

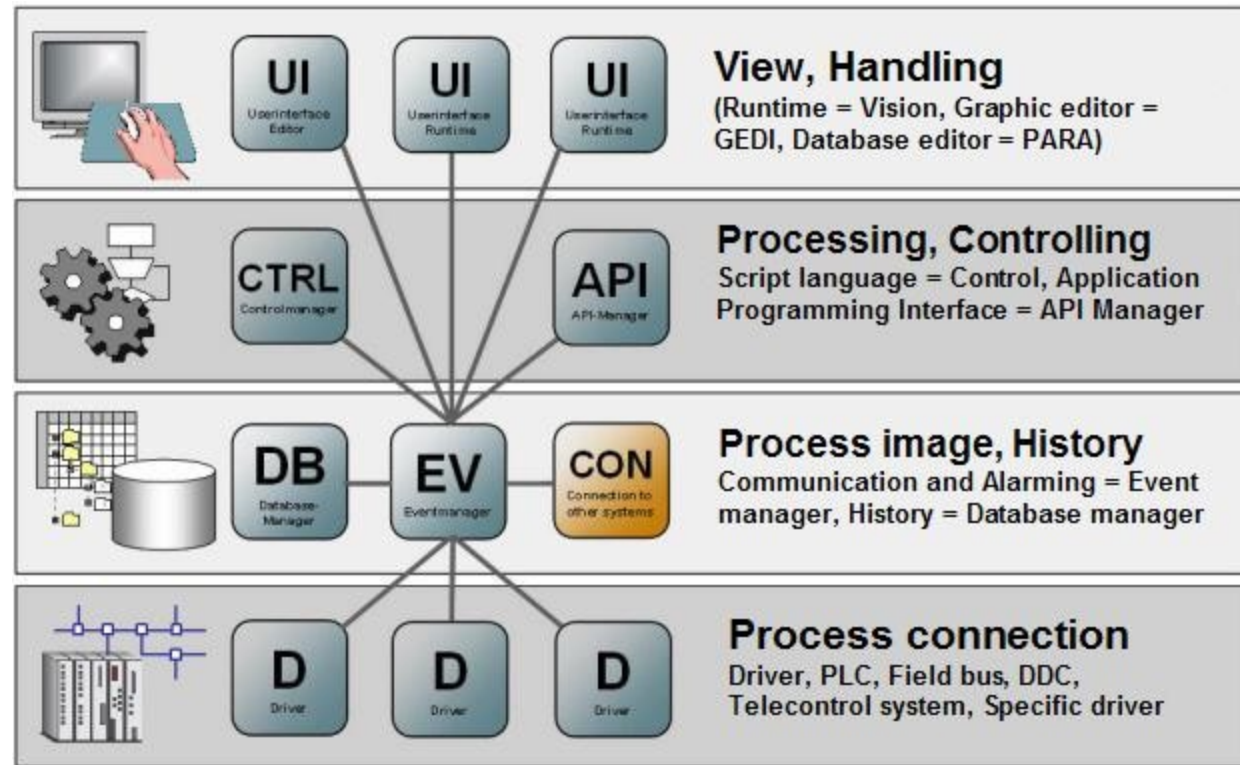
Integration of SVN into PVSS

Choices and Challenges

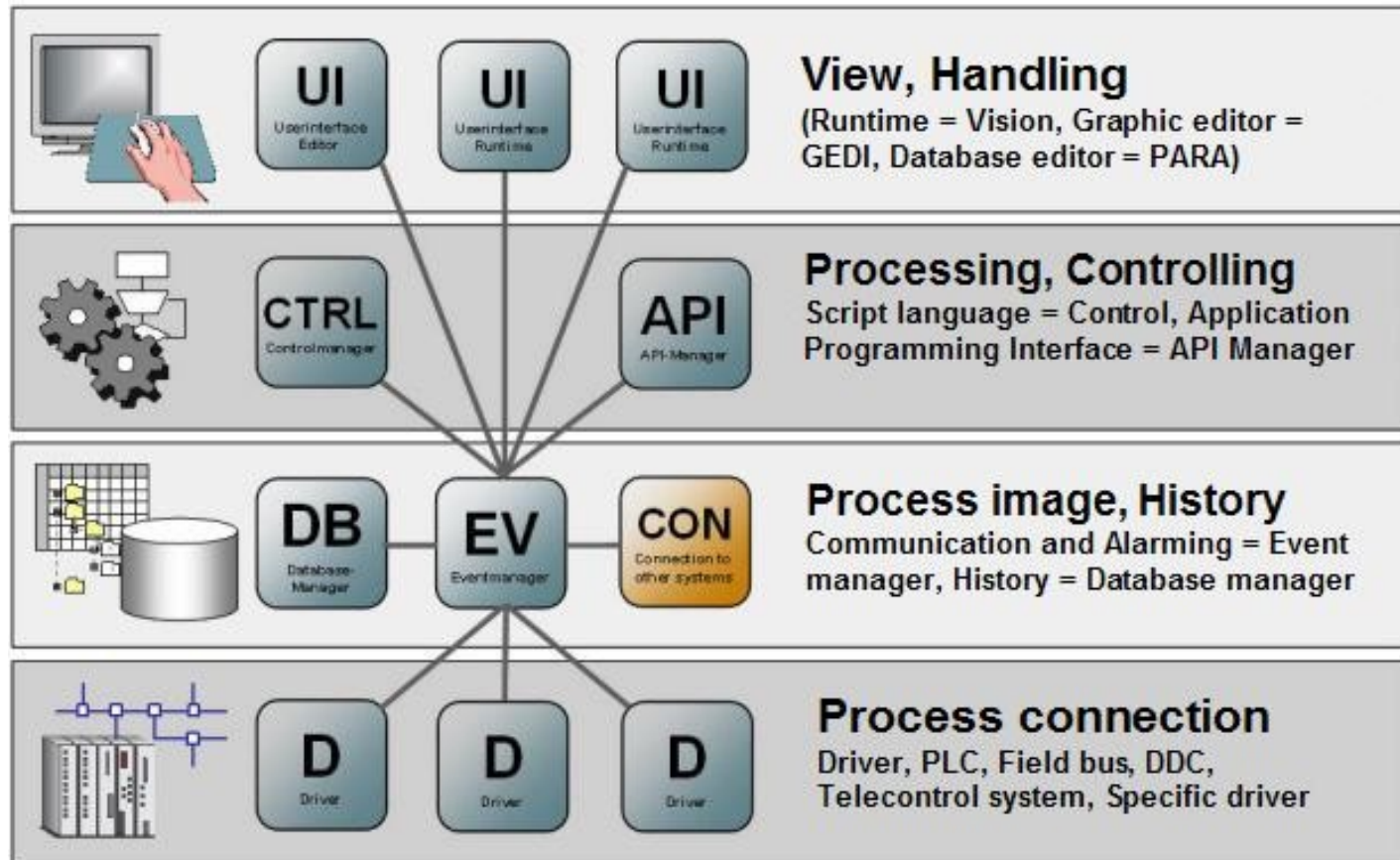


- PVSS Architecture and Basic Concepts
 - Projects
 - Gedi
- Versioning Control in PVSS
 - Strategy
 - Ctrl Interface
 - Integration into GEDI
