

Constructing a portable dance appliance on a USB key

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Abstract

This article discusses the creation of a “dance music and instructions” appliance on a USB key drive, that is, a portable device that provides the music and instructions for a variety of social dances. The report details various approaches that were attempted to produce such a USB key (“flash drive”) that, plugged into a laptop with attached loudspeakers, would “boot” and offer a simple interface to view the instructions and play the music. The design considerations are presented, and there is discussion of how they are realized (or not). Many arcane details are included for those who may be working on issues related to creation of Live USB devices. Sections with such details are noted *technical* so general readers can skip them.

1 Background

The author has been involved for many years in social dancing from the English and American genre. This style of dance is most commonly linked to the publication by John Playford in 1651 of *The English Dancing Master*. A scan

of this can be found at http://www.pbm.com/~lindahl/playford_1651/ Those not involved with such dancing may be familiar with it as the dancing in films based on Jane Austen novels, in particular the 1995 mini-series and 2005 feature-film versions of **Pride and Prejudice**.

This dancing is done in sets and the movements – called **figures** – form patterns on the dance floor. While formal balls and many dance sessions use musicians, it is useful to have a compact yet flexible appliance to play a wide selection of tunes and also display, when needed, the dance instructions or notes.

In the 1950s and 1960s, records were used to provide the music. These are bulky, heavy and fragile. They gave way to cassette tapes, then later to compact discs (CDs). All these media have the disadvantage that cueing is more or less awkward. However, a more annoying problem is that the media inevitably fail to be restored to their correct storage location.

Except for expensive and quite rare equipment, it is generally not possible to slow or speed up the playing of tunes with traditional records, tapes or CDs. However, many recordings by musicians are not at a satisfactory tempo, and such adjustment can be very helpful, especially when dancers are attempting a dance they have not tried before.

2 Using a laptop or other portable device

The advent of inexpensive laptop computers allowed for storage of many tracks, especially with the widespread use of the mp3 audio format (<https://en.wikipedia.org/wiki/MP3>). Moreover, a computer can also store the dance instructions as text files.

Other devices can play mp3 files. The Apple iPod has been successfully used by one of the Ottawa callers who is visually handicapped. This device can provide audible cueing information, and seems well-designed for playing the music if the subset chosen for a particular dance session is loaded onto it appropriately. Given its tiny screen, it is not well suited for showing the dance instructions, and neither the screen nor the audible cueing are suitable for providing access to a wide selection of music. Hence it is important for this device – and indeed helpful for any device – to have the music that will be needed for a single session placed in a working directory or folder.

To give an idea of the number of tracks, the Ottawa English Country Dance Club owns 93 CDs – well over 1000 tracks. We have instructions for

over 600 dances in machine readable form, and many more in a collection of different books and pamphlets and computer files. The club's laptop – a very low-end offering – is still easily capable of storing all these tracks.

Since the laptop has a CD drive, it can be used to convert CD tracks to mp3 or other audio files. The Club chose to standardize on mp3 files to minimize the difficulty of ensuring the right software – in particular COder/DE-Coder or codec files – is available. (It appears that earlier issues of the legality of format conversion are no longer a matter of concern. However, OECDC tries to ensure we play only tracks for which we have legitimate media.)

The laptop is fairly bulky, and we actually only need its computer and audio hardware. It is possible to have the dances and instructions on a single USB storage device, often called a thumb drive or flash drive. Such a device has been used as a security backup for our collection of dances for some time.

The USB drive allows yet another possibility thanks to the ingenuity of some clever computer programmers. This is the inclusion of the software to select, display and play the files. The essential mechanism for this is the live-media operating system, in particular, a version of Linux that can be loaded (“booted”) from the USB drive. The use of USB drives for this purpose is an outgrowth of the live CD Linux systems of the late 1990s and early 2000s. Of these live CDs, Knoppix by Klaus Knopper is, in the author's opinion, a key innovation, though it was not the first such bootable CD.

For convenience, I will henceforth use the name DanceBox for the live USB appliance discussed here.

