY: XUPROGMODE
  REVIEW DATE:
Select KEY: XUMGR
  REVIEW DATE:
Select KEY:



Select NEW PERSON NAME:
```

2) Install Cweb RPC broker Cache/MUMPS code

Log into system as CWEB,USER and install the latest KIDS file “CWEB_1_1_YYYY-MM-DD.KID” in your new namespace:

```
CWEBD>D ^XUP

Setting up programmer environment
This is a TEST account.

Terminal Type set to: C-VT320

Select OPTION NAME: XPD MAIN       Kernel Installation & Distribution System

Select Kernel Installation & Distribution System <TEST ACCOUNT> Option: installa
tion
```

```
Select Installation <TEST ACCOUNT> Option: 1  Load a Distribution
Enter a Host File: C:\hfs\CWEB_1_1_2016-07-13.KID

KIDS Distribution saved on Jul 13, 2016@19:34:04
Comment: CWEB KIDS build - routines,files,options,RPCs

This Distribution contains Transport Globals for the following Package(s):
   CWEB*1.0*1
Distribution OK!

Want to Continue with Load? YES// y  YES
Loading Distribution...

   CWEB*1.0*1
Use INSTALL NAME: CWEB*1.0*1 to install this Distribution.


Select Installation <TEST ACCOUNT> Option: 2  Verify Checksums in Transport Glob
al
Select INSTALL NAME: CWEB*1.0*1       Loaded from Distribution    7/13/16@19:50:
32
     => CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 201

This Distribution was loaded on Jul 13, 2016@19:50:32 with header of
   CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 2016@19:34
:04
   It consisted of the following Install(s):
     CWEB*1.0*1

Want each Routine Listed with Checksums: Yes//   YES
DEVICE: HOME// ;;9999999  Console (Cache' on Windows)



PACKAGE: CWEB*1.0*1     Jul 13, 2016 7:50 pm                          PAGE 1
-------------------------------------------------------------------------------


CWAPRPC   Calculated   49469116
CWRPC     Calculated   24504432
CWUTIL    Calculated    3120020
CWUTIL1   Calculated      40019
CWUTIL2   Calculated   16355058

   5 Routines checked, 0 failed.


Select Installation <TEST ACCOUNT> Option: 3  Print Transport Global
Select INSTALL NAME: CWEB*1.0*1       Loaded from Distribution    7/13/16@19:50:
32
     => CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 201
```

```
This Distribution was loaded on Jul 13, 2016@19:50:32 with header of
   CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 2016@19:34
:04
   It consisted of the following Install(s):
     CWEB*1.0*1

     Select one of the following:

          1         Print Summary
          2         Print Summary and Routines
          3         Print Routines

What to Print: 1  Print Summary
DEVICE: HOME// ;;9999  Console (Cache' on Windows)
```

```
PACKAGE: CWEB*1.0*1     Jul 13, 2016 7:51 pm                            PAGE 1
-------------------------------------------------------------------------------
TYPE: SINGLE PACKAGE                              TRACK NATIONALLY: NO
NATIONAL PACKAGE: CACHE WEB SERVICES            ALPHA/BETA TESTING: NO

DESCRIPTION:

ENVIRONMENT CHECK:                                DELETE ENV ROUTINE:
 PRE-INIT ROUTINE:                           DELETE PRE-INIT ROUTINE:
POST-INIT ROUTINE:                          DELETE POST-INIT ROUTINE:
PRE-TRANSPORT RTN:

                                          UP    SEND  DATA                USER
                                          DATE  SEC.  COMES   SITE  RSLV  OVER
FILE #      FILE NAME                     DD    CODE  W/FILE  DATA  PTRS  RIDE
-------------------------------------------------------------------------------

555001      CW USER SESSION REGISTRATION  YES   YES   NO

555002      CW USER SETTINGS              YES   YES   NO

555003      CW APPLICATIONS               YES   YES   YES     MERG  NO    NO

ROUTINE:                                      ACTION:
   CWAPRPC                                       SEND TO SITE
   CWRPC                                         SEND TO SITE
   CWUTIL                                        SEND TO SITE
   CWUTIL1                                       SEND TO SITE
   CWUTIL2                                       SEND TO SITE

OPTION:                                       ACTION:
   CWEB CACHE CONNECTOR CONTEXT                  SEND TO SITE

REMOTE PROCEDURE:                             ACTION:
```

```
   CW ADD TO CW USER SETTINGS                     SEND TO SITE
   CW FIND USER                                   SEND TO SITE
   CW SESSION REGISTRATION                        SEND TO SITE

Select Installation <TEST ACCOUNT> Option: 4  Compare Transport Global to Curren
t System
Select INSTALL NAME: CWEB*1.0*1       Loaded from Distribution    7/13/16@19:50:
32
     => CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 201

This Distribution was loaded on Jul 13, 2016@19:50:32 with header of
   CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 2016@19:34
:04
   It consisted of the following Install(s):
     CWEB*1.0*1

     Select one of the following:

          1         Full Comparison
          2         Second line of Routines only
          3         Routines only
          4         Old style Routine compare

Type of Compare: 1  Full Comparison
DEVICE: HOME// ;;9999  Console (Cache' on Windows)



Compare KIDS package CWEB*1.0*1 to current site (Disk)
Site: FOIA.DOMAIN.EXT  UCI: CWEBD,PLA     Jul 13, 2016@19:51:08
   KIDS                                    Disk
-------------------------------------------------------------------------------


*ADD* Routine: CWAPRPC


*ADD* Routine: CWRPC


*ADD* Routine: CWUTIL


*ADD* Routine: CWUTIL1


*ADD* Routine: CWUTIL2


               FILE # 555001 (CW USER SESSION REGISTRATION) is NEW
```

```
               FILE # 555002 (CW USER SETTINGS) is NEW


               FILE # 555003 (CW APPLICATIONS) is NEW



-------------------------------------------------------------------------------
                    ENTRIES IN FILE #8994 (REMOTE PROCEDURE)

 *ADD* REMOTE PROCEDURE: CW FIND USER

 *ADD* REMOTE PROCEDURE: CW SESSION REGISTRATION

 *ADD* REMOTE PROCEDURE: CW ADD TO CW USER SETTINGS


-------------------------------------------------------------------------------
                          ENTRIES IN FILE #19 (OPTION)

 *ADD* OPTION: CWEB CACHE CONNECTOR CONTEXT



Select Installation <TEST ACCOUNT> Option: 6  Install Package(s)
Select INSTALL NAME: CWEB*1.0*1       Loaded from Distribution    7/13/16@19:50:
32
     => CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 201

This Distribution was loaded on Jul 13, 2016@19:50:32 with header of
   CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 2016@19:34
:04
   It consisted of the following Install(s):
     CWEB*1.0*1
Checking Install for Package CWEB*1.0*1

Install Questions for CWEB*1.0*1

Incoming Files:


   555001    CW USER SESSION REGISTRATION


   555002    CW USER SETTINGS


   555003    CW APPLICATIONS  (including data)

Want KIDS to Rebuild Menu Trees Upon Completion of Install? NO// y  YES


Want KIDS to INHIBIT LOGONs during the install? NO//
Want to DISABLE Scheduled Options, Menu Options, and Protocols? NO//

Enter the Device you want to print the Install messages.
You can queue the install by enter a 'Q' at the device prompt.
Enter a '^' to abort the install.

DEVICE: HOME// ;;999999  Console (Cache' on Windows)
```

```
                                Rebuilding Menus
qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
 NO Install Message sent

 Call MENU rebuild

Starting Menu Rebuild:  Jul 13, 2016@19:51:23

Collecting primary menus in the New Person file...

                    Primary menus found in the New Person file
                    ------------------------------------------

OPTION NAME         MENU TEXT                    # OF         LAST     LAST
                                                 USERS        USED     BUILT


Building secondary menu trees....

Merging.... done.
qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq
          lqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqk
    0%    x             25             50             75               x
Complete  mqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqj


Select Installation <TEST ACCOUNT> Option:
```

Make sure the checksums are correct:

```
CWAPRPC   Calculated   49469116
CWRPC     Calculated   24504432
CWUTIL    Calculated    3120020
```

```
CWUTIL1   Calculated      40019
CWUTIL2   Calculated   16355058
```

Make sure you don't have errors in the install log

```
CWEBD>D ^XUP

Setting up programmer environment
This is a TEST account.

Terminal Type set to: C-VT320

Select OPTION NAME: XPD MAIN      Kernel Installation & Distribution System

Select Installation <TEST ACCOUNT> Option:

Select Kernel Installation & Distribution System <TEST ACCOUNT> Option: utilitie
s

Select Utilities <TEST ACCOUNT> Option: install File Print
Select INSTALL NAME:    CWEB*1.0*1     Install Completed    7/13/16@19:51:21
    => CWEB KIDS build - routines,files,options,RPCs  ;Created on Jul 13, 201
DEVICE: HOME// ;;999999  Console (Cache' on Windows)



PACKAGE: CWEB*1.0*1     Jul 13, 2016 7:55 pm                    PAGE 1
                                  COMPLETED          ELAPSED
-------------------------------------------------------------------------------
STATUS: Install Completed               DATE LOADED: JUL 13, 2016@19:50:32
INSTALLED BY: CWEB,ADMIN
NATIONAL PACKAGE: CACHE WEB SERVICES

INSTALL STARTED: JUL 13, 2016@19:51:21       19:51:21
```

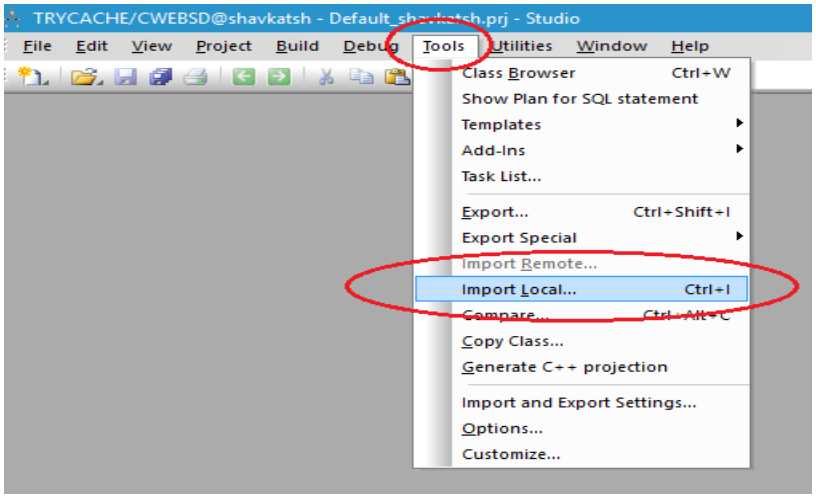
```
ROUTINES:                                19:51:21

FILES:
CW USER SESSION REGISTRATION                19:51:21
CW USER SETTINGS                          19:51:21
CW APPLICATIONS                           19:51:21

REMOTE PROCEDURE                            19:51:21
OPTION                                19:51:21

INSTALL QUESTION PROMPT                                    ANSWER

XPO1   Want KIDS to Rebuild Menu Trees Upon Completion of Install     YES
XPI1   Want KIDS to INHIBIT LOGONs during the install                 NO
XPZ1   Want to DISABLE Scheduled Options, Menu Options, and Protocols NO
MESSAGES:

 Install Started for CWEB*1.0*1 :
            Jul 13, 2016@19:51:21

Build Distribution Date: Jul 13, 2016

 Installing Routines:
            Jul 13, 2016@19:51:21

 Installing Data Dictionaries:
            Jul 13, 2016@19:51:21

 Installing Data:
            Jul 13, 2016@19:51:21

 Installing PACKAGE COMPONENTS:

 Installing REMOTE PROCEDURE

 Installing OPTION
            Jul 13, 2016@19:51:21

 Updating Routine file...

 Updating KIDS files...

