

RANCID and CVS

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Overview – what is CVS ?

Version Control Systems:

- **CVS**
- **Mercurial**
- **RCS**
- **Subversion**

- **RANCID** works with CVS to as a version control system for network hardware configurations.

What is Version Control?

Version control, and change management

- Keep track of changes (revisions)
- Share changes with others (public repository)
- Maintain multiple versions of a same set of data (branches)

What types of data?

- Source code
- Documentation
- Configuration files
- Binary data as well (less efficient)

CVS terminology

repository

- Central, master copy containing all files being versioned. Directory structured

working copy

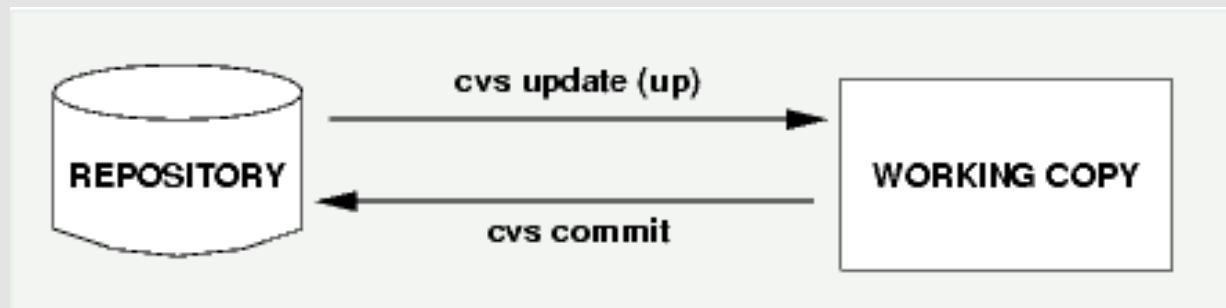
- Local copy of a project, checked out from a repository. Contains special directories (CVS) with information about which files are under CVS control, where they files come from and where they should be committed.

module

- A set of directories, files or other modules under a common “shortcut” name

CVS principles

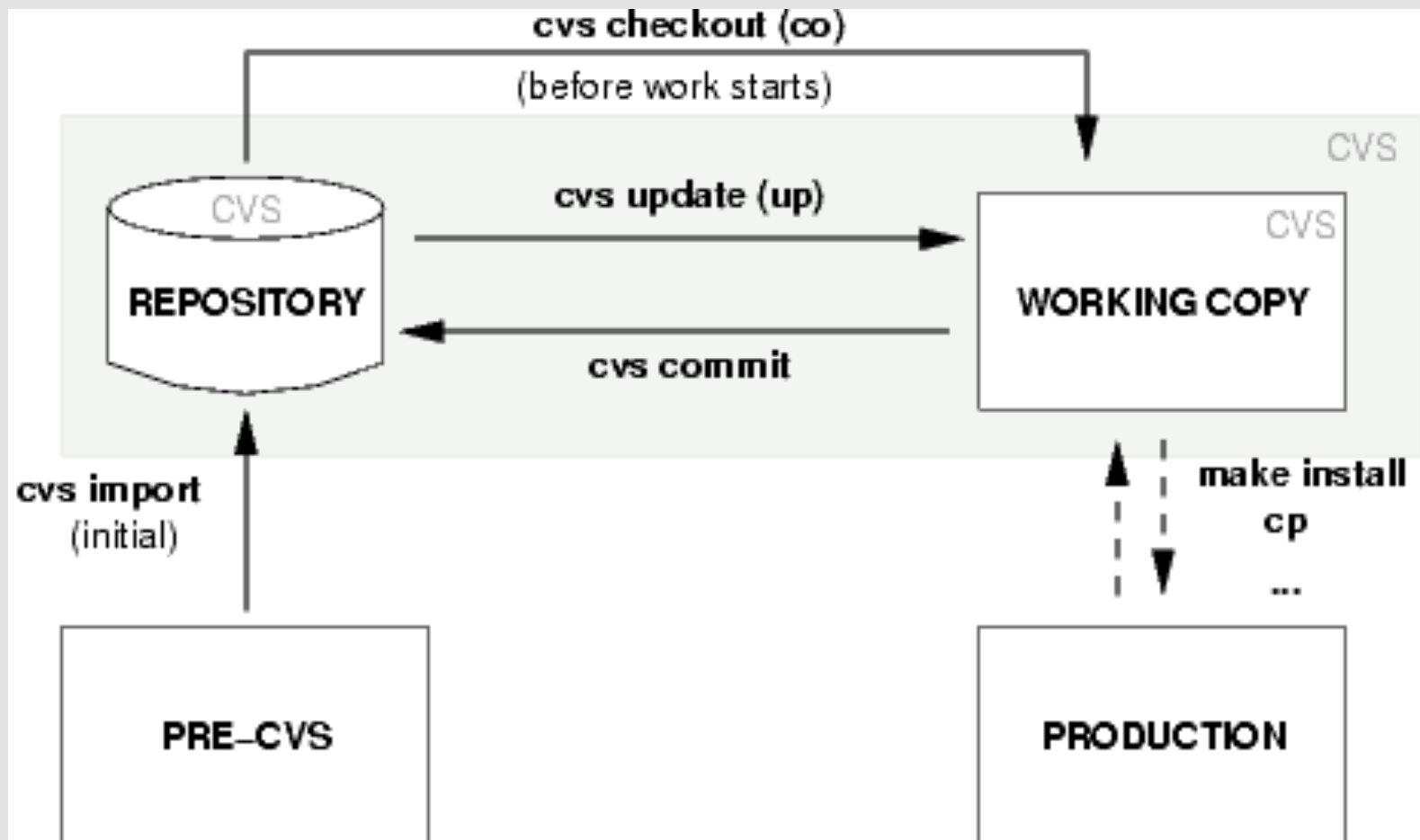
- CVS uses a centralized “master copy”: the *repository*
- All work is done in a *working copy*
- Changes are *committed* back to the *repository*
- Special directory, *CVS*