3 Some design choices

In the busy environment of the dance hall, there are some design choices that can make the system used to play music or display dance instructions much easier to use. Primary among such choices is to have a system that does **not** require the pointer device to be used. In particular, most laptops offer a touchpad as a pointing device, but many users find this difficult or awkward to use. On the other hand, a mouse introduces an extra wire to clutter the location where equipment is placed. Moreover, given that the selection of dance tracks is a discrete operation, an appropriate file manager display can allow arrow keys and the “Enter” key to be used for dance selection.

By careful selection of the software to play the tracks, it is possible to have keyboard control of start, pause, and stop, and even speed up or slow

down. Clearing a player instance launched for a given track is accomplished by quitting it using the mostly-standard key combination of **Control + q** or else **Alt + F4**.

The author spent about two days in 2012 trying out a number of audio file players before settling on **AlsaPlayer** (<http://alsaplayer.sourceforge.net/>), one of the older pieces of audio player software. AlsaPlayer uses a rather arcane set of keyboard controls. The four most used are Z to start, V to stop, Q to slow about 5%, T to speed up 5%. One could probably reconfigure these choices, but the Z key is easy to find, and our dancers know that whoever is closest to the laptop (when the caller is dancing) will “press the Z key” when we are ready to dance. Given that we have shared our expertise with the Ogdensburg NY dancers, there is an ongoing Zed/Zee joke.

4 The 2012 version

In 2012, the author was experimenting with CrunchBang Linux. This was a lightweight Linux distribution (version of the operating system with other software) developed by Philip Newborough (a.k.a. corenominal). The principal reasons for choosing this distribution as a base for development were that I had learned how to modify the `openbox` window manager menu and autostart script to make it easy to launch certain programs on the computer used at dances. CrunchBang was also very fast to respond. The `openbox` menu was modified to drop unused functions (e.g., Web browser), and introduce the launching of the file manager and CD track ripping script. AlsaPlayer or a text editor (e.g., leafpad) were launched when a file was selected in the file manager dialog. The file manager chosen was Thunar, which in the particular situation was easily modified to display in list mode with a large font, as one of our callers is visually handicapped.

The dance computer worked well, and the idea of encapsulating it in a liveUSB form was attractive. The Remastersys script and graphical user interface (GUI) by Fragadelic (the pseudonym of the creator) was available to convert a running Debian linux to a liveUSB. I created a version of the operating system that was used in our dance club computer and installed it as a virtual machine (VM) under VirtualBox, which allows many different operating systems to be run as “guests” under a real “host” operating system (<https://en.wikipedia.org/wiki/VirtualBox>). I removed as

much unnecessary software as I could, customized the `openbox` menu and autorstart files and the `conky` system monitor and menu display, then ran `Remastersys` to create a compact disc image file (called an ISO file after the ISO 9660 standard that it follows.) I then burned the ISO to a CD and tested it, then transferred the image to a USB drive with the `Unetbootin` (<https://unetbootin.github.io/>) tool.

This DanceBox version proved highly satisfactory. By putting it in a small FAT32 formatted partition on a USB drive, music and instruction files could be copied to a second FAT32 formatted partition on the rest of the drive. This allowed all of our club collection to be placed on a 32 GB USB drive. (At the time of writing, a 16 GB drive is actually sufficient.) In fact, the iso file `BasedanceCDLive121127.iso` is about 562 Megabytes, and can be installed in a partition of just over half a gigabyte on a USB key, with the rest of the pen-drive available for music and dance instructions. I found that both partitions could be formatted in FAT32 format, despite various warnings about such a layout being either unsuitable or impossible. Here is an example of the actual formatting of one 32 GB USB key I use (as displayed by `fdisk`)

```
Disk /dev/sde: 31.4 GB, 31406948352 bytes
64 heads, 32 sectors/track, 29952 cylinders, total 61341696 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0xc3072e18
```

Device	Boot	Start	End	Blocks	Id	System
/dev/sde1	*	32	1333247	666608	c	W95 FAT32 (LBA)
/dev/sde2		1333248	61341695	30004224	b	W95 FAT32