 CWEB*1.0*1 Installed.
            Jul 13, 2016@19:51:21

 NO Install Message sent

 Call MENU rebuild


Select Utilities <TEST ACCOUNT> Option:
```

3) Import Cache classes and CWEB M-code

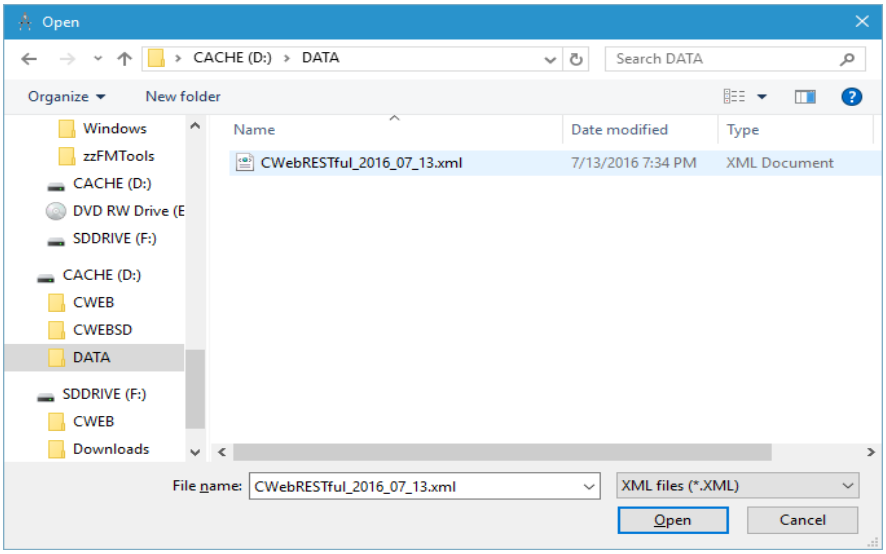
a) Open the Cache studio

b) go to your new namespace

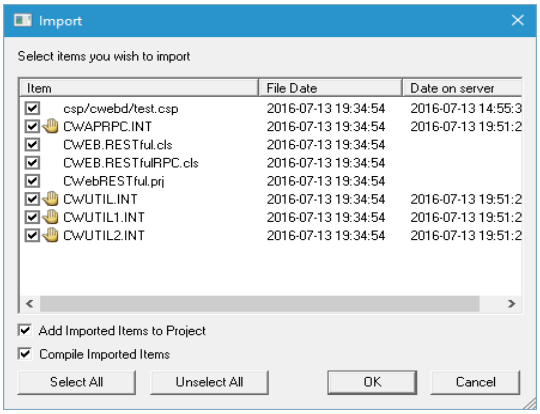
Use the “import local” option in the Cache studio:



Select the provided XML file :



and import it:



make sure everything was imported and compiled successfully:

Load started on 07/13/2016 20:00:19
Loading file D:\DATA\CWebRESTful_2016_07_13.xml as xml
Imported routine: CWAPRPC.INT
Imported class: CWEB.RESTful
Imported class: CWEB.RESTfulRPC
Imported routine: CWUTIL.INT
Imported routine: CWUTIL1.INT
Imported routine: CWUTIL2.INT
Imported CSP/CSR or file: csp/cwebd/test.csp
Imported project: CWebRESTful.prj
Load finished successfully.

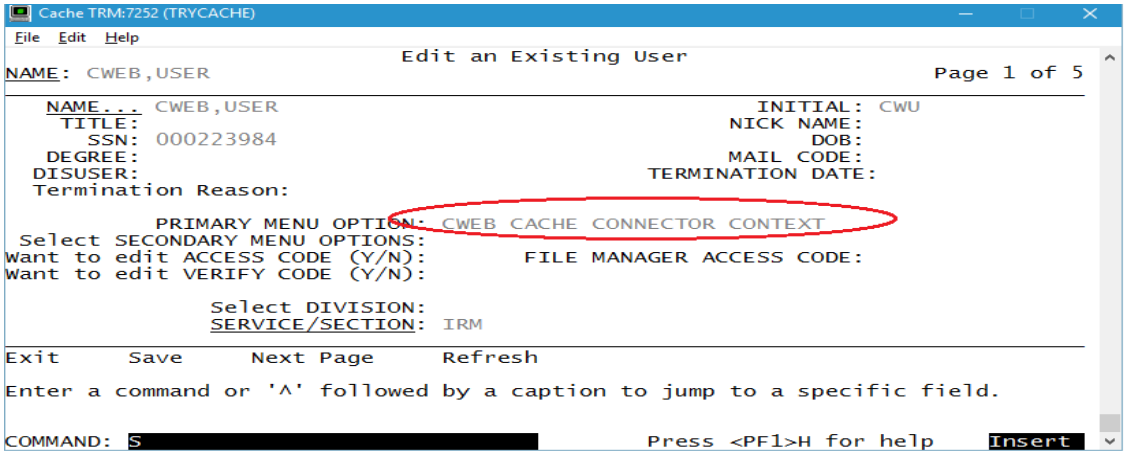
Compilation started on 07/13/2016 20:00:20 with qualifiers 'cukd'
Compiling routine : CWAPRPC.int
Compiling routine : CWUTIL1.int
Compiling routine : CWUTIL.int
Compiling routine : CWUTIL2.int, compiling 2 classes, using 4 worker jobs
Compiling class CWEB.RESTful
Compiling class CWEB.RESTfulRPC
Compiling table CWEB.RESTfulRPC
Compiling routine CWEB.RESTful.1
Compiling routine CWEB.RESTfulRPC.1
Compiling file /csp/cwebd/test.csp
Compiling class csp.test
Compiling routine csp.test.1
Compilation finished successfully in 1.292s.

4) Create the test user "CWEB,USER" with the context menu option

Log in to the system as CWEB,ADMIN (so you have the XUMGR key - you will need XUMGR key to assign the CWEB CACHE CONNECTOR CONTEXT option as a primary for the user CWEB,USER either directly in the USER MANAGEMENT → Add the user

```
CWEBD>D ^XUP

Setting up programmer environment
This is a TEST account.

Terminal Type set to: C-VT320

Select OPTION NAME: Systems Manager Menu  EVE     Systems Manager Menu

WARNING -- TASK MANAGER DOESN'T SEEM TO BE RUNNING!!!!



Select Systems Manager Menu <TEST ACCOUNT> Option: user Management

Select User Management <TEST ACCOUNT> Option: add a New User to the System
Enter NEW PERSON's name (Family,Given Middle Suffix): CWEB,USER
  Are you adding 'CWEB,USER' as a new NEW PERSON (the 61ST)? No// y  (Yes)
Checking SOUNDEX for matches.
     CWEB,ADMIN
Do you still want to add this entry: NO//y
Now for the Identifiers.
```

```
INITIAL: CWU
SSN: 000223984
SEX: M  MALE
NPI
```

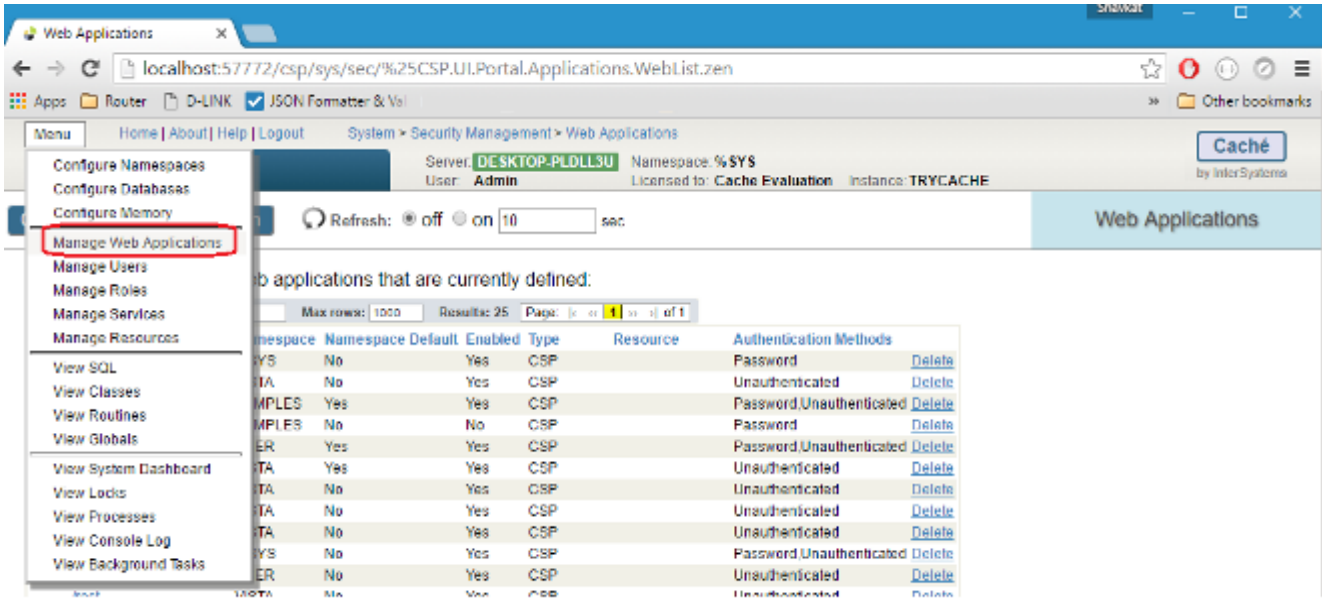


Or as an alternative - after you created the user by using FileMan:

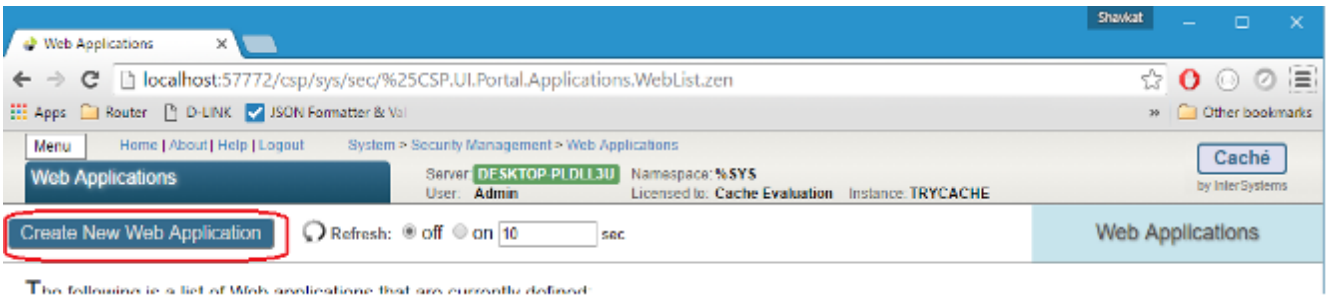
```
Select OPTION: 1  ENTER OR EDIT FILE ENTRIES


INPUT TO WHAT FILE: NEW PERSON//
EDIT WHICH FIELD: ALL// PRI
    1   PRIMARY MENU OPTION
    2   PRIMARY WINDOW
CHOOSE 1-2: 1  PRIMARY MENU OPTION
THEN EDIT FIELD:


Select NEW PERSON NAME: CWEB
    1   CWEB,ADMIN      CWA
    2   CWEB,USER      CWU
CHOOSE 1-2: 2  CWEB,USER     CWU
PRIMARY MENU OPTION: CWEB CACHE CONNECTOR CONTEXT      CWEB CACHE CONNECTOR CON
TEXT TEXT