- Current challenges

- PVSS is a SCADA system suitable for Large Distributed Control Systems



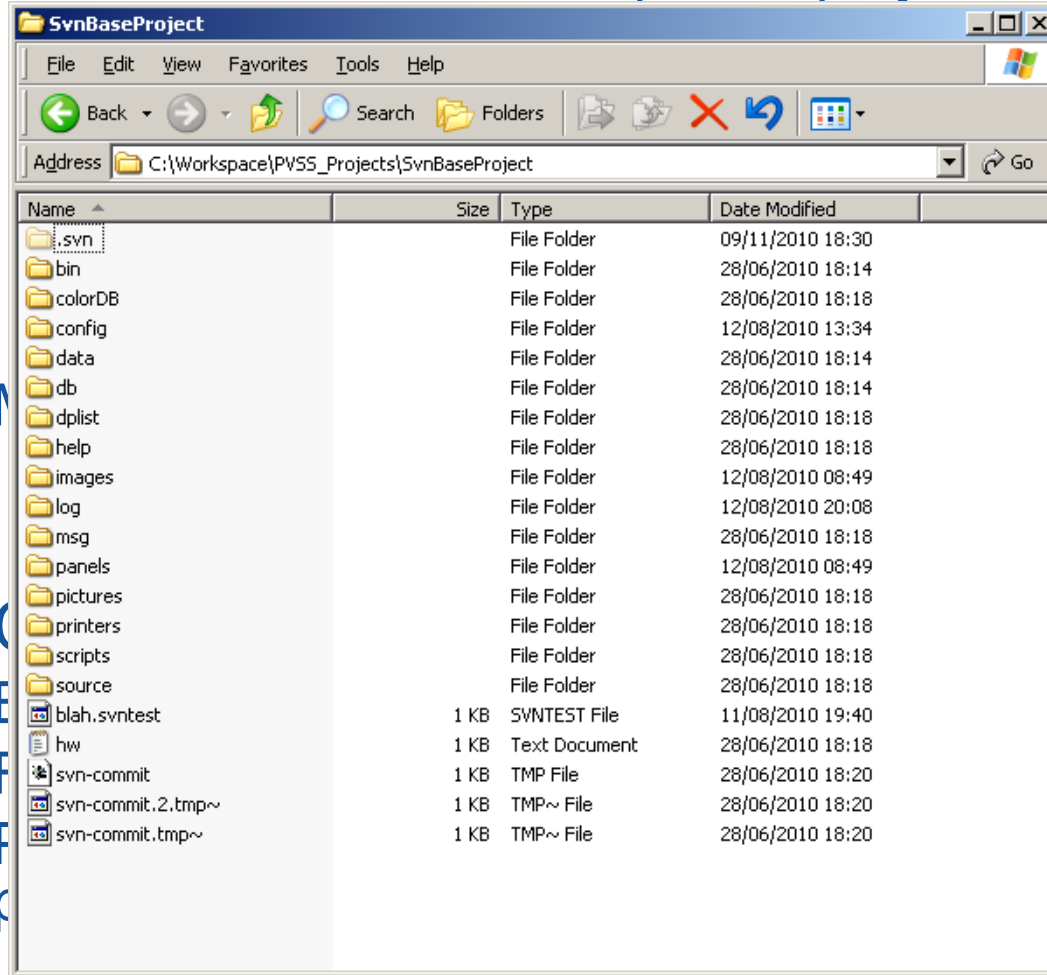
- Basic Concepts



- Understood by some managers (UI Manager, Ctrl Manager)

- PVSS Projects

- Consist of files within a specific project folder:



- M

- At C

- E
 - F
 - F

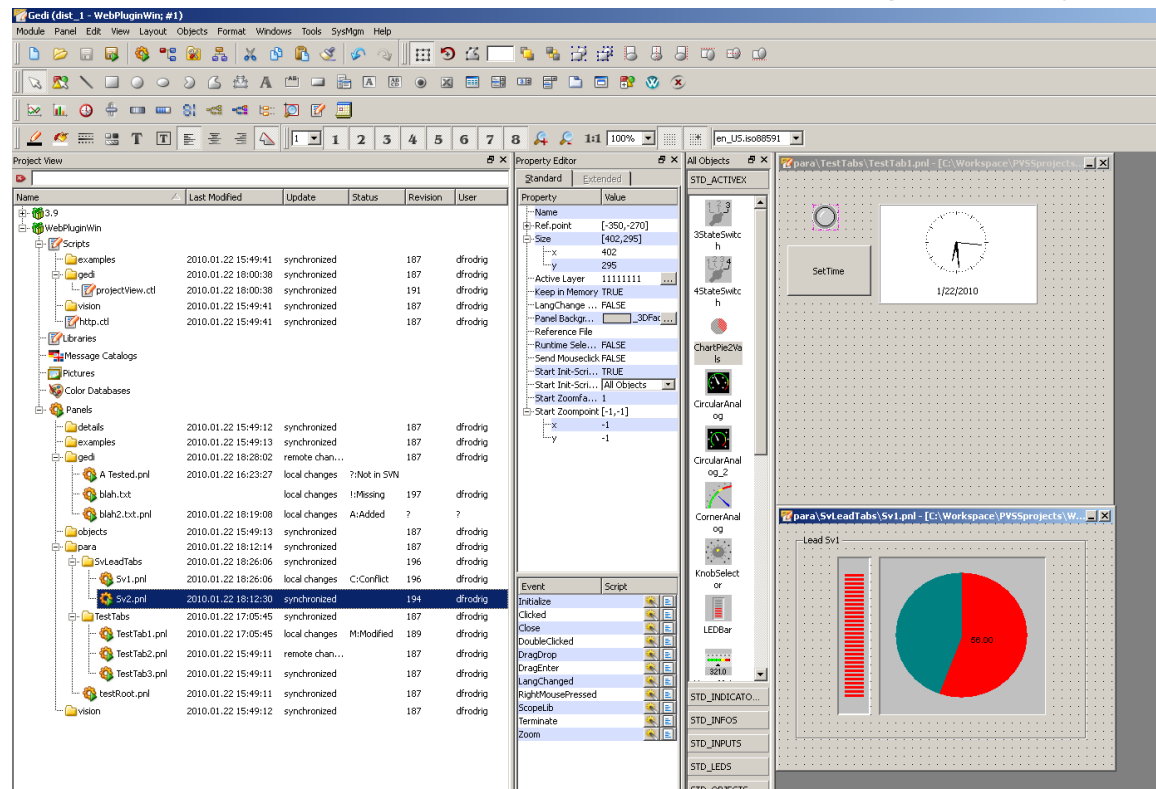
...)

project
process

nsively

projects
project

- **GEDi**
 - A PVSS Integrated Development Environment
 - Creation of Panels and Scripts
 - Access to different functionalities (para, system, ...)



- Benefits of using Version Control are well known
 - Change control, accountability, rollback, team collaboration, backup

- PVSS Projects change over time
 - We want those benefits into PVSS.
 - Panels, scripts, datapoints are candidates

 - not the project database, however
 - Keeps the current project running status
 - Most development is on static components

- GEDI should embed versioning control capabilities

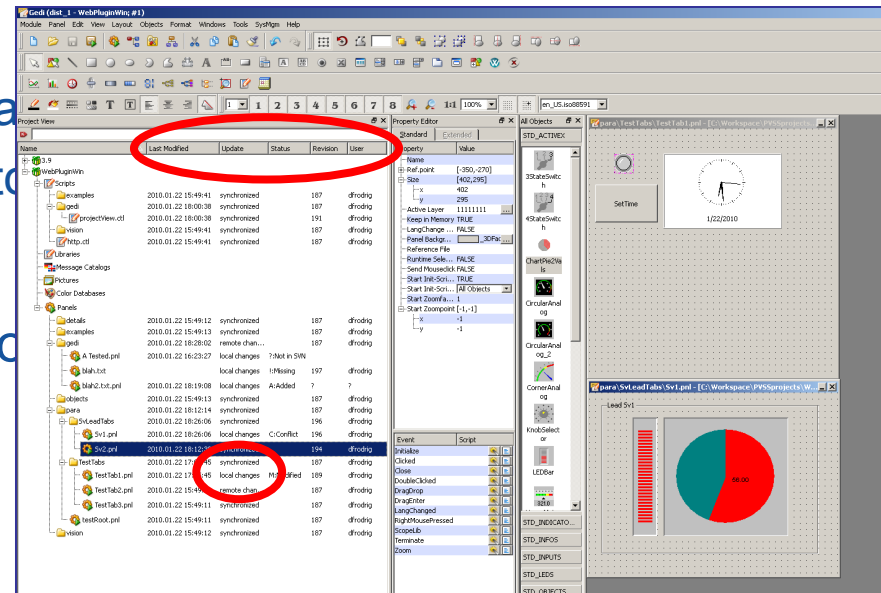
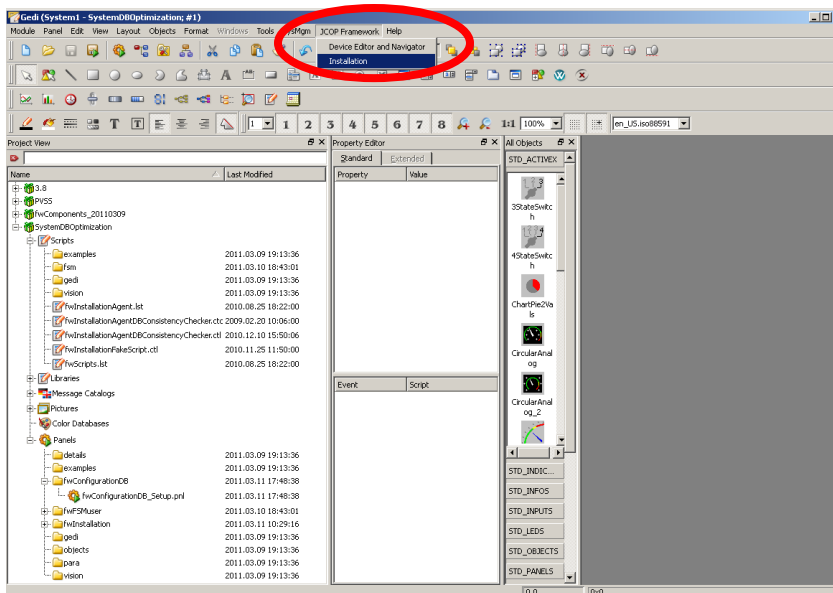
■ Strategy