To summarize, our primary needs are to have a liveUSB that can

- play mp3 files of the music,
- display (and possibly edit) text files of the instructions
- store mp3 and text files and allow them to be loaded
- if a CD reader is attached, then rip selected tracks to the music store

Unfortunately, in early 2016, a colleague acquired a new laptop and the volume control icon disappeared from the main screen on bootup, and no sound was heard when an attempt was made to play music files. We believe the most likely reason for this is that the audio circuitry of the new machine requires software (called drivers) which were unknown at the time the 2012 liveUSB image was created.

It was time to update DanceBox.

5 Obstacles

There are four main issues that prevent a simple update to the 2012 live image:

- Philip Newborough has ceased work on CrunchBang Linux
- Fragedelic has stopped work on Remastersys and taken down his website and software repository
- Most Linux distributions have become more sophisticated and the kernel – the part of the operating system that manages everything – has a lot more features to handle almost all common computer devices.
- Major companies in the computer field have changed the way in which operating systems are started in computers. Previously the BIOS did this task, but now there is the Unified Extensible Firmware Interface (UEFI) which imposes a lot more conditions and structure.

The rest of this article addresses these issues. It also contains detailed notes on various attempts to find suitable methods to create a live USB image. As previously indicated, some of these notes are very technical and may be skipped by the general reader.

6 What has to be done

Creation of the live USB involves the following steps:

- Install a suitable distribution of Linux, likely as a virtual machine rather than on an actual computer.

- Install the set of software required for the DanceBox.
- Remove unnecessary software. This step can result in a non-functional operating system. I managed to cripple my example installation several times in my experiments.
- Customize the appearance and menus.
- Package the files for use in a live distribution. This is generally done by preparing a directory structure that is then “squashed” into a large file that will be uncompressed into memory when the live media is booted.
- Add a bootloader that will bring the software into memory and execute it appropriately for the hardware at hand.
- Bundle all the materials into a suitable ISO9660 structure (ISO file)
- Test the resulting ISO using VirtualBox or QEMU or similar virtual machine execution facility.
- Burn the ISO file to a CD/DVD or copy the image to the appropriate blocks of a USB drive.

Remastersys was helpful because it scripted some of the more awkward of the above steps. Because the software and Linux distributions are continually changing and even with the assistance of a good script it is non-trivial to achieve a satisfactory ISO file, fragedelic took down his site in 2014. This was, perhaps, the main obstacle to building a new device.

7 Choosing the base Linux distribution

Linux distributions are organized collections of an appropriate Linux kernel and compatible and interconnected software. If the organization is imperfect, the distribution will have errors (“bugs”) or will not work correctly. The creators of different distributions select the pieces to combine and the ways in which they are accessed and controlled – for instance by choice of window manager or menuing system – to achieve certain goals.

Since a liveUSB system has to run mostly in memory, and possibly on older or less powerful equipment, a lightweight distribution using smaller and less demanding software is preferred. Because there are two main families

of processors for laptops, which operate with 32 bit or 64 bit data, there are 32 and 64 bit versions of most Linux distributions, though recently the 32 bit versions are starting to disappear. Generally 32 bit versions of Linux will run on 64 bit processors, but not the converse. There are also some issues with very old 32 bit processors associated with their lack of Physical Address Extension (pae) capability. Rather few distributions have a version supporting non-pae processors at the time of writing (April 2016).

Some of the distributions considered for use in developing what we will call the DanceBox live USB are as follows:

- BunsenLabs Hydrogen, which is a successor to CrunchBang Linux
- CrunchBang++, or cb++, another successor to CrunchBang
- Slitaz Linux
- Linux Mint 17.2
- Ubuntu Linux
- Debian Linux
- Arch Linux
- ArchBang Linux
- Bodhi Linux
- Antix Linux
- Tinycore Linux
- Turnkey Linux
- PinguyOS
- RefractaLinux
- Vector Linux Light
- Nelum Bang Linux

Frankly, any of these options **should** allow the creation of some sort of Linux live USB that can do what is desired. However, the actual creation of the live USB image turned out to be remarkably tedious and error-prone. We will look at each of the options above (there are more possibilities, but these are the ones that showed up in my experiments)

8 Pros and cons of different distributions

(This section is partly *technical*).