Select NEW PERSON NAME:
```

5) Configure RESTful web application in Cache

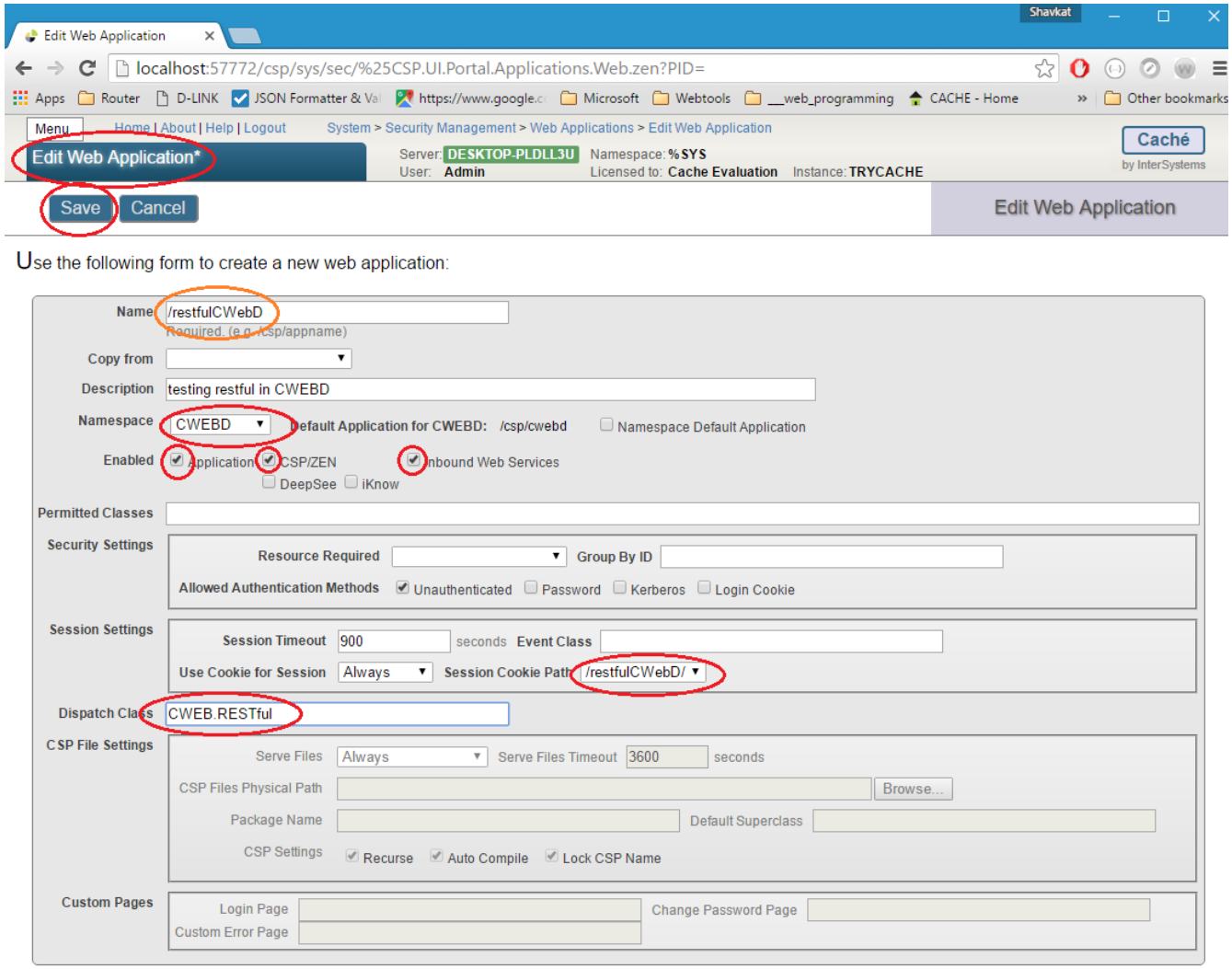
1. Go to the Cache Management portal
2. Select Manage Web Applications



3. Create a new web application



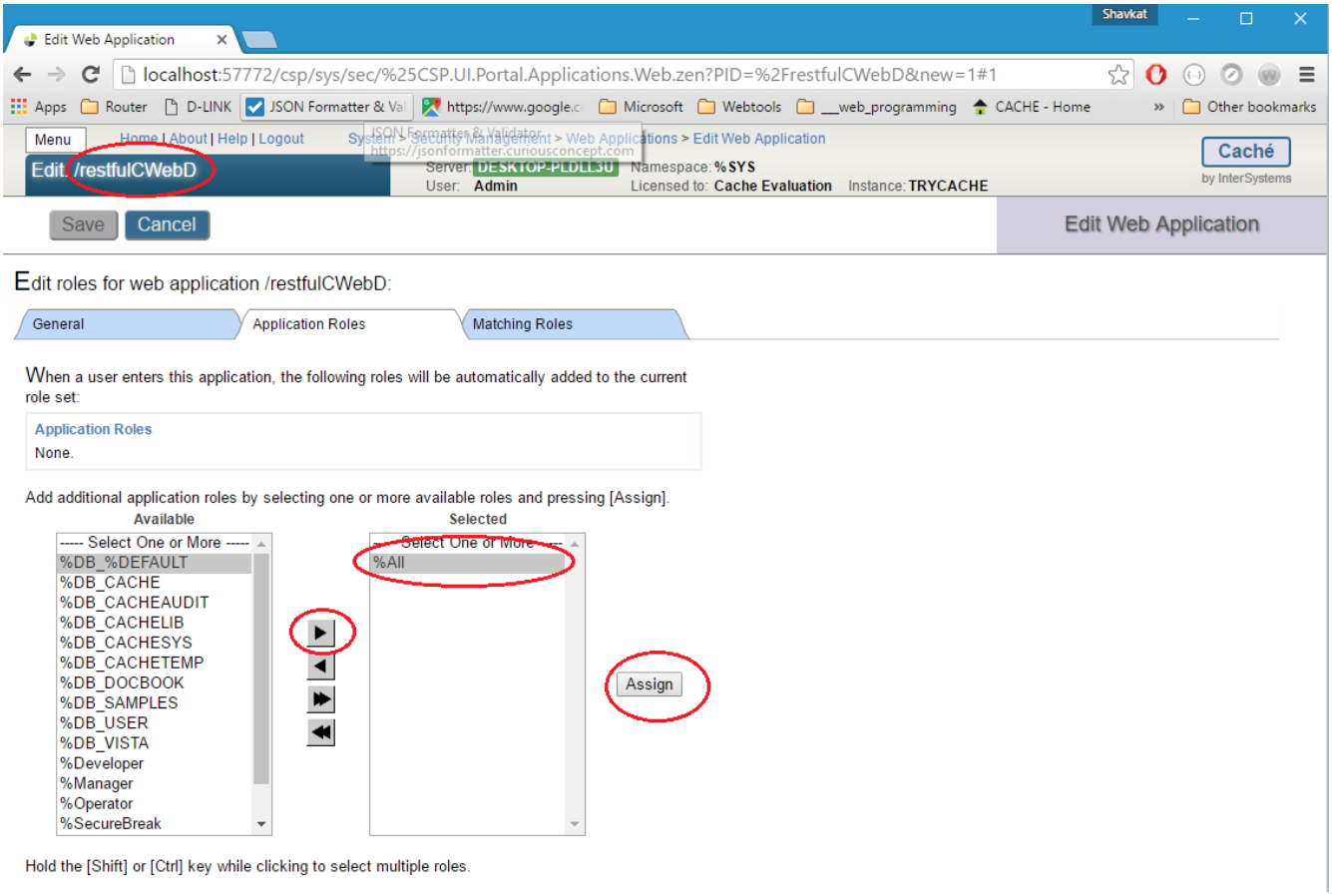
4. Populate fields as shown below and click “SAVE”



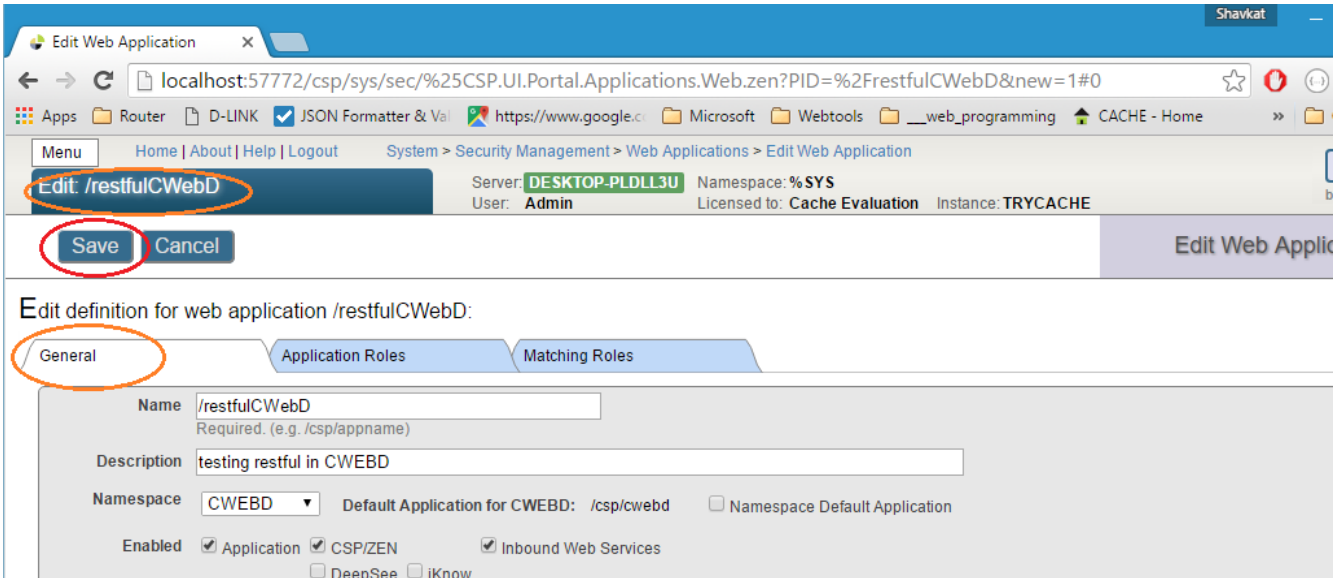
5. then make security settings

IMPORTANT: for demo and testing only you can set using %All roles – see an example below.

For production – you must use the appropriate setting for required level of security.


Edit Web Application
localhost:57772/csp/sys/sec/%25CSP.UI.Portal.Applications.Web.zen?PID=%2FrestfulCWebD&new=1#1
Menu
Home | About | Help | Logout
System > Security Management > Web Applications > Edit Web Application
Edit: /restfulCWebD
Server: DESKTOP-PLDLL3U
Namespace: %SYS
User: Admin
Licensed to: Cache Evaluation
Instance: TRYCACHE
Caché
by InterSystems
Save
Cancel
Edit Web Application
Edit roles for web application /restfulCWebD:
General
Application Roles
Matching Roles
When a user enters this application, the following roles will be automatically added to the current role set:
Application Roles
None.
Add additional application roles by selecting one or more available roles and pressing [Assign].
Available
Selected
----- Select One or More -----
%DB_%DEFAULT
%DB_CACHE
%DB_CACHEAUDIT
%DB_CACHELIB
%DB_CACHESYS
%DB_CACHETEMP
%DB_DOCBOOK
%DB_SAMPLES
%DB_USER
%DB_VISTA
%Developer
%Manager
%Operator
%SecureBreak
%All
Assign
Hold the [Shift] or [Ctrl] key while clicking to select multiple roles.

And save it :

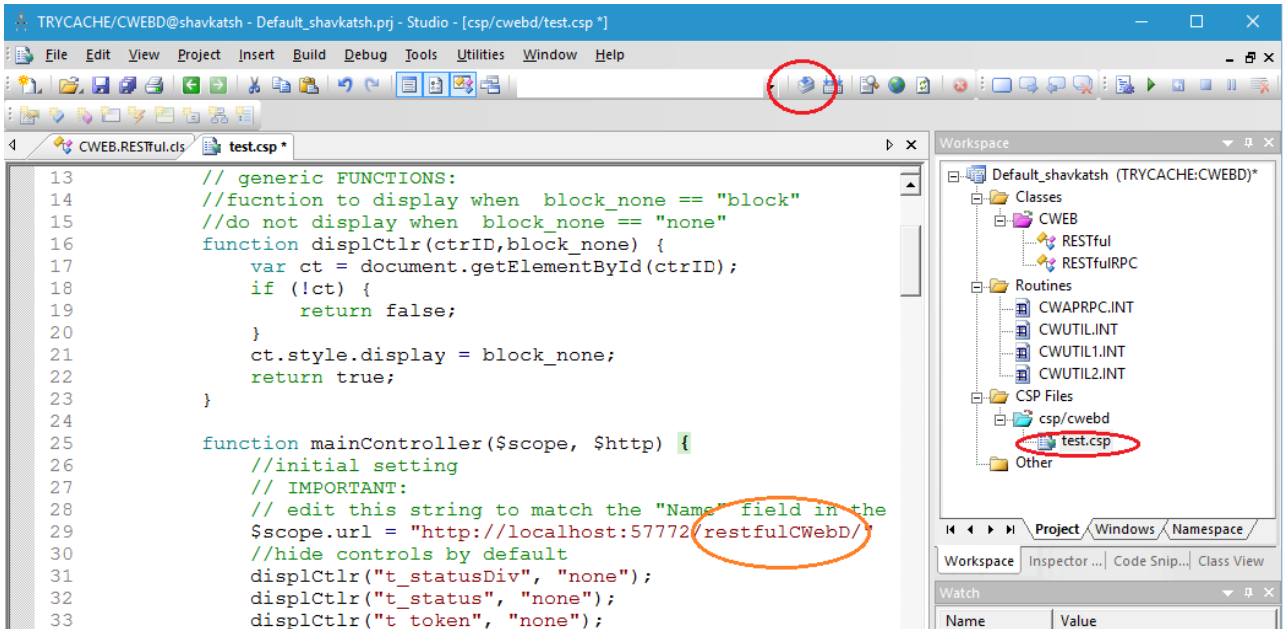

Edit Web Application
localhost:57772/csp/sys/sec/%25CSP.UI.Portal.Applications.Web.zen?PID=%2FrestfulCWebD&new=1#0
Menu
Home | About | Help | Logout
System > Security Management > Web Applications > Edit Web Application
Edit: /restfulCWebD
Server: DESKTOP-PLDLL3U
Namespace: %SYS
User: Admin
Licensed to: Cache Evaluation
Instance: TRYCACHE
Save
Cancel
Edit Web Applic
Edit definition for web application /restfulCWebD:
General
Application Roles
Matching Roles
Name
/restfulCWebD
Required. (e.g. /csp/appname)
Description
testing restful in CWEBD
Namespace
CWEBD
Default Application for CWEBD: /csp/cwebd
Namespace Default Application
Enabled
Application
CSP/ZEN
Inbound Web Services
DeepSee
iKnow

Testing

1) Test the sample angular web application' within Cache Studio by using the CSP file

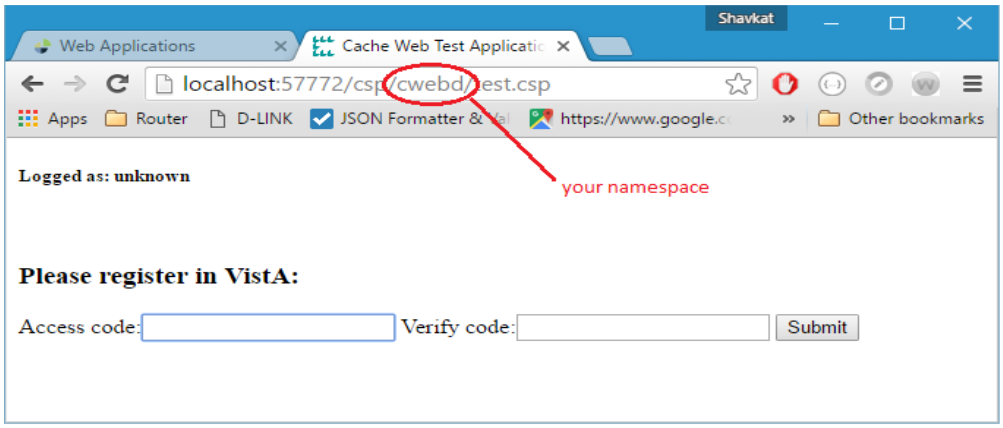
a) Open the test.csp page in the Cache Studio

b) in the csp file - change the $scope.url = "http://localhost:57772/cwebtest/" to the value of the "Name" field you used at the step above

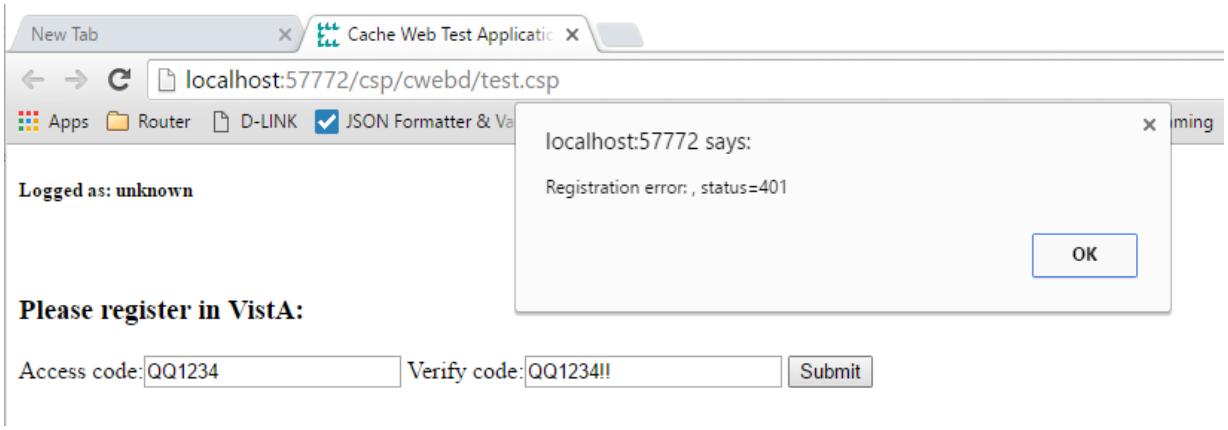


c) run the page from Cache Studio (F5)

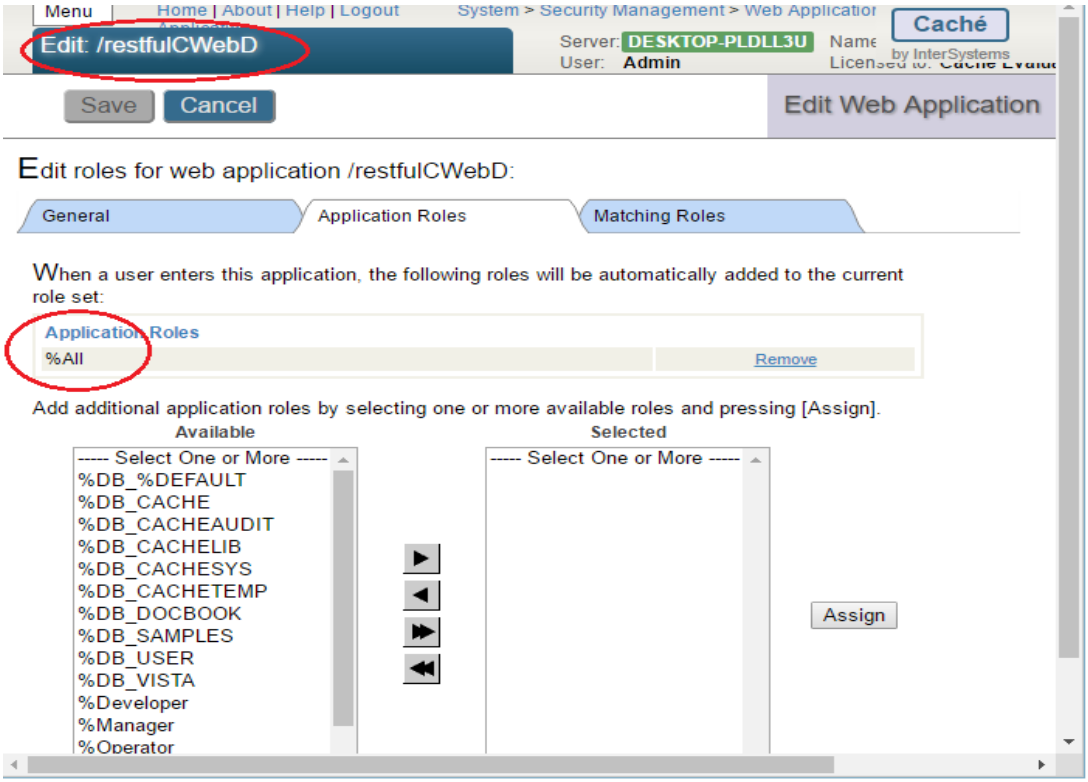
d) you will see the web page below



e) if enter access and verify codes for CWEB,USER , you might get the error 401

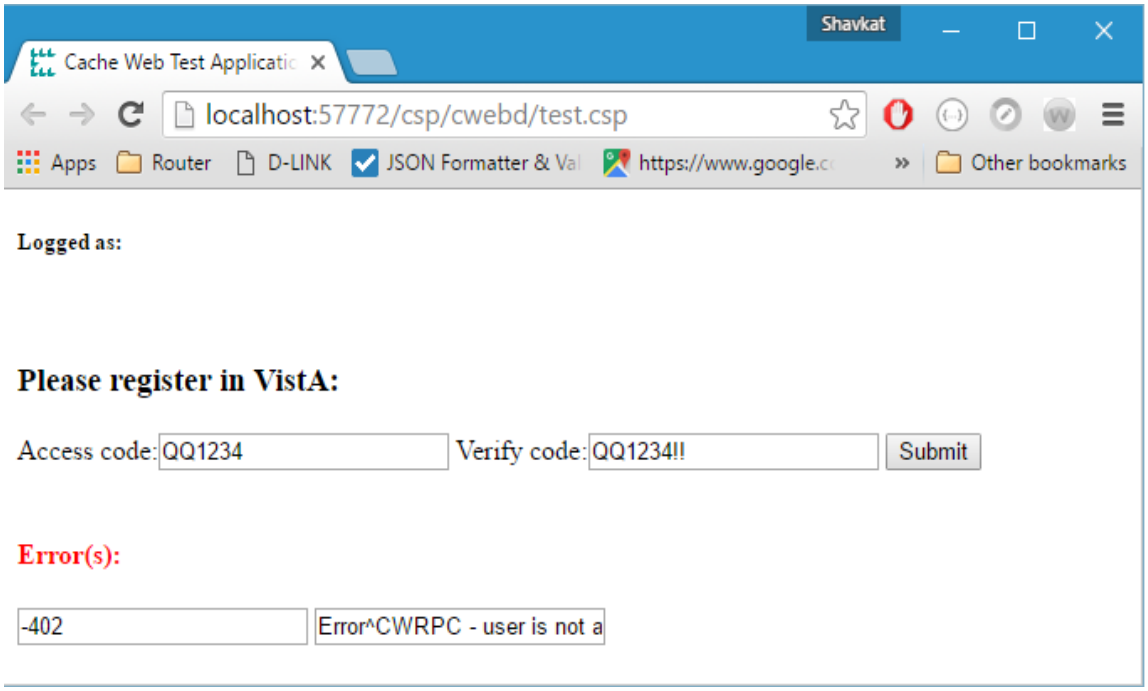


f) if so then check again the security setting for the web application:



g) if security settings are correct the you will get the Cweb error with the code = -402 :

Error^CWRPC - user is not allowed to run the CW SESSION REGISTRATION RPC



h) it is expected, this is why:

i. registration is done by running the RPC

ii. the user cannot run RPCs until the user is registered in the system and passes the correct token

iii. so someone needs to run Registration for the user

iv. the registration RPC is the only RPC that is ran by so called “system user”

v. the default system user is specified in CWUTL1 routine:

