FOSDEM26

Get the most out of Linux for music production

Jeremy Jongepier

Intro

Hello,
my name is

Jeremy

Intro

Intro

Hello,
my name is

Jeremy

Who?

autostatic

Intro

Hello, my name is **Jeremy**

Who? **autostatic**

What? **Linux Specialist Engineer**

Intro

Hello, my name is	**Jeremy**
Who?	**autostatic**
What?	**Linux Specialist** **Engineer**
Where?	**SURF** **Dutch NREN**

Where to begin?

Hardware

Computer, audio interface, cables

Where to begin?

Hardware

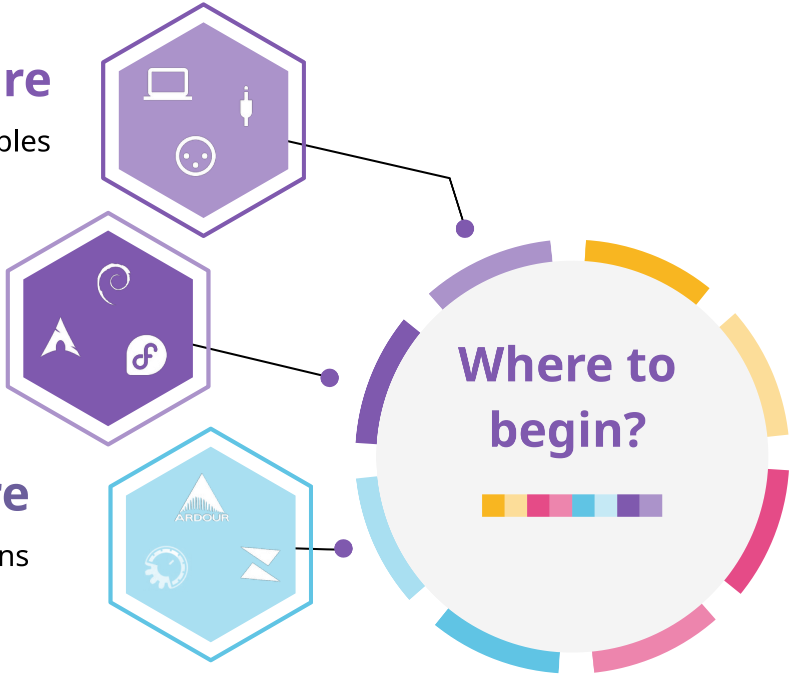
Computer, audio interface, cables

Distribution

Any distribution should do

Where to begin?

Where to begin?



Hardware

Computer, audio interface, cables

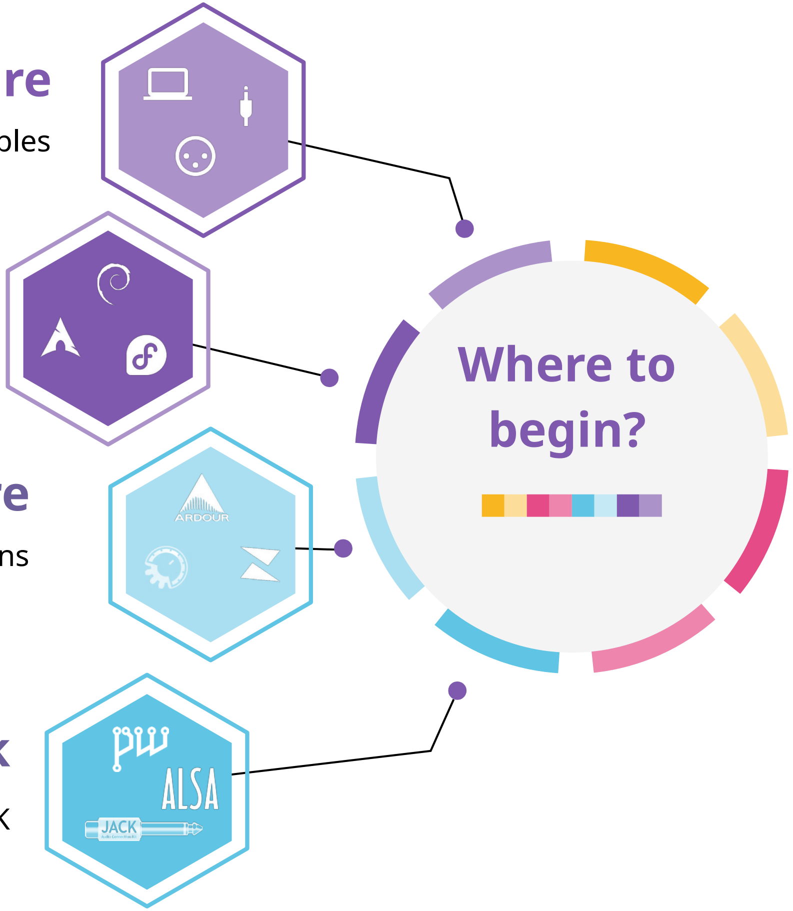
Distribution

Any distribution should do

Software

Modular, monolithic, DAW, plugins

Where to begin?



