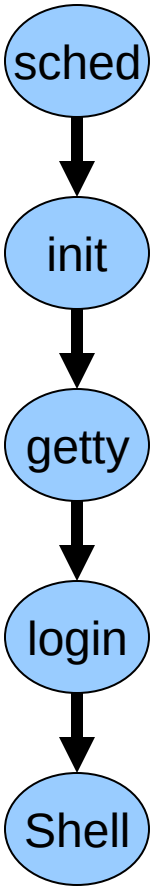
Session #1: The login Process

How UNIX logs in users and how a shell prompt is sent to the user's screen

The Login Process

- The scheduler starts **init**
- init starts **getty** or equivalent, like mingetty or vtgetty
- getty starts **login**
- login starts the **shell**
  - **Bourne, Korn, bash or cshells are started**



The init process: sample /etc/inittab

- cr::sysinit:/sbin/ckroot >/dev/sysmsg 2>&1
- cc::off:/sbin/chkconsole >/dev/sysmsg 2>&1
- ap::sysinit:/sbin/autopush -f /etc/ap/chan.ap
- bchk::sysconf:/sbin/bcheckrc </dev/console >/dev/sysmsg 2>&1
- **is:3:initdefault:**
- a0:0123456:wait:/sbin/contty -c 1> /dev/sysmsg 2>&1
- r0:0:wait:/sbin/rc0 off 1> /dev/sysmsg 2>&1 </dev/console
- r1:1:wait:/sbin/rc1 1> /dev/sysmsg 2>&1 </dev/console
- r2:23:wait:/sbin/rc2 1> /dev/sysmsg 2>&1 </dev/console
- r3:3:wait:/sbin/rc3 1> /dev/sysmsg 2>&1 </dev/console
- r5:5:wait:/sbin/rc0 reboot 1> /dev/sysmsg 2>&1 </dev/console
- r6:6:wait:/sbin/rc6 reboot 1> /dev/sysmsg 2>&1 </dev/console
- li:23:wait:/usr/bin/ln /dev/systty /dev/syscon >/dev/null 2>&1
- **sc:234:respawn:/usr/lib/saf/sac -t 300**
- xdev::boot:/sbin/rm -rf /dev/X/* >/dev/sysmsg 2>&1
- **n1:1:respawn:/sbin/getty term/00 9600HW**
- **c0:0:respawn:/sbin/vtgetty vt00 9600NP**
- **c4:4:respawn:/sbin/vtgetty vt00 9600NP**
- c5:5:respawn:/sbin/vtgetty vt00 9600NP
- c6:6:respawn:/sbin/vtgetty vt00 9600NP

/etc/passwd

- Many programs need to reference information about users. Much of this information is found in the /etc/passwd file. In addition, the login program also reads this file to get information about the user's initial environment such as home directory, group id, and startup program. The /etc/passwd file contains a line for each registered user and is made up as follows:
- Login name
- Unused field where encrypted password was formerly held
- Numeric User Id
- Numeric Group Id (primary group)
- Comments - often user full name
- Home directory for user
- Startup program
- The startup program is usually a shell -

  /sbin/sh (Bourne Shell)
  /usr/bin/ksh (Korn Shell)
  /usr/bin/csh (c Shell)

/etc/shadow

- The 1st field in the shadow file, like the password file, has the user name
- The 2nd field of the shadow file has the encrypted password
- Other fields in the shadow file has to do with when the password would expire and so on

The Default Environment

- **$HOME** **HOME** contains the full path name of the user's home (login) directory (i.e.. /home/fred). This is the default argument for the **cd** command, and is commonly used to reference path names to a user's home directory.
- **$PATH** This variable specifies the names and the order of directories to be searched by the shell when it looks for an executable file (a command). **PATH** consists of a list of directory names separated by colons.

  The default **PATH** is: /usr/bin:/usr/sbin

  This **PATH** specifies that, when locating a command, /usr/bin and /usr/sbin are to be searched, in that order.

  PATH can be set using an assignment statement. e.g. **PATH=$PATH:.:$HOME/bin**

  As a result of this assignment, the search for any command will begin with the already existing **PATH**, followed by the current directory (.), followed by a **bin** directory within the user's home directory. By including the last directory in this value, a user can create his/her own "private" commands that the user can access from any location in the file system.

  Note: For security reasons, the current directory (.) should not be included in the PATH. Putting (.) at the end of the PATH is better than having it at the beginning of the PATH. It is even better not to have (.) at all in the PATH.
- **$SHELL** This variable may be set by the system administrator to the path name of a shell interpreter other than the Bourne shell.. The information is extracted from the /etc/passwd file and if not present, defaults to the standard Bourne shell (/sbin/sh)
- **$MAIL** /var/mail/your_login_name. If set, the shell (before displaying a prompt) checks this file to see if any new mail has arrived since the last prompt. If it has, then it prints a message “you have mail”.
- **$TZ** Set to a series of abbreviations of the form ttthh
  where ttt is the standard time abbreviation, and hh represents hours difference (+ or -) from Greenwich Mean Time. e.g. TZ=EST-10

exec shell: /bin/sh & equivalent

- The login process will then “exec” the shell listed in the /etc/passwd file for the user
- There are many shells that can be started for the user for example:
  - The Bourne shell /sbin/sh
  - The Korn shell /usr/bin/ksh
  - The C-Shell /usr/bin/csh
  - The Bourne Again Shell /bin/bash

/etc/profile

- The ***/etc/profile*** script is only modifiable by the system administrator (usually) and is responsible for such things as:
- setting the timezone for correct display of local time
- displaying a summary of disk free space
- displaying the message of the day (/etc/motd)
- advising whether you have mail
- advising the names of unread news items
- anything else the system administrator has instituted for every Bourne or Korn Shell user.

$HOME/.profile script & equivalent

- The ***.profile*** script (located in the user's home directory) can usually be modified by the user to automatically customize his/her own login environment.
- The user's .profile often includes such things as:
- **mesg n** to prevent other users writing to the terminal,
- setting up the pre-requisites for Korn Shell command-line history and command-line editing,
- changing the PATH variable to add additional directories for command searching,
- changing your prompt to always show your current directory
- **mail** to automatically read any mail
- There are other files equivalent to .profile in other shells, for example .bashrc for the bash shell and .cshrc for the C shell

Sample .profile

- This is the default standard profile provided to a user #They are expected to edit it to meet their own needs.

```
MAIL=/usr/mail/${LOGNAME:?}
EXINIT='set showmode exrc'     # make vi nicer
EDITOR=vi                      # ksh command history
FCEDIT=viPS1='[$PWD]  '        # curr dir in prompt
export EXINIT EDITOR FCEDIT PS1
mesg  n
```