

# Running/Debugging AppEngine Program Using AePlus

## Tutorial Document

Product From:

SRI Technologies Pty Ltd  
WebSite: [www.sritech.biz](http://www.sritech.biz)  
Email: [sritech@sritech.biz](mailto:sritech@sritech.biz)



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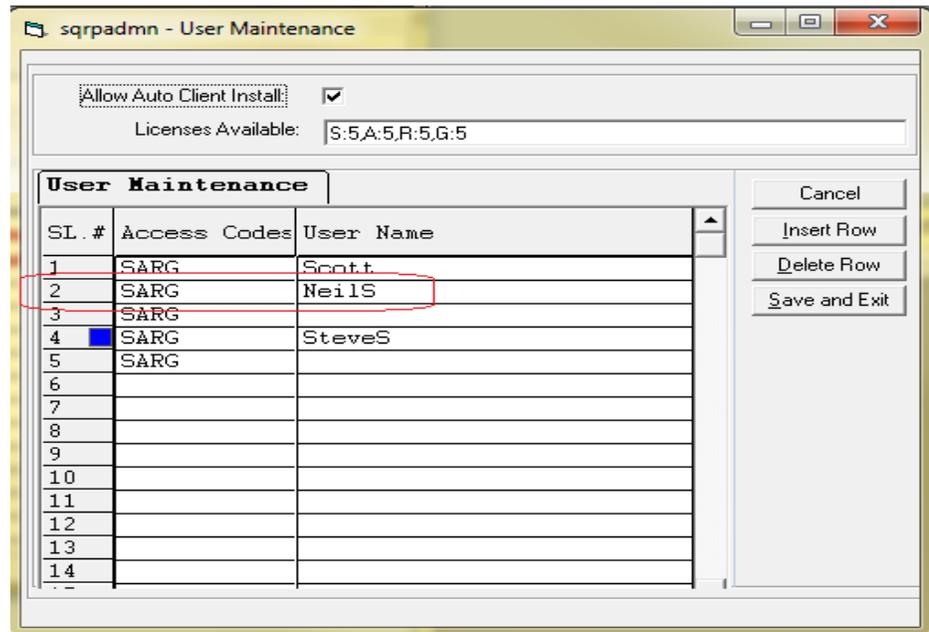


## Introduction

**AePlus** (Application Engine Workbench with Interactive Debugger) is a productivity tool that provides developers with a user friendly front-end through which they can run, test and debug AppEngine programs more efficiently thereby cutting down development effort and time. This results in time saving as well as improved quality outcome.

## AePlus Terminologies

- PSoft User:** User name that will be used to Logon PeopleSoft application. e.g. PS, VP1 etc.
- Source Database:** PeopleSoft Database name where AppEngine Source resides. e.g. HR90DEV, HR90INT etc
- Target Database:** PeopleSoft Database name where AppEngine Runs e.g. HR90DEV, HR90INT etc. Generally it is same as Source Database but you can choose it to be different in that case AppEngine runs in Target database picking source code from Source Database. Source and Target Databases should have same Tools version.
- AE Name:** Application Engine Program Name.
- AE Descr:** Application Engine Program Description.
- AePlus User Name:** User name registered with SqrPlus/PsPlus. This is same as LanId that you use to logon to Windows.
- AePlus User ID:** PeopleSoft is a multi-user/multi-process system. To avoid any conflicts with other AePlus User running/debugging AppEngine programs, AePlus uses an unique identifier called AePlus User ID. This is constructed from Serial Number allocated to AePlus User Name. For example for User NeilS in the screen below, User ID is U002.



All PeopleSoft objects that relate to AePlus start with PP\_XXX. These objects are integral part of AePlus. These objects are installed automatically except for the followings:

SINo	Component	Remarks
1	<b>Project:</b> PP_AEPLS	<p>This project is available under aeplus folder.</p> <p>This should be imported in PeopleSoft Target Database if you would like to run AppEngine thru Process Scheduler. (i.e. Run Thru ProcSched checkbox is ticked).</p> <p>This project contains PP_SCHD_AE AppEngine that is used by AePlus to Schedule AppEngine program in Target Database.</p>
2	<b>Project:</b> PP_DEMO	<p>This project is available under aeplus folder.</p> <p>This should be imported in PeopleSoft Source Database if you would like to evaluate AePlus using supplied Demo AppEngine programs. Project does not contain Process Definition for PP_DEMO AppEngine program.</p>
3	<b>Process Definition:</b> PP_Unnn_A00	<p>This is required if you would like to run AppEngine thru Process Scheduler and :</p> <ul style="list-style-type: none"> <li>• In Debug mode Or</li> <li>• In Target database that is different to Source database</li> </ul>

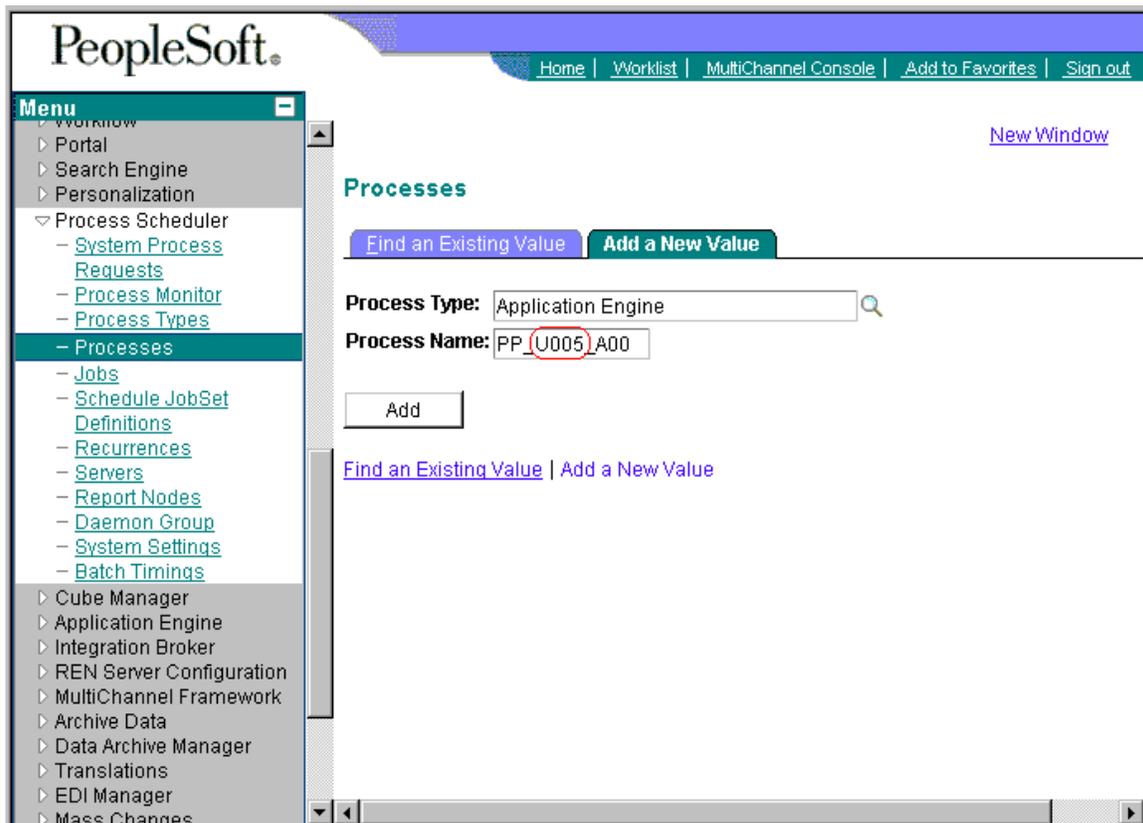


		<p>Create process definition for Application Engine PP_Unnn_A00 where Unnn is your AePlus User ID. For Example PP_U002_A00 if you are the second SqrPlus/AePlus user.</p> <p>Please see User Maintenance screen under SqrPlus User Administration for the number that has been allotted to you.</p>
4	<b>Server Agent</b>	<p>This is required if you would like to run AppEngine thru Process Scheduler and in Debug mode.</p> <p>Please see '<i>Installing Server Agent</i>' for further details.</p>

## Process Definition Setup

When AePlus runs AppEngine program in debug mode or when Source Database is different to Target Database and run location is not client, there must be a process definition for AppEngine program PP\_Unnn\_A00 where Unnn is AePlus User ID. AePlus uses this program name as placeholder. This also ensures that there is no conflict when two AppEngine programs are run at the same time by different PeopleSoft user.

Screen captures below show how this Process Definition should be created in PeopleSoft when AePlus User ID is U005.



PeopleSoft®

Home | Worklist | MultiChannel Console | Add to Favorites | Sign out

New Window | Customize Page

**Menu**

- Worklist
- Portal
- Search Engine
- Personalization
- Process Scheduler
  - System Process Requests
  - Process Monitor
  - Process Types
  - Processes
    - Jobs
    - Schedule JobSet Definitions
    - Recurrences
    - Servers
    - Report Nodes
    - Daemon Group
    - System Settings
    - Batch Timings
- Cube Manager
- Application Engine
- Integration Broker
- REN Server Configuration
- MultiChannel Framework
- Archive Data
- Data Archive Manager
- Translations
- EDI Manager
- Mass Changes
- Performance Monitor
- Web Profile