Hardware

Computer, audio interface, cables

Distribution

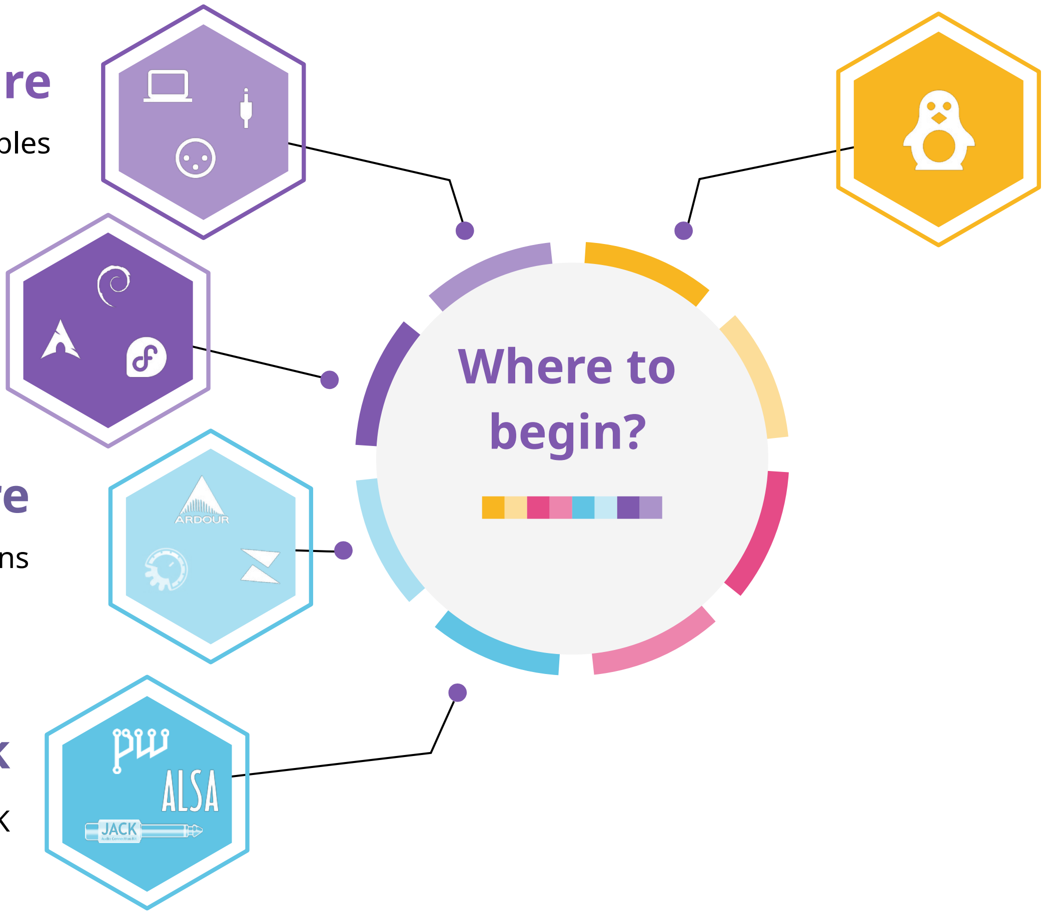
Any distribution should do

Software

Modular, monolithic, DAW, plugins

Audio framework

ALSA, PipeWire, JACK



Where to begin?