8.1 BunsenLabs Hydrogen

BunsenLabs is a community continuation of CrunchBang, and it even uses the same servers for the time being. Moreover, it turns out that one of the main developers was working on a Remastersys-like script called **crunchmaster**. Because of the similarity to the 2012 Dance USB system, BunsenLabs was an obvious contender, but some early experiments with it were disappointing due to some mistakes on the human side of the keyboard.

8.2 CrunchBang++, or cb++

This also claims to be a successor to CrunchBang, but it is intended to be installed. That is, it is NOT a live system, so unsuitable for the live USB that is the goal of this article.

8.3 Slitaz Linux

Slitaz Linux (<http://www.slitaz.org>) advertises itself as “Simple, fast and low resource Linux OS for servers & desktops”. There are strong two reasons it appears in this list:

- it has a very tiny ISO (around 50 MB, compared to around 1 GB for most distributions)
- it has the **tazlito** tool that claims to build new, customized distributions and put them on live media.

There are many versions of Slitaz, and I found it confusing to decide which to use as a base for my dance box appliance. Moreover, the tazlito tool seems not to work for all of them. Finally I discovered that I could use the command

```
tazlito writeiso
```

to get an ISO file that would run under VirtualBox. I did not try customization, but put the ISO on a USB key using Unetbootin. This would boot on an Asus UL30A (which usually runs “everything”) but eventually got to a black screen. On an Asus EEE 900A, I got a screen that was clearly a distorted version of the welcome screen. So it looks like the small size of Slitaz implies an incomplete set of drivers. The reason for trying to update the DanceBox USB is, however, to include a wider set of drivers. Worse, using the `'uname -a'` command reveals that the kernel is in the 2.6.x series, while the current stable version is 4.5.1 and most mainstream distributions e.g., Linux Mint and Ubuntu, are using 3.13.x or later.

8.4 Ubuntu Linux

Ubuntu (and the company behind it, Canonical) has become one of the main forces in the Linux world with their large contribution to the development of desktop software designed for non-technical users. There are many derivatives of Ubuntu Linux, largely in the form of different user presentations.

Ubuntu offers a comprehensive distribution, suitable for a wide range of machines. It is really too big for the live USB, and requires many packages to be removed.

8.5 Linux Mint 17.x

Linux Mint is one of the most popular distributions and comes in several versions. These versions are built upon the Ubuntu Long Term Support version (14.04), which in turn are based upon Debian Linux. The main differences between Ubuntu and Mint are the user interface. Generalizing, Ubuntu uses an interface that resembles that of a cell-phone. Mint uses a more traditional layout where there is a Menu button similar to the Start button of Windows XP. The underlying software packages are almost always identical. As with Ubuntu, many packages must be removed to streamline the live USB.

8.6 Debian Linux

Debian Linux is the grandparent of Mint and parent of Ubuntu. It is relatively straightforward to install and use. However, in the last year or so there has been a significant schism in the Debian developer group, with some strong members forking the project to Devuan, which is an attempt to avoid the need for the **systemd** process manager. (Calling **systemd** a “process manager” may be an oversimplification, but I want to avoid detail here.)

The main objection I have to using a flavour of Debian Linux itself for the liveUSB is that it offers too much choice, so that I could not profit from the work of others in establishing a lot of the basic infrastructure needed.

8.7 Arch Linux

Arch Linux (<https://www.archlinux.org/>) is rather different from most of the other distributions in that it requires a fairly large amount of setup. Most users of Arch do this more or less manually, though there apparently was a script available for some time to do a generic setup.

The principle advantage of Arch Linux is that one can set up just the pieces needed. This is building up rather than removing software.

A second motivation for Arch is that it uses a very recent kernel. The ISO I used to experiment was version 4.4.5.