■ Gedi is an UI Manager

- Understands Scripting Language (CTRL)

■ Before loading, project view runs a ctrl script

- We can add



C:\Workspace\PVSS_Projects\SvnPluginDev\scripts\libs\svnPlugin.ctl - Script Editor (System1 - SvnPluginDev; #1)

File Edit View Tools

isSvnUrl(

```

496     returnValue["revision"] = substr(line, 9);
497     if(substr(line, 0, 19) == "Last Changed Author" )
498         returnValue["author"] = substr(line, 20);
499     if (substr(line, 0, 17) == "Last Changed Date" )
500         returnValue["svnDate"] = substr(line, 18, 19);
501     }
502
503     if (!mappingHasKey(returnValue, "svnDate" ) ) {
504         returnValue["svnDate"] = "";
505     }
506     if (!mappingHasKey(returnValue, "author" ) ) {
507         returnValue["author"] = "";
508     }
509     DebugSvn("GetSvnInfo: returnValue: " + returnValue);
510     return returnValue;
511 }
512
513
514 //-----
515 //
516 dyn_string getSvnLog(string filePath) synchronized (tmpFile)
517 {
518     filePath = resolveLocalPath(filePath);
519     InfoSvn("[SVN] getSvnLog(" + filePath + ")");
520
521     setTmpNam();
522     SVN_command("log -v", filePath);
523
524     string stringResult;
525     fileToString(tmpFile, stringResult);
526
527     return strsplit(stringResult, "\n");
528 }
529
530 //-----
531 //
532 dyn_string getSvnDiff(string filePath) synchronized (tmpFile)
533 {
534     filePath = resolveLocalPath(filePath);
535     InfoSvn("[SVN] getSvnDiff(" + filePath + ")");
536

```

Functions

- DebugSvn
- doSvnAdd
- doSvnCat
- doSvnCheckout
- doSvnCommit
- doSvnExport
- doSvnRemove
- doSvnUpdate
- getCommitComment
- getSvnDiff
- getSvnInfo
- getSvnLog
- getSvnRepositoryList
- getSvnStatus
- importProject
- InfoSvn
- init
- isSvnUrl
- parseStatusLine
- setTmpNam
- showResult
- SVN_command
- svnDiff

Insert Line: 516 Column: 1

- CTRL allows for system calls

```
int system(string shellcommand);
exec(c:\> shellcommand)
```

- Ctrl SVN interface

- Requires svn command line client installation

Uses system calls to issue svn commands

- ex: `system("svn add filename");`
- Reads stdout to temporary file

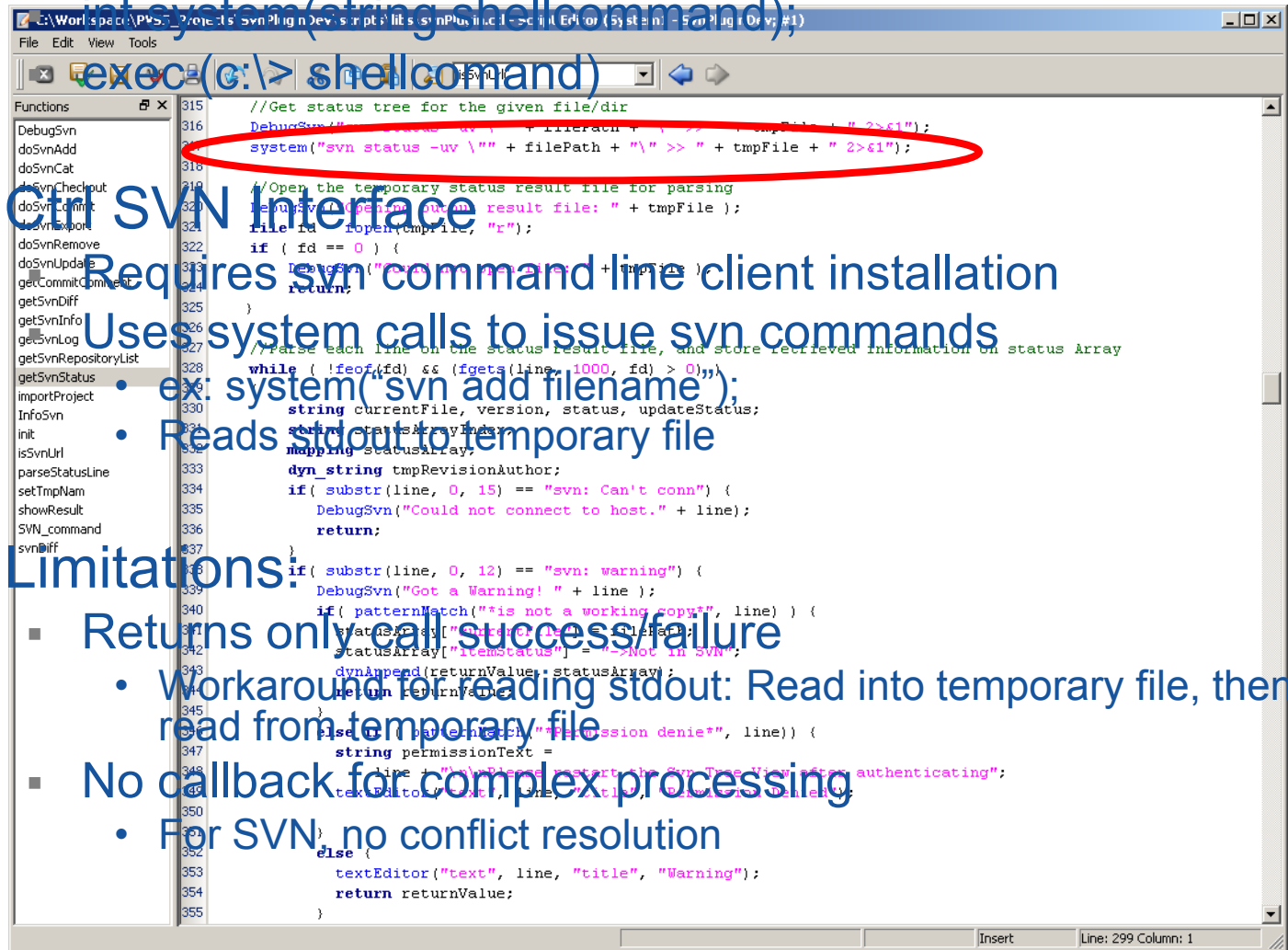
- Limitations:

- Returns only call success/failure

- Workaround for reading stdout: Read into temporary file, then read from temporary file

- No callback for complex processing

- For SVN no conflict resolution



```

315 //Get status tree for the given file/dir
316 DebugSvn("Got status for file: " + filePath + "\n");
317 system("svn status -uv \"" + filePath + "\" >> " + tmpFile + " 2>&1");
318
319 //Open the temporary status result file for parsing
320 DebugSvn("Opening temporary result file: " + tmpFile);
321 FILE *fd = fopen(tmpFile, "r");
322 if ( fd == 0 ) {
323     DebugSvn("Could not open temporary file: " + tmpFile);
324     return;
325 }
326
327 //Parse each line on the status result file, and store retrieved information on status Array
328 while ( !feof(fd) && (fgets(line, 1000, fd) > 0) )
329 {
330     string currentFile, version, status, updateStatus;
331     string statusArrayIndex;
332     mapping statusArray;
333     dyn_string tmpRevisionAuthor;
334     if( substr(line, 0, 15) == "svn: Can't conn" ) {
335         DebugSvn("Could not connect to host." + line);
336         return;
337     }
338     if( substr(line, 0, 12) == "svn: warning" ) {
339         DebugSvn("Got a Warning! " + line );
340         if( patternmatch("is not a working copy?", line) ) {
341             statusArray["itemstatus"] = "Not in SVN";
342             statusArray["itemstatus"] = "Not in SVN";
343             dynAppend(returnValue, statusArray);
344             return returnValue;
345         }
346         else if ( patternmatch("Permission denied", line) ) {
347             string permissionText =
348                 line + "\nPlease restart the Svn-Tree-User after authenticating";
349             textEditor("text", line, "title", "Warning");
350         }
351     }
352     else {
353         textEditor("text", line, "title", "Warning");
354         return returnValue;
355     }
356 }
  
```

- Ctrl SVN library summary
 - Portable library, supporting linux and win32
 - Abstracts SVN command line

Interface

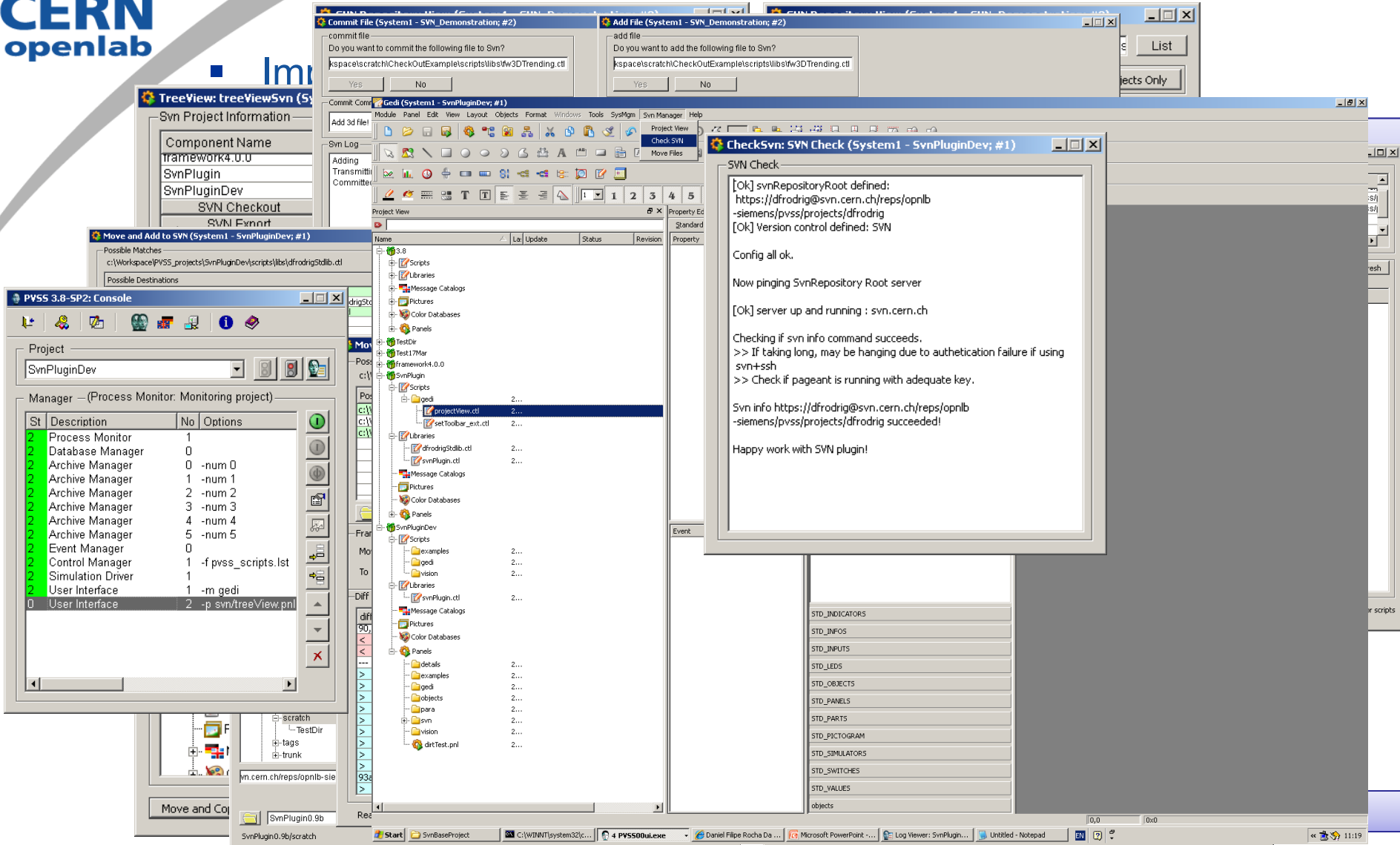
```
dyn_mapping getSvnStatus (string filePath )
dyn_string  getSvnLog    (string filePath )
dyn_string  getSvnDiff   (string filePath )
mapping     getSvnInfo   (string filePath )
string      doSvnRemove  (string filePath, bool commit=False )
string      doSvnUpdate  (string filePath, bool commit=False )
string      doSvnAdd     (string filePath, bool commit=false, string commitComment=" " )
string      doSvnCommit  (string filePath, string commentText = " " )
dyn_string  importProject(string projectPath, string projectRepositoryRoot, string commentText = " " )
dyn_string  doSvnCheckout(string projectPath, string projectSvnUrl )
dyn_string  doSvnExport  (string projectPath, string projectSvnUrl )
dyn_string  doSvnCat     (string fileSvnUrl, string dumpFile = " " )
dyn_string  getSvnRepositoryList(string svnRepositoryUrl )
```

