SELinux in Fedora 8

Dan Walsh <dwalsh@redhat.com>
Red Hat

SELinux History In Fedora

- Fedora 2
  - SELinux Introduced
    - Strict Policy, Disabled, Confine User/Daemons
- Fedora 3
  - Targeted Policy, Enabled, Confine Daemons
  - 12 Targets, Basis for RHEL 4
  - Unconfined user
- Fedora 4, Fedora 5
  - Increase Targets, Bugfixes

SELinux History In Fedora

- Fedora 6
  - Over 200 Targets, Basis for RHEL5
  - Reference Policy, Policy Modules
  - System-config-selinux, policygentool, semanage
- Fedora 7
  - Continued Development, Bugfixes
- Fedora 8
  - Confinement of Users

User Confinement

- Strict Policy/MLS has User confinement
  - user_t, staff_t, sysadm_t, auditadm_t, secadm_t
  - Not well defined not well separated
- Fedora 8 introduces the least privileged users
  - Guest_t (people.fedoraproject.org, git accounts)
    - Terminal Only, No network, no setuid apps
  - Xguest_t (public Kiosks)
    - Xwindows login, No network, no setuid apps
  - user_t (Normal office workers, no admin privs)
    - Full X Windows Session, Full Network, No SETUID
  - staff_t (Admin with limited access to root, webadm?)
    - Full X Windows Session, Full Network, Can sudo to other root roles
  - unconfined_t (Admin, owner of box)
    - Default, can do anything

User Confinement

- useradd -Z guest_u guest
- semanage login -m -Z user_u __default__
- semanage login -a -Z unconfined_u dwalsh
- semanage login -l
- semanage user -l

xguest kiosk user

- Target.
  - Libraries, Universities, Coffee Shops
- No Password required, only when in SELinux Mode
  - pam_selinux_permit
  - Password disabled, no ssh access
- Only use Firefox to talk to internet
  - Xguest user with transition to confined mozilla (firefox) policy
- No setuid
  - Xguest policy
- Temporary home directory, /tmp, /var/tmp
  - When user logs out, everything gets wiped out
  - pam_namespace
  - sabayon

SELinux Policy Modules

Fedora 6 Introduces the concept of SELinux Policy Modules

- Allows users to easily customize policy
- Allows third parties to ship policy with their rpms
- Similar to kernel Modules
  - In Fedora 5 you have to install entire policy source tree
  - Recompile and reload
  - In Fedora 6 and beyond you can build a policy module without source tree

Requirements

- RPMS required to build SELinux Policy Modules
  - selinux-policy-devel
    - Existing policy “interface files”
      - /usr/share/selinux/devel/*
    - Replaces selinux-policy-TYPE-sources in RHEL5.
    - Policy sources still available in srpm.
  - checkpolicy
    - checkmodule (Policy module compiler)
  - policycoreuitils-gui
    - semodule, audit2allow, sepolgen
    - system-config-selinux
      - polgengui

Policy Modules

- Three Components
  - Type Enforcement (TE) File
    - Contains all the rules used to confine your application
  - File Context (FC) File
    - Contains the regular expression mappings for on disk file contexts
  - Interface (if) Files
    - Contains the interfaces defined for other confined applications, to interact with your confined application
- Policy Package (pp)
  - Compiler/packager roles generates policy package to be installed on systems.

Building Policy Packages

- audit2allow
  - Examines /var/log/audit/audit.log and /var/log/messages for AVC messages
  - Searches Interface files for correct interface
  - If no interface found generates allow rules

audit2allow

time->Thu Apr 12 05:12:01 2007
type=PATH msg=audit(1176369121.794:1514): item=0 name="/usr/games/vultureseye/vultureseye.#prelink#.m8SXxq" inode=11960540 dev=fd:00 mode=040755 ouid=0 ogid=0 rdev=00:00 obj=system_u:object_r:usr_t:s0
type=CWD msg=audit(1176369121.794:1514): cwd="/"
type=SYSCALL msg=audit(1176369121.794:1514): arch=40000003 syscall=5 success=no exit=-13 a0=bfe58b40 a1=80c2 a2=180 a3=180 items=1 ppid=1443 pid=1452 auid=0 uid=0 gid=0 euid=0 suid=0 fsuid=0 egid=0 sgid=0 fsgid=0 tty=(none) comm="prelink" exe="/usr/sbin/prelink" subj=user_u:system_r:prelink_t:s0 key=(null)
type=AVC msg=audit(1176369121.794:1514): avc: denied { add_name } for pid=1452 comm="prelink" name="vultureseye.#prelink#.m8SXxq" scontext=user_u:system_r:prelink_t:s0 tcontext=system_u:object_r:usr_t:s0 tclass=dir

