Linux Power Management One Step Ahead!

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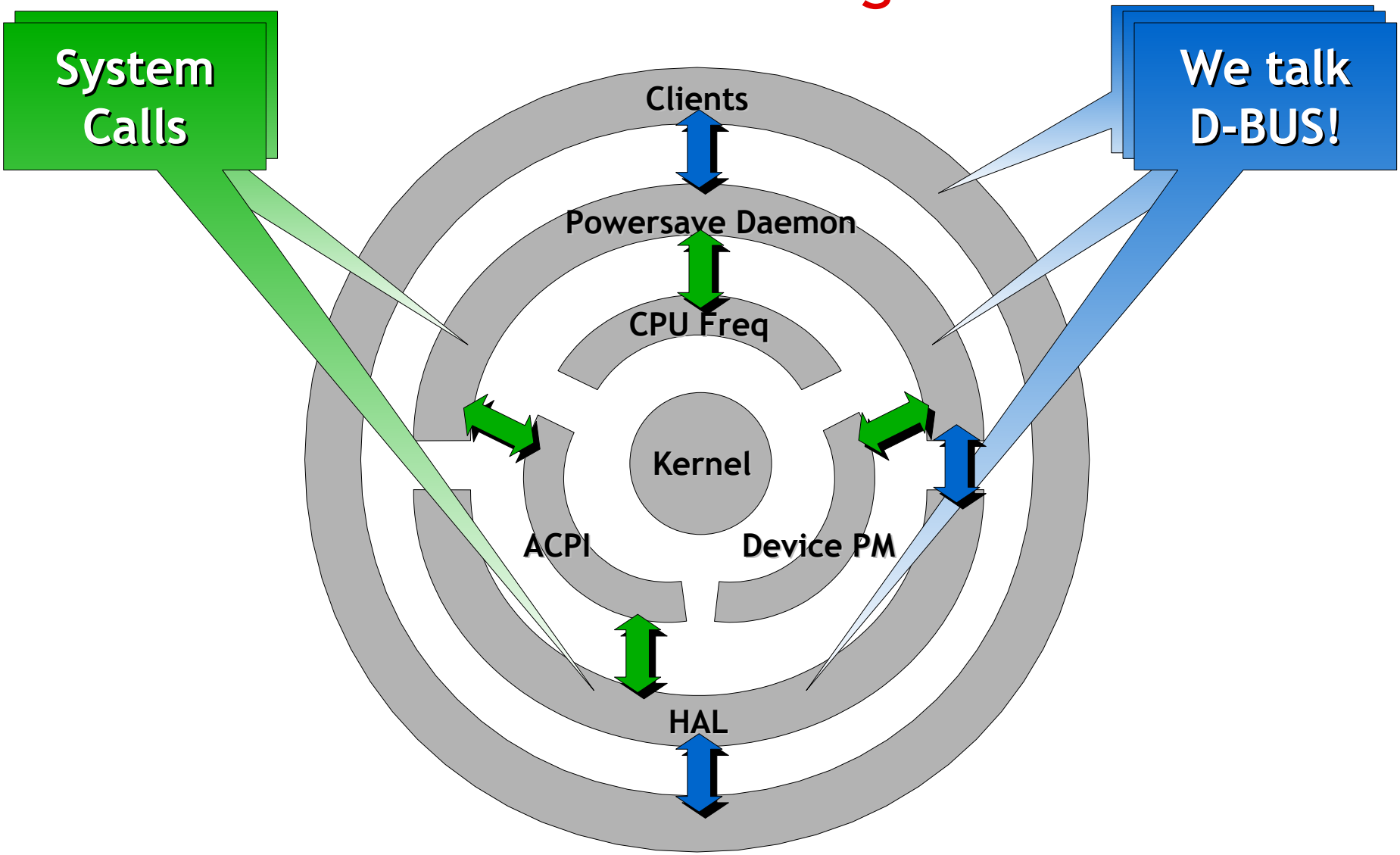
Linux Power Management
One Step Ahead!