```
SYSTUSER() ;
 Q .5 ;VistA postmaster
```

By default it is the POSTMASTER, if POSTMASTER in your VistA instance doesn't have the key “XUPROGMODE” then you will get this error.

i) You have two options to resolve this issue:

- assign the “XUPROGMODE” to POSTMASTER , but it is not recommended as this user is used by many VISTA application and this assignment might affect other

applications

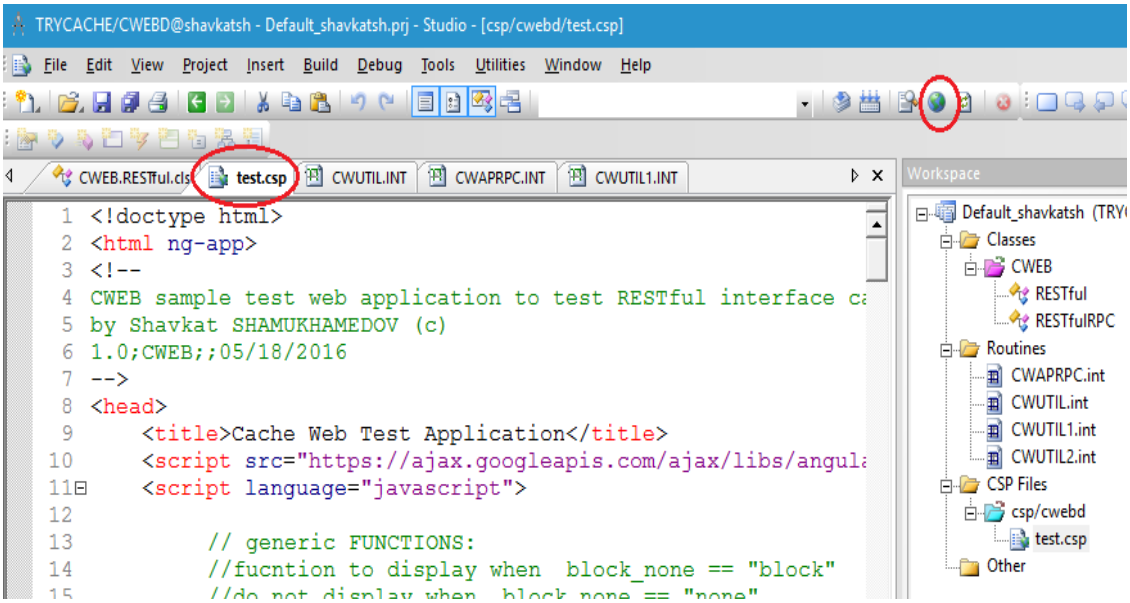
- edit the SYSTUSER^CWUTIL1 to return the IEN of the CWEB,ADMIN in your system in the file #200. in my system it was created with the IEN = 58