With Alex Pilon, I set up a virtual machine for Arch Linux, but we only got it “mostly” customized, and – more to the point – we did not have time to sort out how to merge in the boot loader. However, I believe that the general approach of Arch Linux is the right way to go – building up rather than taking away. On the other hand, it would be good to have scripts to take care of a lot of the work, as typed commands are error-prone.

Completing a DanceBox based on Arch Linux is on my “to do” list.

8.8 ArchBang Linux

ArchBang (<http://wiki.archbang.org/>) is a pre-packaged version of Arch Linux and uses the openbox window manager, so is a potentially interesting starting point for the DanceBox. It is a “rolling release” and the ISO I tested had the 4.4.1 kernel. However, the “community pages” on the Arch wiki for ArchBang were empty, though there is a forum on

<http://bbs.archbang.org/>. I found a prototype recipe for building new ISO files at <http://bbs.archbang.org/viewtopic.php?id=4569>, but this is prefaced with the warning “Please note this guide is for people who want to try out iso building, not a supported howto.”

8.9 Bodhi Linux

Bodhi Linux <http://www.bodhilinux.com/> promotes itself as “a minimalist enlightened distribution”. Its downloadable images are relatively small (about 0.5 GB). However, I’ve had some trouble booting these images in the past, but managed with VirtualBox using the file `bodhi-3.2.0-64.iso`. I had a minor issue in stopping the virtual machine, and had to force a virtual “power off”.

Bodhi uses a very different user interface called Moksha. As such I decided it would be too much work to customize. I did not explore whether there were customization tools available, though there is a three year old posting about doing so with Remastersys

(<http://yetanotheropinon.blogspot.ca/2013/03/remastering-bodhi-linux-live-cd.html>).

8.10 Antix Linux

“antiX is a fast, lightweight and easy to install linux live CD distribution based on Debian Stable for Intel-AMD x86 compatible systems.”

(<http://antix.mepis.org/>) It is being maintained (the present release is from February 2016). The file

`antiX-15.1_386-base.iso`
is just 496 MB.

I found the VirtualBox VM of antiX was indeed fast, but I was unable to match the display to my screen (the antiX window was bigger than the available screen). However, I did not install the VirtualBox Guest Additions to this distribution, and indeed did not do an install. It appears

(<http://www.linuxinsider.com/story/82166.html>)

that the MX variant of antiX has a built-in remastering tool. I will add this to my “to do” list, though the ISO is double the size of the Antix one. I noted that MX offers a non-pae version for 32 bit processors which could be of interest. The “About_antix” web page states:

The 32 bit version ships with 2 stable 3.16 Debian kernels (pae and non-pae), while the 64 bit comes with the more recent kernel 4.2 Debian backports kernel to cater for newer hardware.

Both iso files weigh in at around 1GB in size.

For 32 bit users, download MX-15.01.386.iso. It fixes a bug found that meant the non-pae kernel did not boot when used live (on cd/dvd/usb). It works fine installed.

However, when I put the suggested ISO file on a USB key and tried to boot in an old Asus EEE 701 (the original netbook computer), I got a “kernel panic” after selecting the non-pae boot option.

8.11 Tinycore Linux

Tinycore linux (<http://tinycorelinux.net/>) attempts to provide a very compact distribution. A workable starting version has an ISO file of about 106 MB (CorePlus-current.iso). The splash screen on booting this in VirtualBox offers a number of different window managers. The default FLWM worked reasonably well, but openbox presented a screen where the mouse pointer would not move to desired positions. Moreover, the pre-

sentation of many of the fonts and other objects was quite rough. However, there is a built-in and quite flexible tool (`ezremaster`) for remastering the distribution. I made no attempt to customize, but did check that an ISO file was produced. However, I then discovered TinyCore offered no tool such as `scp` to transfer this to the host machine or elsewhere, and the tools to mount the VirtualBox shared folder also appeared to be missing. On the positive side, the kernel appears to be quite recent (4.1.x).