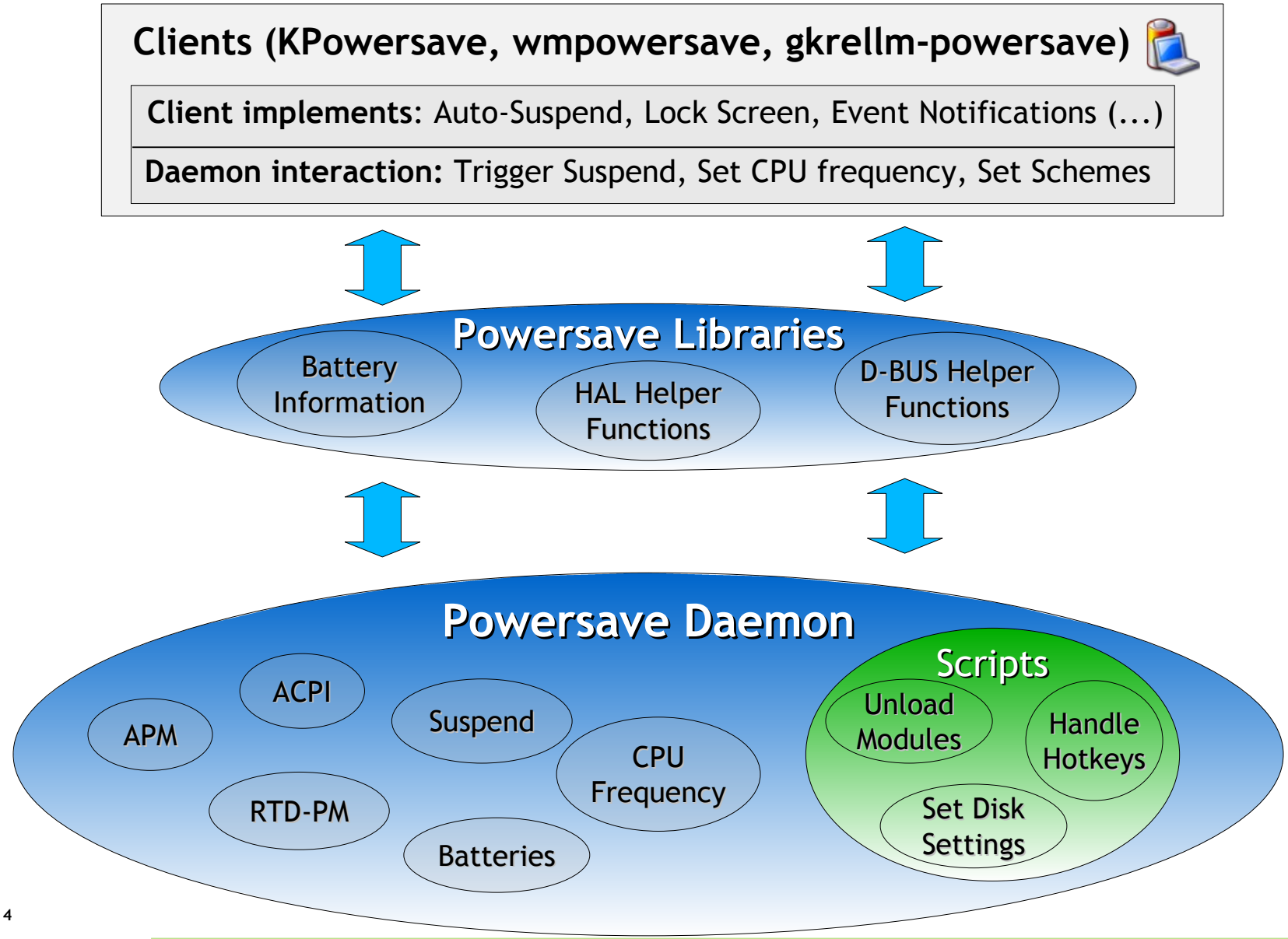
- Linux Power Management
- The Powersave Architecture
- Runtime Device Power Management (RTD-PM)
- Live Demo
- What's Next?



