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# ARDOUR

## Reference Manual

**ardour** n 1: a feeling of strong eagerness (usually in favor of a person or cause); *"they were imbued with a revolutionary ardor"*; *"he felt a kind of religious zeal"* [syn: ardor, elan, zeal] 2: intense feeling of love [syn: ardor] 3: feelings of great warmth and intensity; *"he spoke with great ardor"* [syn: ardor, fervor, fervour, fervency, fire, fervidness] Source: WordNet 1.6, 1997 Princeton University

### Linux Audio Systems

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## **Part 1**

# **Introduction**



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## **Chapter 1**

# **Ardour Concepts and Terms**

Welcome to Ardour, a piece of software that can be used to record, edit and mix digital audio on a computer. Those of you familiar with similar software, such as DigiDesign's ProTools, Samplitude by SEK'D and many others, may recognize some of the terms used throughout this manual. If you are new to digital audio, the terms may seem new and/or confusing.

Whatever your previous experience with digital audio software, it is very important that you become familiar with the way in which certain key terms are used within Ardour. The following is a list of the most significant; the ?? contains a more complete list.

Throughout these descriptions, we will try not to assume that you are familiar with either computers in general or the Linux operating system (on which Ardour runs) in particular. However, we do assume that you understand basic digital audio concepts.

**Audio Interface** An *audio interface* is the hardware attached to your computer (quite probably installed within it) that allows the computer to send and receive audio data, in analog and/or digital form. They are often called "sound cards", a reference to the earliest generations of audio interfaces. The capabilities, size, design, operation and quality of audio interfaces from various manufacturers varies widely, as do the details of how the computer interacts with them.

**Device Driver** The *audio interface* is of little use without a *device driver*, which is software that runs as part of the operating system for your computer. The device driver understands how to control the electronics of the audio interface when other software asks it to send or deliver audio data, or when various controls on the interface are adjusted by other software (e.g. volume, channel routings, EQ settings).

Ardour does not interact with device drivers at all. Instead, all of its audio data is handled by the JACK Audio Connection Kit, which allows us to send and receive data not only to an audio interface, but also to any number of other programs.

**JACK** JACK is the JACK Audio Connection Kit. It is

Most uses of JACK rely on a set of device drivers developed by the Advanced Linux Sound Architecture (ALSA) project. This manual does not contain information on installing and configuring ALSA itself, but it will provide some guidance on using ALSA to configure your audio interface for use with ARDOUR.

JACK sends requests to the device driver to configure the audio interface in various ways, check on the interface status, and during recording and playback. The device driver is essentially a middle-man that allows JACK to remain ignorant of the intricate details of how to operate a particular audio interface. At the same time, JACK presents an even simpler picture of how to move audio data around to the applications that it is serving.

**Channel** A *channel* describes a destination on an *audio interface* to which audio can data be sent or retrieved. Specifically, it refers to a *single* stream of audio data that is

sent to/from a hardware connector. For example, many consumer grade audio interfaces, such as those made by Creative Laboratories or Ensoniq, have 2 or 4 channels, each of which corresponds to a connection established by plugging a 1/4" jack into a socket on the back of the interface. Likewise, professional interfaces such as those made by RME and Midiman may have 10, 12, 26 or more channels, which correspond to the audio data streams sent to/from the AES or S/PDIF or ADAT connectors on the interface.

Note that a *channel* is unidirectional, and mono. A card with stereo inputs and outputs has 2 input channels and 2 output channels.

**Bus** A *bus* is an internal software entity that can carry audio data from one place to another. Ardour has 32 busses built in, and each of them can have many other software entities (Tracks, Auxiliary Inputs) both sending and receiving audio data to/from them. A bus is a mono audio data stream with no inherent direction. If someone sends data to a bus, but no-one reads it, the audio data vanishes shortly after it was sent.

**Session** A *session* is a software entity that exists to gather together all the information and settings used while working on a recording. In particular, a session has a set of *Tracks* that are used to record and playback audio data. A session can be used for any recording duration that will fit on your system, but it is generally wise to use one session per musical/acoustic piece. You will find it much easier to record/edit/mix a session like this.

**Track**

**Mixer**

**Sound File**

**Playlist**

**Region**

**Buffer**

**Plugin**

**Disks** A *disk* is a storage medium for digital data, specifically digital audio data in Ardour's case. When you record with Ardour, the audio data is written the disk; when you playback, the data is read from the disk. In today's computer systems, the disk and the subsystem that controls it are the single most important factor in determining what you can do with Ardour. This is because Ardour can require the movement of extremely large quantities of data to/from the disk, in a way quite unlike almost any software (including web and database servers). If your disk and/or disk subsystem cannot keep up with Ardour's requirements, you will have serious problems.

Fortunately, most newer disks can provide the level of performance required, and other than some minor adjustments needed with many IDE/ATA drives (see page ??) this is not something you will need to worry about.

**CPU** A *Central Processing Unit* or *CPU* is a hardware component in your computer that can run software like Ardour. Often known by their names (“Intel Pentium III”, “Alpha”, “UltraSPARC”, “PowerPC”), the CPU is the second most important factor in determining how much Ardour can do on your system.

If you are serious about digital audio on your computer, you should consider investing in a computer with 2 or more CPU’s (if you don’t already have one). This type of configuration has recently become dramatically cheaper, and it offers enormous benefits for doing digital audio work. Even without any special work by a programmer, a dual CPU system will allow the audio software to run on one CPU while other activities (the graphical user interface, email, text editing, and so on) take place on the other.

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## **Part 2**

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