Processes

Every running program is called a process. A vim that you are running, a shell that you are running, a daemon that is waiting for ssh connections are examples of processes.

All Unix systems can run several processes simultaneously.

Listing processes – ps

There are two versions of ps on babbage — /usr/ucb/ps and /bin/ps (also installed as /usr/bin/ps). Most important /usr/ucb/ps options:

- `a` include processes owned by others
- `l` long listing
- `u` user-oriented listing
- `w` wide output (132 columns rather than 80)
- `ww` arbitrarily wide output
- `x` include processes with no controlling terminal
- `nn` list information on process nn
Creating new processes

*fork* creates a duplicate (a *child*) of a current process. *exec* replaces the existing process with a new one (the PID stays the same).

Normal execution of a command from shell: *fork–exec–wait.*

*command* & executes the *command* in background: *fork–exec.*

Suspend key (usually Ctrl-Z, changed by *stty* utility) suspends a running process.

*jobs* lists the suspended and background jobs (-1 option gives process IDs), *fg %nn* brings job *nn* into foreground and *bg %nn* brings job *nn* into background (useful for suspended jobs).

*kill -signal %nn* sends a *signal* to job *nn* and *kill -signal pid* send a *signal* to process *pid*.

Useful signals: *HUP* (hang-up), *KILL* and *TERM* (terminate). By default, *kill* sends a TERM signal.
Shell startup

bash reads:
- at login: ~/.bash_profile, or else ~/.bash_login, or else ~/.profile
- when interactive: ~/.bashrc
- non-interactive: $ENV

tcsh reads: ~/.tcshrc, or else ~/.cshrc
- and at login: ~/.login

Interesting variables

Environment: PATH, TERM
bash: PS1, HISTSIZE
tcsh: prompt, rprompt, history, savehist, correct, autologout
## Aliases

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## Passing arguments into an alias (tcsh)

- !\(n\) \(n\)th argument
- !\(^\) same as !1
- !\(*) all arguments
- !\($\) the last argument
- !\(m-n\) range of arguments