8.12 Turnkey Linux

Turnkey Gnu/Linux (<https://www.turnkeylinux.org/>) claims to offer hundreds of pre-configured Linux appliance images. However, there was one that offered a Dokuwiki server, and that interested me for other reasons, so I downloaded the `turnkey-dokuwiki-14.1-jessie-amd64.iso`, which was 229 MB in size. Unfortunately, booting this and choosing the “live CD demo mode” version for trial purposes immediately asked for a new root password and then a Dokuwiki admin password, but would not accept reasonable test passwords, insisting on long, involved and supposedly secure ones. I found this frustrating, but not nearly as annoying as that the rather long configuration steps ended with a command line login. As the appliance is a server, I should have guessed it offered only the server end of the demonstration. Along with the limited documentation, I gave up on Turnkey, even though the concept is interesting.

8.13 PinguyOS

Documentation for this distribution includes a pointer to the Pinguy Builder script and GUI for (re-)creating Ubuntu-based

ISO files. The discussion on the page

<http://pinguyos.com/2015/09/pinguy-builder-an-app-to-backupremix-buntu/> is quite recent, and indicates ongoing development. I tried this script with a Linux Mint virtual machine and was able to get a bootable image. However, PinguyOS itself is an expanded – hence very large – distribution based on Ubuntu, and all the Ubuntu-based distributions are quite large and generally unsuited to DanceBox.

Antoni Norman (Pinguy) is the lead developer of this distribution, which aims at an audience of “ordinary users”. In some of its pages, it suggests that it is “small”, but the downloadable images for the full operating system are nearly 3 GB, and even the “mini” versions are 1.8 GB. Thus PinguyOS is not a reasonable candidate for the DanceBox.

Nevertheless, the existence of this builder tool is encouraging.

8.14 RefractaLinux

Refracta Linux (<http://www.ibiblio.org/refracta/>) is a Debian based distribution that claims “Refracta is an operating system designed for home computer users. It provides a simple and familiar layout that most users will find very comfortable.”

However, it was the note further down the introductory screen that got my attention.

“Refracta also includes special tools - refractainstaller, refractasnapshot and refracta2usb - that allow you to customize your installation and create a live-CD or live-USB of your running system. These tools will work on most Debian or Debian-based systems.”

The refracta iso `refracta8_xfce_i386_beta-20160223_0123.iso` is mid-sized (654 MB).

On booting, I got an immediate message – I believe concerning the screensaver rather than the operating system – that “This version is very old, please upgrade”. Actually the kernel is 3.16.0, whereas my main working machine’s Linux Mint is still at 3.13.0.

I have not yet had enough time to explore either this distribution or the tools.

8.15 Vector Linux Light

Vector Linux (<http://vectorlinux.com/>) aims for “speed, performance and stability”. Unfortunately, it appears that the creators intend that it be installed to a hard drive, so it is unsuitable for the present DanceBox project.

8.16 Nelum Bang

A review (<http://www.linuxinsider.com/story/83031.html>) of the Nelum family of Linux distributions by Ostro Leka caught my attention. They are intended to be straightforward and fast. While the live media booted fine, I could not find information about remastering. The file Nelum-Bang-64.iso I downloaded was 764 MB, and offered a 3.16.0 kernel. Since there are other similar distributions with more support for remastering, I will not pursue this one further.

9 Tools for remastering

(This is a *technical* section.)

As indicated, the 2012 DanceBox was built using the `Remastersys` tool. This tool worked extremely well, across several dis-

tributions, and was straightforward to use. It took the place of a difficult set of detailed manual steps that I had experience with in 2004-5 with the TellTable project (see <http://telltabels.sourceforge.net/>). The author of Remastersys, in withdrawing the software, was clearly frustrated with the many requests for adjustments and extensions. It is also likely that ongoing changes and evolution in the underlying operating system software continually rendered Remastersys out of date.

Following the withdrawal of Remastersys, there were and are still some copies of the files extant, and for a while various workers used and modified these for their own use. From services like filewatcher.com, there are a number of different remastersys files available. For the prospective user, the difficulty is in selecting an appropriate one.