```
CWEBD>D ^%G

Device:

Right margin: 80 =>

Screen size for paging (0=nopaging)? 24 => 0

For help on global specifications DO HELP^%G

Global ^VA(200,"B","CWEB,ADMIN"

^VA(200,"B","CWEB,ADMIN",58)=""

Global ^
```

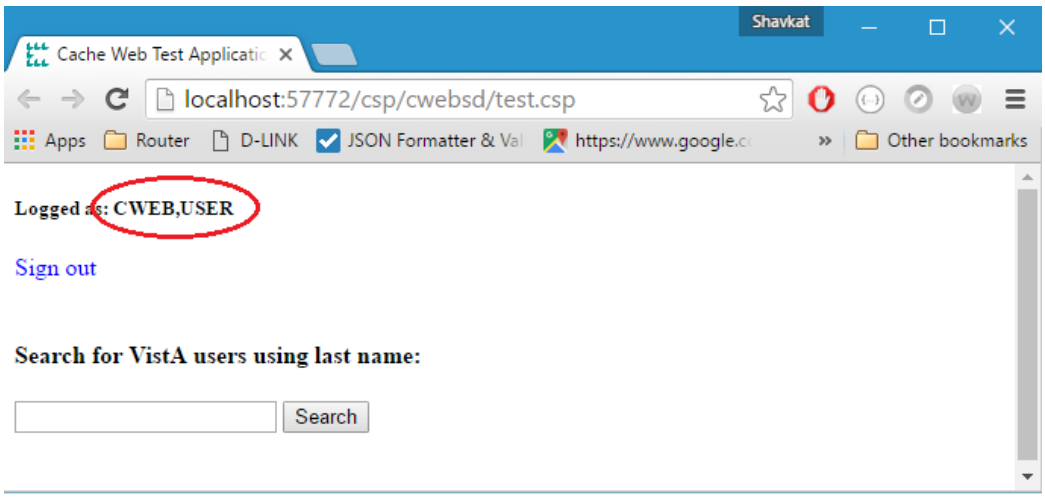
Edit the MUMPS code as in the example below and re-compile the routine or un-comment the code that determines IEN for “CWEB,ADMIN” via “B” x-ref (if you are using this user):

```
SYSTUSER() ;
        ;Q .5 ;VistA postmaster
        ;Q 58 ;CWEB,ADMIN
        N X S X=$O(^VA(200,"B","CWEB,ADMIN",0)) Q $S(X'="":X,1:.5)
        ;
```

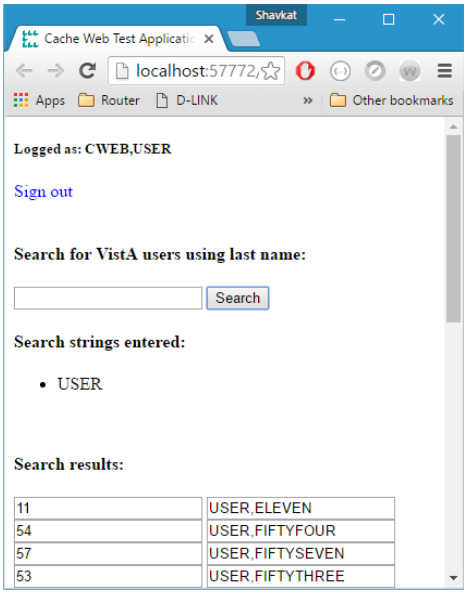
Select test.csp tab and run F5 again



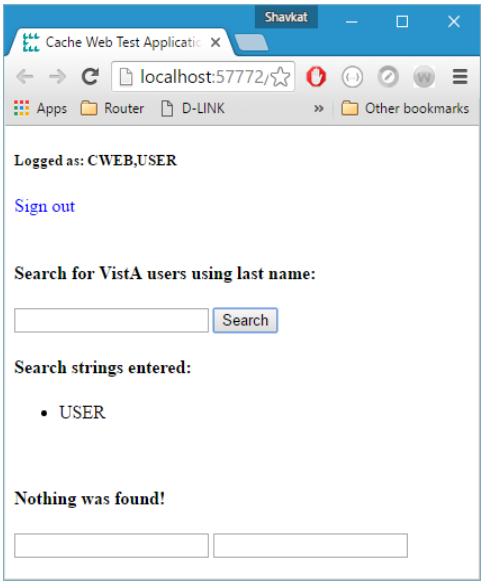
j) if you enter correct access and verify codes then you will see the name of the user at the left top corner:



k) enter “USER” in the search text field and you will see results provided by the RPC “CW FIND USER” that will be ran on behalf of the logged user:



Note: the session time out period is just 1 minute (for testing purposes) , so if you allow more than 1 minute lag between registration and search then you will not get any results and will have to click at “sign out” and re-register.



You can increase the time out period by editing the SESSTOUT^CWUTIL1, for example you can make it 10 minutes:

```
CWEB.RESTfulRPC.cls   CWAPRPC.int   CWUTIL.int   CWUTIL1.int
39 ;return the encryption type for tokens
40 ;0/null - no encryption
41 ENCRTOK() ;
42 Q 0
43 ;
44 ;session timeout in secs
45 SESSTOUT() ;
46 Q 10*60  ;1 minute(s)
47 ;
```

l) CWEB,USER can run the search RPC because has the context menu in his primary menu:

```
NAME: CWEB,USER                    INITIAL: CWU
  SIGNATURE BLOCK PRINTED NAME: USER CWEB
  PRIMARY MENU OPTION: CWEB CACHE CONNECTOR CONTEXT
```

m) Try now to login as CWEB,ADMIN and run the search.

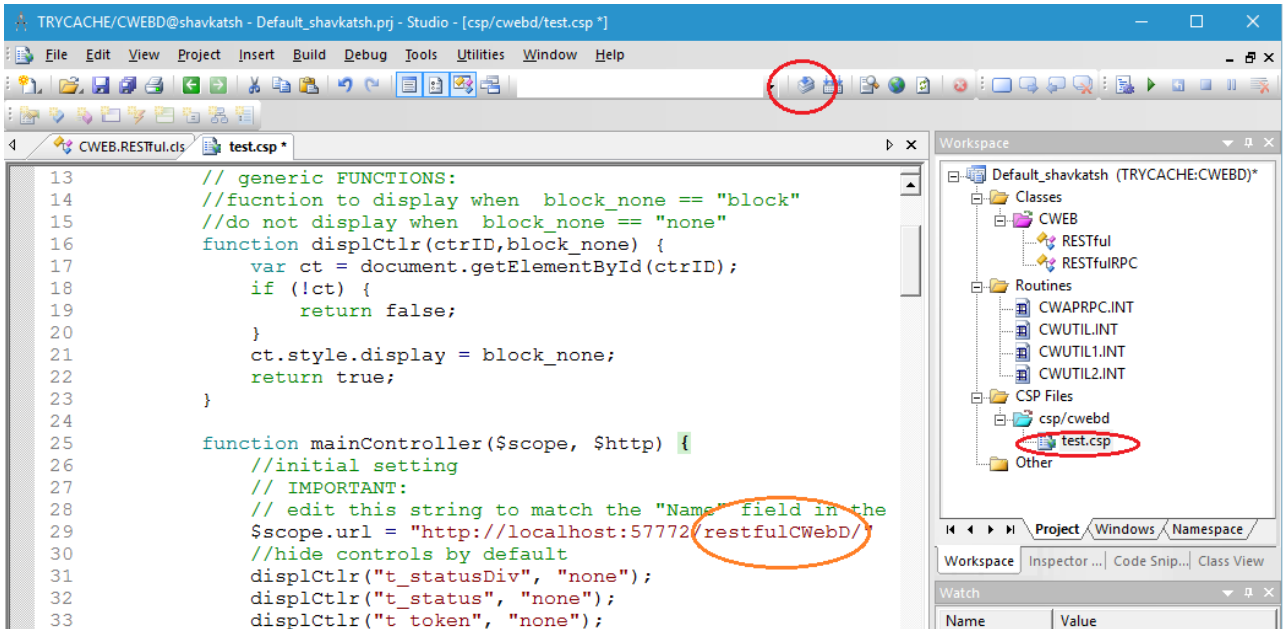
You will be able to do it despite the fact that CWEB,ADMIN doesn't have the context menu in the primary menu. It is possible because CWEB,ADMIN does have the special “admin” key “XUPROGMODE” that allows the user to run any RPC.

