Introduction to CVS

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CVS: Concurrent Versions System is a program which provides a way to record the revision history of any document and allows for concurrent editing file.

Terminology:

- 1. **Repository:** Central location where CVS server stores its files. In our server, it is located at /cvsroot.
- 2. **Sandbox:** Local copy of a directory tree checked out from a repository.
- 3. **Module:** Directory tree or trees that pertain to a single project.

Installation

sudo apt-get install cvs

Environment Variables:

1. **CVSROOT:** contains repository root directory, use following command to set this variable:

export CVSROOT=/cvsroot

2. CVS_RSH: remote shell command.

export CVS_RSH=ssh

Some Basic Commands:

General form of CVS command is as follow:

cvs {<global option>} <command> {<command option>} name ...

Common global options are:

- -d <dir> Specify repository dir
- -m <msg> Use <msg> as the log message
- -D <date> Use the latest version as of <date>

1. Creating a Repository

mkdir /cvsroot

cvs -d /cvsroot init

2. Importing a Module

mkdir module_name

cd module_name

cvs import -m 'improting new project' module_name vendor_tag release_tag

3. Checking out a Module: this command creates a sandbox of the module in working directory

cd local_dir cvs co module_name

These command creates a directory (module_name) at current working directory containing module files and a CVS directory with following files:

- Entries: contains a line for each file or directory in the current directory
- Repository: contains the location in the repository of this module
- Root: contains the location of the root of the CVS repository
- **4.** Adding a File: adding a file to a module has 2 steps. First use '*add*' command to locally add the file to the module and then use '*commit*' command to update the CVS.

cd module_name cat >main.c << 'EOF' //sample code EOF cvs add main.c cvs commit -m 'initiating main code' main.c

5. Checking what is changed in edited file: if the main.c changes as follow:

```
//sample code
int main()
{
    return 0;
}
```

Before committing the changes, you can see what exactly was changed by following command: *cvs diff main.c*

6. Updating: if someone changes the repository source files, you can also update your sandbox and get the latest version of files. To see the changes, use following commands:

```
cvs status
```

cvs update

7. Merge: consider user1 changes main.c and commit the changes while user2 is still using previous edition of the files and making changes on earlier revision. If user2 tries to commit changes, following error will be generated:

cvs commit -m 'user2 changes' main.c

cvs commit: Up-to-date check failed for 'main.c' cvs [commit aborted]: correct above error first

User2 must first update main.c then perform commitment. Note that using 'status' command indicates merge is needed:

cvs status main.c

File:main.cStatus: Needs MergeWorking revision: 1.1 Sat Oct 9 10:45:22 2010Repository revision: 1.2 /cvsroot/pr1/main.c,v

cvs update main.c RCS file: / cvsroot/pr1/main.c,v retrieving revision 1.1 retrieving revision 1.2 Merging differences between 1.1 and 1.2 into main.c M main.c

The 'M' means that CVS has automatically merged local version with the latest reversion of repository.

Note: Always run update before committing any changes.

8. Conflict: if *update* command couldn't merge the files, then a conflict occurs.

Cvs update main.c RCS file: / cvsroot/pr1/main.c,v retrieving revision 1.2 retrieving revision 1.3 Merging differences between 1.2 and 1.3 into main.c rcsmerge: warning: conflicts during merge cvs update: conflicts found in limerick.txt C main.c

The 'C' means that CVS tried to automatically merge the two files, but conflict arose. This requires user's action. Conflicts are always indicated like this: <//>

local file text that doesn't jive with repository version ====== repository version text that doesn't jive with local file >>>>> revision number

Graphical User Interface

1. Windows-based

Any CVS client software could be used to connect to CVS server which is installed on the COBRA server. COBRA server address is 131.202.9.73 and can be connected from anywhere in the university. First step is to use 'check out' command to get a copy of project into your local machine. Then after adding or editing files, you should 'commit' changes on server. Don't forget to use other commands such as 'update'.

a. TortoiseCVS (freeware)

Download link: http://www.tortoisecvs.org/download.shtml

By installing this software, some new CVS commands will be added to context menue as displayed in figure 1.

