Beyond Init: Systemd

LinuxTag 2010

Lennart Poettering
lennart@poettering.net

June 2010

Who Am I?

Software Engineer at Red Hat, Inc.

Developer of PulseAudio, Avahi and a few other Free Software projects

`http://0pointer.de/lennart/`

`lennart@poettering.net`

IRC: `mezcalero`

"systemd is a system and session manager for Linux,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts.

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons, keeps track of processes using Linux cgroups,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons, keeps track of processes using Linux cgroups, supports snapshotting and restoring of the system state,

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons, keeps track of processes using Linux cgroups, supports snapshotting and restoring of the system state, maintains mount and automount points
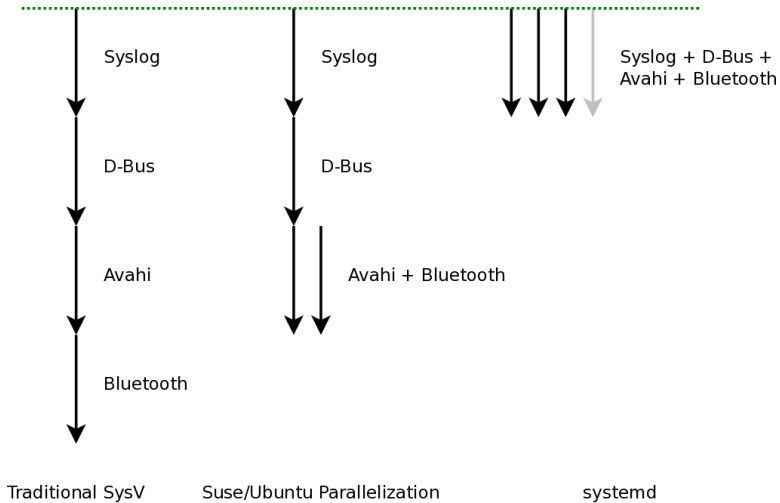
"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons, keeps track of processes using Linux cgroups, supports snapshotting and restoring of the system state, maintains mount and automount points and implements an elaborate transactional dependency-based service control logic.

"systemd is a system and session manager for Linux, compatible with SysV and LSB init scripts. systemd provides aggressive parallelization capabilities, uses socket and D-Bus activation for starting services, offers on-demand starting of daemons, keeps track of processes using Linux cgroups, supports snapshotting and restoring of the system state, maintains mount and automount points and implements an elaborate transactional dependency-based service control logic. It can work as a drop-in replacement for sysvinit."

init(8)

Parallelization

Syslog

Syslog

Syslog + D-Bus +
Avahi + Bluetooth

D-Bus

D-Bus

Avahi

Avahi + Bluetooth

Bluetooth

Traditional SysV   Suse/Ubuntu Parallelization   systemd

Socket-Based Activation

Socket-Based Activation

The kernel orders and buffers requests for us!

Socket-Based Activation

The kernel orders and buffers requests for us!

Implicit dependencies!

Socket-Based Activation

The kernel orders and buffers requests for us!

Implicit dependencies!

Patching daemons

Bus-Based Activation

Starting Less: On-Demand Loading

Parallelizing File System Jobs

Parallelizing File System Jobs

autofs!

Shell is evil

Shell is evil

Move to systemd, daemons, kernel, udev, . . .

Shell is evil

Move to systemd, daemons, kernel, udev, . . .

Provide proper debugging facilities

The best babysitter.

The best babysitter.

Control Groups!

The best babysitter II

The best babysitter II

Environment, resource limits, working directory, `chroot()`, umask, OOM adjustment, nice level, IO priority and class, CPU scheduler priority and policy/reset-on-fork, CPU affinity, timer slack, stdio to syslog/tty/null/kmsg, uid, gid, supplementary groups, file system namespacing (r/o file systems, inaccessible systems, mount propagation, private /tmp), capabilities (inherited set, bounding set, secure bits), . . .

Unit types: service, socket, device, mount, automount, target, snapshot, timer, swap, path

Don't reinvent the wheel:

Don't reinvent the wheel:

Read SysV/LSB init script headers, read /etc/fstab, support traditional inetd modes, support /dev/initctl, utmp, wtmp, support double-fork()ing daemons.

Don't reinvent the wheel:

Read SysV/LSB init script headers, read /etc/fstab, support traditional inetd modes, support /dev/initctl, utmp, wtmp, support double-fork()ing daemons.

.desktop files.

Snapshots

Transaction System

D-Bus!

systemadm

Future: managing sessions

Say No! to Copyright Assignment.

That's all, folks.

That's all, folks.

Any questions?

systemd

http://www.freedesktop.org/wiki/Software/systemd

http://0pointer.de/blog/projects/systemd

git://anongit.freedesktop.org/systemd

#systemd on irc.freenode.org