Homework 3 (Program)

Points: 100 **Due Date**: Friday, November 18, 1999 at 11:59PM

1. (*100 points*) Write a program called *xsu* that takes a command as an argument. Your program is to authenticate the user running the program by requesting the password and validating it, then change the UID to the user's UID and the GID to the user's primary GID and execute the command. The program is described further in the attached manual page.As always, your program must be robust.

Extra Credit

2. (*15 points)* Modify your program in problem 1 so that is the *user* flag is given as *user.group*, the GID is changed to that of *group* when *user* is a member of the group. If *user* is not a member of the *group*, and the real UID is *root*, allow the change; otherwise, deny it.

NAME

xsu - run a command as another user

SYNOPSIS

xsu [**–d**] [**–u** *user*] *command*

DESCRIPTION

The command *xsu* executes the given *command* with the UID of the named *user*. If no user is named, the UID of *root* is used.

The *command* may be in quotes (one argument) or may be multiple arguments. The command is run in a pristine environment. Specifically, the **PATH** is set to search /usr/bin, /bin, /usr/sbin, /sbin, and /etc in that order; the **HOME** is set to the home of *user* (again, to that of *root* if no *user* is named on the command line); **SHELL** is set to the user's login shell; **IFS** is set to tab, newline, and blank; and **TZ** is set to PDT8PST. No other environment variables are set. All files except for standard input, output, and error are closed.All signals are reset to their default value.

OPTIONS

–d Ignore failure of the change to the requested UID (or *root*, if none). This flag is used for debugging, when the programmer is not running as *root*.

–u *user* The real and effective UIDs and GIDs are to be set to those of *user* rather than *root*. If *user* is an integer, it is handled as follows. If a user exists with that integer UID, the command acts as though the name of the user had been typed. If no user exists with that UID, and the user executing *xsu* has the real UID of *root*, the password requested is that of *root* and the given UID is used. If no user exists with that UID and the user executing *xsu* does not have the real UID of *root*, the command is refused.

EXIT CODE

If *command* cannot be executed, *xsu* exits with a code of –127. If *command* is executed, the program returns with the return code of *command*.

EXAMPLES

xsu –u bishop more /home/bishop/private

This executes the command "more /home/bishop/private" with *bishop*'s privileges.

xsu –u nobody ed /tmp/plugh

This allows the user to edit the file "/tmp/plugh" with the privileges of the *nobody* user.

SEE ALSO

su(1)