**Process Definition** | Process Definition Options | Override Options | Destination

**Process Type:** Application Engine  
**Name:** PP\_U005\_A00

**\*Description:** PP\_U005\_A00  **API Aware**

**Long Description:**   **Restart Enabled?**  
**Retry Count:** 0

**\*Priority:** Medium

**\*Process Category:** Default Default Category

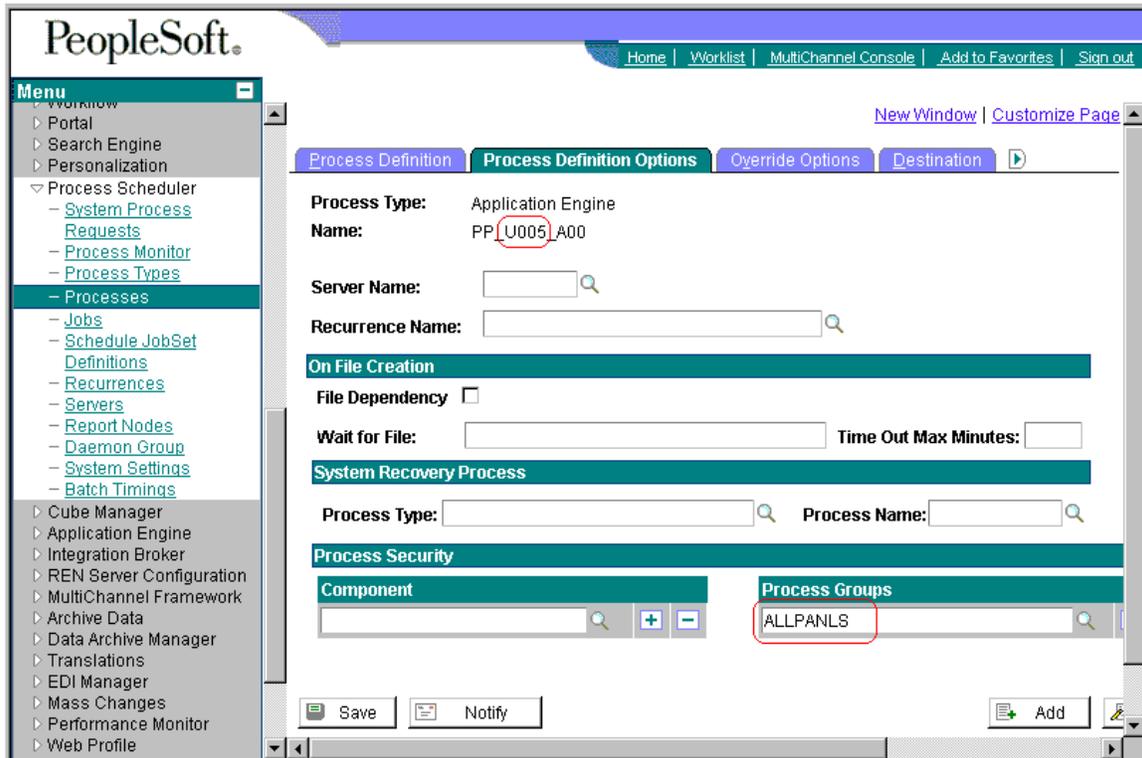
**System Constraints**

**Max Concurrent:**  **Max Processing Time:**  minutes

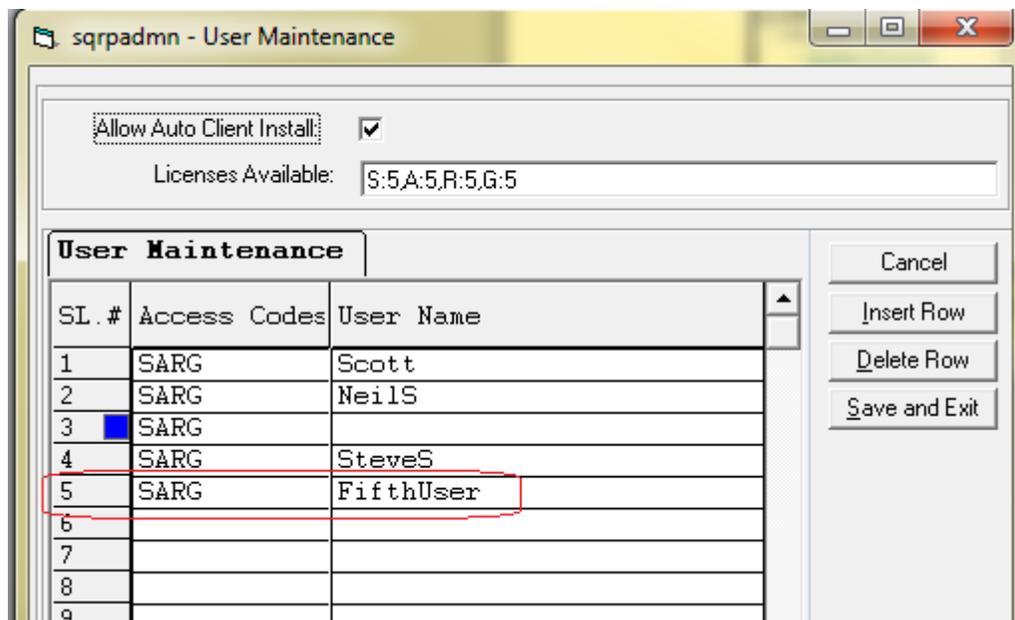
**Mutually Exclusive Process(es)** [Customize](#) | [Find](#)

	*Process Type	*Process Name	Description
1	<input type="text"/>	<input type="text"/>	

Save Notify



Other tabs may have default values. Click Save Button to save the Process Definition for AppEngine Program Name PP\_U005\_A00. This definition is only for AePlus user who has been setup as fifth user under SqrPlus/PsPlus. Each AePlus user should have their own PP\_U005\_A00 process definition setup.





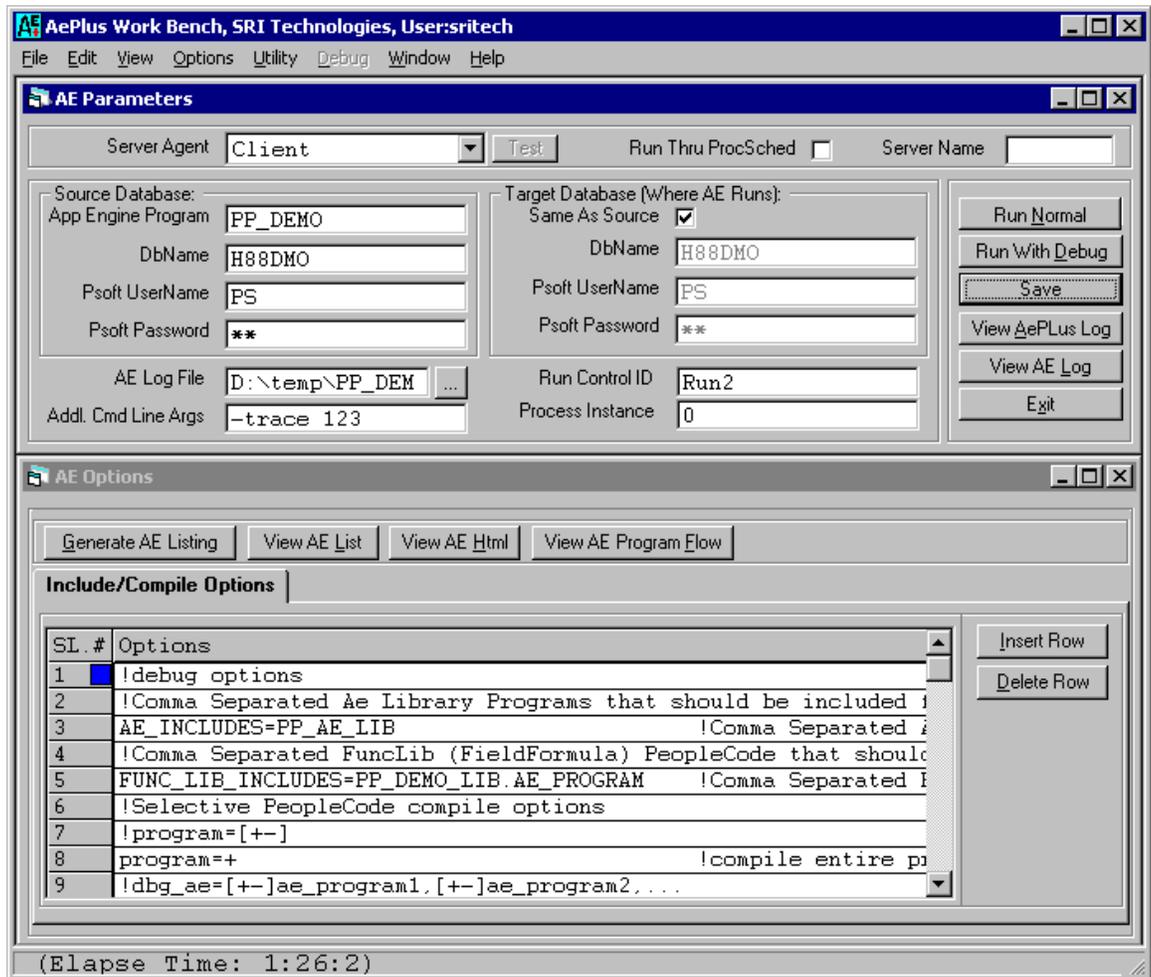
## AePlus Tutorial

This section describes a step-by-step tutorial for using AePlus.

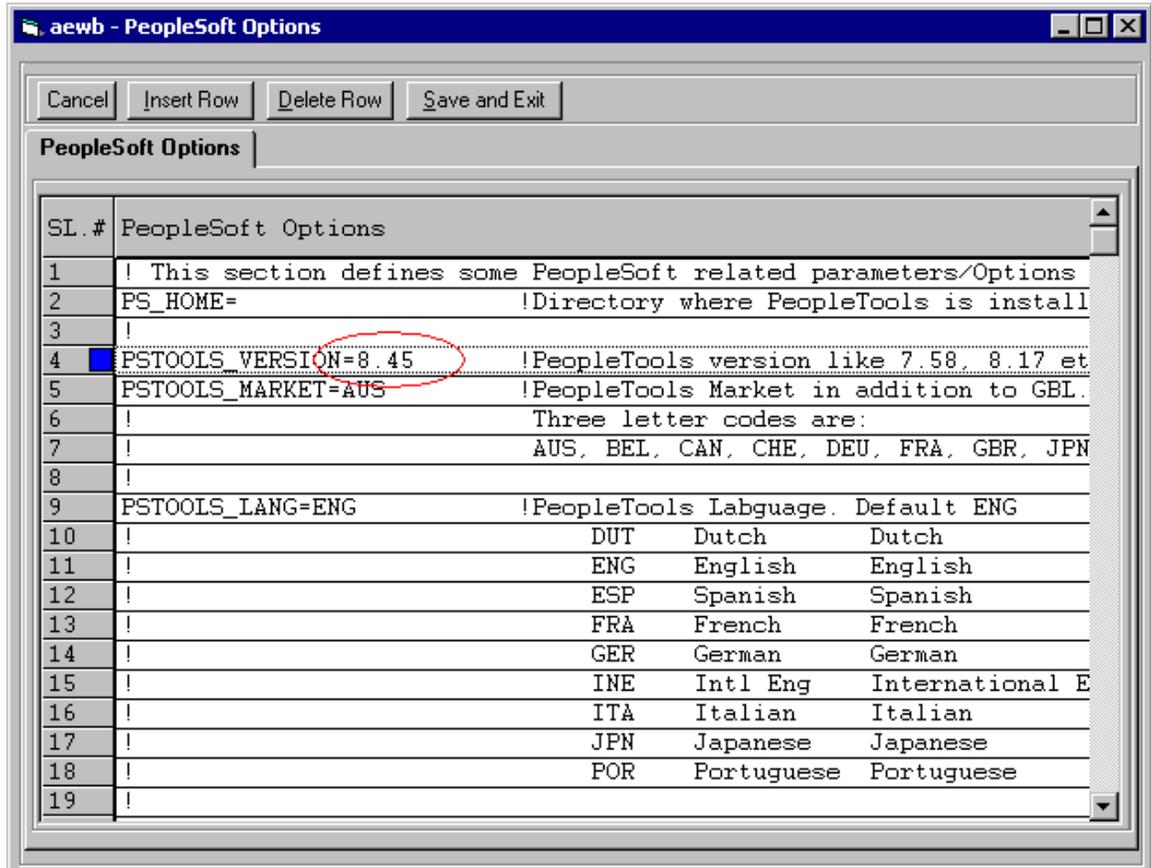
### Setup/Installation Check

AePlus uses PeopleTools product as it is. Before you start using AePlus you must make sure that the AppEngine program (psae.exe) has been setup/installed properly on your PC. This is done as part of PeopleTools setup/install on your PC.

Invoke AePlus Workbench. This program (aewb.exe) is located in your Server directory (e.g. P:\sritech). You may invoke this through AePlus Workbench shortcut (created while installing SqrPlus/PsPlus client) on your Desktop. This will put you in the following AePlus Workbench screen. The screen supports on-line help.



In addition, PeopleSoft options (Options->PeopleSoft Options) should be setup correctly. This screen mainly defines setup related to PeopleSoft like PS\_HOME, Database type etc. Please see the screen below:



**PS\_HOME** should be left as blank that takes the value of PS\_HOME as defined at AePlus installation time. Different value like p:\pt843 may be specified if you would like to use different Tools Version for time being.

**PSTOOLS\_VERSION** should also be specified in n.nn format ignoring other characters like Tools Release 8.45.10 may be entered as 8.45.

Enter your preferred source code editor. This is available under Options->General Options. Default value of 'System Editor' is notepad.



**Java Api's:** AePlus uses few java api's while it runs AppEngine in debug mode. These Api's are:

- &javafile = CreateJavaObject("java.io.File", &FileName)
- &JavaThread = CreateJavaObject("java.lang.Thread")

It is important that these api's call work without any errors. If you find any error message while calling these api's, this would imply that PeopleTools installation is not properly done and some java components are missing. By default, when PeopleTools is installed, java components are automatically installed. Supplied demo program PP\_DEMO has included above java api's calls to ensure that your PeopleTools installation is proper. For example, if PeopleTools installation is proper, you should be able to run demo AppEngine program PP\_DEMO as Normal without any errors.

If Java Api's fail to work as expected, AePlus uses Win Api's instead to cope with the situation. However this switchover is meaningful only if AppEngine runs under windows.

**Run Options:**

Depending on setup and installation, you can run an AppEngine in many ways. The table below explains various combinations along with the prerequisites:

Run Location	Run Option Tools Version	Run Description	Prerequisites
<b>Client:</b> Run NOT Thru Process Scheduler Using Windows psae.exe	A. Option- <b>CNS 8.1</b> and above	Run Normal at Client in Source Database	None
	B. Option- <b>CNT 8.1</b> and above	Run Normal at Client in Target Database	Objects/Tables used/referred by AppEngine program that is not part of AppEngine program definition must exist in Target Database.
	C. Option- <b>CDS 8.4</b> and above	Run with Debug at Client in Source Database	None
	D. Option- <b>CDT 8.4</b> and above	Run with Debug at Client in Target Database	Objects/Tables used/referred by AppEngine program that is not part of AppEngine program definition must exist in Target Database.