Hardware

Computer, audio interface, cables

Distribution

Any distribution should do

Software

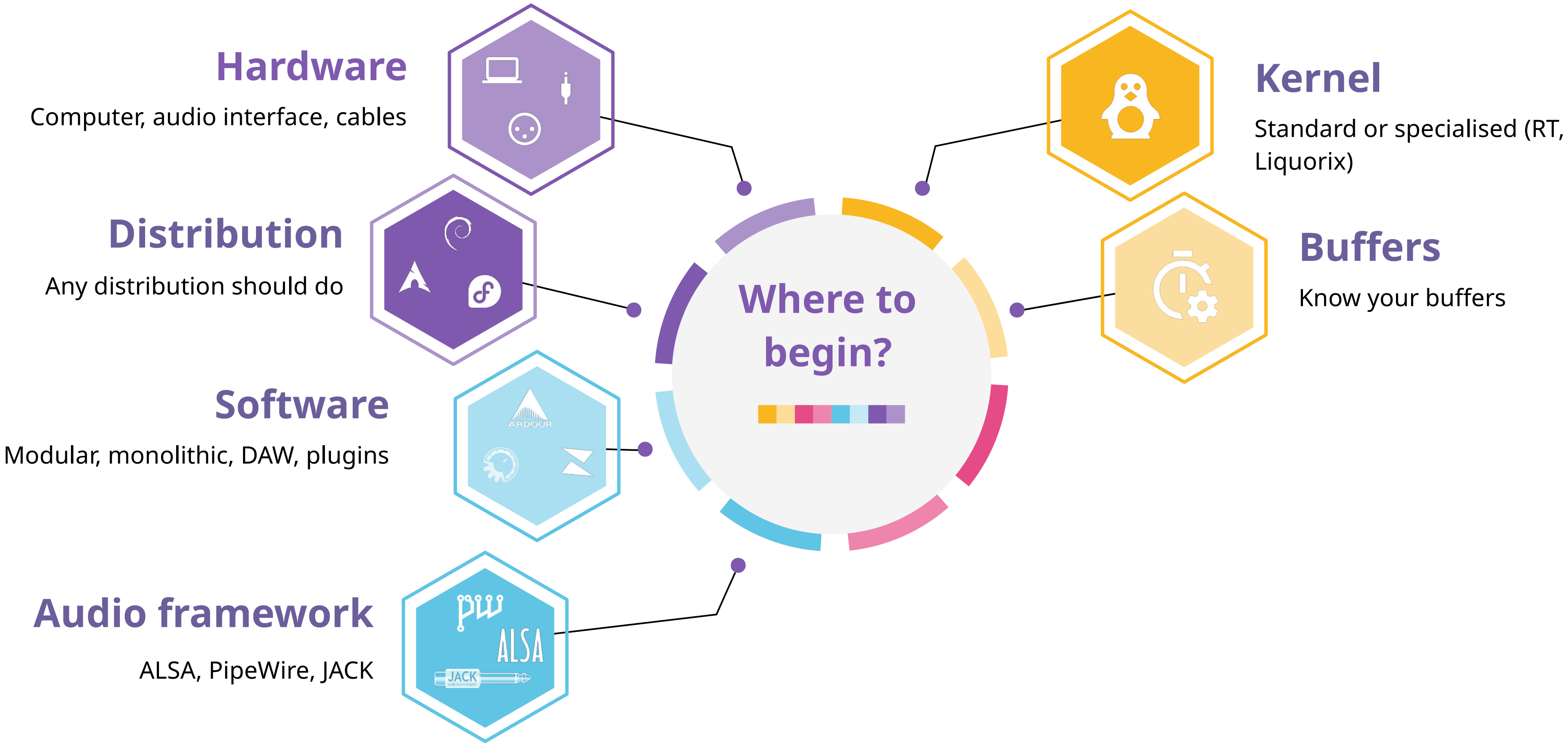
Modular, monolithic, DAW, plugins

Audio framework

ALSA, PipeWire, JACK

Kernel

Standard or specialised (RT, Liquorix)



Where to begin?

Hardware

Computer, audio interface, cables

Distribution

Any distribution should do

Software

Modular, monolithic, DAW, plugins

Audio framework

ALSA, PipeWire, JACK

Kernel

Standard or specialised (RT, Liquorix)

Buffers

Know your buffers

ARDOUR
pw
ALSA
JACK

Where to begin?

Hardware

Computer, audio interface, cables

Distribution

Any distribution should do

Software

Modular, monolithic, DAW, plugins

Audio framework

ALSA, PipeWire, JACK

Kernel

Standard or specialised (RT, Liquorix)

Buffers

Know your buffers

Round-trip latency

What happens outside your system

ARDOUR
pw
ALSA
JACK

Where to begin?

Hardware

Computer, audio interface, cables

Distribution

Any distribution should do

Software

Modular, monolithic, DAW, plugins

Audio framework

ALSA, PipeWire, JACK

Kernel

Standard or specialised (RT, Liquorix)