Auxiliar functions

```
dyn_string  parseStatusLine( string line )
void        SVN_command( string cmd, string fileName )
void        DebugSvn( string message )
...
```

- Objective
 - Enhance the Project View with SVN capabilities
 - Using the Ctrl SVN interface
- Limitations
 - GEDI Project View has limited hooks
 - Context Menus, toolbar menus
 - Not oriented to work with subprojects
- Solution
 - Prototype project view with panels
 - Panels are read by the UI Manager
 - We can implement additional functionalities
 - UI understands Ctrl, so re-use Ctrl SVN interface!

■ Implementation



The screenshot displays a software development environment with several windows:

- Console (PVSS 3.8-SP2):** Shows a list of running processes, including Process Monitor, Database Manager, and User Interface.
- Project View:** Displays a tree structure of files and folders, including 'SvnPlugin', 'Scripts', 'Libraries', and 'SvnPluginDev'.
- Dialogs:**
 - Commit File:** Asks to commit 'kspacetscratch:hiCheckoutExampleScripts\libstfW3DTrending.cti'.
 - Add File:** Asks to add the same file.
 - Move and Add to SVN:** Shows possible destinations for a file.
 - CheckSVN:** Displays the output of an SVN check, including repository root, version control definition, and success messages.
- Event Log:** Lists system events such as 'STD_INDICATORS', 'STD_INFOS', and 'STD_VALUES'.

- There are limitations to the available solution:
 - Dependencies
 - external installation of svn comand line client is required
 - Authentication should be in place
 - Pageant(Putty) + .pkp
 - https certificates
 - Password based authentication not possible
 - Resolving conflicts not trivial
 - Svn comand line client requires user input
 - Ex: SVN update with conflicts
 - SvnCTRL library based on system() calls, no interaction
- Some solutions have been explored:

- Write a client based on the SVN C API
 - [+] could be closely binded to PVSS
 - [-] significant amount of coding involved
- Change svn command line client
 - sending callbacks into dialog boxes
 - [+] easier development, Apache License
 - [-] distribution of a specific re-compiled svn command line client required
- Change the system() call on the Ctrl code to allow callbacks
 - [+] not requiring recompilation of svn command line client and distribution
 - [-] first trials not successful due to decoupling between Ctrl and C

- How to use SVN more effectively in GEDI?
 - PVSS projects are developed while running!
 - internal db always changing
 - GEDI is an IDE, but at the same time, UI Manager
 - Depends on a running instance of PVSS, unlike typical IDE's
 - Notion of reusable components is limited
 - Sub projects must contain “static” files/objects
 - Associated datapoints/configs must go in running project
 - CERN developed its own approach for reusable code
 - JCOP framework / Unicos
 - Installation tool
 - Suitable for creation and deployment of components
 - able to pack/unpack code
 - run pre and post processing of datapoints/configs
 - Manages dependencies
- Integration of SVN and Installation Tool
 - Read xml descriptions from SVN repository
 - SVN checkout processes Installation Tool rules
 - SVN commit creates Installation Tool rules

JCOP Framework Installation tool: MainPanel (System1 - SystemDBOptimization; #1)

Framework Installation Tool

Install Components
Look for new components in:
 Scan recursively
C:\Workspace\CurrentProjects\

Available Components:
 Show also Sub-Components

Component Name	Version	Install ?
fwMCS	3.1.1	
fwTrending	3.3.2	Installed
fwWiener	3.2.7	
fwXML	1.3.0	
fwConfigurationDB	3.4.0	Installed
fwConfigurationDBSystemInform	3.0.4	Installed
fwConfigurationDB	3.4.0	Installed
fwConfigurationDBSystemInform	3.0.4	Installed
fwCore	4.0.0	Installed
fwTrending	3.3.2	Installed

Refresh Install

View / Delete Components
Installed Components:
 Show also Sub-Components

Component Name	Version	Delete ?	Help
fwConfigurationDB	3.4.0		HELP
fwConfigurationDBSystemInform	3.0.4		
fwCore	4.0.0		HELP
fwTrending	3.3.2		HELP