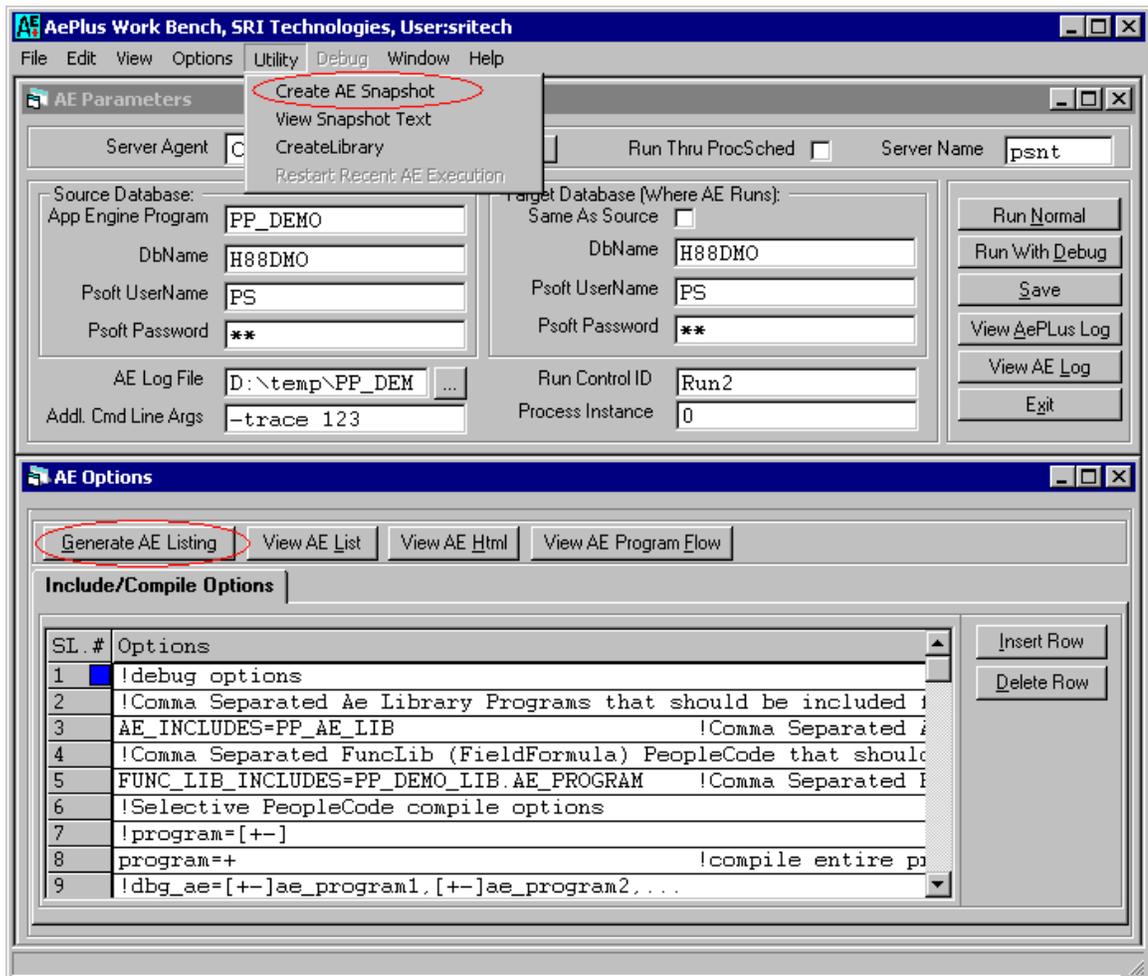


<p><b>Server:</b> Run Thru Process Scheduler  Using Server psae</p>	<p>E. Option-<b>SNS</b> <b>8.4</b> and above</p>	<p>Run Normal at Server in Source Database</p>	<ul style="list-style-type: none"> <li>• PP_SCHD_AE AppEngine in Source Database.</li> <li>• Process Definition of Source AppEngine in Source Database.</li> </ul>
	<p>F. Option-<b>SNT</b> <b>8.4</b> and above</p>	<p>Run Normal at Server in Target Database</p>	<ul style="list-style-type: none"> <li>• PP_SCHD_AE AppEngine in Target Database.</li> <li>• Process Definition for PP_Unnn_A00 AppEngine in Target Database where Unnn is AePlus User ID.</li> <li>• Objects/Tables used/referred by AppEngine program that is not part of AppEngine program definition must exist in Target Database.</li> </ul>
	<p>G. Option-<b>SDS</b> <b>8.4</b> and above</p>	<p>Run with Debug at Server in Source Database</p>	<ul style="list-style-type: none"> <li>• PP_SCHD_AE AppEngine in Source Database.</li> <li>• Process Definition for PP_Unnn_A00 AppEngine in Source Database where Unnn is AePlus User ID.</li> <li>• Server Agent running on machine where Process Scheduler is running.</li> </ul>
	<p>H. Option-<b>SDT</b> <b>8.4</b> and above</p>	<p>Run with Debug at Server in Target Database</p>	<ul style="list-style-type: none"> <li>• PP_SCHD_AE AppEngine in Target Database.</li> <li>• Process Definition for PP_Unnn_A00 AppEngine in Target Database where Unnn is AePlus User ID.</li> <li>• Objects/Tables used/referred by AppEngine program that is not part of AppEngine program definition must exist in Target Database.</li> <li>• Server Agent running on machine where Target Process Scheduler is running.</li> </ul>

### Snapshot and Source Code Listing:

In addition to running AppEngine program as normal or in debug mode, you can also:

- Take a snapshot of AppEngine source code for Source Version Control purpose.  
 Snapshot creates DMS \*.dat version of AppEngine program and DMS import script that should be stored in Source Version Control repository. This \*.dat and \*.dms script file can be used to restore AppEngine program from history.
- Generate AppEngine Source Code listing for quick browsing and analysis. This provides text and html version of source code for quick analysis.





## List Version

List version looks something like:

```
000001 Source DbName:      H88DMO
000002 Psoft User:        PS
000003 AePlus User ID:     U004
000004 AePlus User Name:  sritech
000005 AE Name:           PP DEMO
000006 TimeStamp:         2010-08-30 21:40:07
000007 AE Descr:         Demo AE program
000008 AE Comments:       This is a demo AE program to demonstrate AppEngine Debugging features in GUI mode.
000009
000010
000011
000012 0001 :PP DEMO.MAIN.GetAE_ID.Active.Get Current ApplId
.GBL.default.1900-01-01.
000013 0001:Step Comments--> Get Current Appl-ID.
000014
000015 0000: SQL
000016 0001: %Select(AE APPLID)
000017 0002: SELECT %AEPProgram
000018 0003: FROM PS INSTALLATION
000019
000020 0002 :PP DEMO.MAIN.START.Active.Common Start Actions .GBL.default.1900-01-01.
000021 0000: Call Section PP_AE_LIB.PP_START
000022
000023 0003 :PP DEMO.MAIN.ReadRC.Active.Read Run Control .GBL.default.1900-01-01.
000024 0000: SQL
000025 0001: %Select(ASOFDATE, FLAG1, FLAG2)
000026 0002: SELECT %DateOut(ASOFDATE) , FLAG1 , FLAG2
000027 0003: FROM PS PP DEMO RC
000028 0004: WHERE OPRID = %Bind(OPRID) AND
000029 0005: RUN_CNTL_ID = %Bind(RUN_CNTL_ID)
000030
000031 0004 :PP DEMO.MAIN.SetRC.Active.Set Defaults in RC if not four .GBL.default.1900-01-01.
000032 0001:Step Comments Set RunControl.
000033
000034 0000: PeopleCode
000035 0001: Declare Function ToLog PeopleCode PP_DEMO_LIB.AE_PROGRAM FieldFormula;
000036 0002:
000037 0003: Global number &gbl_menu_items;
000038 0004: Global number &gbl_Navig_items;
000039 0005:
000040 0006: ToLog("", "AET OPRID: " | PP_DEMO_AET.OPRID);
000041 0007: ToLog("", "AET RUN_CNTL ID: " | PP_DEMO_AET.RUN_CNTL_ID);
000042 0008:
000043 0009: If None(PP_DEMO_AET.ASOFDATE) Then
000044 0010: /* RC table is not populated */
000045 0011: ToLog("", "RC Not Populated, Setting Defaults RC Values.");
000046 0012: PP_DEMO_AET.ASOFDATE = %Date;
000047 0013: PP_DEMO_AET.FLAG1 = "Y";
000048 0014: PP_DEMO_AET.FLAG2 = "Y";
000049 0015: End-If;
...
...
000347 0011 :PP DEMO.PP_MENU.Step02.Active.Step02 description .GBL.default.1951-01-01.
000348 0000: PeopleCode
000349 0001: Declare Function ToLog PeopleCode PP_DEMO_LIB.AE_PROGRAM FieldFormula;
000350 0002: Global number &gbl_menu_items;
000351 0003:
000352 0004: ToLog("", "Total Menu Items Listed: " | &gbl_menu_items);
000353 0005:
000354
000355
000356 0012 :PP DEMO.PP_NAVIG.Step01.Active.Step01 description .GBL.default.1900-01-01.
000357 0000: PeopleCode
000358 0001: Declare Function ToLog PeopleCode PP_DEMO_LIB.AE_PROGRAM FieldFormula;
000359 0002:
000360 0003: ToLog("", "Navigations yet to be processed");
000361 0004:
000362 0005: &INFO = GetRecord(@"RECORD." | "PP DEMO AET");
000363 0006: &MYFLD = &INFO.GetField(@"FIELD." | "OPRID");
000364 0007:
000365 0008: &tmp = &MYFLD.value;
000366 0009: ToLog("", "OprId Value: " | &tmp);
000367 0010:
000368 0011: rem last line;
000369 0012:
000370
000371 ** End Of Source Code **
000372
000373 ** Declared Global/Component Generic Data Type Variables
000374
```



Slno	Scope	Type	Variable	Dimension	Line Reference
000375					
000376	----	-----	-----	-----	-----
000377					
000378	0001	component	number	&com_var_num	94
000379	0002	component	string	&com_var_str	95
000380	0003	global	number	&gbl_menu_items	37,336,350
000381	0004	global	number	&gbl_navig_items	38
000382	0005	global	boolean	&gbl_var_bool	90
000383	0006	global	date	&gbl_var_date	88
000384	0007	global	datetime	&gbl_var_datetime	89
000385	0008	global	float	&gbl_var_float	91
000386	0009	global	integer	&gbl_var_integer	92
000387	0010	global	number	&gbl_var_num	86
000388	0011	global	string	&gbl_var_str	87,96
000389	0012	global	time	&gbl_var_time	93
000390					
000391	** Declared Global/Component Generic Data type Arrays				
000392					
000393	Slno	Scope	Type	Variable	Dimension Line Reference
000394	----	-----	-----	-----	-----
000395					
000396	0001	component	number	&com_arr_num	2 106
000397	0002	component	string	&com_arr_str	2 107
000398	0003	global	boolean	&gbl_arr_bool	1 102
000399	0004	global	date	&gbl_arr_date	2 100
000400	0005	global	datetime	&gbl_arr_datetime	2 101
000401	0006	global	float	&gbl_arr_float	2 103
000402	0007	global	integer	&gbl_arr_integer	2 104
000403	0008	global	number	&gbl_arr_num	2 98
000404	0009	global	string	&gbl_arr_str	2 99
000405	0010	global	time	&gbl_arr_time	2 105
000406					
000407	** Declared Global/Component Record Variables				
000408					
000409	Slno	Scope	Type	Variable	Dimension Line Reference
000410	----	-----	-----	-----	-----
000411					
000412	0001	global	record	&flddefn	111
000413	0002	global	record	&recdefn	110
000414					
000415	** Declared Global/Component Field Variables				
000416					
000417	Slno	Scope	Type	Variable	Dimension Line Reference
000418	----	-----	-----	-----	-----
000419					
000420	0001	global	field	&flddescr	113
000421	0002	global	field	&recdescr	112
000422					
000423					
000424	** End Of Listing **				
000425					