CVS – the repository

- CVS is a centralized VCS (1 repository)
- The repository contains files in the RCS format, all ending in ' ,v '
- Each RCS file contains a complete history, with changelog, of the file being versioned
- Well adapted to text files
- The repository is NEVER edited by hand
- A number of tools exist to analyze or browse the repository
 - cvsweb/webcvs

CVS – example workflow – cont'd



CVS clients

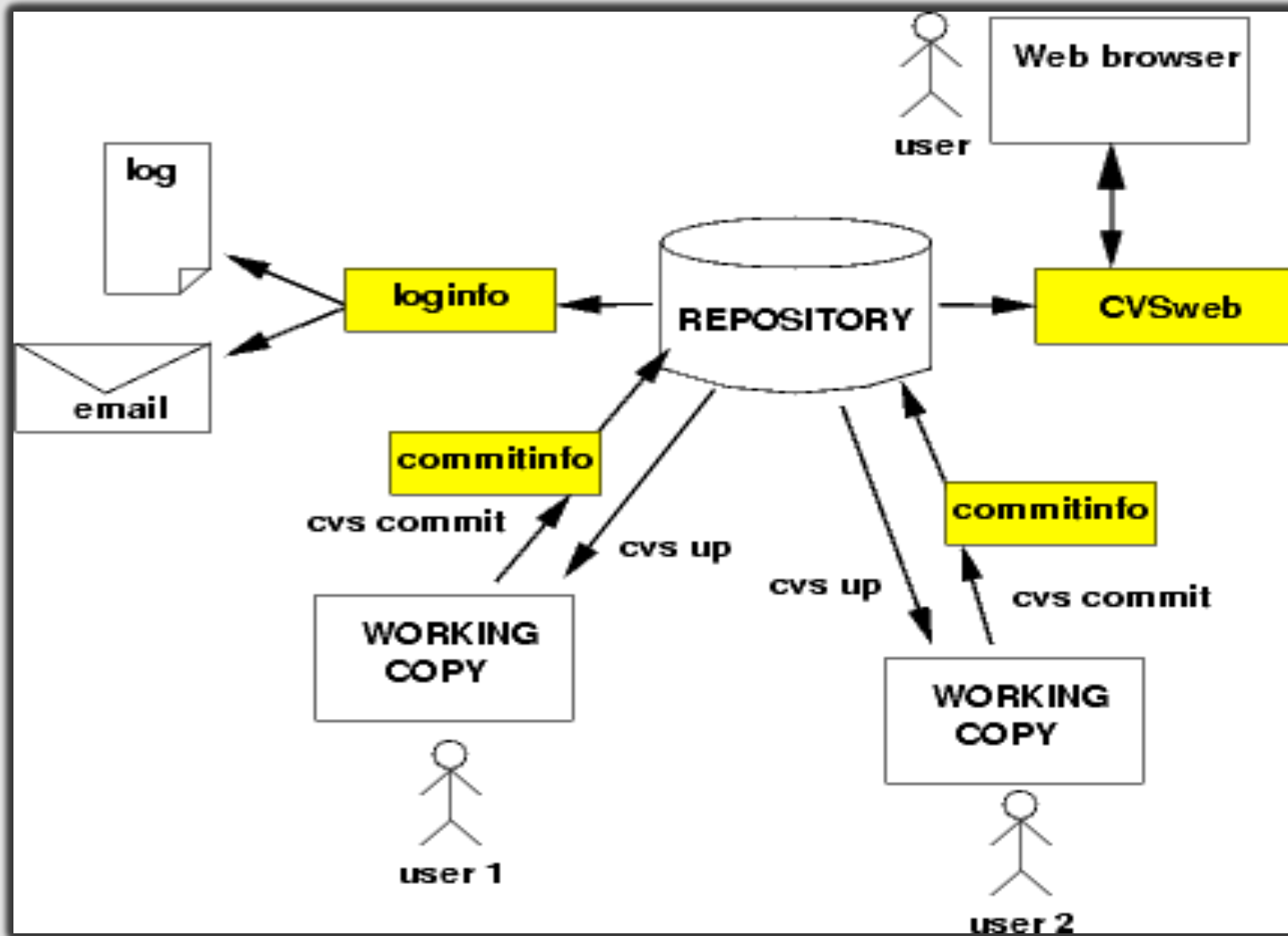
- Exist for most operating systems
 - cvs command line (UNIX, Win32)
 - TortoiseCVS – embeds in Explorer (Win32)
 - WinCVS (Win32)
 - ...
- Access the repository over the network or locally