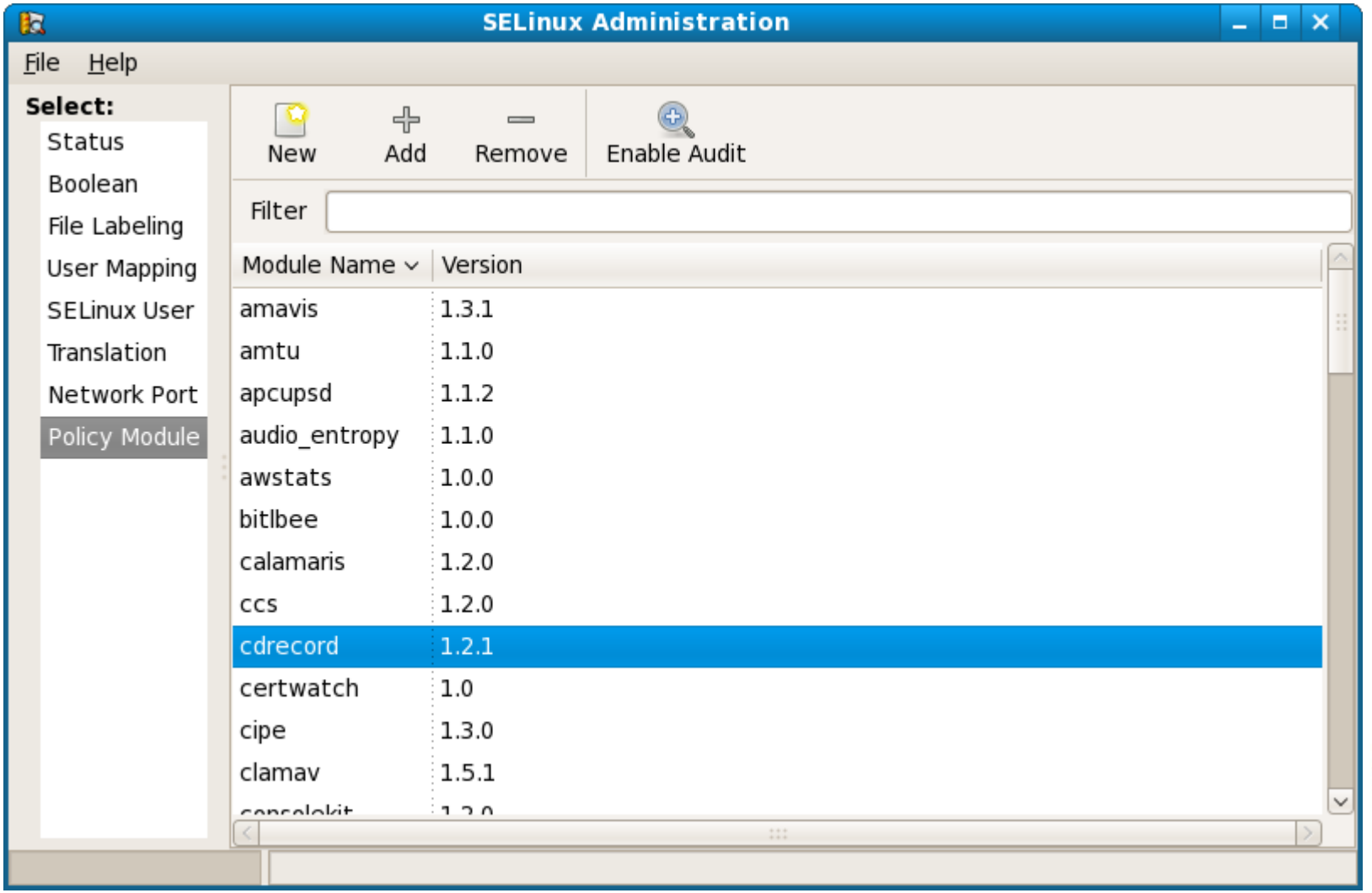
```
# audit2allow  -i /var/log/audit/audit.log
allow prelink_t usr_t:dir add_name;
# audit2allow -R  -i /var/log/audit/audit.log
require {
        type prelink_t;
}
files_rw_usr_dirs(prelink_t)
```