```
NAME: CWEB,ADMIN                   INITIAL: CWA
KEY: XUPROG                   GIVEN BY: POSTMASTER
  DATE GIVEN: JUL 11, 2016
KEY: XUMGR                    GIVEN BY: POSTMASTER
  DATE GIVEN: JUL 11, 2016
KEY: XUPROGMODE                   GIVEN BY: POSTMASTER
  DATE GIVEN: JUL 11, 2016
```

2) *Testing the sample angular web application with external web server*

Install any web server and copy the content of the test.csp page to the index.html file and place it in the appropriate folder of the web server.

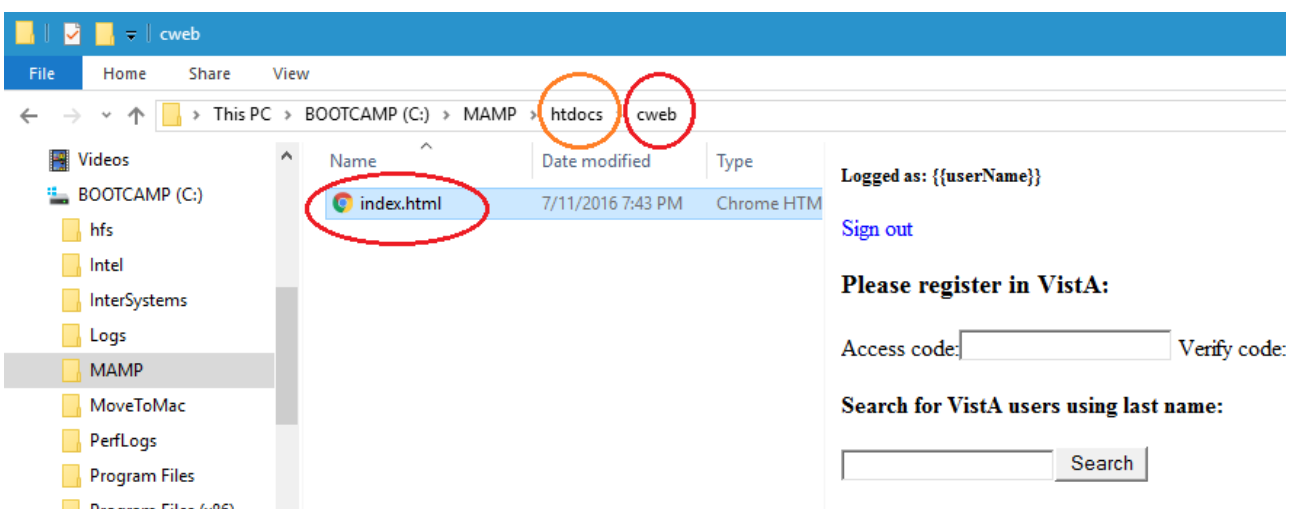
Note: make sure you make the change in the test.csp before that in order to use the correct url (See Testing 1.b above):



For example, if you use MAMP:

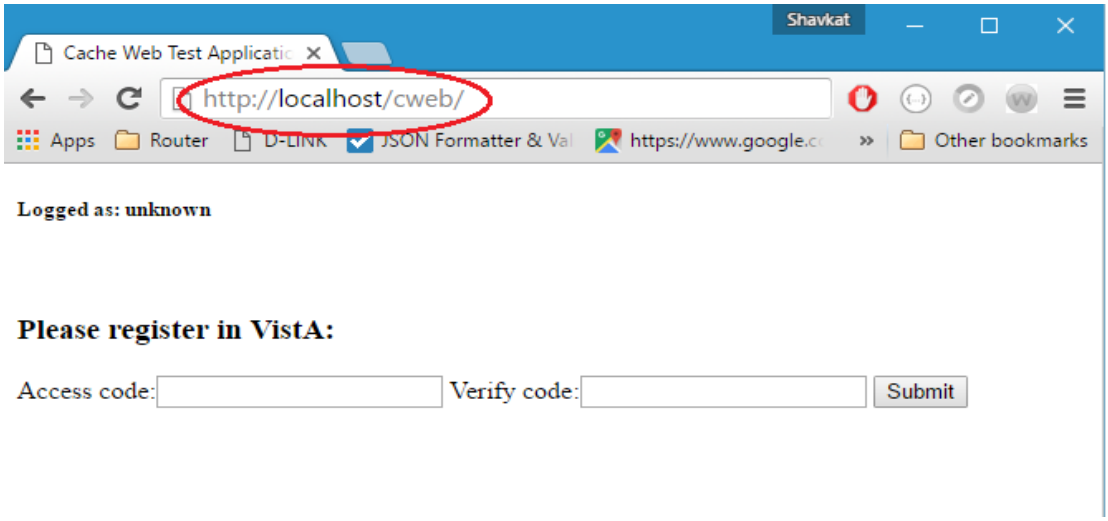
a) install MAMP

b) copy the content of the test.csp page to the index.html file and place it in the folder:



c) start the MAMP server

d) point the browser to the local host (with the default port # 80)

