

Secure Copy Paste Manager for MLS System

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Background

- ▶ No standard way to copy/paste
- ▶ ICCCM
 - PRIMARY – single argument
 - SECONDARY – not used much
 - CLIPBOARD – transfer wider variety/greater amount of data

Motivations and Implementation

- ▶ Requirements
 - Allow for downgrade when copying between X apps running at different levels
 - Audit downgrades
- ▶ Aggressive selection manager
 - Modeled after glipper
 - Training issue?
- ▶ MLS constraints

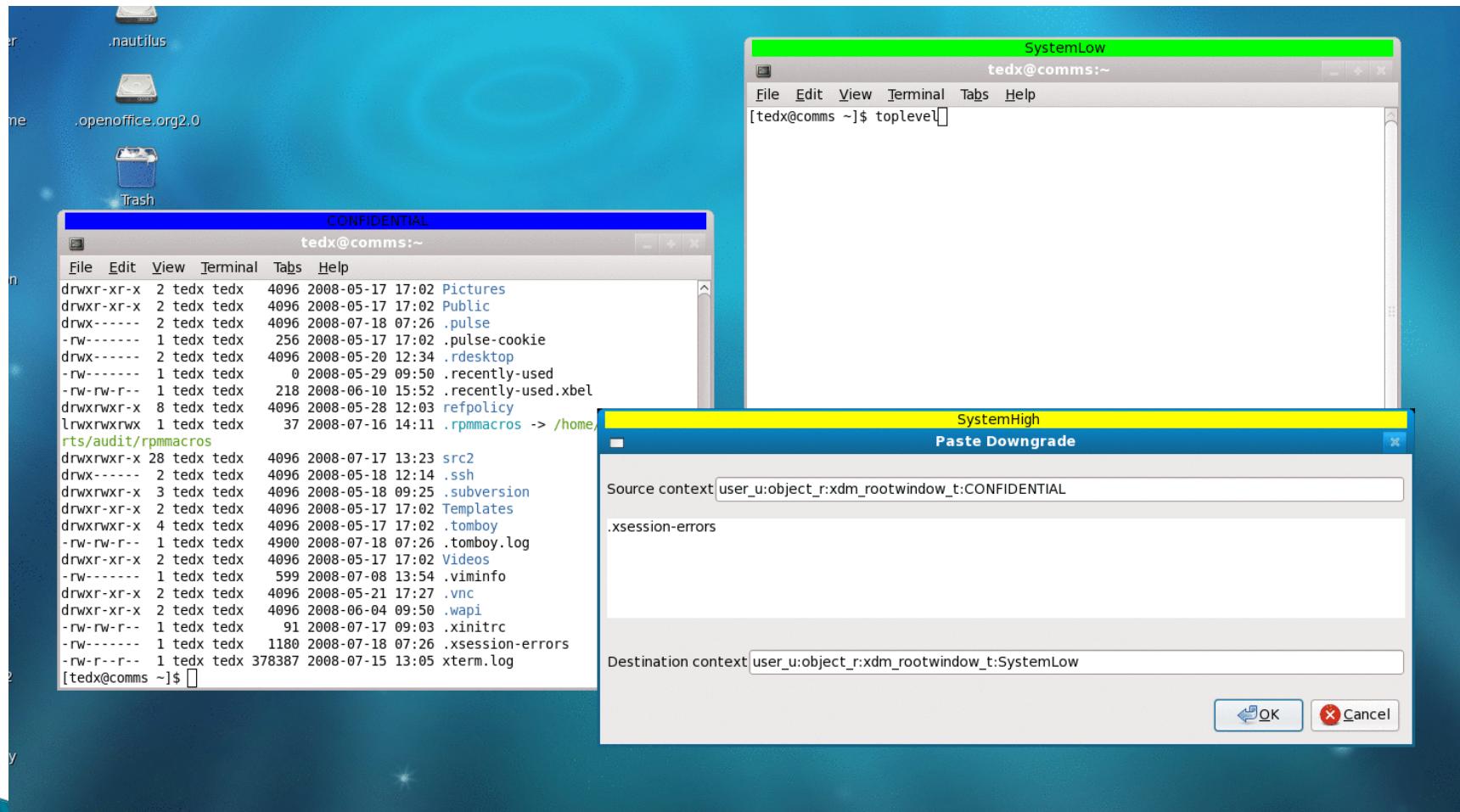
```
# the x_application_data "paste" ops (explicit single level)
mlsconstrain x_application_data { paste }
  ( l1 eq l2 );

# the x_application_data "paste_after_confirm" ops (downgrade permitted)
mlsconstrain x_application_data { paste_after_confirm }
  ( l1 domby l2 );
```

Code snippet

```
avd = selinux.av_decision()
selinux.avc_reset()
rc = selinux.avc_has_perm_noaudit(ssid, dsid, SECCCLASS_X_APPLICATION_DATA, X_APPLICATION_DATA__PASTE, None, avd)
logging.debug("\non_selection_request: avc_has_perm %d" % (rc))
if (avd.allowed & X_APPLICATION_DATA__PASTE) != X_APPLICATION_DATA__PASTE:
    selinux.avc_reset()
    rc = selinux.avc_has_perm_noaudit(ssid, dsid, SECCCLASS_X_APPLICATION_DATA, X_APPLICATION_DATA__PASTE_AFTER_CONFIRM, None, avd)
    logging.debug("\non_selection_request: avc_has_perm %d" % (rc))
    if (avd.allowed & X_APPLICATION_DATA__PASTE_AFTER_CONFIRM) == X_APPLICATION_DATA__PASTE_AFTER_CONFIRM:
        try:
            self.downgrade.set_item(self.item)
            self.downgrade.set_destination_context(dest_context)
        except:
            logging.debug("exception: %s" % (sys.exc_info()[0]))
            logging.debug("traceback: %s" % (traceback.format_exc()))
        self.downgrade.run_modal()
    if not self.downgrade.approved:
        try:
            logging.debug("Reject paste request")
            gtk.gdk.selection_send_notify(event.requestor,
                                          event.selection,
                                          event.target,
                                          gtk.gdk.atom_intern("GDK_NONE", False),
                                          event.time)
        except:
            logging.debug("exception: %s" % (sys.exc_info()[0]))
            logging.debug("traceback: %s" % (traceback.format_exc()))
    return True
else:
    logging.debug("allow paste")
else:
    return True
else:
    logging.debug("allow paste")
```

Downgrade Dialog



Issues

- ▶ Dependence on xcb-xselinux and its python bindings
- ▶ Existing X apps which don't implement ICCCM or use selection mechanism in unexpected ways

TBD

- ▶ Integrate with audit
- ▶ Policy – flesh out for enforcing X
- ▶ Single process
 - Currently there is a process to handle PRIMARY and another to handle CLIPBOARD
- ▶ Test, test, test, ...