What's in the CVS/ directory ?

- Entries
 - existing files, and newly added files
- Root
 - where is the repository located
- Repository
 - name of module or path in the repository

The Big Picture

mail, CVSWeb, lists



Automated scenarios

- Idea: automatize configuration management tasks so that configuration files are automatically versioned using CVS...
- ... even when the sysadmin forgets :)
- Implementation – cron job
 - look at all files in a given directory
 - if they exist in the repository already -> commit
 - if they don't, add, then commit

Automated scenarios – cont'd

- Already exists for network equipment:
RANCID
 - <http://www.shrubbery.net/rancid/>
- Simple concept to implement for all relevant files in /etc
- Subscribe all admins to the alias / mailing list, so everyone receives a notification when a change takes place – whether planned or not!

RANCID

Really Awesome New Cisco Differ

- Available from <http://www.shrubbery.net/rancid/>
- Designed initially for Cisco routers but now supports other manufacturers and models such as:
 - Juniper, Foundry, Extreme, Redback, Alteon, HP Procurve, Force10, etc.
- Basic Operations
 - Via RANCID download the equipment's configuration via commands (such as show)
 - Manipulate the information:
 - Remove confidential information such as passwords
 - You can compare information with last saved copy
 - Notify of changes (via email by default)
 - Save the latest version (and all prior versions) in an version control system:
 - Subversion
 - CVS

RANCID: Example

In this example a Gigabit ethernet card has been removed:

From: rancid <rancid@example.com>
To: rancid-example@example.com
Subject: example router config diffs
Precedence: bulk

Index: configs/dfw.example.com

=====
===

retrieving revision 1.144

diff -u -4 -r1.144 dfw.example.com

@@ -57,14 +57,8 @@

!Slot 2/MBUS: hvers 1.1

!Slot 2/MBUS: software 01.36 (RAM) (ROM version is 01.33)

!Slot 2/MBUS: 128 Mbytes DRAM, 16384 Kbytes SDRAM

!

- !Slot 6: 1 Port Gigabit Ethernet

- !Slot 6/PCA: part 73-3302-03 rev C0 ver 3, serial CAB031216OL

- !Slot 6/PCA: hvers 1.1

- !Slot 6/MBUS: part 73-2146-07 rev B0 dev 0, serial CAB031112SB

- !Slot 6/MBUS: hvers 1.2

- !Slot 6/MBUS: software 01.36 (RAM) (ROM version is 01.33)

!Slot 7: Route Processor

!Slot 7/PCA: part 73-2170-03 rev B0 ver 3, serial CAB024901SI

!Slot 7/PCA: hvers 1.4

!Slot 7/MBUS: part 73-2146-06 rev A0 dev 0, serial CAB02060044

@@ -136,11 +130,8 @@

boot system flash slot0:

logging buffered 32768 debugging

no logging console

enable secret 5 \$1\$73Y1\$grXuRjuZxfSiLYv1sBRUz0

RANCID: Testing

- Check a router via RANCID

```
bin/clogin <ip del router>
```
- Test all the devices that you have manually configured:
 - `bin/rancid-run`
- Check to see if there are errors in the logs (logs/*)
 - FAQ de Rancid:
<http://www.shrubbery.net/rancid/FAQ>
- Repeat until no errors
- The last configuration can be found in:
 - `/usr/local/rancid/var/<group>/configs/`