Buffers

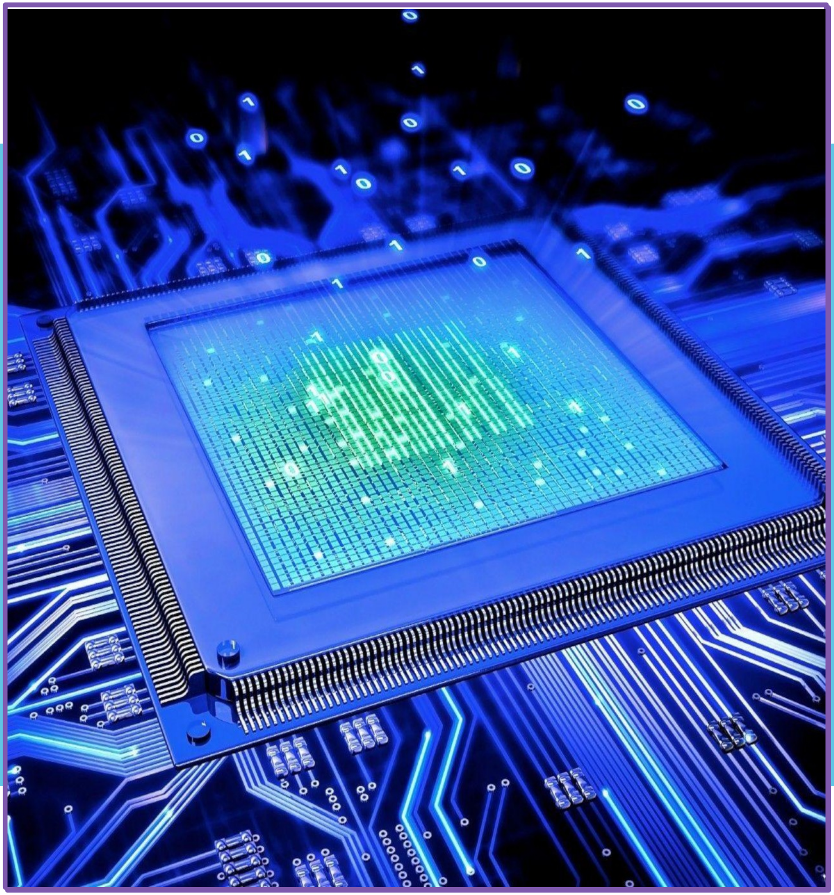
Know your buffers

Round-trip latency

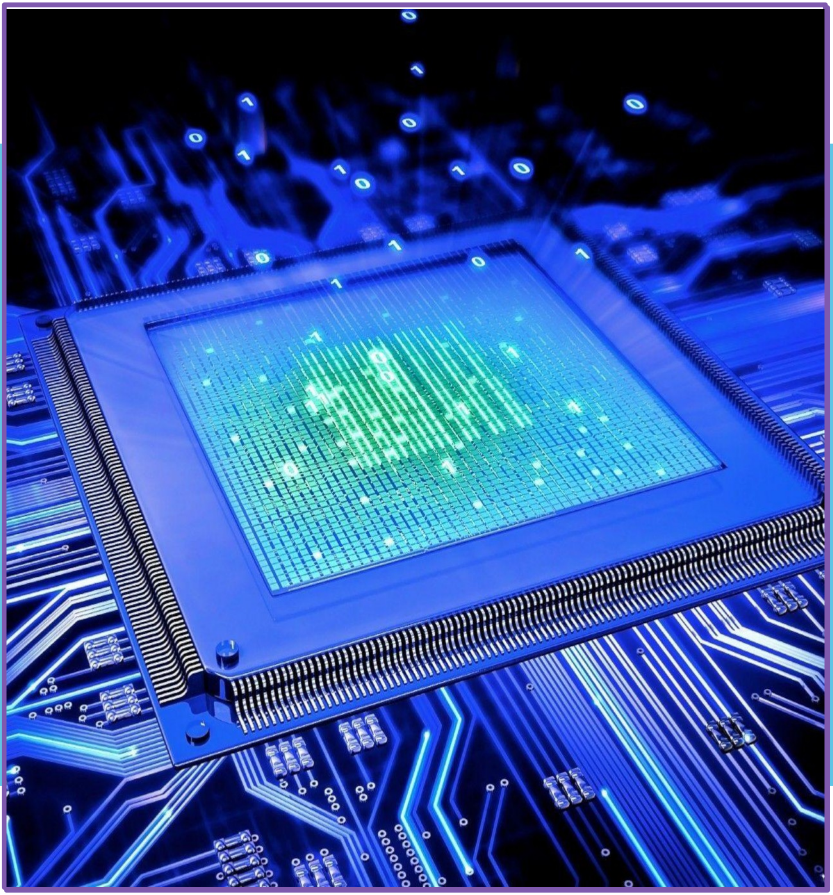
What happens outside your system

Time

Commitment, patience, acceptance



Improve Performance