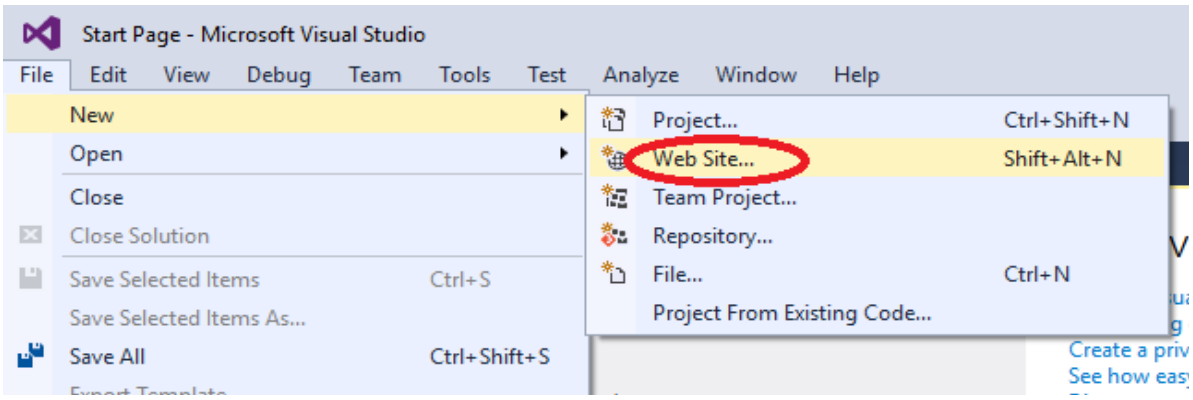


e) you can test the same steps as described in the section #1 above

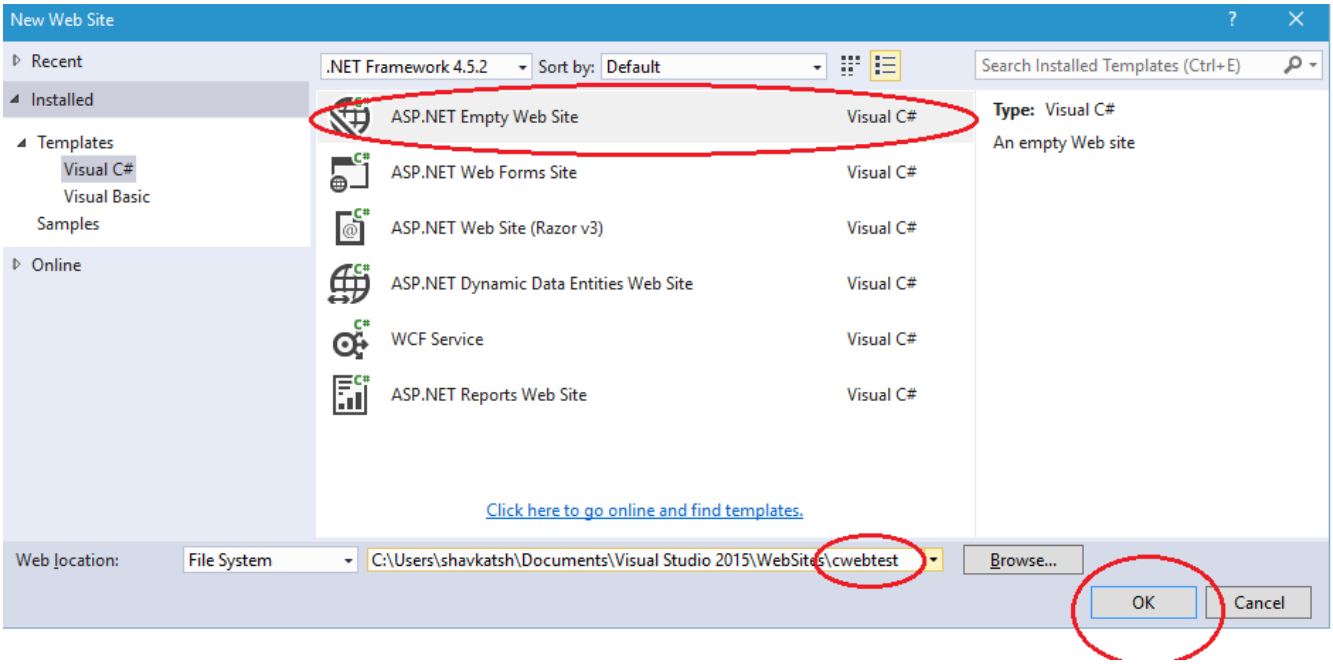
3) Testing the sample angular web application in the Visual Studio

a) If you would like to use the Visual Studio for testing then

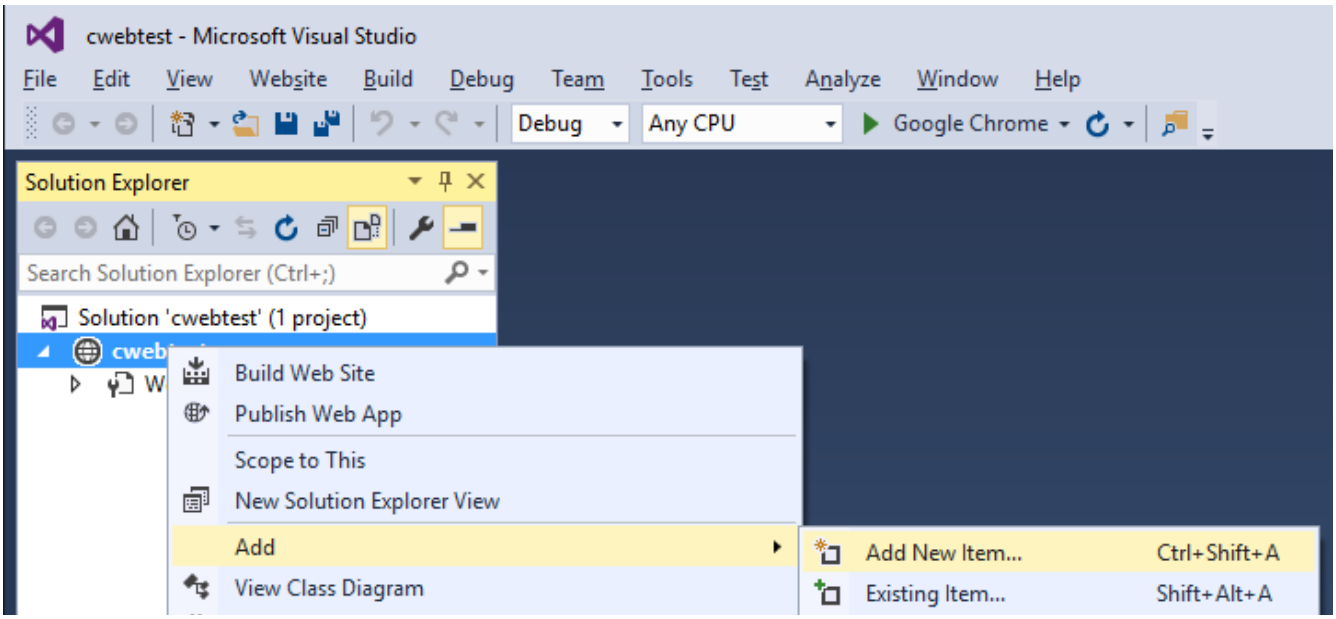
– open new web site project



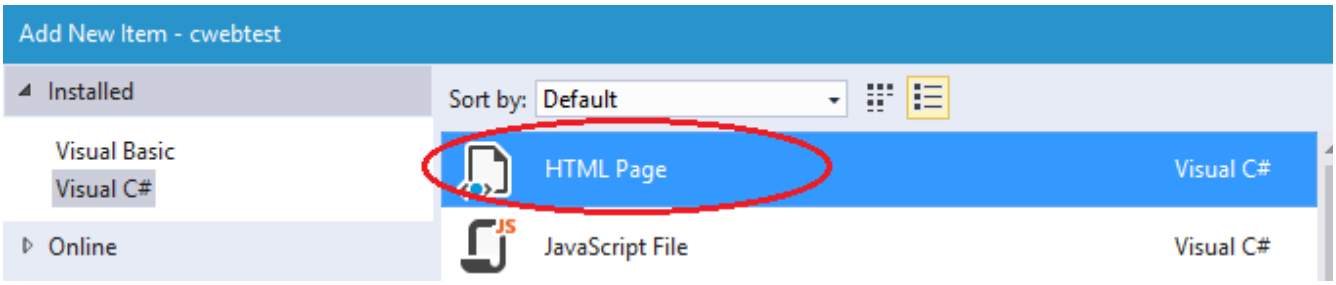
– select Empty Web Site, specify the folder, click OK



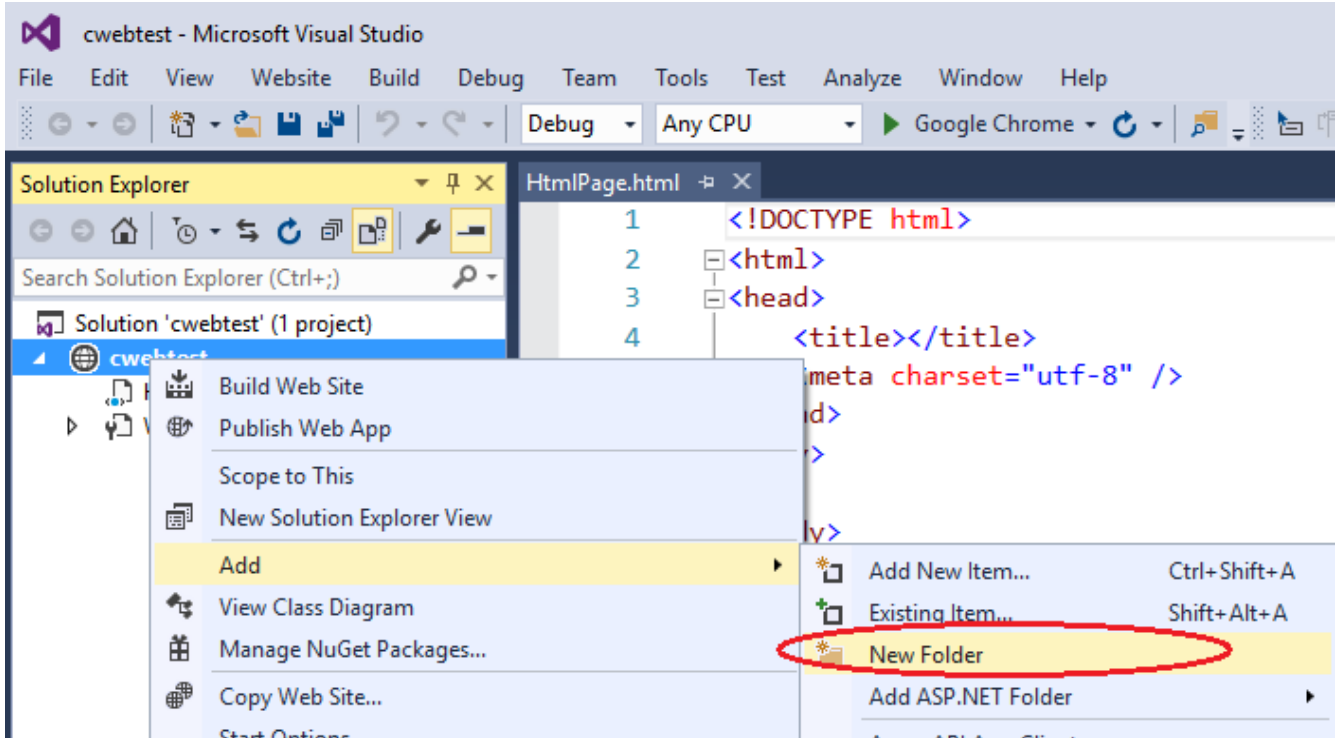
– add the new item

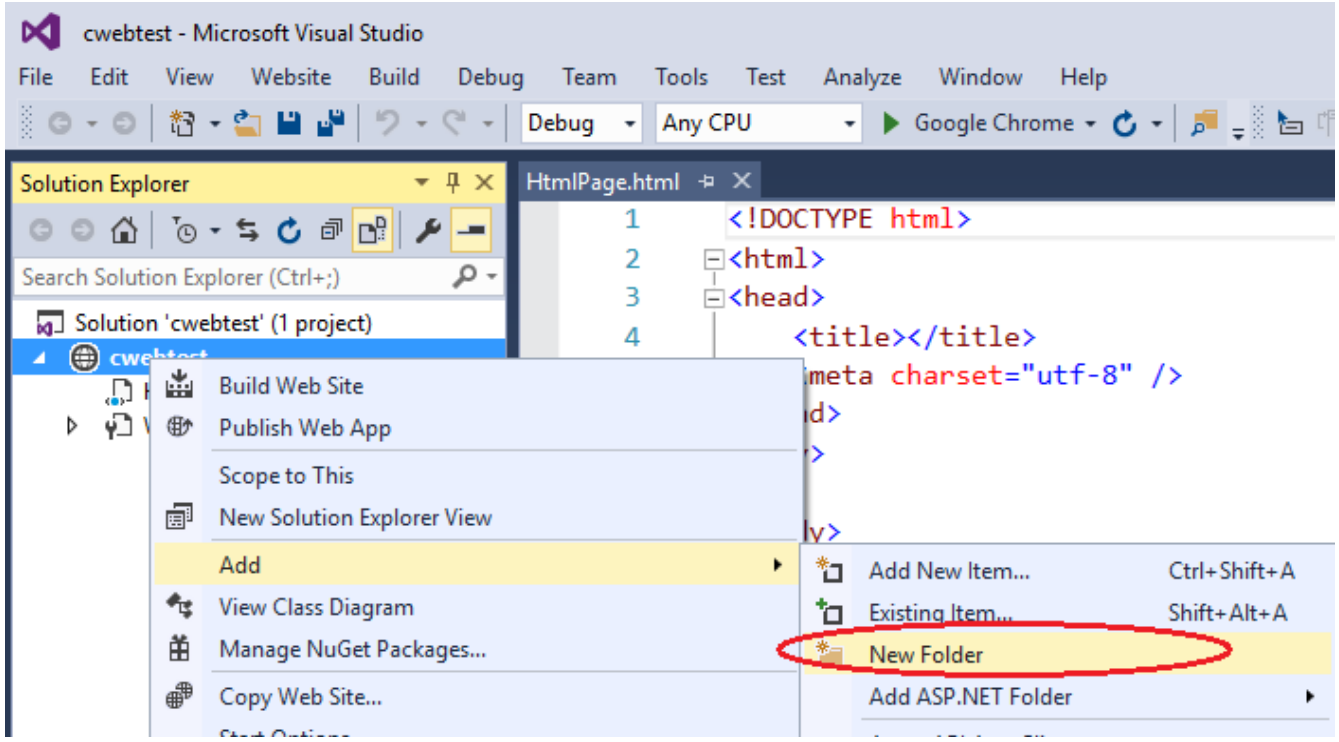


– select HTML, click OK

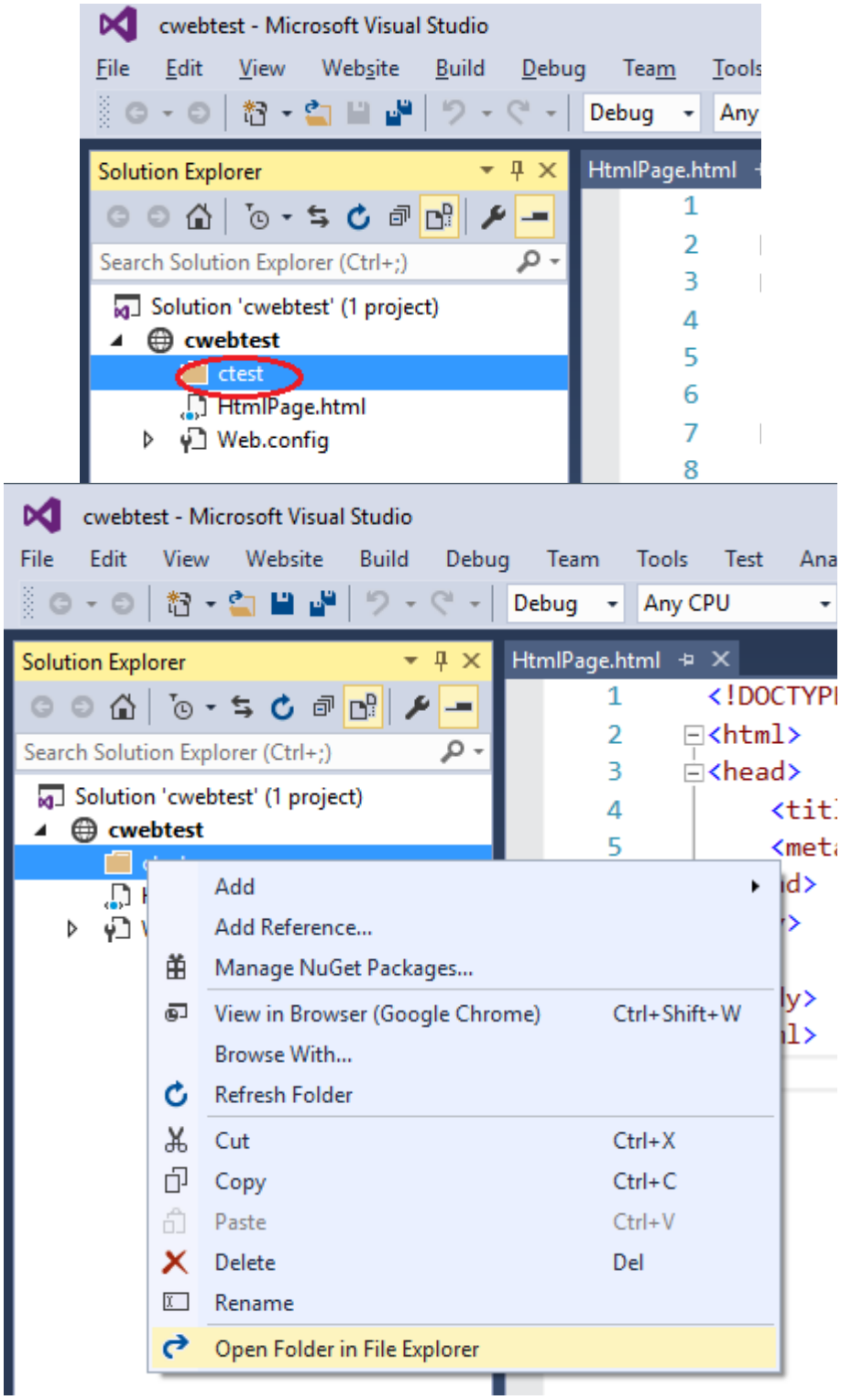


– add new folder:





– rename it to “ctest”:



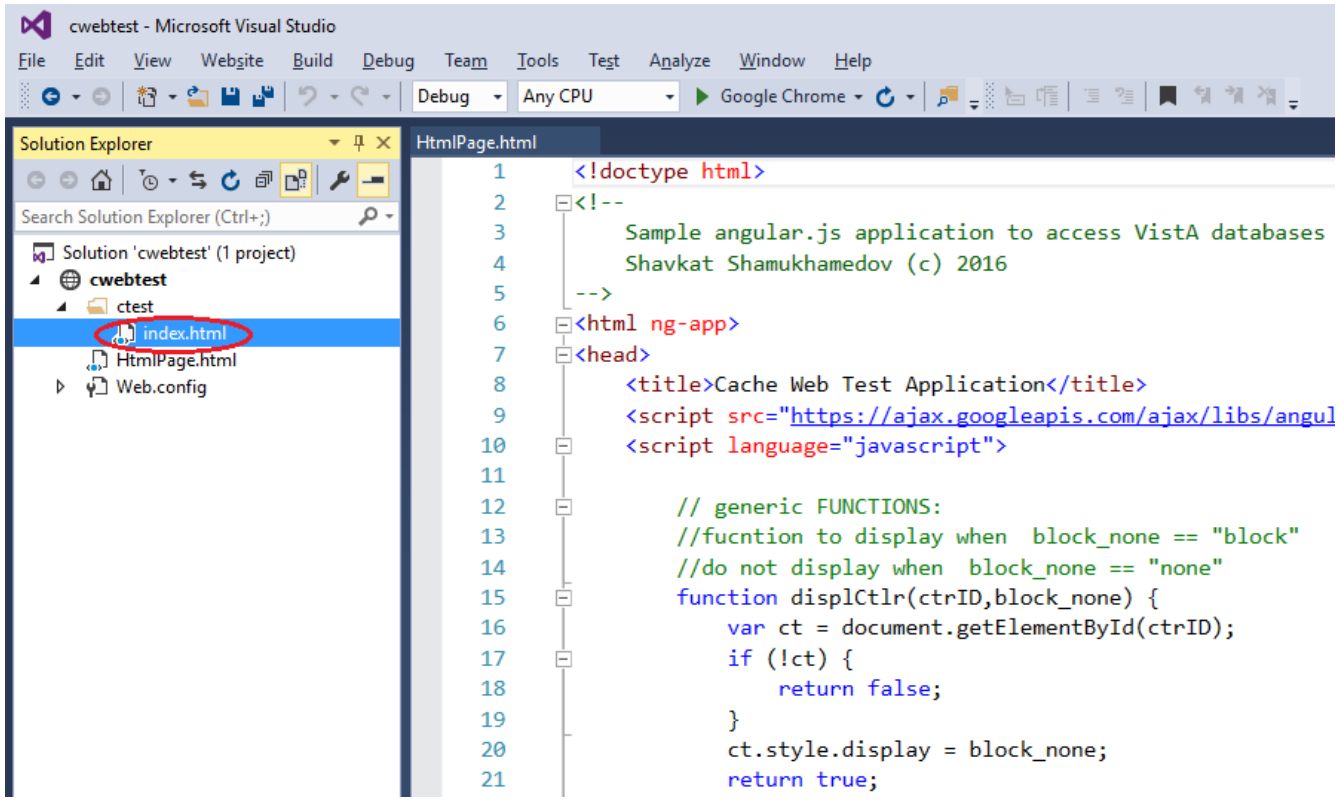
- rename the folder in windows explorer

  - copy the the provided sample angular web application's index HTML file into the folder

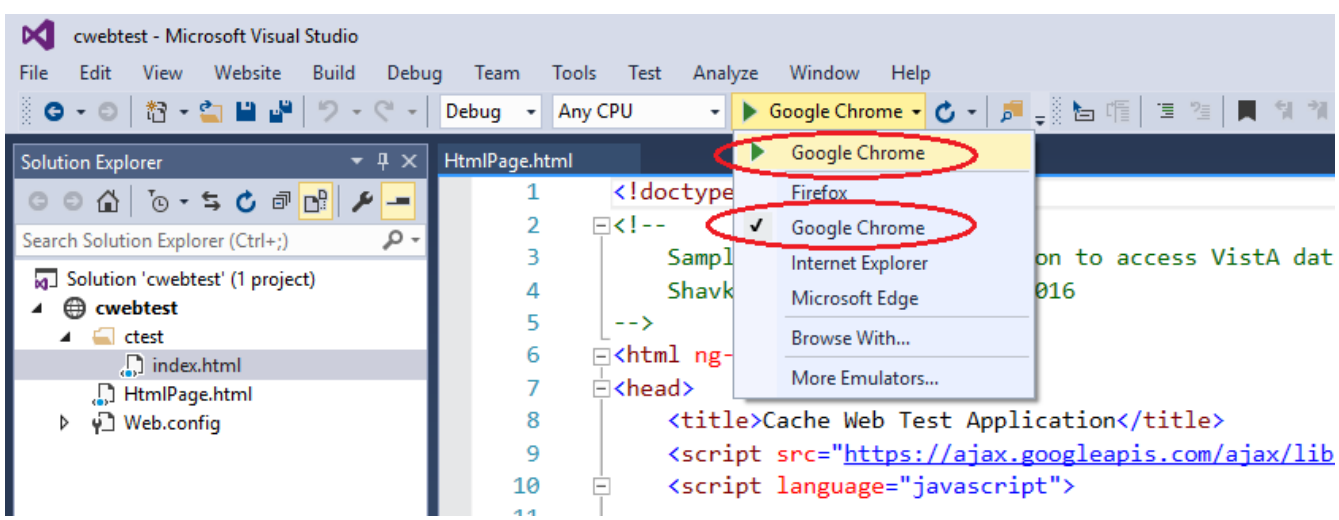
NOTE:

Note: make sure you make the change in the test.csp before that in order to use the correct url (See Testing 1.b above).