🗁 pr1		
File Edit View Favorites Tools Help		<u></u>
🕒 Back 🔹 🕥 - 🎓 🔎 Search 🍋 Folders	🔢 🗸 🔞 Folder Sync	
Address D:\pr1		🖌 🄁 Co
File and Folder Tasks		
 Make a new folder Publish this folder to the Web Share this folder 		
Other Places	ATI CATALYST(R) Control Center	
 Projects (D:) My Documents Shared Documents My Computer My Network Places 	Arrange Icons By Refresh Customize This Folder Peste Peste Shortout	
Details		
pr1 File Folder Date Modified: Today, October 14, 2010, 10:46 AM	Image: Groove Folder Synchronization New Properties	
1 objects	0 bytes 🛛 😼 My Co	mputer

Figure 1 Tortoise CVS is added to context menu

Use *CVS Checkout...* command to download source codes into your local directory. Put your username and other parameters of connection as displayed in figure 2. After checking out project, you can edit or add any other file to the project. When a file is edited, its icon will be changed as displayed in figure 3. The changes can be committed by performing *commit* command.

🐨 TortoiseCVS - Ch	eckout Module							
Module Revision Op	tions							
Previous CV5ROOTs Module :ssh:mostafa@131.202.9.73;22/cvsroot pr1 :ssh:mostafa@131.202.9.73;22/cvsroot sample3			File		Revision	Date		
CVSROOT: :ssh:mos	tafa@131.202.9.73:22;	/cvsroot						
Protocol:	Secure shell (:ssh:)							
Protocol parameters:		1						
Server:	131.202.9.73	•						
Port:	22	•	-					
Repository folder:	/cvsroot	•	-					
User name:	mostafa	•	-					
Edit Use Bug	Bug number:			Module:	pr1		<u>F</u> etch list	
		ОК		Cancel				
								1

Figure 2 Checkout dialog box

🔁 pr1		
File Edit View Favorites Tools Help		4
🔇 Back 🔹 🕥 - 🏂 🔎 Search 🛛	Folders 🔝 - 🔞 Folder Sync	
Address 🗁 D:\pr1\pr1		💌 🛃 Go
File and Folder Tasks 🔕 🔷 🏱	cvs	
Rename this file Move this file Copy this file Publish this file to the Web E-mail this file Delete this file Other Places	1 KB	
 pr1 My Documents Shared Documents My Computer My Network Places 	CVS Diff CVS Update CVS Commit CVS Add to archive Add to "main.rar"	
Details	Compress and email Compress to "main.rar" and email	
main.c C Source Date Modified: Today, October 14, 2010, 9:24 PM	Send To Cut Copy	
	Figure 3 CVS commands	

b. smartCVS (shareware)