audit2allow

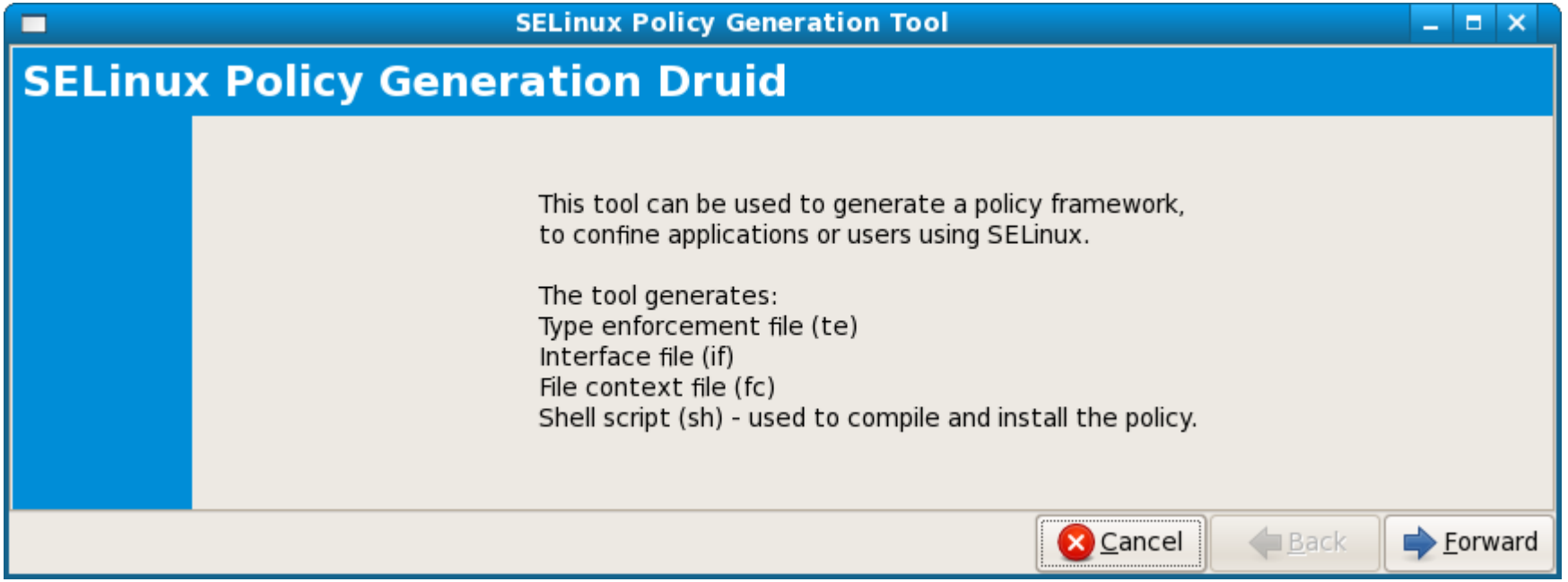
```
# audit2allow -M myprelink -R -i /var/log/audit/audit.log
****************** IMPORTANT ***********************
To make this policy package active, execute:
semodule -i myprelink.pp

# ls myprelink*
myprelink.fc  myprelink.if  myprelink.pp  myprelink.te
```

SELinux Administration



SELinux Policy Generation Druid



polgengui

- Generates 4 files
  - te, fc, if file
  - sh file used to compile/load/set file context
- Tool is not currently an editor.
- Required Fields
  - Name
  - Executable
  - Application Type
- Important Fields
  - What files/directories does application modify?

Lets Start Generating Policy

```
# semodule -r rwho
# fixfiles -R rwho restore
# rm -f /usr/share/selinux/devel/include/service/rwho.if
# system-config-selinux
```