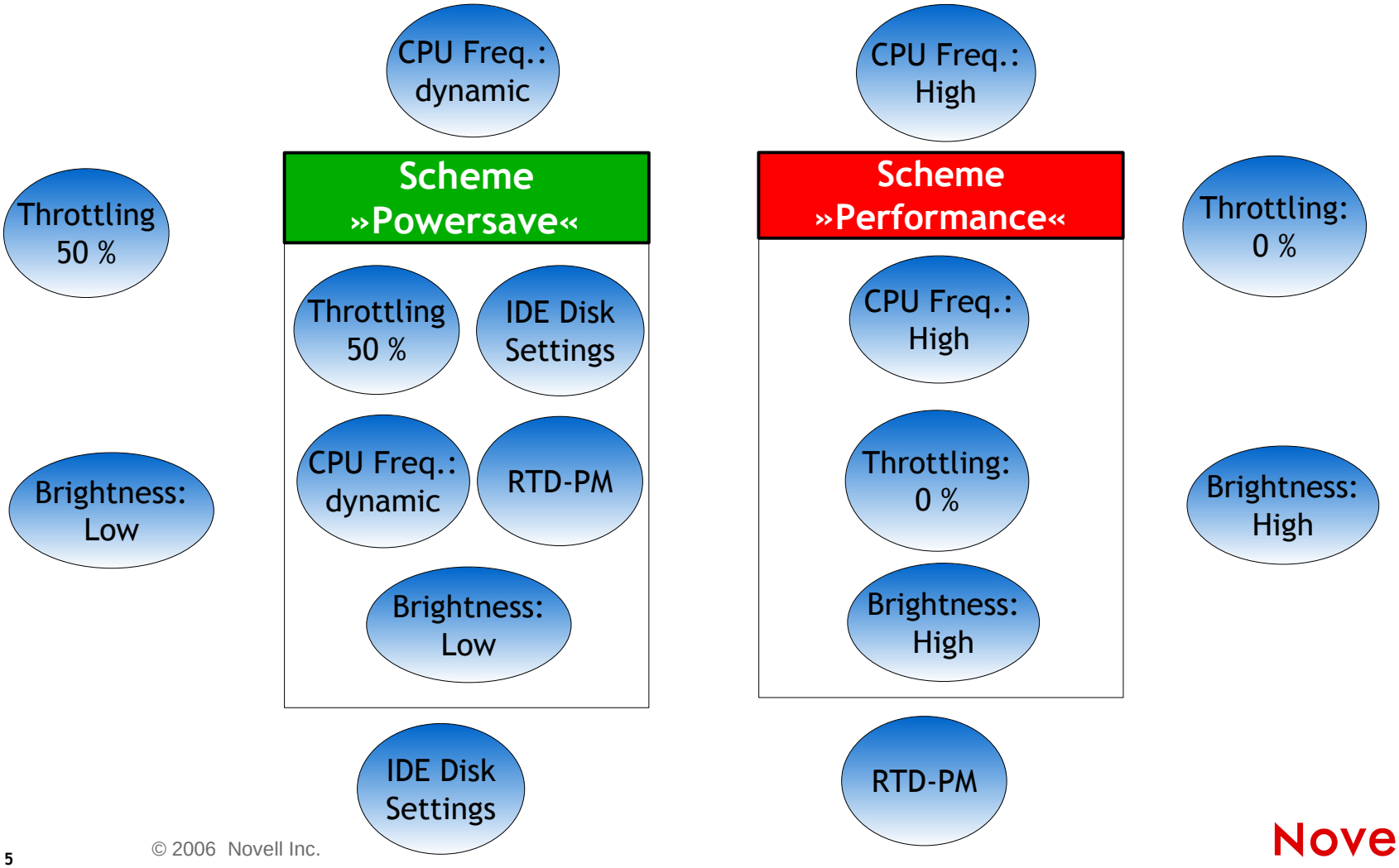
Linux Power Management



Powersave Architecture



Scheme Architecture



Validated Distributions

- SUSE Linux
- Fedora Core
- ALT Linux
- Debian
- Ubuntu
- Kubuntu
- Gentoo

Runtime Device Power Management (RTD-PM)

- Today, we can:
  - switch the global system state and CPU frequency
  - adjust LCD brightness
- What do we get?
  - Save time (suspend and resume cycle)
  - Save power consumption at the expense of performance
- Next:
  - Runtime Device Power Management (RTD-PM)
- What do we get?
  - Extend battery lifetime by switching off unnecessary subsystems or devices (LAN, WLAN, USB, Modem, ...)