trial version can be downloaded from

http://www.syntevo.com/smartcvs/download.html

🛚 pixhawk-qgroundcontrol - S	martCVS Professional Demo	7.1.3											PX
Project Edit View Modify Chang	e Set Tag/Branch Query Trace	e T <u>o</u> ols <u>A</u> dmin	<u>W</u> indow <u>H</u> elp										
	Fish I III III	D. D.		. 24	2	lina.							
	26 Pr Pr	No IX			Care a	-100							
Stop Refresh Update Commit	Smart Commit Add Remove	Revert Delete	Compare Change F	Report Log	Refresh Remote	Annotate							
Directories 💌	Files									🔎 File Filter 🛛 🔇			
D:\UGV\pixhawk-ggroundcont	Name	Local State 🔻	Remote State Char	ae Set Revisi	on Type	Sticky	Editors	Time	Size	Relative Directory	Ext	Edital	ole Ar
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	.gitmodules	Non-CVS						10/08/2010 08:32 AM	82	pixhawk-ggroundcontrol-23d31e9		Yes	
	.project	Non-CV5						10/08/2010 08:32 AM	2,884	pixhawk-qgroundcontrol-23d31e9		Yes	
	🖪 demo-log.txt	Non-CVS						10/08/2010 08:32 AM	174,949	pixhawk-ggroundcontrol-23d31e9	txt	Yes	
	license.txt	Non-CVS						10/08/2010 08:32 AM	28,628	pixhawk-ggroundcontrol-23d31e9	txt	Yes	
	mavground.grc	Non-CVS						10/08/2010 08:32 AM	4,590	pixhawk-ggroundcontrol-23d31e9	qrc	Yes	
	🗟 mavlinkgen.pro	Non-CV5						10/08/2010 08:32 AM	1,113	pixhawk-ggroundcontrol-23d31e9	pro	Yes	
	price.txt	Non-CV5						10/08/2010 08:32 AM	92	pixhawk-ggroundcontrol-23d31e9	txt	Yes	
	ggroundcontrol.pri	Non-CV5						10/08/2010 08:32 AM	4,909	pixhawk-qgroundcontrol-23d31e9	pri	Yes	
	groundcontrol.pro	Non-CV5						10/08/2010 08:32 AM	7,873	pixhawk-ggroundcontrol-23d31e9	pro	Yes	
	ggroundcontrol.pro.user	Non-CV5						Yesterday 08:34 AM	8,137	pixhawk-ggroundcontrol-23d31e9	user	Yes	
	ggroundcontrol.rc	Non-CV5						10/08/2010 08:32 AM	81	pixhawk-qgroundcontrol-23d31e9	rc	Yes	
	README	Non-CV5						10/08/2010 08:32 AM	2,281	pixhawk-qgroundcontrol-23d31e9		Yes	
	🗟 testlog.txt	Non-CVS						10/08/2010 08:32 AM	120	pixhawk-ggroundcontrol-23d31e9	t×t	Yes	
	🗟 testlog2.txt	Non-CV5						10/08/2010 08:32 AM	6,124	pixhawk-ggroundcontrol-23d31e9	txt	Yes	
	🗟 alert.wav	Non-CV5						10/08/2010 08:32 AM	88,334	pixhawk-qgroundcontrol-23d31e9	laudio wav	Yes	
	SDL.dⅡ	Non-CVS						10/08/2010 08:32 AM	324,096	pixhawk-ggroundcontrol-23d31e9	(bin dll	Yes	
	📑 .gitignore	Non-CVS						10/08/2010 08:32 AM	14	pixhawk-ggroundcontrol-23d31e9	(deploy	Yes	
	linux_create_debian_packet.st	Non-CV5						10/08/2010 08:32 AM	334	pixhawk-ggroundcontrol-23d31e9	deploy sh	Yes	
	mac_audiotest.sh	Non-CV5						10/08/2010 08:32 AM	66	pixhawk-ggroundcontrol-23d31e9	deploy sh	Yes	
	mac_create_dmg.sh	Non-CV5						10/08/2010 08:32 AM	605	i pixhawk-qgroundcontrol-23d31e9	(deploy sh	Yes	
	ggroundcontrol_installer.nsi	Non-CV5						10/08/2010 08:32 AM	977	pixhawk-ggroundcontrol-23d31e9	deploy nsi	Yes	
	.gitignore	Non-CV5						10/08/2010 08:32 AM	17	pixhawk-ggroundcontrol-23d31e9	(doc	Yes	
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	.gitignore	Non-CVS						10/08/2010 08:32 AM	3	pixhawk-qgroundcontrol-23d31e9	limages	Yes	
	🗟 splash.png	Non-CV5						10/08/2010 08:32 AM	28,482	pixhawk-qgroundcontrol-23d31e9	limages png	Yes	×
< >	<	N 202						10/00/2010 00.00 AM	/ OFF	states and a second descent and a second	N	0	>
Output													
Ready									Dire	ctory Latest			

Figure 4 GUI of smartCVS software

To checkout a project, go to *project* menu and click on '*Check Out* ...' follow the wizard to connect to the repository and download the project into your local directory. Follow figures 5-13 to download project from the repository on the server.

After these steps, you can change any files and then again by CVS commands like *update, commit, add,* ... perform your changes and upload them into the server.

🛯 Check Out Proje	ct 🛛 🔀
 Check Out Project Steps Repository Modules Target Directory Checkout Options Project Settings Confirmation 	Repository Choose a profile of the repository you want to check out from. Repository Profile: <no defined="" repository=""> To create, edit or delete repository profiles, click Manage. Manage</no>
	< Back Next > Finish Cancel

Figure 5 check out wizard, if you have no repository, press *Manage...* button.