## HTML Version

Html version looks something like:

```
D:\temp\PP_DEMO_H88DMO.html - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Home Search Favorites History Print
Address D:\temp\PP_DEMO_H88DMO.html Go Links >>

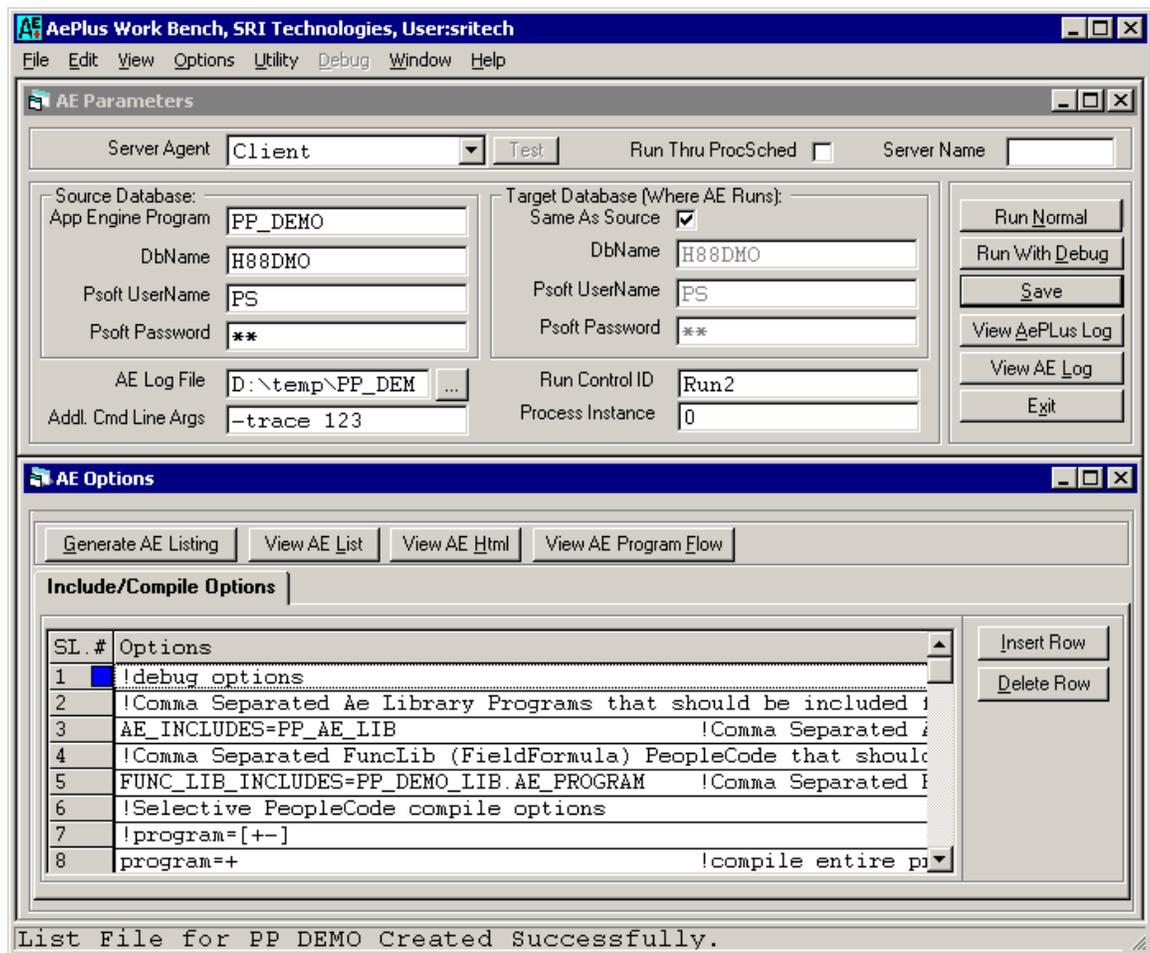
000001 Source DbName:      H88DMO
000002 Psoft User:         PS
000003 AePlus User ID:     U004
000004 AePlus User Name:  sritech
000005 AE Name:          PP_DEMO
000006 TimeStamp:        2010-10-31 15:21:43
000007 AE Descr:         Demo AE program
000008 AE Comments:      This is a demo AE program to demonstrate App Engine Debugging features
000009
000010 ** AE Section Call Tree **
000011
000012 00  PP_DEMO.MAIN
000013    05  PP_AE_LIB.PP_START
000014    05  PP_DEMO.PP_Menus
000015    05  PP_DEMO.PP_NAVIG
000016    05  PP_AE_LIB.PP_STOP
000017
000018
000019 0001 :PP_DEMO.MAIN Section
000020 0001 :PP_DEMO.MAIN.GetAE_ID.Active.Get Current ApplId
000021 0000 : 0001:Step Comments--> Get Current Appl-ID.
000022
000023 0000: SQL
000024 0001:  %Select(AE_APPLID)
000025 0002:  SELECT %AEProgram
000026 0003:  FROM PS_INSTALLATION
000027
000028 0002 :PP_DEMO.MAIN.START.Active.Common Start Actions
000029 0000:  Call Section PP_AE_LIB.PP_START
000030
000031 0003 :PP_DEMO.MAIN.ReadPC.Active.Read Run Control
```

## Running AppEngine Program

AppEngine can be run in many ways. This section describes various Run Options.

### A. Run Option-CNS : Run Normal at Client in Source Database

Enter AppEngine Name, Database, Username and Password etc as shown in the screen below:



- Keep 'Run Location' as Client. This means that AePlus will use your psae.exe located under PS\_HOME to run AppEngine programs. Enter 'App Engine Program:' as 'PP\_DEMO'. This is supplied demo program that should be loaded into Source Database by importing supplied project PP\_DEMO. Alternatively, you can enter any App Engine program that you would like to run thru AePlus Workbench.
- This will update the 'Ae Log File' text box with the default value.



- Tick 'Same as Source' Check box as we would like to run this AppEngine in Source Database itself.
- Enter Source DbName, PeopleSoft User and PeopleSoft Password. For example: H88DMO, PS and password for PeopleSoft User PS.
- Enter 'Run Control Id' that this AppEngine will use.
- Process Instance can be left as 0.
- Enter 'Additional Cmd Line Args' that you would like to have for this AppEngine. For example, -TRACE 123 can be used to produce \*.AET file with trace.
- Click 'Run Normal' to run this AppEngine in source database.

The specified AppEngine will run and produce the AE Log file like: D:\temp\PP\_DEMO.log. Click 'View Log File' to verify results in log file.

If any errors are reported (PeopleTools/Windows related or anything else), or you did not get the log file, the problem needs to be FIXED before proceeding further.

AePlus log may be referred (by clicking 'View AePlus Log') to analyze the issue. It may be due to psae.exe or psdmt.exe not able to complete successfully. This log file shows what command was issue like:

```
2010-08-18 23:22:37 Exporting AE Definition PP_DEMO from H88DMO
2010-08-18 23:22:37 Executing Command: F:\pt845\bin\client\winx86\psdmt.exe -CT
MICROSFT -CD H88DMO -CO PS -CP <Password> -FP
D:\temp\PP_U004_aedms_exp.dms
```

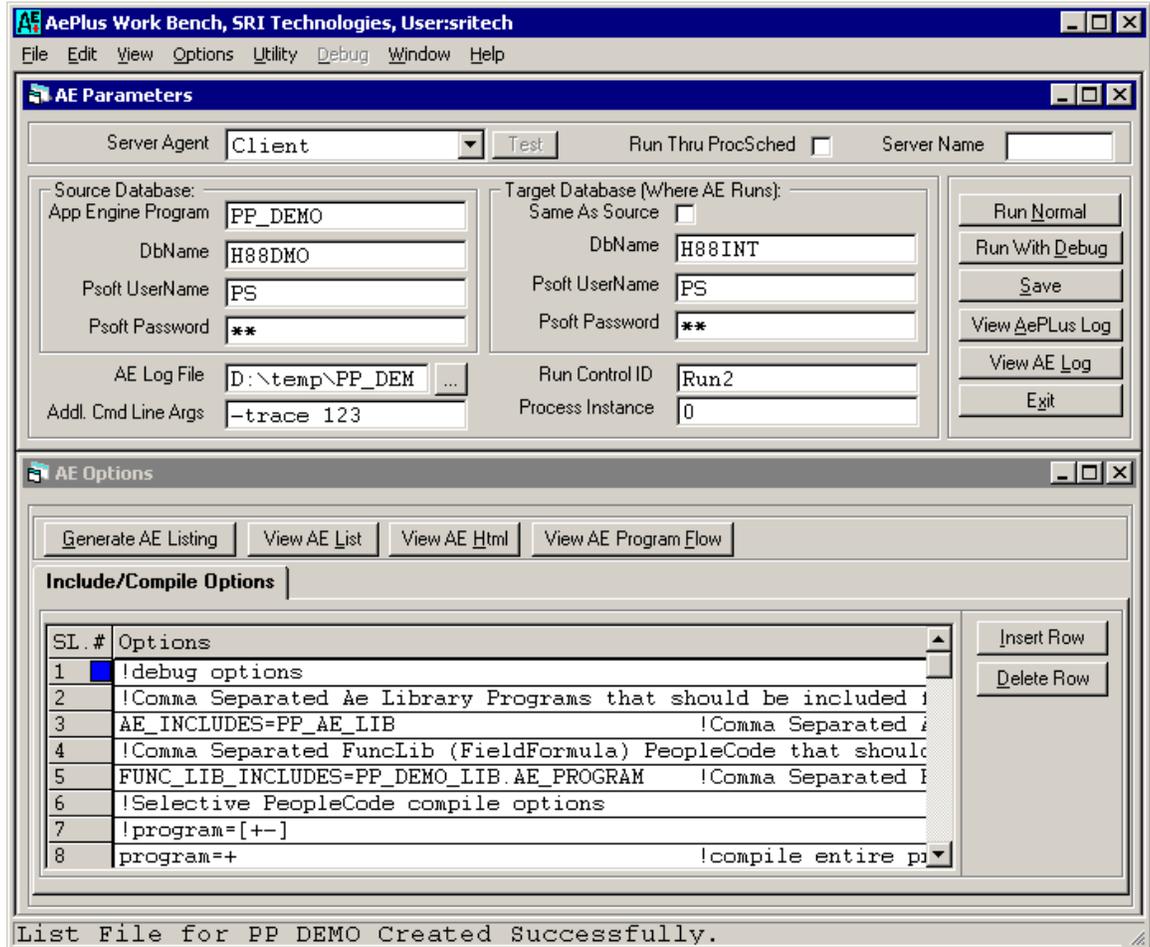
AePlus uses psdmt.exe (Data Mover) program to extract AppEngine definition. This is launched Synchronously. If this fails to launch due to insufficient windows resources, AePlus will continue to wait. To terminate this wait, use 'cancel Active/Synchronously wait' that can be invoked from:

AePlus Workbench->File-> Cancel Active/Synchronous Wait

Try again after freeing some Windows resources.

## B. Option-CNT : Run Normal at Client in Target Database

Enter AppEngine Name, Database, Username and Password etc as shown in the screen below:



- Uncheck 'Same as Source' Check box as we would like to run this AppEngine in different Database (Different to Source Database).
- Enter Target DbName, PeopleSoft User and PeopleSoft Password. For example: H88INT, PS and password for PeopleSoft User PS.
- Click 'Run Normal' to run this AppEngine in Target Database.

This will get AppEngine definition from source database. Compiles it as PP\_Unnn\_A00 AppEngine program in Target Database where Unnn AePlus\_User ID. Runs newly compiled program in Target database.



It is important that each AePlus User ID is unique so that two users who may share same PeopleSoft Username (Like PS) have their own version of AppEngine program (PP\_Unnn\_A00) in Target database. PP\_Unnn\_A00 is just a placeholder for AppEngine program that is used for various AePlus activities like running AppEngine program in different database or running it in Debug mode.

The compiled version of AppEngine holds objects (Sections/Steps/Actions) specific to Source AppEngine program only (i.e. all other objects and data are used from Target database). These objects are used to run AppEngine program in Target Database using the application data of Target database. With this flexibility, you can run AppEngine program in different database without changing/migrating AppEngine program in target database but utilizing Target database application data set that is hard to simulate in Source database to address particular business data scenario. Compiled version of AppEngine uses/refers all other objects from Target database.