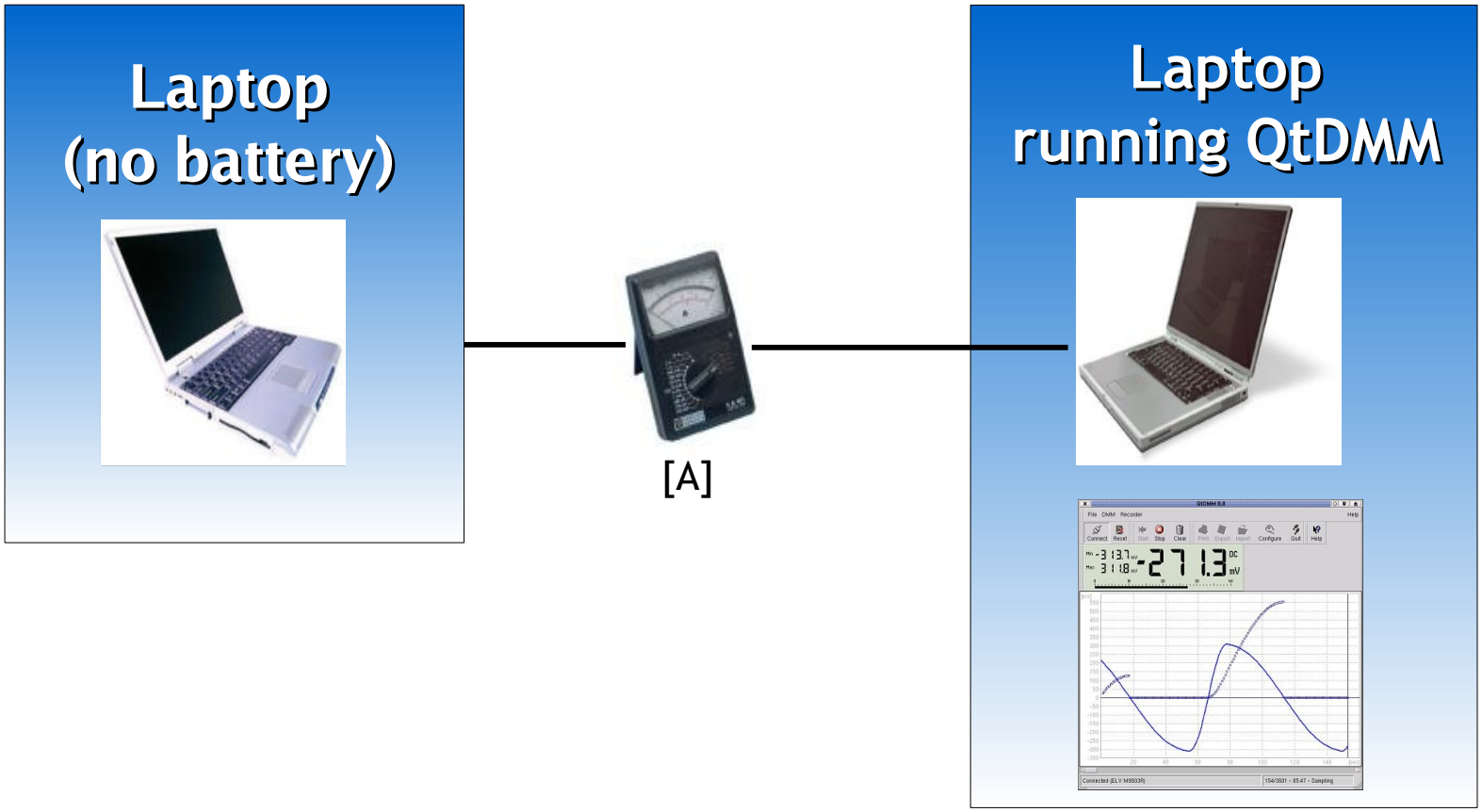
Runtime Device Power Management

- Power States According to ACPI
  - D0 (fully-on, mandatory)
  - D1, D2 (depending on device class, optional)
  - D3 (off, device context lost, mandatory)
- Switch Device Power State
  1. Identify (e.g. lspci)
  2. echo -n [0-3] > $SYSFS_PATH

```
$ lspci |grep Ethernet
02:0e.0 Ethernet controller: Broadcom Ethernet
$ echo -n 3 > /sys/bus/pci/devices/0000:02:0e.0/power/state
```