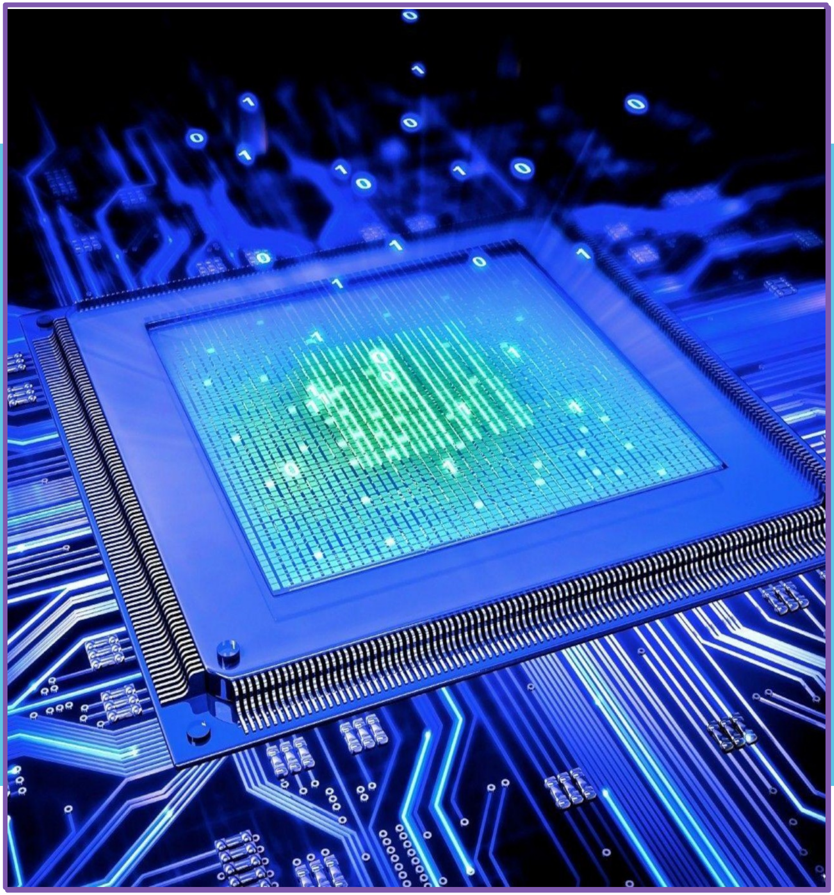


Improve Performance

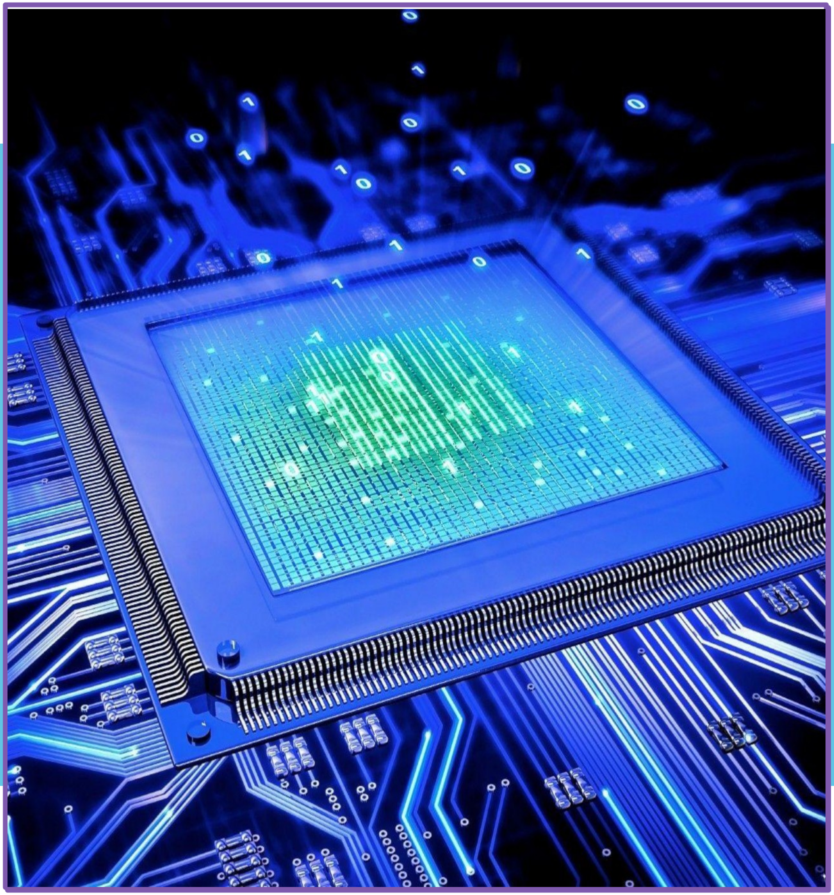
- CPU scaling governor

Improve Performance

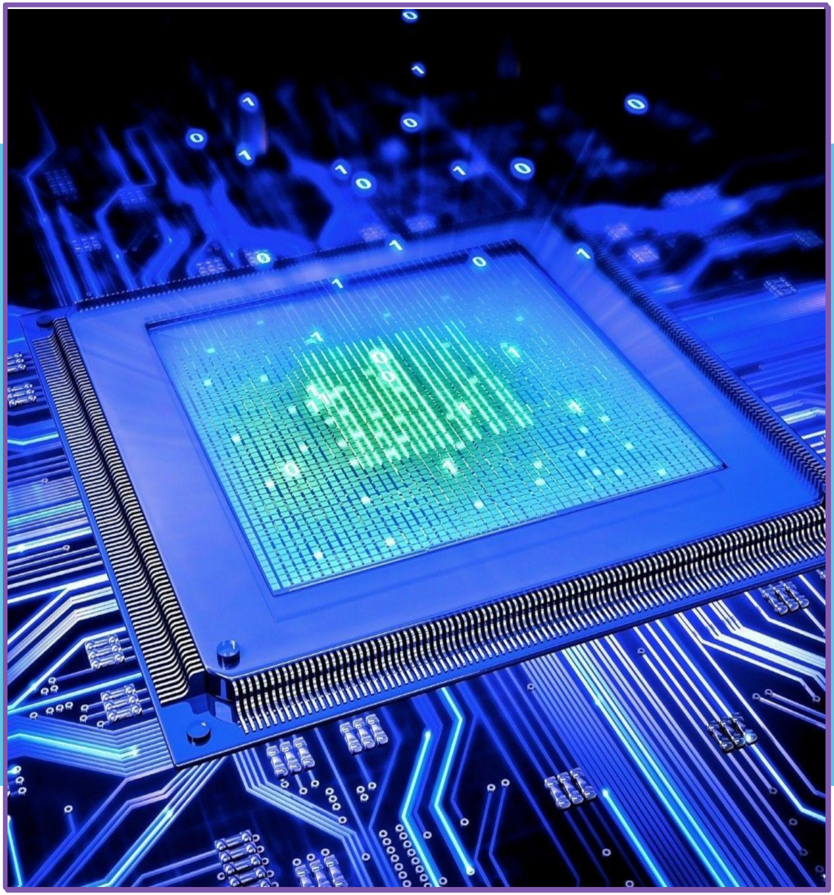
- CPU scaling governor
- SMT (Simultaneous MultiThreading)



