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?
<table>
<thead>
<tr>
<th>Type</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>FireWire</td>
<td>High bandwidth, external, low latency, synchronous data streams, significant number of supported devices (FFADO)</td>
</tr>
<tr>
<td>USB1.1</td>
<td>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)</td>
</tr>
<tr>
<td>USB2.0</td>
<td>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)</td>
</tr>
<tr>
<td>PCI(e)</td>
<td>High bandwidth, internal, large number of supported devices (ALSA)</td>
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Unbinding:

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

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

```bash
blacklist module_name
```
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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   -  rtprrio     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"