- We should not require users to use echo
- UI required, enhance Powersave Daemon clients

Test Environment



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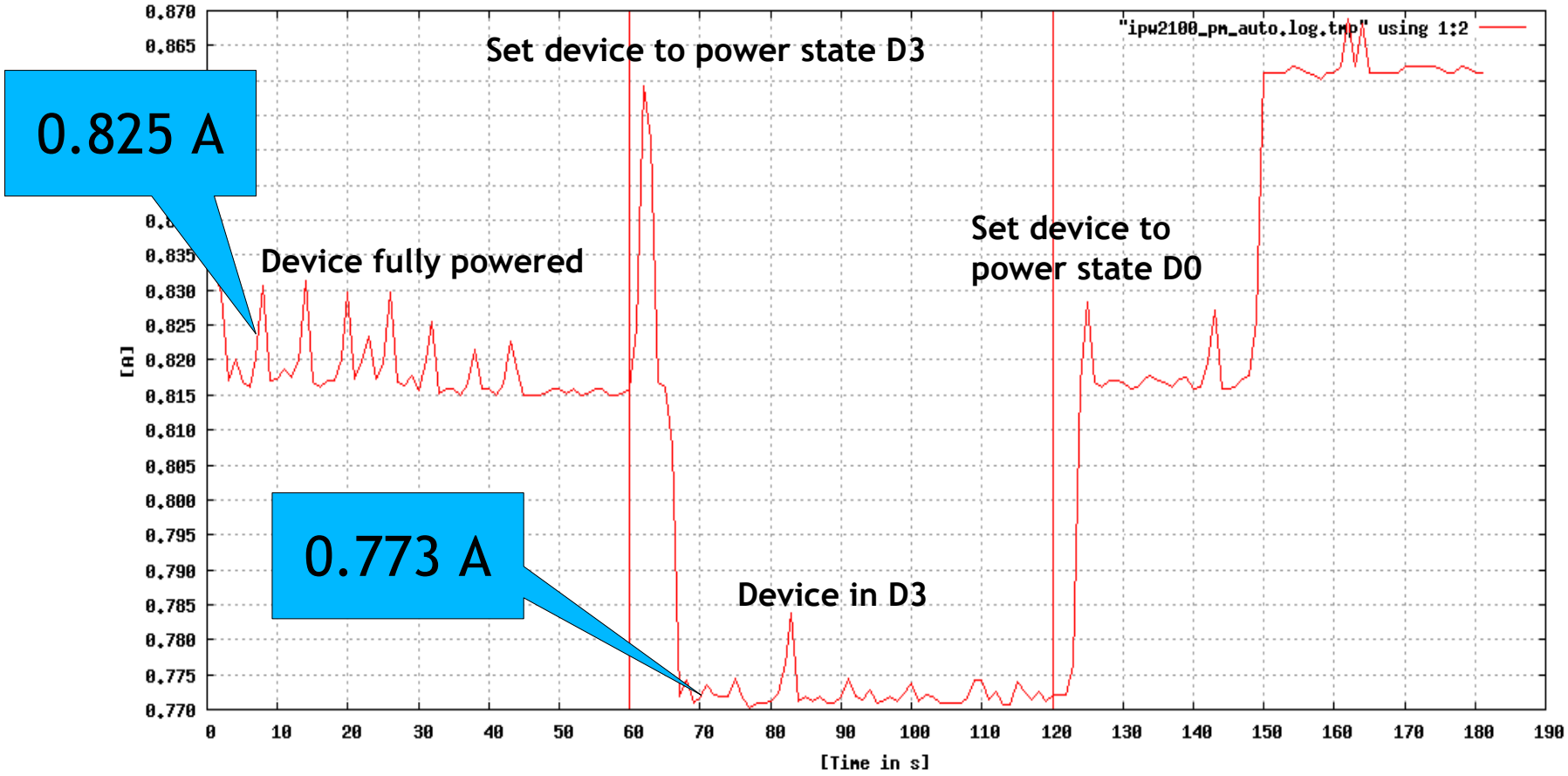
Example: IPW 2100