RANCID: Automating

- Create an entry in *cron* to periodically check for revisions and store these to the VCS.
 - Depending on how many devices you have configured RANCID may need enough time between runs to check all the device configurations:

```
# su - rancid
# crontab -e
1 * * * * /usr/local/rancid/bin/rancid-run
50 23 * * * /usr/bin/find /usr/local/rancid/logs -type f -mtime +2 -exec rm {} \;
```


Sample RANCID Install

1. Install an MTA (postfix in our case) on the box where RANCID will run.
2. Configure postfix
3. Install RANCID
4. Create a rancid user
5. Configure RANCID so that you can access your devices automatically
6. Initial the VCS (in our case CVS)
7. Create *cron* entry for RANCID
8. Do stuff on the your devices (routers)
9. See the change results (diffs) using CVSWeb, ViewVC, etc.

ViewVC Sample

[Diccionario de la len...](#) [Google Calendar](#)

[\[rancid\]](#) / [routers](#) / [configs](#) / [192.188.51.41](#) Repository:

Diff of /routers/configs/192.188.51.41

[Parent Directory](#) | [Revision Log](#) | [Patch](#)

revision 8, Thu Jun 15 19:16:02 2006 ECT

revision 9, Thu Jun 15 19:18:22 2006 ECT

#	Line 26	Line 26
26	!Flash: 10739712 bytes available (21192704 bytes used)	!Flash: 10739712 bytes available (21192704 bytes used)
27	!	!
28	!Flash: nvram: Directory of nvram:/	!Flash: nvram: Directory of nvram:/
29	!Flash: nvram: 188 -rw- 1204 <no date>	!Flash: nvram: 188 -rw- 1160 <no date>
	startup-config	startup-config
30	!Flash: nvram: 189 ---- 1915 <no date>	!Flash: nvram: 189 ---- 1915 <no date>
	private-config	private-config
31	!Flash: nvram: 190 -rw- 1204 <no date>	!Flash: nvram: 190 -rw- 1160 <no date>
	underlying-config	underlying-config
32	!Flash: nvram: 1 -rw- 0 <no date>	!Flash: nvram: 1 -rw- 0 <no date>
	ifindex-table	ifindex-table
33	!Flash: nvram: 196600 bytes total (192405 bytes free)	!Flash: nvram: 196600 bytes total (192449 bytes free)
34	!	!
35	!Interface: FastEthernet0/0, GT96K FE ADDR: 62AC3F38, FASTSEND: 6155D164, MCI_INDEX: 0	!Interface: FastEthernet0/0, GT96K FE ADDR: 62AC3F38, FASTSEND: 6155D164, MCI_INDEX: 0
36	!Interface: FastEthernet0/1, GT96K FE ADDR: 62AD1FB8, FASTSEND: 6155D164, MCI_INDEX: 0	!Interface: FastEthernet0/1, GT96K FE ADDR: 62AD1FB8, FASTSEND: 6155D164, MCI_INDEX: 0
#	Line 127	Line 127
127	ip ssh version 2	ip ssh version 2
128	!	!
129	!username rancid password <removed>	!username rancid password <removed>
	!username walc password <removed>	
130	!username walc2006 password <removed>	!username walc2006 password <removed>
131	!	!
132	interface FastEthernet0/0	interface FastEthernet0/0

Colored Diff

Show

Legend:

Removed from v.8

changed lines

Added in v.9

[walc@localhost](#) [ViewVC Help](#)

Done

CVSWeb Example

all/configs/

Click on a directory to enter that directory. Click on a file to display its revision history and to get a chance to display diffs between revisions.

Current directory: [\[Local Repository\]](#) / [all](#) / configs

File	Rev.	Age	Last log entry
[BACK] Parent Directory			
[TXT] 192.168.0.254	1.4	36 seconds	updates

Show only files with tag: Module path or alias:

General options

Sort files by: , case-insensitive: ☐ Hide files in Attic: ☒
Sort log by: Show line numbers: ☐
Diff format:

FreeBSD-CVSweb <frebsd-cvsweb@FreeBSD.org>