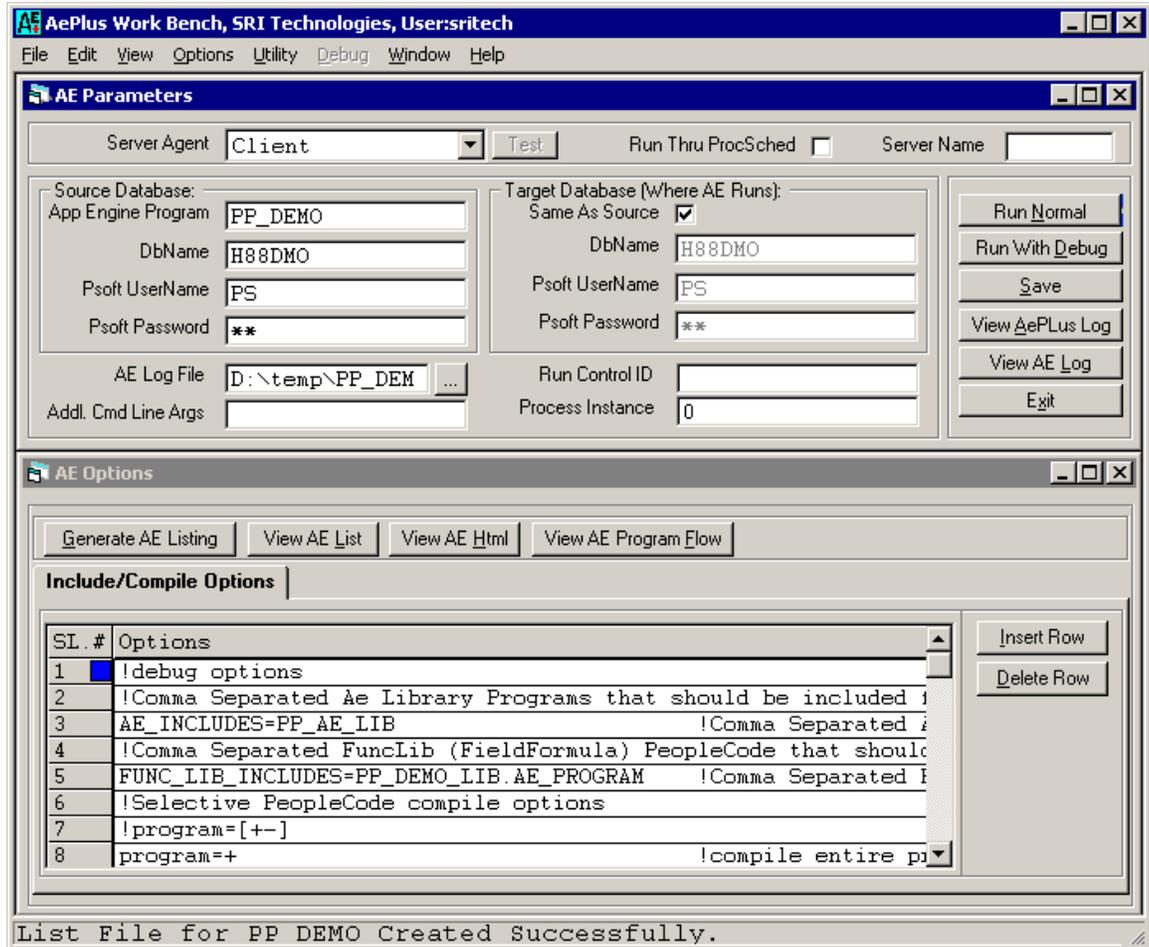
### **C. Run Option-CDS : Run with Debug at Client in Source Database**

Although you can run any AppEngine program in debug mode but for demonstration purpose supplied demo program PP\_DEMO has been used. This can be loaded into source database by importing PP\_DEMO project located in aeplus folder under 'Server Directory' (e.g. p:\sritech\aeplus).

This is a small comprehensive AppEngine program that uses:

- State Record PP\_DEMO\_AET
- Derived Record PP\_DEMO\_LIB for some FuncLib PeopleCode
- Run Control Record PP\_DEMO\_RC
- AppEngine Library PP\_AE\_LIB
- AppEngine SQL
- Comprehensive PeopleCode

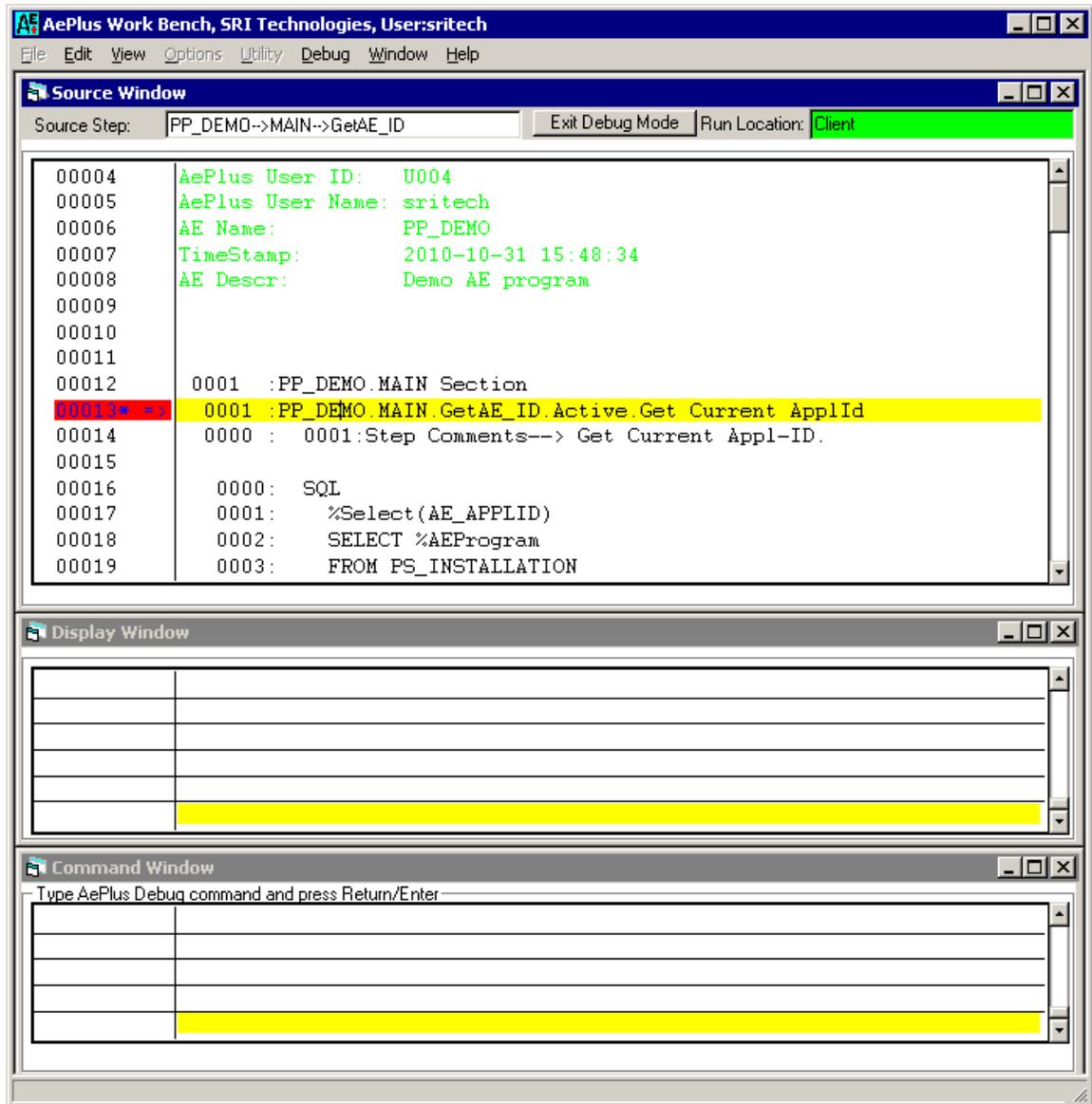
Enter AppEngine Name, Database, Username and Password etc as shown in the screen below:



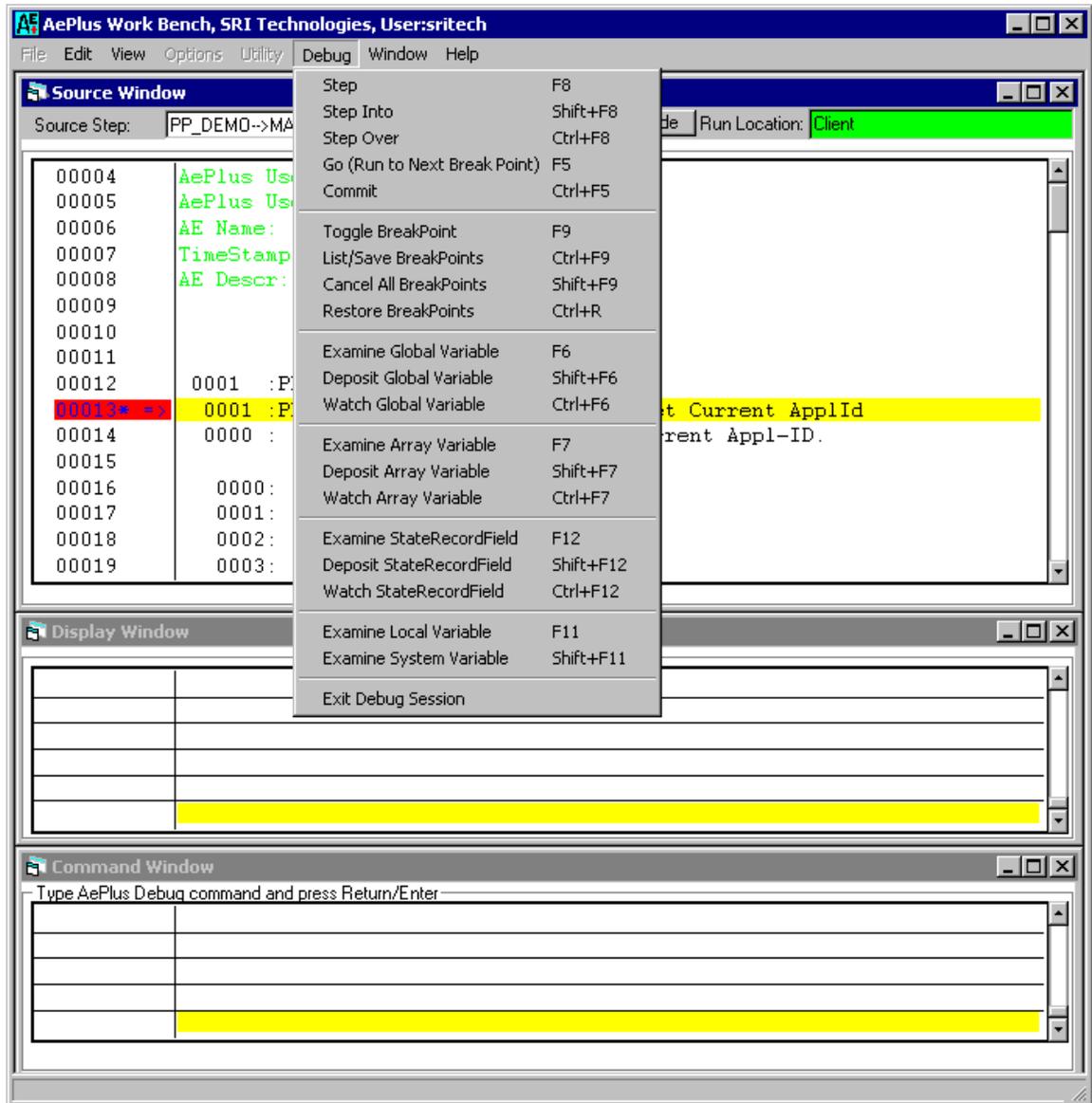
- Since AppEngine program will run in debug mode at client, Select 'Server Agent' as Client and Un-Check 'Run Thru ProcSched' checkbox.
- Enter PP\_DEMO as 'App Engine Program'
- Check 'Same as Source' Check box as we would like to run this AppEngine in Source Database.
- Enter Source DbName, PeopleSoft User and PeopleSoft Password. For example: H88DMO, PS and password for PeopleSoft User PS.
- 'Addl Cmd Line Args' can be left as blank.
- Run Control Id can be left as blank.
- Process Instance can be left as 0
- Click 'Run With Debug' to run this AppEngine in Source Database with Debug.



AePlus goes thru the compilation process that is logged in AePlus log file (Unnn\_AePlus.log in AePlus Temp folder. e.g. c:\temp\U001\_AePlus.log). If compilation is successful you will get into following screen for interactive debug session with your AppEngine program.