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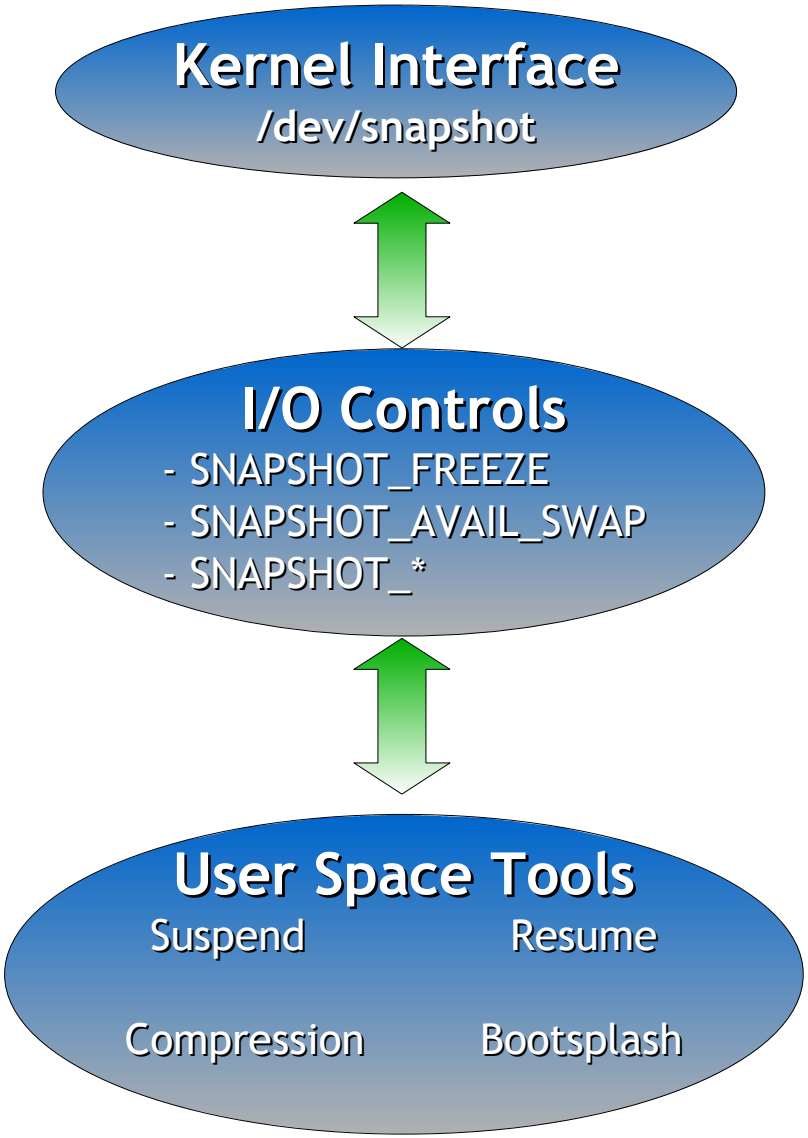
Live Demo

What's Next?

User Space Software Suspend



Dynticks

- Skip timer ticks if CPU is idle
  - Make HZ dynamic
  - HZ is arch depending

→ Allow the CPU to enter C3 more often

- Problems
  - Losing interrupts

Running Out of Time^w Battery.

Open Discussion

Thanks for coming!

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Resources of Interest

- http://powersave.sourceforge.net/pm-report/
- http://www.opensuse.org/Projects_Powersave
- http://powersave.sourceforge.net
- http://sourceforge.net/Projects/Powersave
- Mailing lists:
  - powersave-users@forge.novell.com
  - powersave-devel@forge.novell.com