🗠 Repository Profiles	
Profile Name CVS-Location Password/Passphrase	<u>A</u> dd
	<u></u>
	Edit
	Delete
	Move Up
	Move Down
ОК	Cancel

Figure 6 add new repository, if you have no profile, press Add ... button.

🛯 Add Repository	Profile 🛛 🔀
Steps	General Options
> General Options	Please enter the general repository information.
Configuration	Access Method: Ogserver Enter CVS-Location
Name	<u>○ s</u> server
	⊙ <u>e</u> xt (SSH1, SSH2)
	Use :ssh:-prefix to be compatible with non-standard CV5 clients
	User Name: mostafa
	Server Name: 131.202.9.73
	Repository Path: /cvsroot
	Server Port: 💿 Default i Non-Default:
	Use proxy
	< Back Next > Finish Cancel

Figure 7 general options of new repository

🗠 Add Repository	Profile	
Steps General Options > Configuration Name	Configuration Authentication: • Password • Public/Private Key Password: • • • • • • • • • • •]
	SSH-Type to Use: ● Auto ○ SSH 1 ○ SSH 2 Preferred Public Key: ● Auto ○ DSA ○ RSA ▼ Verify connection when pressing Next	
	< Back Next > Finish Cancel	

Figure 8 enter your password

🗠 Add Repository	Profile	×
Steps General Options Configuration > Name	Name Ise CV5-Location as profile name Use this profile name:	
	< Back Next > Finish Cancel	

Figure 9 finish this repository profile

🗠 Check Out Proje	st 🛛 🔀
Steps Repository > Modules Target Directory Checkout Options Project Settings Confirmation	Modules Select the module, file or directory you want to check out. • Browse Repository Repository Structure Modules • pserver:mostafa@localhost:/cvsroot • pxmu • pxmu
	< Back Next > Finish Cancel

🛯 Check Out Proje	ct 🛛
Steps	Target Directory
Steps Repository Modules > Target Directory Checkout Options Project Settings Confirmation	Target Directory Enter or select a local directory, where the checked out project should be stored. Local Directory: d:\pr1 If you enter a non-existing directory name, it will be created automatically. If you enter a non-existing directory name, it will be created automatically. Check gut into alternative path (instead of module path/name) Alternative Path: pximu
	<back next=""> Finish Cancel</back>

Figure 10 enter your local directory to store project

🗠 Check Out Projec	st 🛛 🗙
 ✓ Check Out Project Steps Repository Modules Target Directory Checkout Options Project Settings Confirmation 	Checkout Options If you need, change the following checkout options. • Default (keep sticky) • Main trunk's head (reset sticky) • Retrieve Iag/Branch (new sticky): • Retrieve Revision (new sticky): • Before Date (new sticky): • Example: yyyy-mm-dd hh:mm • If no matching revision is found, use the most recent one • Recurse into gubdirectories • Prune empty directories • Prune empty directories
	<back next=""> Finish Cancel</back>

Figure 11 checkout default options



Figure 12 set project name

🗠 Check Out Proje	it 🛛 🔀
Steps	Confirmation
Repository Modules	Review the choices you have made. To modify any of your choices, click Back. To check out the module(s), click Finish.
Target Directory	Repository Profile: pserver:mostafa@localhost:/cvsroot
Checkout Options Project Settings	Module: pximu
 Confirmation 	Local Directory: d:\pr1
	Alternative Path: pximu
	Project Name: pximu
	< Back Next > Finish Cancel