Refresh Delete

PVSS00ascir (1), 2011.03.22 12:59:56.404, SYS, INFO, 2, Manager Stop

Please find the log file for this installation operation in:
C:\Workspace\CurrentProjects\InstallationToolDBOptimization\fwComponents_20110309\log\fwInstallation_20110322_125951.log

Version 5.0.3 Advanced Options View Logfile Close

SVN Repository View (System1 - SvnPluginDev; #1)

Svn Root : https://dfrodricg@svn.cern.ch/repos/opnlb-siemens/pvss List

Installation Tool specific Checkout List Projects Only

SvnDirs	Projec	Version
fwFSM_README_v26		
fwFSM_README_v27		
fwFSM_old.xml_old		
fwGeneral.xml		
fwMCS.xml		
fwNode.xml		
fwTrending.xml	3.2.1	fwTrending f
fwWiener.xml		
help		
images		

pnlb-siemens/pvss/projects/dfrodricg/framework4.0.0/PVSS/fwTrending.xml

Checkout Export Import To SVN

fwTrending.xml

/fwTrending.xml

Component Name : fwTrending
Component Version : 3.2.1
Component Date : 2009/01/19
Is Sub Component : FALSE
Required Components : fwCore=3.0.0

- **SVN can improve PVSS**
 - Projects are file based as other software
 - Some specificities apply (running database)

- **SVN features were integrated into GEDI**
 - Using a CTRL SVN client interface
 - Based on svn command line client
 - Using PVSS's ctrl scripting language
 - Graphical tools were created

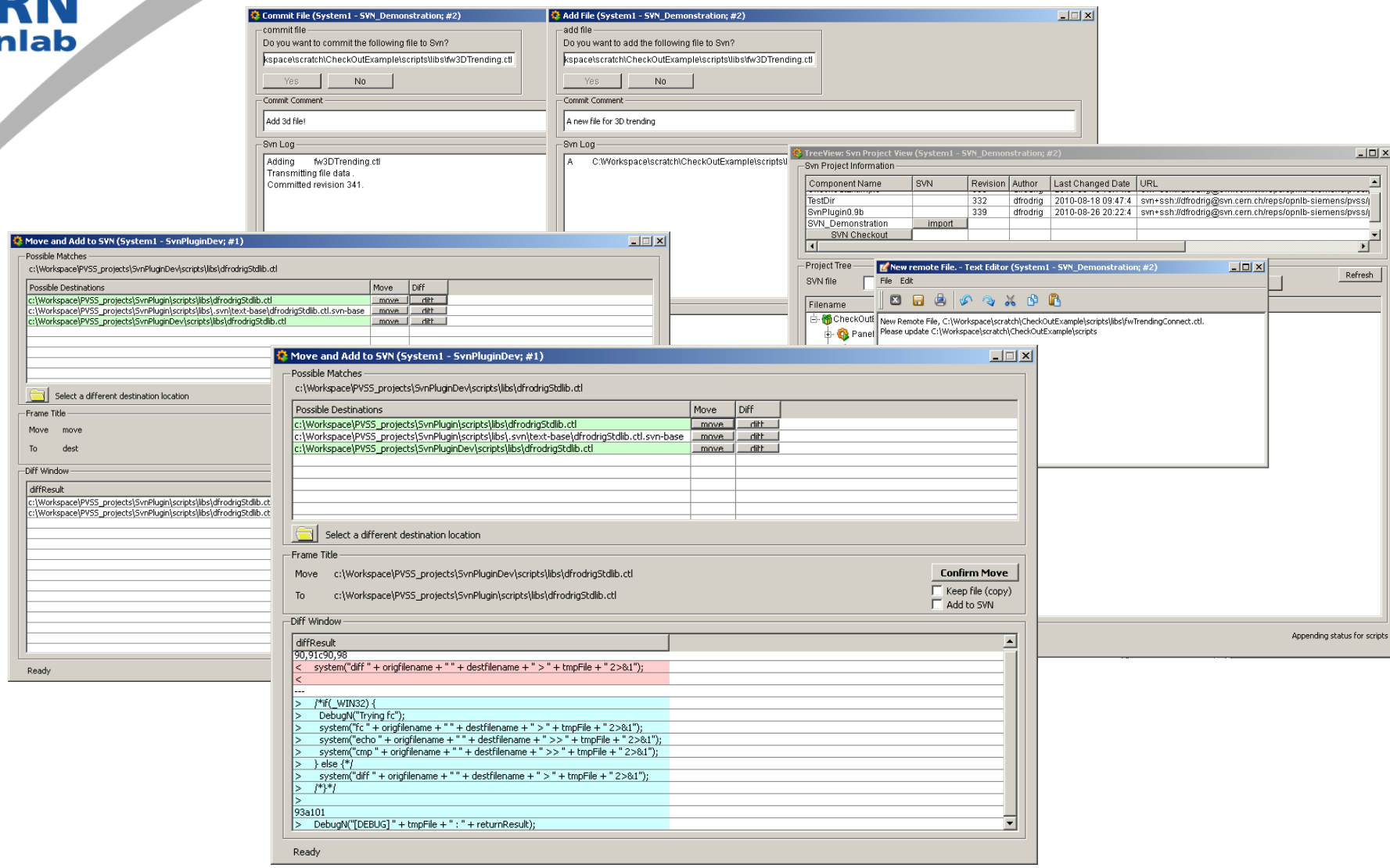
- **There are some challenges to tackle**
 - Enhance the Ctrl SVN library
 - Different approaches were analysed
 - Integration with the Installation Tool
 - An adequate solution for deployment
 - Would benefit CERN users directly

- Thank You for your attention!
- Questions?