Improve Performance

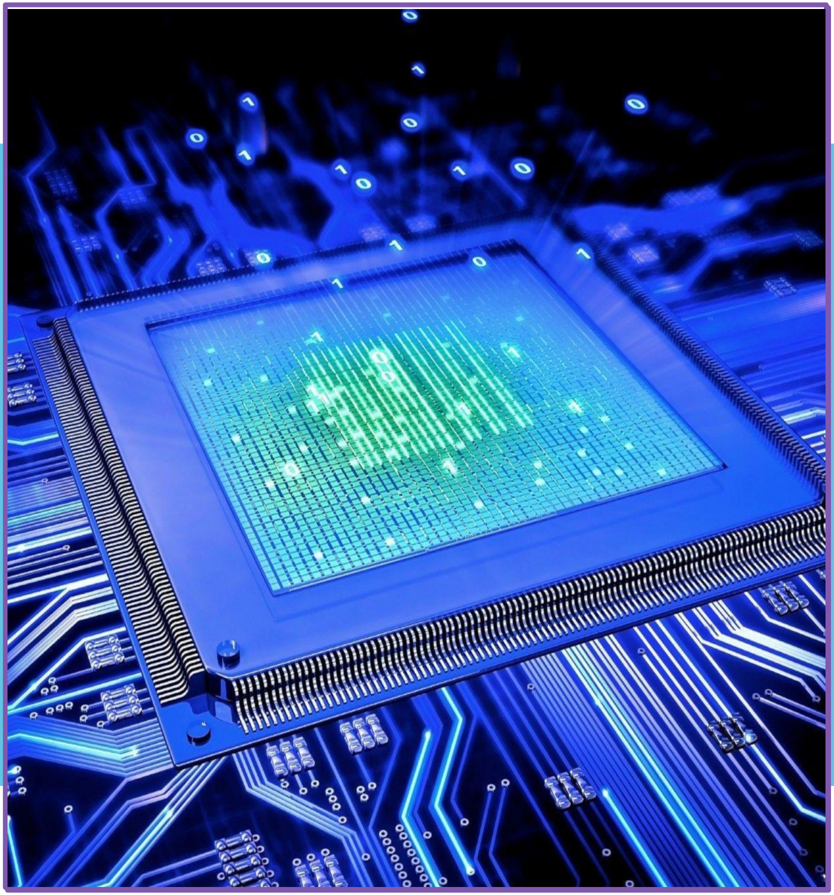


- CPU scaling governor
- SMT (Simultaneous MultiThreading)
- CPU DMA latency



Improve Performance

- CPU scaling governor
- SMT (Simultaneous MultiThreading)
- CPU DMA latency
- Allow user to set real-time priorities



Improve Performance

- CPU scaling governor
- SMT (Simultaneous MultiThreading)
- CPU DMA latency
- Allow user to set real-time priorities
- Kernel

Zero to little impact

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)
- Changing the kernel timer frequency

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)
- Changing the kernel timer frequency
- Using threaded IRQs without configuring them

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)
- Changing the kernel timer frequency
- Using threaded IRQs without configuring them
- Real-time kernel

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)
- Changing the kernel timer frequency
- Using threaded IRQs without configuring them
- Real-time kernel
- Re-nice processes

Zero to little impact

- Changing frequency of clock sources (RTC, HPET)
- Changing the kernel timer frequency
- Using threaded IRQs without configuring them
- Real-time kernel
- Re-nice processes
- Inotify `max_user_watches`