In above screen the demo program PP\_DEMO is running in Database H88DMO in debug mode and ready to execute first Step of the Main section while waiting for the user input. At any point while program is waiting for user input, a debug command can be used. List of debug commands are available under Menu Item ‘Debug’



The screen is divided into three windows as:

- Display window will be blank at this stage. Later on, this window will be used to display the results of various AePlus debug commands.
- Command window will also be blank at this stage. The left column shows the serial number and will be 1 at this stage.
- Source and Display windows are 'Read Only' windows. Command window provides the area where you will enter various AePlus debug commands.

Current line that will be executed is shown as:

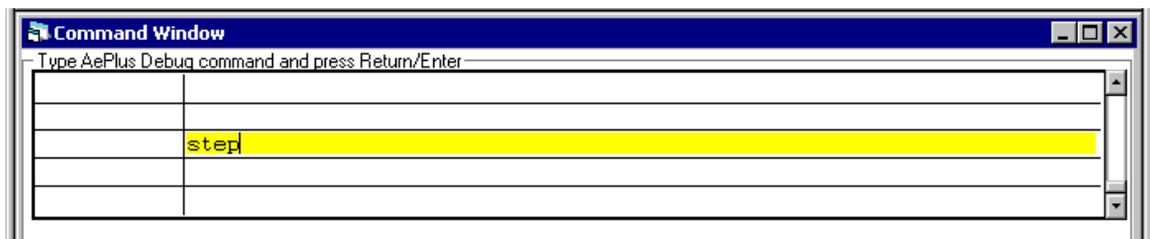
```
00012 | 0001 :PP_DEMO.MAIN Section  
00013* -> | 0001 :PP_DEMO.MAIN.GetAE_ID.Active.Get Current ApplId  
00014 | 0000 : 0001:Step Comments--> Get Current Appl-ID.  
00015 |
```

which will execute SQL:

```
0001: %Select(AE_APPLID)  
0002: SELECT %AEProgram  
0003: FROM PS_INSTALLATION
```

‘\*’ after the line number indicates that it is a valid source line where break point can be set.

Enter F8 (or enter step in command window followed by ‘Enter’ key)

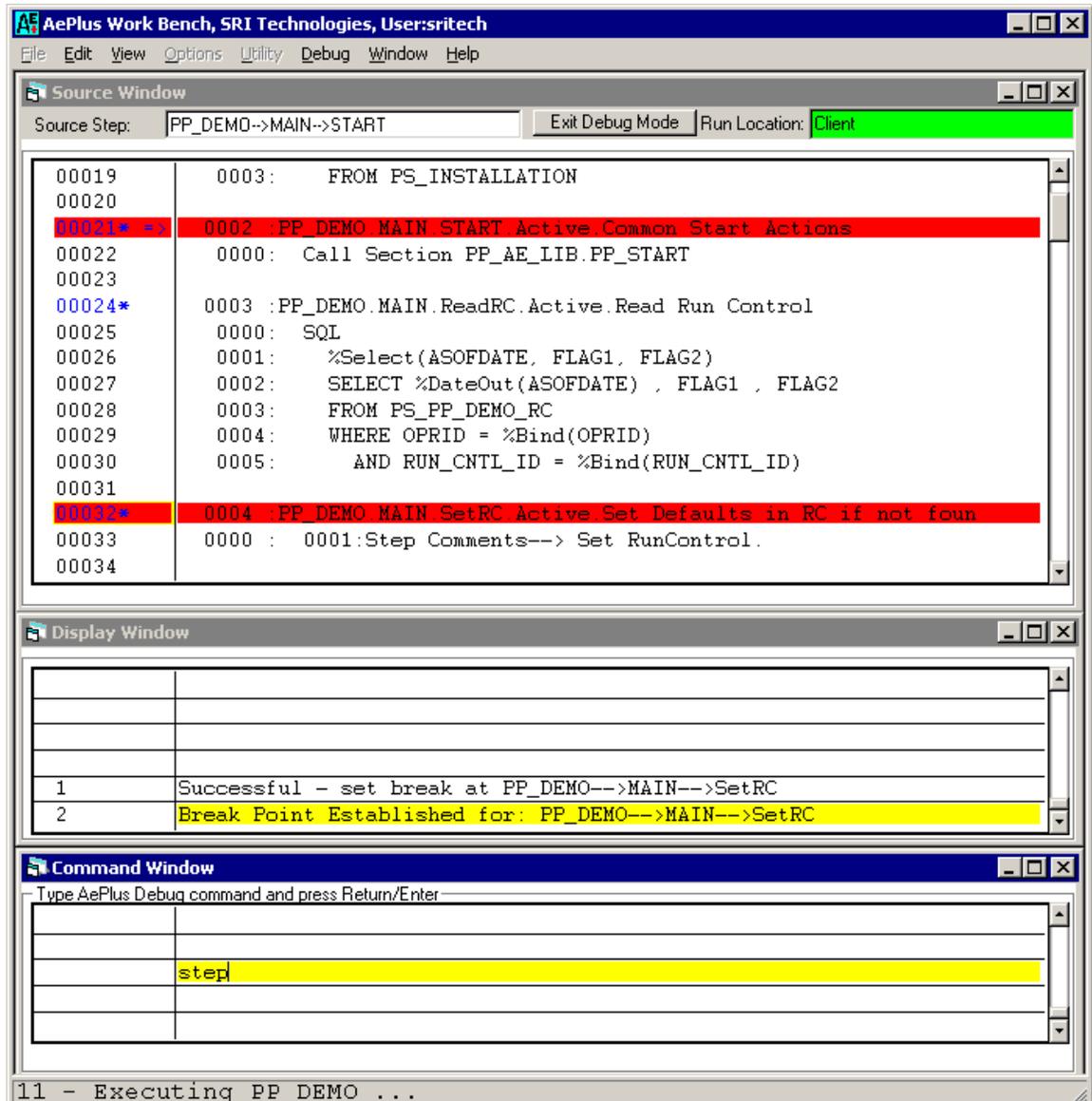


This will execute SQL at step 0001 and cursor will move to Step 0002 as shown below:

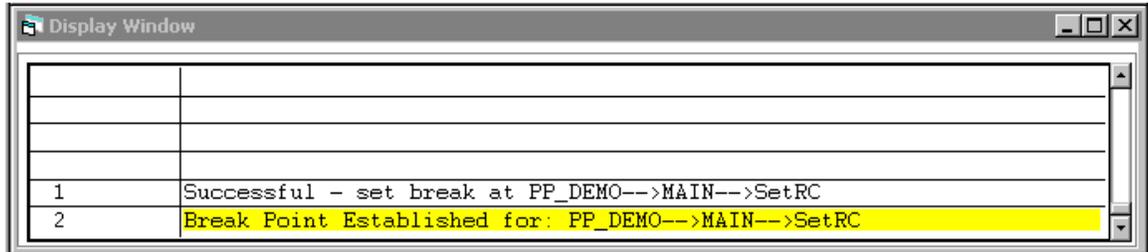


```
-----
00020
00021* 0002 :PP_DEMO.MAIN.START.Active.Common Start Actions
00022      0000: Call Section PP_AE_LIB.PP_START
00023
00024* 0003 :PP_DEMO.MAIN.ReadRC.Active.Read Run Control
00025      0000: SQL
00026      0001: %Select(ASOFDATE, FLAG1, FLAG2)
00027      0002: SELECT %DateOut(ASOFDATE) , FLAG1 , FLAG2
00028      0003: FROM PS_PP_DEMO_RC
00029      0004: WHERE OPRID = %Bind(OPRID)
00030      0005: AND RUN_CNTL_ID = %Bind(RUN_CNTL_ID)
00031
```

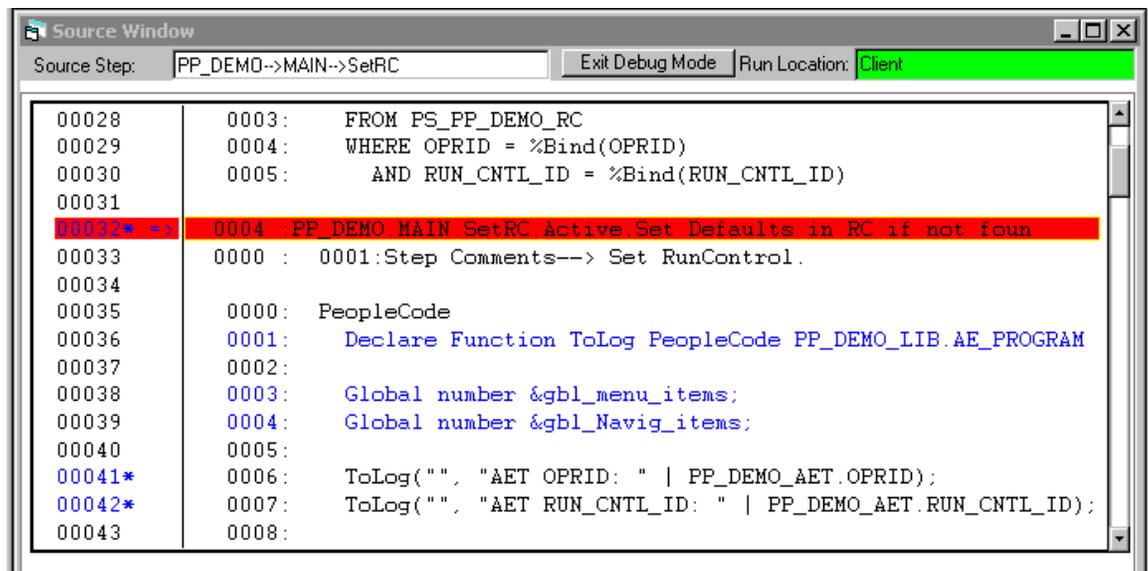
Double click at line number 32 to set a break point.



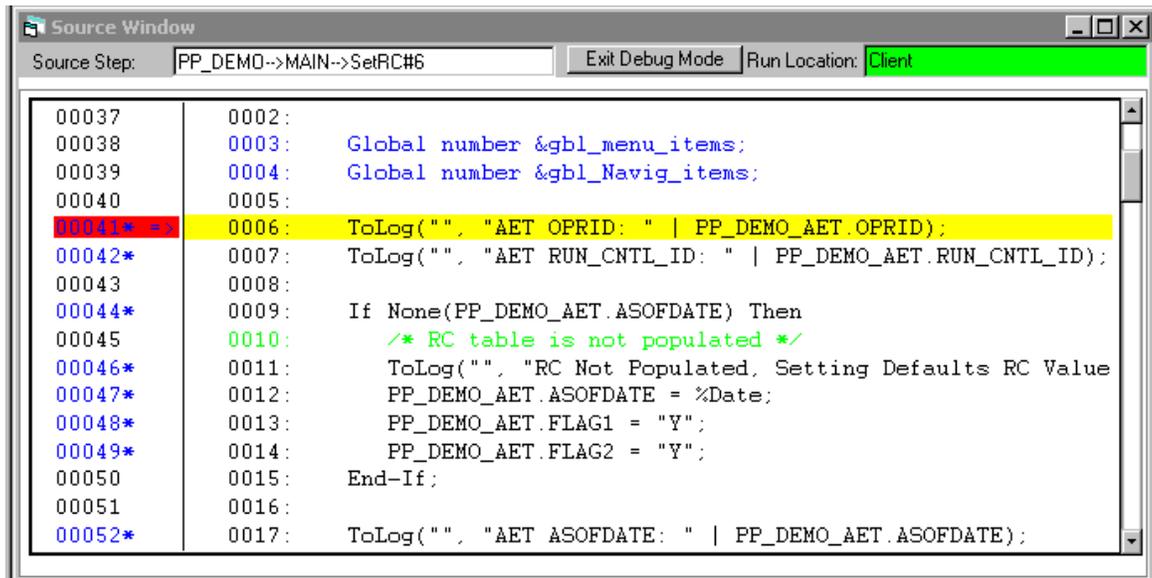
This will set a break point at step 0004 along with command confirmation in Display window:



Press F5 or enter go in the command window. This will execute Step 0002 thru 0003 and cursor will move to line 32 as shown below:



Pressing F8 (step) will execute step 0004 and cursor will move to next step. However, we would like to step thru each line of PeopleCode and so we will press Shift+F8 (step/into) this time. This will take us to the first executable PeopleCode like e.g. line 00041 as shown below:



```

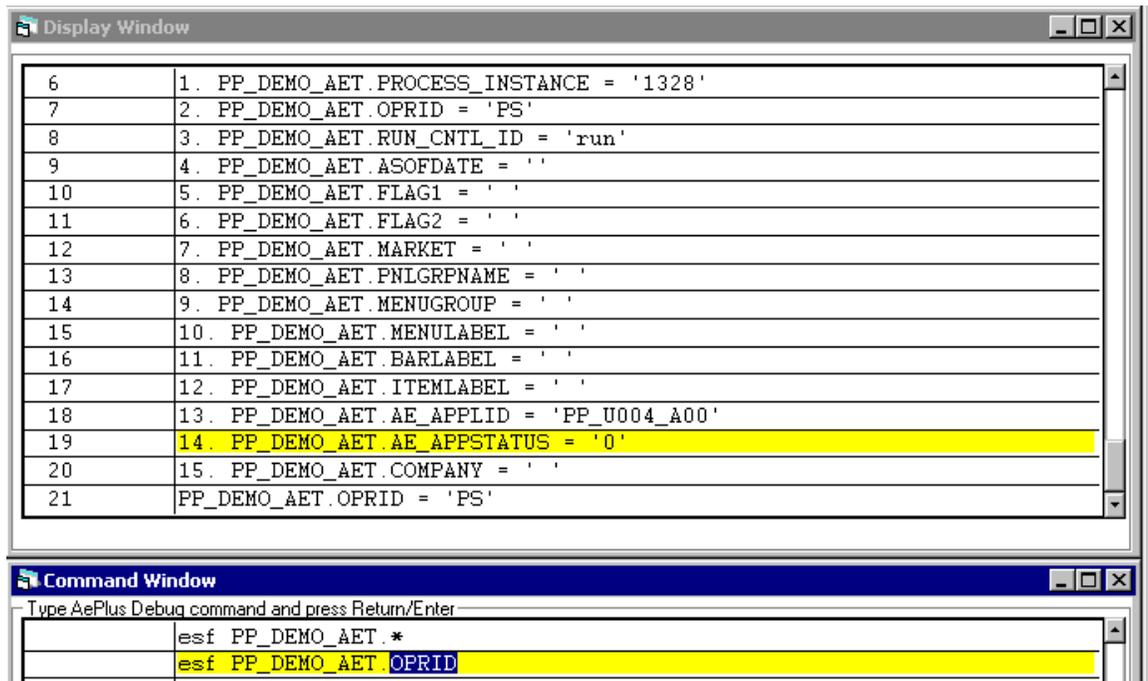
Source Window
Source Step: PP_DEMO-->MAIN-->SetRC#6   Exit Debug Mode   Run Location: Client

00037      0002:
00038      0003:   Global number &gbl_menu_items;
00039      0004:   Global number &gbl_Navig_items;
00040      0005:
00041* - 0006:   ToLog("", "AET OPRID: " | PP_DEMO_AET.OPRID);
00042*    0007:   ToLog("", "AET RUN_CNTL_ID: " | PP_DEMO_AET.RUN_CNTL_ID);
00043      0008:
00044*    0009:   If None(PP_DEMO_AET.ASOFDATE) Then
00045      0010:   /* RC table is not populated */
00046*    0011:   ToLog("", "RC Not Populated, Setting Defaults RC Value
00047*    0012:   PP_DEMO_AET.ASOFDATE = %Date;
00048*    0013:   PP_DEMO_AET.FLAG1 = "Y";
00049*    0014:   PP_DEMO_AET.FLAG2 = "Y";
00050      0015:   End-If;
00051      0016:
00052*    0017:   ToLog("", "AET ASOFDATE: " | PP_DEMO_AET.ASOFDATE);

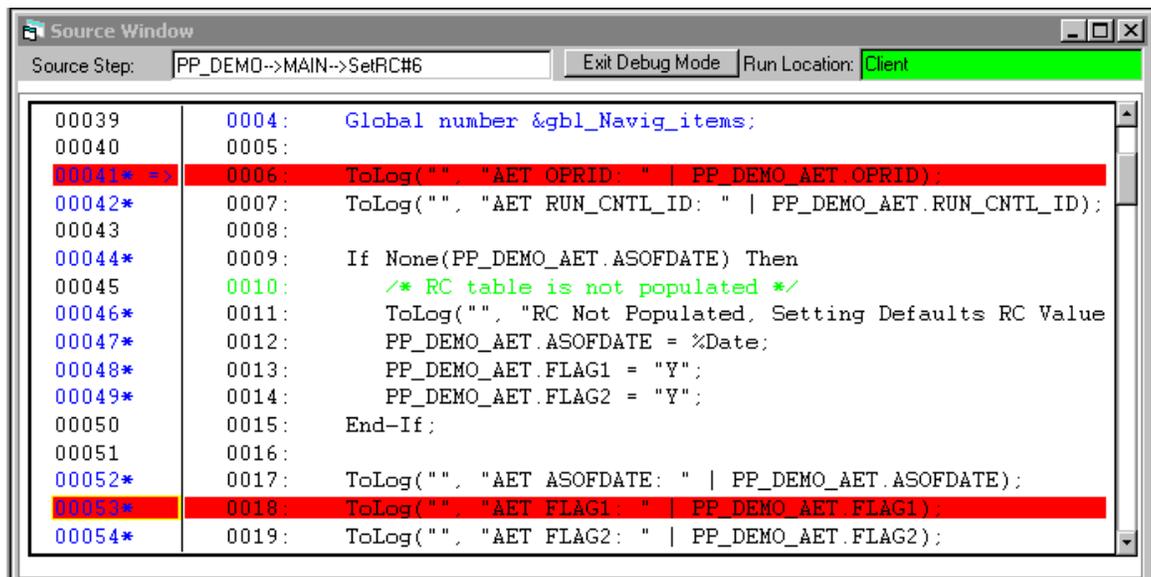
```

While program is waiting for user input, any debug command can be issued. At this stage we can see value of State Record or value of global variable. Also, we can choose to modify value of State Record Field or global variable to impact change in program flow. Let us see what is the value of PP\_DEMO\_AET.OPRID at this stage by issuing debug command:

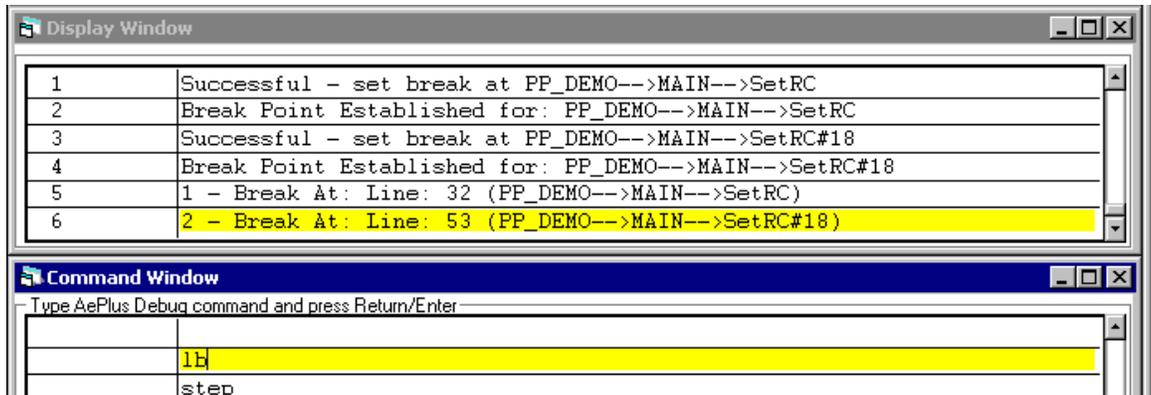
Command: `esf PP_DEMO_AET.*` displays value of all the field in State Record PP\_DEMO\_AET where as command `PP_DEMO_AET.OPRID` displays value of OPRID only as shown in the screen below:



Let us set another break point at line number 00053.

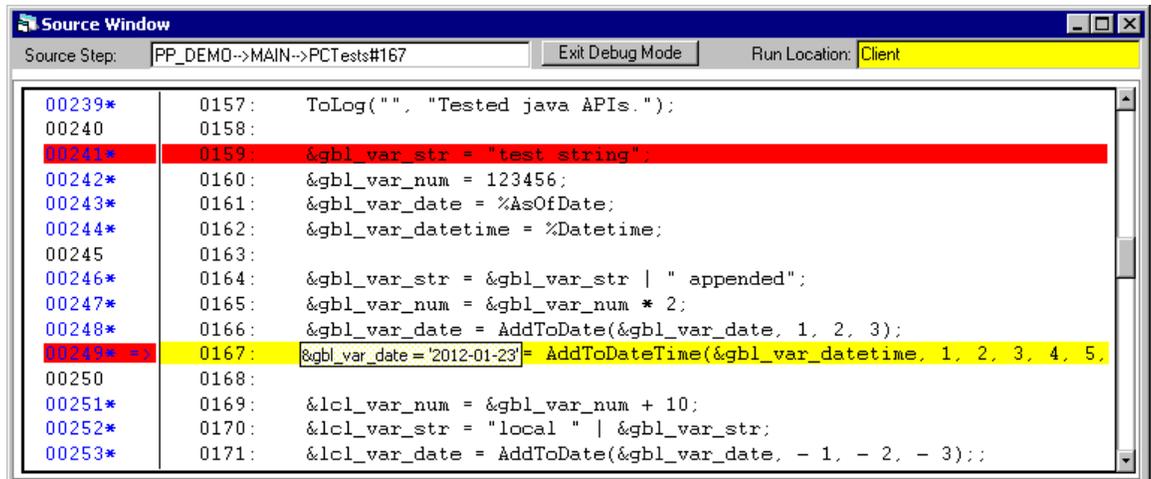


Let us see all the active break points at this stage by issuing debug command:  
lb (list break)



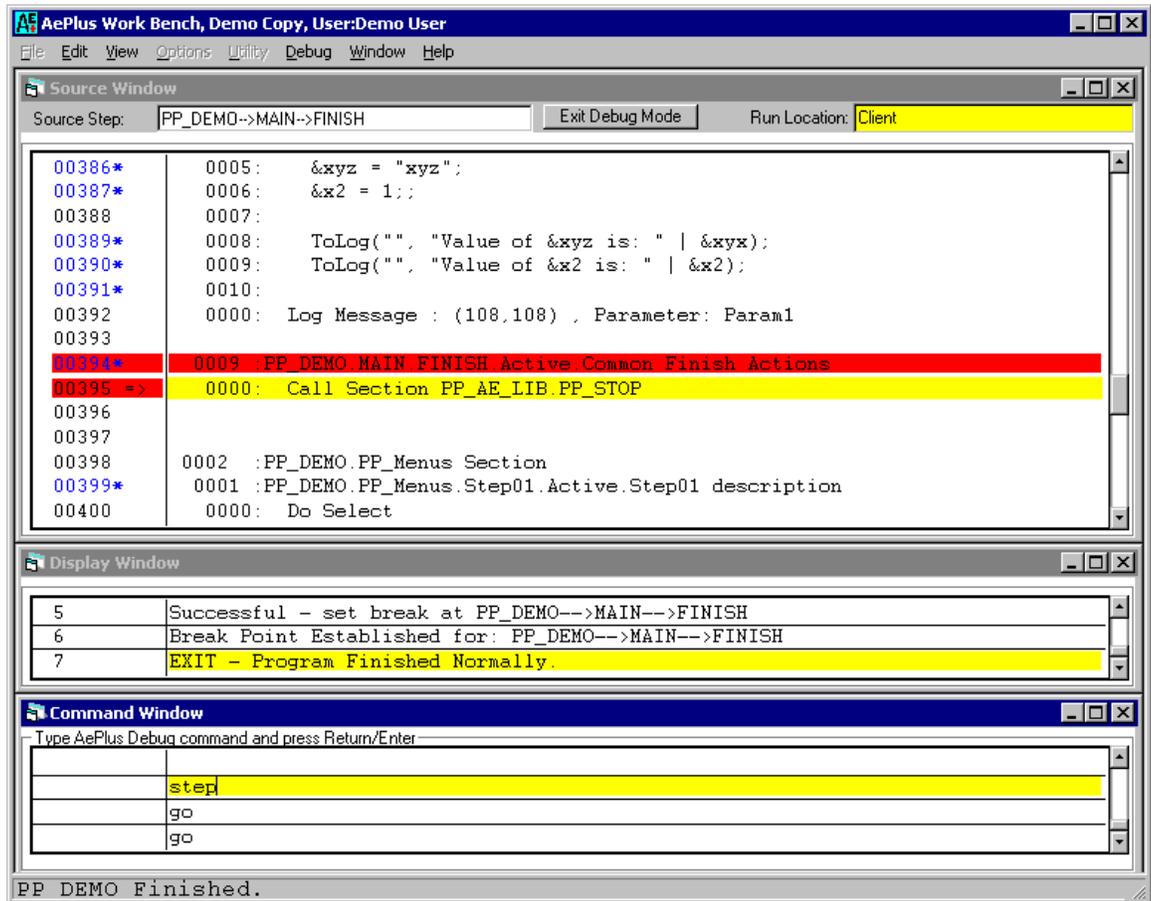
Pressing F5 (go) will take us to line number 00053. We can execute each line of PeopleCode using F8 (step) command and examine result using various debug commands.

