The init process

Members of the Cast

- Starring roles
  - The kernel
  - The init process
- Supporting roles
  - /etc/rc.d/rc.sysinit
  - /etc/rc
  - /sbin/mingetty
- Cast of thousands
  - links in /etc/rc.d/rc?.d
    - to scripts in /etc/rc.d/init.d
    - to /etc/rc.d/rc.local
First process launched during boot

Kernel goes first

- Kernel code loads
  - Identifies/initializes hardware
  - Displays/stores messages
  - et cetera
- Invokes init process
Starring role: init Process

• Father of all processes
  – init is to process structure as
    root is to file structure
  – always PID number “1”

• Creates other processes

• According to /etc/inittab
  – sysinit  system boot process(es)
  – initdefault runlevels for process selection
  – wait    processes to run
  – respawn processes to run and rerun

/etc/inittab lineitem format

• id : runlevels : action : process

• id   : lineitem identifier
• runlevels : for which ones to run process
• action : when to run process
• process : program to run
Runlevels

- Runlevel – a system configuration allowing only selected processes to exist

- 0  halt
- 1  single user mode
- 2  multiuser
- 3  full multiuser
- 4  unused
- 5  X11 (GUI)
- 6  reboot

/etc/inittab

default run level is 5 here (boot to GUI)
What happens if default is 3?

Runs rc script with runlevel as argument based on level desired
Actions

- initdefault  set runlevel after “system boot”
- sysinit      include process in “system boot”
- wait         process run when runlevel entered
- respawn      process restarted whenever ended

Setting Runlevel

<table>
<thead>
<tr>
<th>id</th>
<th>runlevel</th>
<th>action</th>
</tr>
</thead>
<tbody>
<tr>
<td>id : 3 : initdefault :</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
System boot process(es)

<table>
<thead>
<tr>
<th>id</th>
<th>action</th>
<th>process</th>
</tr>
</thead>
<tbody>
<tr>
<td>si</td>
<td>:</td>
<td>sysinit : /etc/rc.d/rc.sysinit</td>
</tr>
</tbody>
</table>

Processes to Run

<table>
<thead>
<tr>
<th>id</th>
<th>runlevel</th>
<th>action</th>
<th>process</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>3</td>
<td>wait</td>
<td>/etc/rc.d/rc 3</td>
</tr>
</tbody>
</table>
Processes to Rerun

<table>
<thead>
<tr>
<th>id</th>
<th>runlevels</th>
<th>action</th>
<th>process</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12345</td>
<td>respawn</td>
<td>/sbin/mingetty tty1</td>
</tr>
<tr>
<td>2</td>
<td>2345</td>
<td>respawn</td>
<td>/sbin/mingetty tty2</td>
</tr>
<tr>
<td>3</td>
<td>2345</td>
<td>respawn</td>
<td>/sbin/mingetty tty3</td>
</tr>
<tr>
<td>4</td>
<td>2345</td>
<td>respawn</td>
<td>/sbin/mingetty tty4</td>
</tr>
<tr>
<td>5</td>
<td>2345</td>
<td>respawn</td>
<td>/sbin/mingetty tty5</td>
</tr>
<tr>
<td>6</td>
<td>2345</td>
<td>respawn</td>
<td>/sbin/mingetty tty6</td>
</tr>
</tbody>
</table>