Tools

Tools

1 rtcqs, Millisecond

Tools

1 rtcqs, Millisecond

DSP load (Ardour, JACK) 2

Tools

1 rtcqs, Millisecond

2 DSP load (Ardour, JACK)

3 xruncounter

Tools

1 rtcqs, Millisecond

2 DSP load (Ardour, JACK)

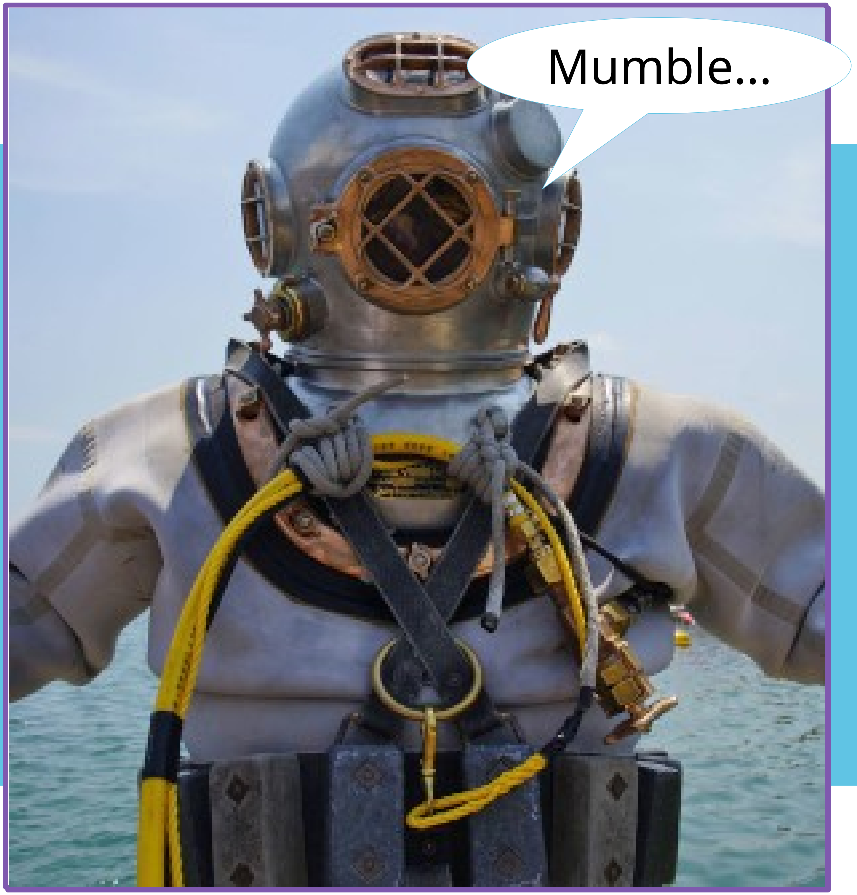
3 xruncounter

4 cyclictest

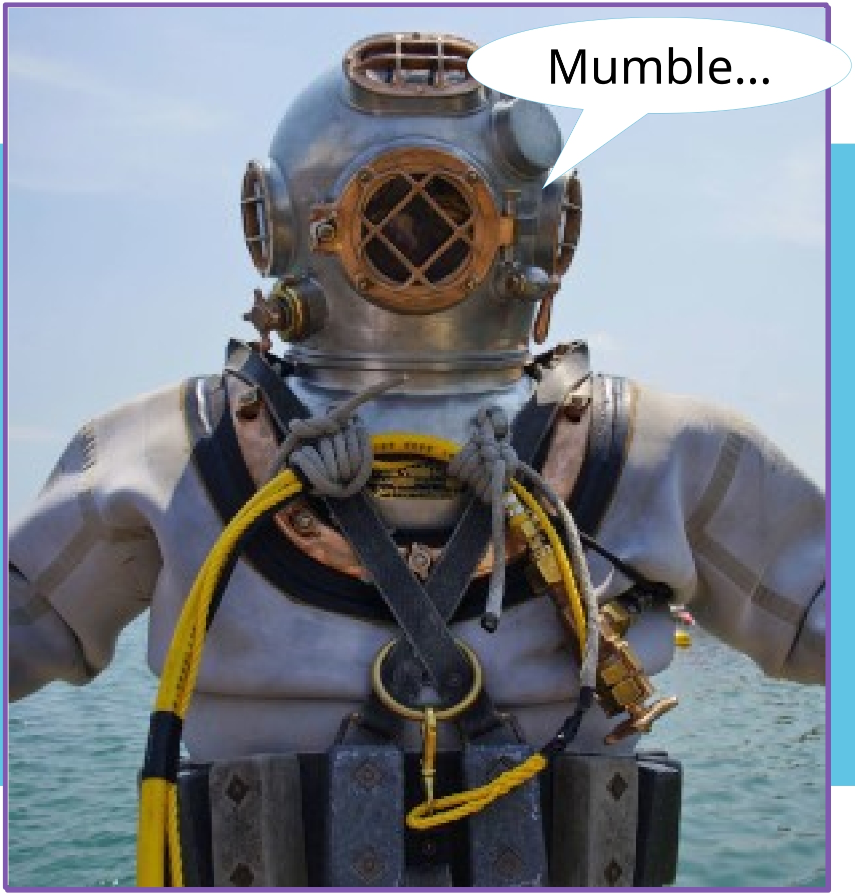
Tools

1. rtcqs, Millisecond
2. DSP load (Ardour, JACK)
3. xruncounter
4. cyclictest
5. IO latency (jack_iodelay, Ardour)