Screen below shows the ability to examine value of global variable by just positioning the mouse on the variable in source window:



**In addition to function keys, command window is used to enter various debug commands. Each debug command is terminated by ‘Enter’ key. The Arrow keys may be used to pickup commands from the history. It is the ‘Enter’ key that completes the debug command.**

Once AppEngine completes successfully, you can exit the debug mode by clicking ‘Exit Debug Mode’ command button or enter Exit command in command window.



This will close the debug window and workbench window will be restored.



When running program in debug mode, if AppEngine calls Sections Dynamically, value of state record should be changed just in time so that appropriate sections are called at run time. For Example, when debugging TL\_TIMEADMIN program that calls section from TL\_TA\_RULES AppEngine dynamically, value of AE Program name should be modified in State Record by appropriate PP\_Unnn\_Axx just before the Section Call where PP\_Unnn\_Axx is the Ae Name assigned to TL\_TA\_RULES by AePlus compiler. This can be achieved by setting break point before the Call Section Step.

PP\_Unnn\_Axx value can be obtained from “Object Mapping” table in \*.lst file that is created by AePlus in SqrPlus temp directory. This will be something like:

```
....
000560 Object Mapping
000561
000562 Original Object Mapped Object
000563 -----
000564 TL_TIMEADMIN PP_U004_A00
000565 TL_TA000410 PP_U004_A01
000565 TL_TA000800 PP_U004_A02
000565 TL_TA_RULES PP_U004_A03
000567
....
....
```



#### **D. Run Option-CDT : Run with Debug at Client in Target Database**

This is same as **Run Option C** (Run With Debug at Client in Source Database) except that and Source Database and Target Database are different. Debug version of AppEngine runs in Target Database instead of Source Database. The compilation process takes AppEngine definition from Source Database but compiled version is created in Target Database.

#### **E. Run Option-SNS : Run Normal at Server in Source Database**

This is same as **Run Option A** (Run Normal at Client in Source Database) except that the AppEngine is run thru Process Scheduler. AePlus uses PP\_SCHD\_AE AppEngine program to schedule AppEngine program in Source Database.

Run Thru ProcSched checkbox should be ticked. Server Name should be specified although that may be overridden by appropriate Server name when process is scheduled. e.g. PSNT may change to PSUNX when process is scheduled.

AePlus Workbench notifies developer when AppEngine completes. However, log files created by the AppEngine program should be viewed thru Process Monitor. It is essential that AppEngine program specified has the Process Definition setup in source database.

#### **F. Run Option-SNT : Run Normal at Server in Target Database**

This is same as **Run Option B** (Run Normal at Client in Target Database) except that the AppEngine is run thru Process Scheduler. AePlus uses PP\_SCHD\_AE AppEngine program to schedule compiled AppEngine program (PP\_Unnn\_A00) in Target Database.

Run Thru ProcSched checkbox should be ticked. Server Name should be specified although that may be overridden by appropriate Server name when process is scheduled. e.g. PSNT may change to PSUNX when process is scheduled.

AePlus Workbench notifies developer when AppEngine completes. However, log files created by the AppEngine program should be viewed thru Process Monitor. It is essential that AppEngine PP\_Unnn\_A00 has the Process Definition setup in target database where Unnn is AePlus User ID.



### **G. Run Option-SDS : Run with Debug at Server in Source Database**

This is same as **Run Option C** (Run with Debug at Client in Source Database) except that the AppEngine runs thru Process Scheduler. AePlus uses PP\_SCHD\_AE AppEngine program to schedule compiled AppEngine program (PP\_Unnn\_A00) in Source Database.

Run Thru ProcSched checkbox should be ticked. Server Name should be specified although that may be overridden by appropriate Server name when process is scheduled. e.g. PSNT may change to PSUNX when process is scheduled.

Debugging interface is same as that in **Run Option C**. However, since AppEngine runs is a different machine, Server Agent must be up and running on machine where AppEngine runs. Server Agent should also point to correct Remote Server Agent (other than Client). For further details on 'Remote Server Agent', please refer to *Installing Server Agent* topic.

It is also essential that AppEngine PP\_Unnn\_A00 has the Process Definition setup in source database where Unnn is AePlus User ID.

### **H. Run Option-SDT : Run with Debug at Server in Target Database**

This is same as Run Option D (Run with Debug at Client in Target Database) except that the AppEngine runs thru Process Scheduler. AePlus uses PP\_SCHD\_AE AppEngine program to schedule compiled AppEngine program (PP\_Unnn\_A00) in Source Database.

Run Thru ProcSched checkbox should be ticked. Server Name should be specified although that may be overridden by appropriate Server name when process is scheduled. e.g. PSNT may change to PSUNX when process is scheduled.

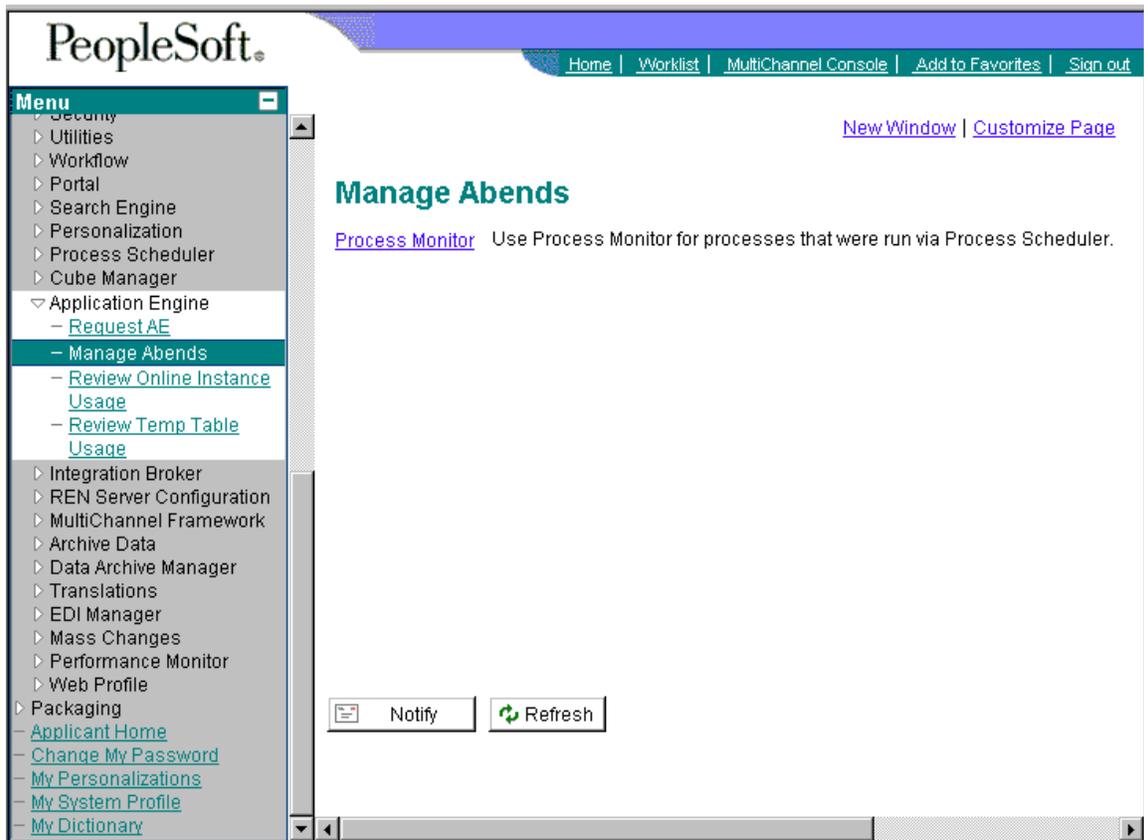
Debugging interface is same as that in **Run Option D**. However, since AppEngine runs is a different machine, Server Agent must be up and running on machine where AppEngine runs. Server Agent should also point to correct Remote Server Agent (other than Client). For further details on 'Remote Server Agent', please refer to *Installing Server Agent* topic.

It is also essential that AppEngine PP\_Unnn\_A00 has the Process Definition setup in target database where Unnn is AePlus User ID.

## Ae Abends

Whenever an AppEngine that runs at Client (i.e. not thru Process Scheduler) and it abends due to some run time errors, you may have to manage this abended process so that you are able to run this process next time. Screen capture below shows how to manage such un-finished process.

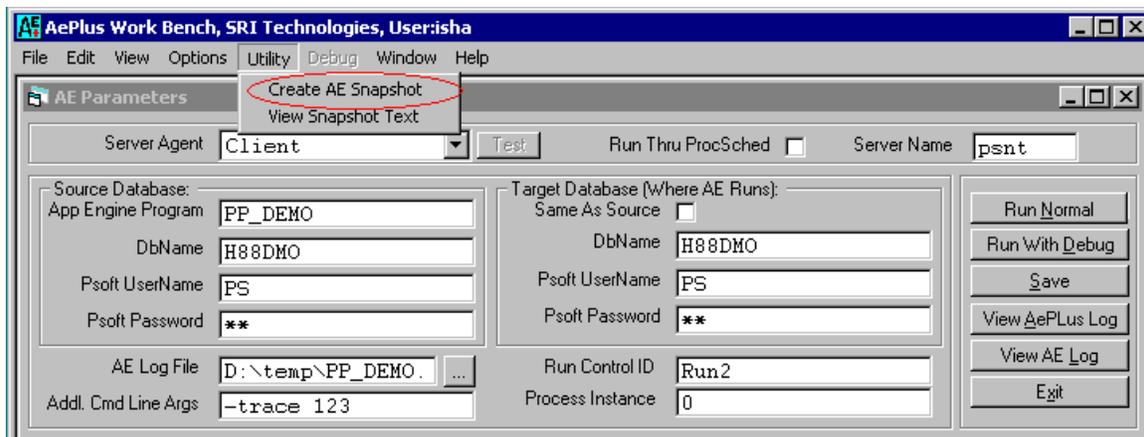
Navigation: PeopleTools->Application Engine->Manage Abends



If AppEngine that runs at Server thru Process Scheduler, it should be managed thru Process Monitor.

## Source Version Control AppEngine using AePlus

Source Version Control is an essential part of any Source Code in any software development environment. With **AePlus** you can Source Version Control AppEngine source code using the same Source Version Control Software that you use for SQRs or COBOLs. AppEngine source code is kept as one unit. Since Source code can be preserved in Source Version Control software - you always know where the master copy is and never lose your coding effort as a result of database refresh. You can easily compare two versions of AppEngine source code (that is available in text format) to find what exactly has changed. Rolling back to previous version is much controlled and quality assured.



Following steps are required:

- Enter AppEngine program name that you would like to put into Source Version Control Software.
- Enter Source Database, Username and Password.
- Click Utility->Create AE Snapshot

This will extract AppEngine Definition from Source Database and produce followings:

- AppEngine Source Code in text format. For example if AppEngine program name is PP\_DEMO and Source Database is H88DMP, text snapshot will be created as `c:\sqrplus\ae\PP_DEMO_H88DMO.txt` where `c:\sqrplus\ae` is `AE_SNAPSHOT_DIR` as defined in AePlus Options. This text file should be checked into your Source Version Control repository to facilitate general browsing and comparison between two versions.



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- In addition, Dat and Dms files are also created to facilitate rollback to specific version when needed. For example for PP\_DEMO AppEngine program, c:\sqrplus\ae\PP\_DEMO\_imp.dat and c:\sqrplus\ae\PP\_DEMO\_imp.dms are created.

----- *End of Document* -----