Figure 13 finish the wizard

😂 pximu - SmartCVS Professional Demo 7.1.3						
Project Edit View Modify Change Set Tag/Branch Query Trace	e Tools Admin Window H	łelp				
	R. R. mm		% . In			
Stop Refresh Update Commit Smart Commit Add Remove	Revert Delete Compare	Change Report Log R	efresh Remote Annotate			
Directories					R File Filter	
😑 🚠 d:\pr1\pximu	Local State =	Remote State Change Se	t Revision Type	Sticky Editors Time	Size Relative Directory	
trunk	Linchanged	sheet	1.1. Text (-ko)	10/12/2010 10:55 M	M 47 bunk	
÷-> .bzr	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 01:39 PM	vi 24.725 trunk	
	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 AF	M 2.245 trunk	
arm7 documentation.dox	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 1.549 trunk	
armcortex main.c	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 2,653 trunk	
- Comm	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 01:46 PM	1 7,751 trunk	
- Conf README	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 385 trunk	
controllers format	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:53 Af	M 35 trunk/.bzr	
E dor	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:53 Af	M 141 trunk/.bzr	
Eusion branch.conf	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 75 trunk/.bzr/branch	
P C bal	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 39 trunk/.bzr/branch	
last-revision	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 50 trunk/.bzr/branch	
tags	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 0 trunk/.bzr/branch	
Conflicts	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 27 trunk/.bzr/checkout	
dirstate	Unchanged L	atest	1.1 Binary	10/12/2010 10:55 Af	M 291,119 trunk/.bzr/checkout	
+ C testing	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 40 trunk/.bzr/checkout	
tools iews	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 0 trunk/.bzr/checkout	
🗋 org.eclipse.cdt.core.prefs	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 13,137 trunk/.settings	
🗋 org.eclipse.cdt.ui.prefs	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 150 trunk/.settings	
🗋 org.eclipse.ltk.core.refactoring	.prefs Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 134 trunk/.settings	
🗋 adc.c	Unchanged L	atest	1.1 Text (-ko)	Today 10:04 PM	2,878 trunk/arm7	
🗋 adc.h	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 1,597 trunk/arm7	
armVIC.c	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 1,826 trunk/arm7	
🗋 armVIC.h	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 5,225 trunk/arm7	
🗋 buzzer.h	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 1,001 trunk/arm7	
🗋 cam_trigger.c	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 720 trunk/arm7	
🗋 cam_trigger.h	Unchanged L	atest	1.1 Text (-ko)	10/12/2010 10:55 Af	M 484 trunk/arm7	~
2	() and a set of the se		e e mara Z hav	10/10/0010 10/25 4/	4 1 FO7 6	>
					· · · · · · · · · · · · · · · · · · ·	<u></u>
Output						a di seconda di s
initial revision: 1.1						
done						
Command Finished.						
editors .						
Command Finished.						
						×
Ready				Direct	ory Latest	

Figure 14 all files will be listed in the main GUI window.

2. Linux-based

http://www.cjlinux.com/software/development/how-to-install-cervisia-in-ubuntu.html

Cervisia is a front-end for the CVS version control system client.

In addition to basic and advanced CVS operations, it provides a convenient graphical interface for viewing, editing, and manipulating files in a CVS repository or working directory. It includes tools designed to ease the use of CVS, such as a log browser, conflict resolver, and changelog editor that checks for incorrect formatting.

This software can be installed on Ubuntu by following command:

sudo apt-get install cervisia

To run this software, type 'cervisia' in a command shell.

<u>F</u> ile <u>V</u> iew	<u>A</u> dvanced	<u>R</u> epository	<u>S</u> ettings	<u>H</u> elp 📒 Rer	move 🐼	Stop		
File Name			∧ Sta	atus	Revision	Tag/Date	Timestamp	÷

Figure 15 GUI of the cervisia

To import new project, go to Repository menu and select checkout ...

Repository:	mostafa@131.202.9.73:/cvsroot		~
<u>M</u> odule:	pr1	~	Fetch List
Branch tag:		×	Fetch List
Working folder:	/home/mostafa/projects/		
Chec <u>k</u> out as:	pr1		
Export only			
✓ Rec <u>u</u> rsive c	heckout		
Help	✓ (<u>o</u> k	Ocancel

Files of the

Figure 16 checkout wizard

project

will be listed in the main windows. Changes can be committed easily by pressing 'commit' button.

<u>File View Advanced Repository</u>	<u>S</u> ettings <u>H</u> elp		
💽 Update 🛛 Status 🛛 🖓 Commit	🕎 Add 🛛 📃 Rem	nove 🐼 Stop	
File Name	∧ Status	Revision Tag/Date	Timestamp
/home/mostafa/projects/pr1			
win.c	Unknown	1.2	2010-10-14 14:06
main.c	Unknown	1.2	2010-10-14 13:17
io.c	Unknown	1.4	2010-10-14 13:58

Figure 17 files of the project will be displayed in the main window.