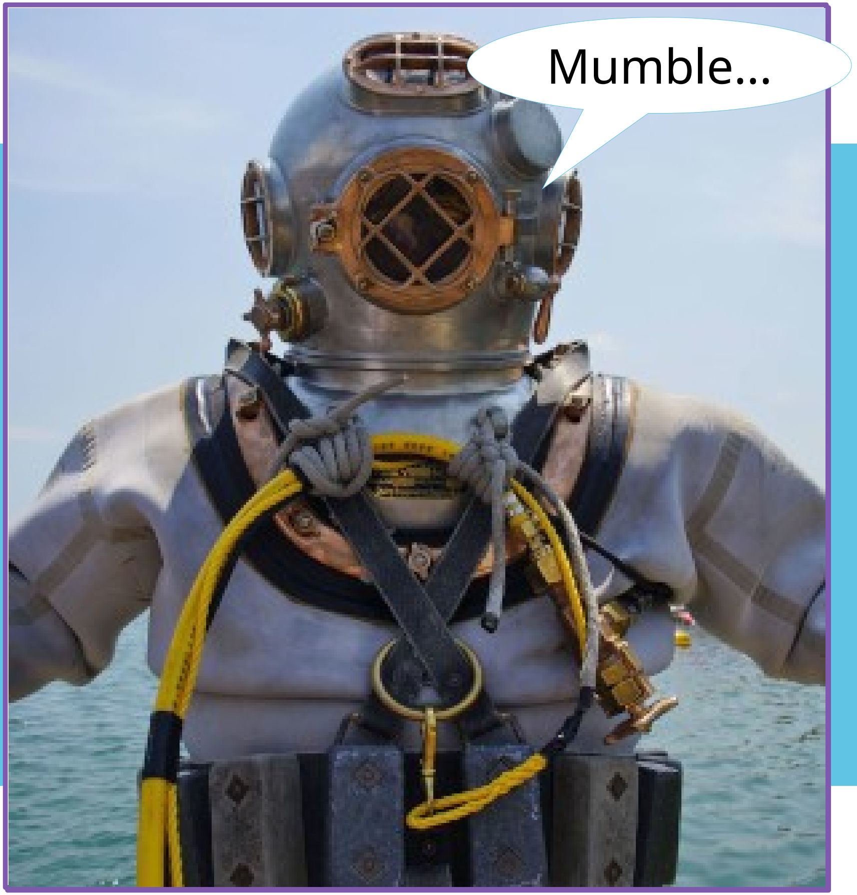
Dive even deeper



Dive even deeper

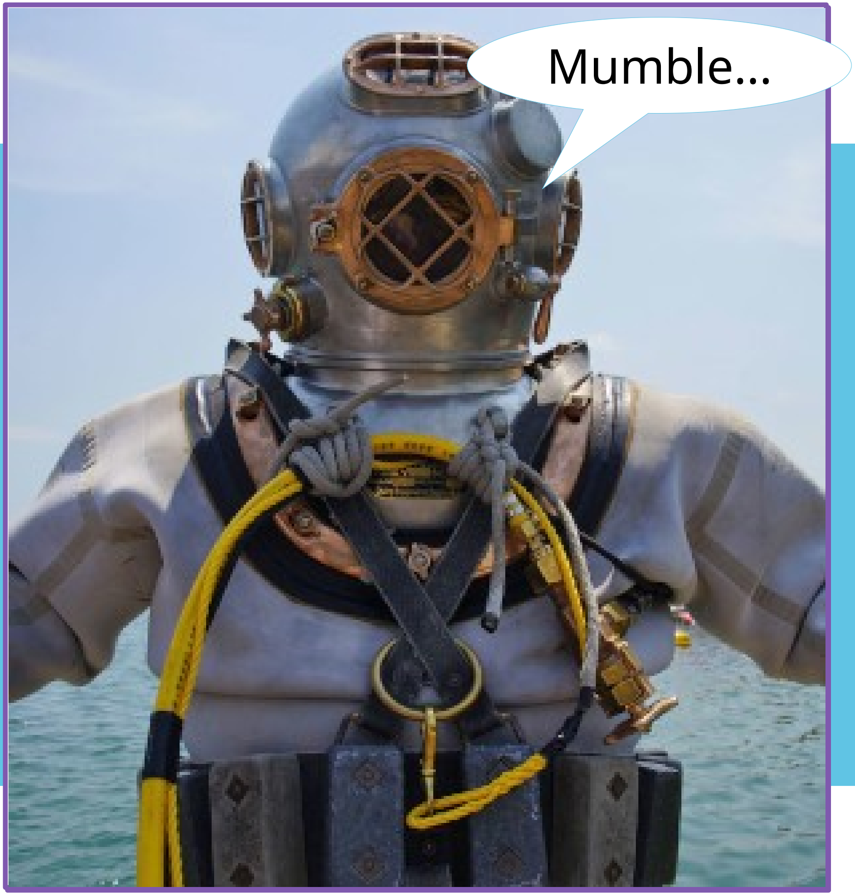


- Prioritise IRQs
  - rtirq
  - rtcirqus



Dive even deeper

- Prioritise IRQs
  - rtirq
  - rtcirqus
- Disable kernel mitigations



Dive even deeper

- Prioritise IRQs
  - rtirq
  - rtcirqus
- Disable kernel mitigations
- Kernel options

Blog

https://autostatic.com

Fediverse

https://mastodon.autostatic.net

Code

https://codeberg.org/autostatic

https://codeberg.org/rtcqs

Contact

jeremy@autostatic.com

THANK YOU