

Configuring your system for real-time low-latency audio processing

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1. Introduction

2. The basis

What hardware is supported?

PCI(e), USB1/2/3 or FireWire?

Which distribution to choose?

Which desktop environment/window manager to choose?

3. System services

4. The kernel

Can I tweak my kernel with kernel parameters?

What kernel to use?

Unbinding, unloading and blacklisting drivers, what is and is it useful?

What about building your own kernel?

Type	Features
FireWire	High bandwidth, external, low latency, synchronous data streams, significant number of supported devices (FFADO)
USB1.1	Low bandwidth, external, asynchronous data streams, audio device class specification (any class compliant USB1.1. Audio device should work on a GNU/Linux system with the ALSA driver backend installed), large number of supported devices (ALSA)
USB2.0	Medium bandwidth, external, asynchronous data streams, no audio device class specification (so no class compliant devices which has resulted in very poor support for USB2 audio devices in GNU/Linux), small number of supported devices (ALSA)
PCI(e)	High bandwidth, internal, large number of supported devices (ALSA)

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Unbinding:

```
echo -n "device ID" >  
/sys/bus/pci/drivers/ehci_hcd/unbind
```

Blacklisting (*/etc/modprobe.d/blacklist.conf*):

```
blacklist module_name
```

Configuring your system for real-time low-latency audio processing

5. Real-time priorities

How do I set up real-time priorities?

What kind of processes use these priorities?

What's up with nice?

Rtirq, what is it and do I need it?

6. Disk IO

What filesystem to use?

Can I tune disk IO?

7. Hello JACK Audio Connection Kitty!

What is JACK?

What can I do with JACK?

How do I configure JACK?

I don't like JACK, is there an alternative?

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Real-time priorities (PAM):

```
@audio    -   rtprio      90
@audio    -   memlock    unlimited
```

Manually:

```
chrt -f -p [1..99] {pid}
```

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8. A word on using FireWire

Why FireWire?

How do I set it up?

Old FireWire stack vs. new 'JuJu' Firewire stack

Why is it so hard to use it as my default soundcard?

9. Conclusion

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Loading raw1394 module (*/etc/modules*):

```
raw1394
```

Create/modify udev rule (*/etc/udev/rules.d/60-raw-firewire-rules*):

```
KERNEL=="raw1394", GROUP="audio"
```