Support slides

- Implementation of graphical panels
 - Tree View Panel
 - Svn Project Information
 - Project Tree
 - Svn Repository View
 - Checkout / Export / Import SubProjects
 - Standard Dialogs
 - for svn operations and comments
 - Diffing Viewers
 - SVN checking tools
 - Help users detect setup errors
 - Easy Install
 - Add sub project
 - Add config information (default svn url)
 - That's it!
 - panels, scripts, toolbar menus automatically loaded



The screenshot displays several windows from an IDE, illustrating the integration of a file into an SVN repository:

- Commit File (System1 - SVN_Demonstration; #2)**: A dialog box asking to commit the file `kspacetscratch\CheckOut\Example\scripts\lib\fw3DTrending.cti`. The commit comment is "Add 3d file!". The SVN log shows: "Adding fw3DTrending.cti", "Transmitting file data", and "Committed revision 341."
- Add File (System1 - SVN_Demonstration; #2)**: A dialog box asking to add the file `kspacetscratch\CheckOut\Example\scripts\lib\fw3DTrending.cti`. The commit comment is "A new file for 3D trending". The SVN log shows: "A C:\Workspace\scratch\CheckOut\Example\scripts\lib\fw3DTrending.cti".
- TreeView: Svn Project View (System1 - SVN_Demonstration; #2)**: Shows the SVN project structure with a table of component information:

Component Name	SVN	Revision	Author	Last Changed Date	URL
TestDir		332	dfrodriq	2010-08-18 09:47:4	svn+ssh://dfrodriq@svn.cern.ch/repos/opnlb-siemens/pvss/
SvnPlugin0.9b		339	dfrodriq	2010-08-26 20:22:4	svn+ssh://dfrodriq@svn.cern.ch/repos/opnlb-siemens/pvss/
SVN_Demonstration	import				
- Move and Add to SVN (System1 - SvnPluginDev; #1)**: A dialog box showing possible matches and destinations for moving a file. The diff window shows the following code:

```
diffResult
c:\Workspace\PVSS_projects\SvnPlugin\scripts\libs\dfrodriqStdlib.cti
c:\Workspace\PVSS_projects\SvnPlugin\scripts\libs\dfrodriqStdlib.cti
c:\Workspace\PVSS_projects\SvnPlugin\scripts\libs\svn\text-base\dfrodriqStdlib.cti.svn-base
c:\Workspace\PVSS_projects\SvnPluginDev\scripts\libs\dfrodriqStdlib.cti
```
- Move and Add to SVN (System1 - SvnPluginDev; #1)**: A dialog box showing the move operation details. The diff window shows the following code:

```
diffResult
90,91c90,98
< system("diff " + origfilename + " " + destfilename + " >" + tmpFile + " 2>&1");
<
---
> /*if(_WIN32) {
> DebugN("Trying fc");
> system("Fc " + origfilename + " " + destfilename + " >" + tmpFile + " 2>&1");
> system("echo " + origfilename + " " + destfilename + " >>" + tmpFile + " 2>&1");
> system("cmp " + origfilename + " " + destfilename + " >>" + tmpFile + " 2>&1");
> } else {
> system("diff " + origfilename + " " + destfilename + " >" + tmpFile + " 2>&1");
> }
>
93a101
> DebugN("DEBUG" + tmpFile + " : " + returnResult);
```
- New Remote File - Text Editor (System1 - SVN_Demonstration; #2)**: Shows the file `New Remote File, C:\Workspace\scratch\CheckOut\Example\scripts\lib\fwTrendingConnect.cti` with the instruction "Please update C:\Workspace\scratch\CheckOut\Example\scripts".

PVSS 3.8-SP2: Console

Project: SvnPluginDev

Manager - (Process Monitor: Monitoring project)

St	Description	No	Options
2	Process Monitor	1	
2	Database Manager	0	
2	Archive Manager	0	-num 0
2	Archive Manager	1	-num 1
2	Archive Manager	2	-num 2
2	Archive Manager	3	-num 3
2	Archive Manager	4	-num 4
2	Archive Manager	5	-num 5
2	Event Manager	0	
2	Control Manager	1	-f pvss_scripts.lst
2	Simulation Driver	1	
2	User Interface	1	-m gedi
0	User Interface	2	-p svn/treeView.pl

Gedi (System1 - SvnPluginDev; #1)

Check Svn: SVN Check (System1 - SvnPluginDev; #1)

SVN Check

```
[Ok] svnRepositoryRoot defined:
https://dfrodrig@svn.cern.ch/repos/opnlb
-siemens/pvss/projects/dfrodrig
[Ok] Version control defined: SVN

Config all ok.

Now ping SvnRepository Root server

[Ok] server up and running : svn.cern.ch

Checking if svn info command succeeds.
>> If taking long, may be hanging due to authentication failure if using
svn+ssh
>> Check if pageant is running with adequate key.

Svn info https://dfrodrig@svn.cern.ch/repos/opnlb
-siemens/pvss/projects/dfrodrig succeeded!

Happy work with SVN plugin!
```

Project View

Name	La	Update	Status	Revision	Property
3.0					
Scripts					
Libraries					
Message Catalogs					
Pictures					
Color Databases					
Panels					
SvnPluginDev					
Scripts					
gedi				2...	
projectView.cti				2...	
setToolBar_ext.cti				2...	
Libraries					
dfrodrigStdlib.cti				2...	
svnPlugin.cti				2...	
Message Catalogs					
Pictures					
Color Databases					
Panels					
SvnPluginDev					
Scripts					
examples				2...	
gedi				2...	
vision				2...	
Libraries					
svnPlugin.cti				2...	
Message Catalogs					
Pictures					
Color Databases					
Panels					
details				2...	
examples				2...	
gedi				2...	
objects				2...	
para				2...	
svn				2...	
vision				2...	
dirTest.pl				2...	

Event

STD_INDICATORS
STD_INFOS
STD_INPUTS
STD_LEDS
STD_OBJECTS
STD_PANELS
STD_PARTS
STD_PICTOGRAM
STD_SIMULATORS
STD_SWITCHES
STD_VALUES
objects