- save, close and re-open the project and open the index.html page



- select the browser and run the application by clicking on the green arrow:



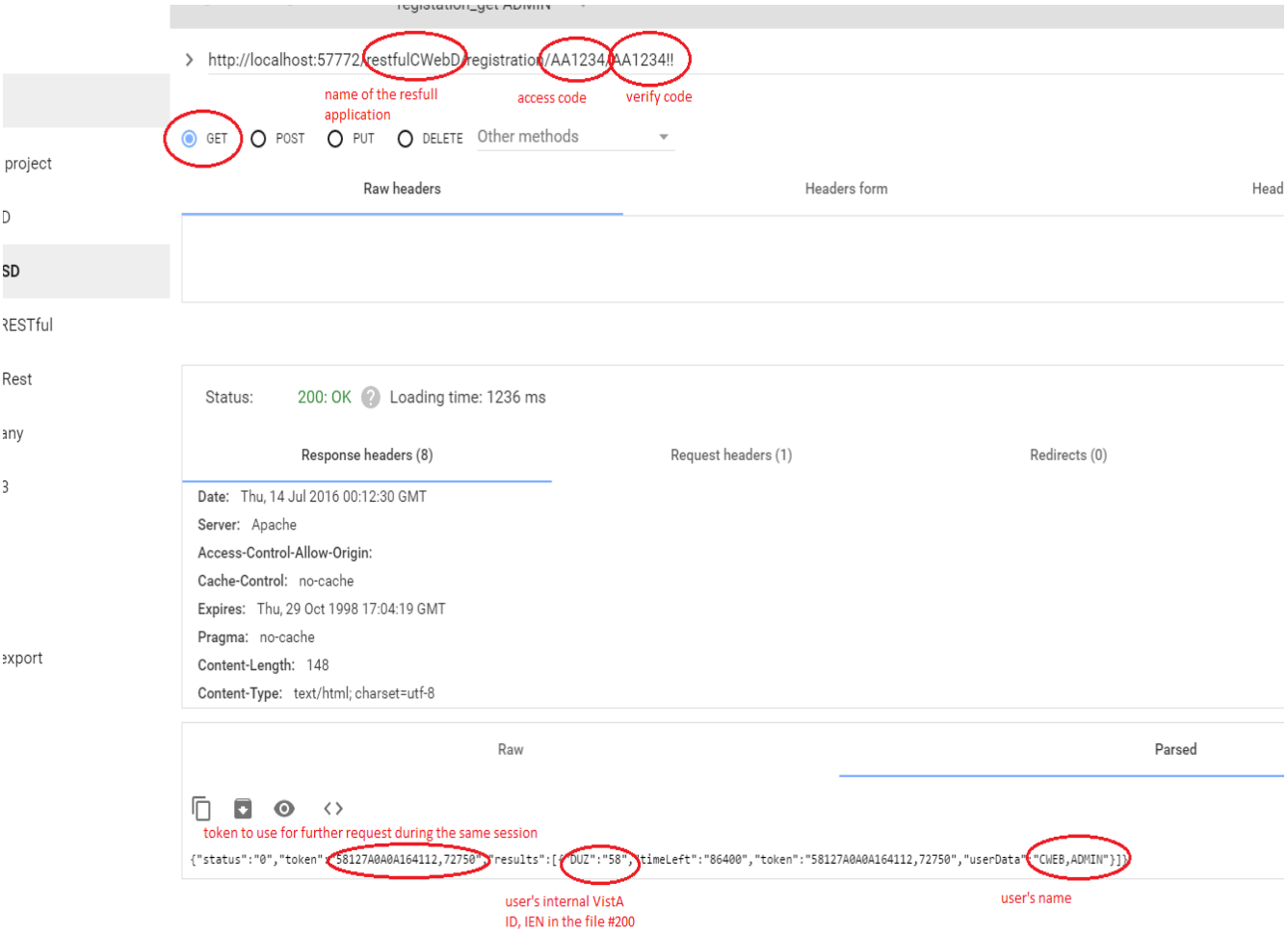
b) if you are using MAMP for testing then copy the provided sample angular web application's index HTML file to the web server folder and run the application from the browser

4) Using Rest client tools

a) You can use different RESTfull clients, I am using Advanced REST client. Download and install it: https://chromerestclient.appspot.com

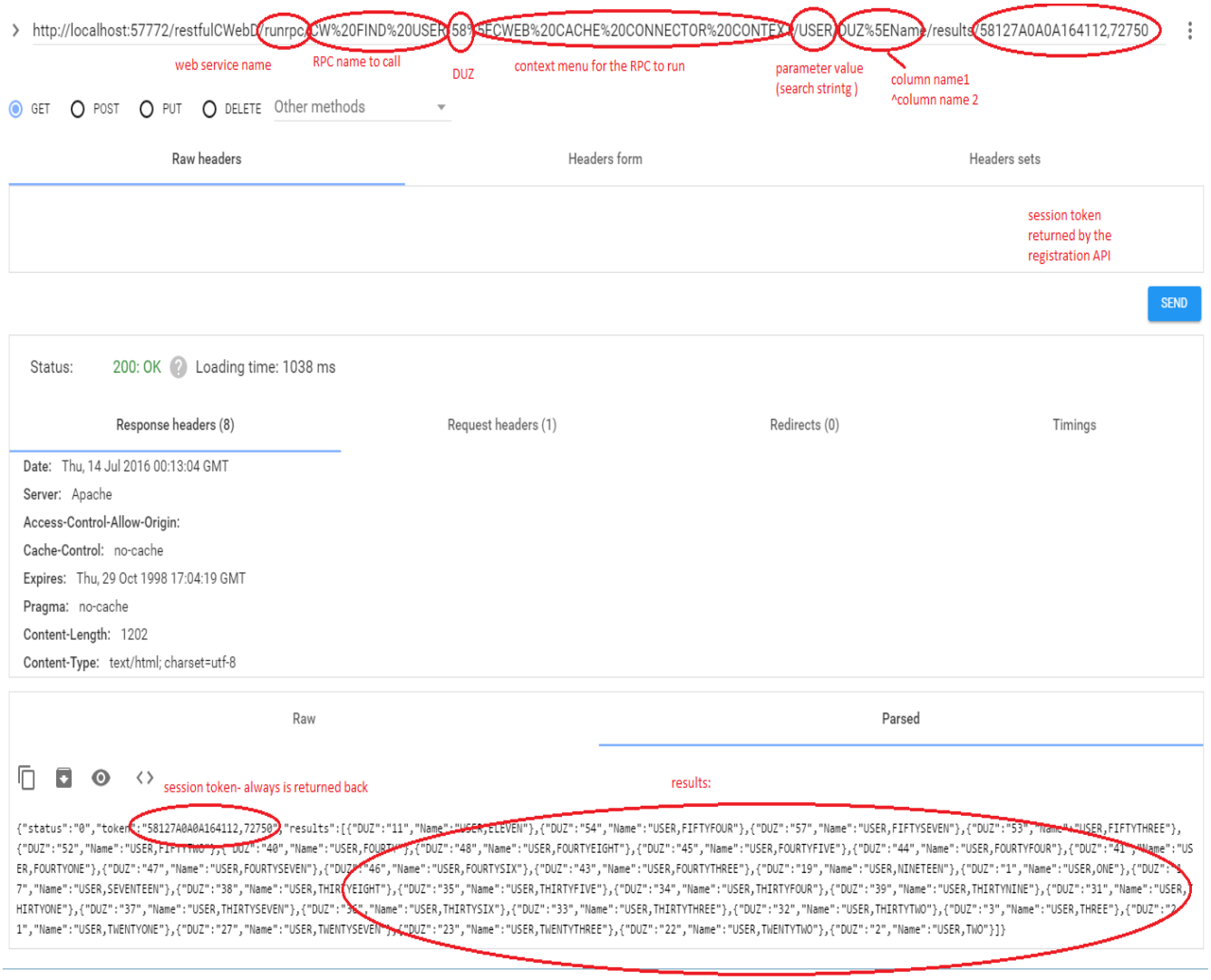
b) call the registration API first, use the following in the url

http://localhost:57772/restfulCWebD/registration/ access code /verify code



c) then call run RPC to search, use in the url:

http://localhost:57772/cwebtest/runrpc/CW%20FIND%20USER/58%5ECWEB%20CACHE%20CONNECTOR%20CONTEXT/USER/DUZ%5EName/results/token



Note: you can save you requests and test it again later