Others have tried to carry forward the work of Fragedelic. There are two Respin projects, respins.org and linuxrespin.org. I found neither in a state to be used directly, though I was able to get the latter site to offer up files that did create an ISO file, though it was not bootable. I am not sure if either of these projects is active at the time of writing.

Clearly several distributions have developed or adapted scripts for building live images as mentioned above in descriptions of different distributions.

10 Version 2016B of DanceBox

This section is quite *technical*.

Given that the 2012 version of DanceBox used CrunchBang Linux, it seemed appropriate to try using its successor, BunsenLabs Hydrogen. For widest usability, the 32 bit version was

chosen first. The name uses B for BunsenLabs.

Using VirtualBox, the 32 bit install was carried out. BunsenLabs has a “welcome” script to add various applications and configurations, but this was NOT executed. The existing software was brought up to date, then various packages were removed. Unfortunately, this process, on the first attempt, resulted in an un-bootable system. This was before the crunchmaster tool was encountered.

A second attempt, using the 64 bit Bunsenlabs iso, was more successful. Here is a summary of the steps used.

```
sudo apt-get update
sudo apt-get upgrade
```

```
menu -> Preferences -> Power Management -> Display
--> Set all to NEVER (0)
```

```
sudo apt-get install dkms build-essential
sudo apt-get install linux-headers-$(uname -r) module-assistant wajig
```

```
sudo m-a prepare
```

On running vm, Devices --> Insert Guest Additions CD

```
sudo addgroup vboxsf
sudo usermod -a -G vboxsf dancing
```

```
cd /media/cdrom
sudo sh ./VBoxLinuxAdditions.run
sudo reboot
```

(screen full size, host /home/john/vmshare is /media/sf_vmshare)

Conky shows 2.86G used.

```
sudo apt-get purge libreoffice*
sudo apt-get autoremove
(down to 2.46G)
sudo apt-get purge iceweasel
```

```
sudo apt-get install alsaplayer cdparanoia lame
(2.35G)
sudo apt-get purge vlc*
sudo apt-get autoremove
(2.26G)
```

power off, boot
Seems OK.

```
menu System --> Login Settings (to edit lightdm.conf)
    remove # in front of autologin-user
    make it 'autologin-user = dancing'
    Put # in front of greeter-hide-users=true
```

```
test reboot
Still got login screen
Took spaces out 'autologin-user=dancing'
-- there were two places -- moved to second [SeatDefaults]
WORKED!
```

PowerOff and make an OVA of it.

```
sudo apt-get remove faenza-icon-theme
reboot
```

Messes up icons at top of screen on left -- but one of these is for
iceweasel and should be removed!
reinstall bunsen-(faenza-icon-theme)

```
edit /home/dancing/.config/tint2/tint2rc
comment (#) launcher-item-app for bl-www-browser.desktop
```

Decided to try

```
sudo apt-get purge faenza-icon-theme
sudo apt-get clean
sudo apt-get autoclean
```

In ~/.config/tint2/tint2rc

```
change launcher_icon_theme =
    from Faenza-Dark-Bunsen    to gnome    (note lower case)
    and restart tint2.
```

This worked. I probably could remove some other icons too.

Crunchmaster -- install crunchmaster_1.1_all.deb in guest machine
then

```
sudo apt-get install -f # to get dependencies
edit /etc/crunchmaster.conf
live user set to 'dancing'
boot method set to ISOLINUX
names of resulting iso etc.
Note the gui (crunchmaster-gui) seemed not to work, does launch
Ran 'crunchmaster dist' as root (sudo su first)
```

copied iso to host, then put on USB with unetbootin

Later, after it was noted that the volume (speaker) icon did not appear on an Acer laptop, some checks and revisions were made.

In particular, it was noted that there are ways to get the icon to appear, but then only a simple volume control was available, and only with the mouse or pointer device. The "Super+v" option which works with the existing DanceBox was not functional. Thus it was decided to keep the keyboard shortcut option of "Super+v" as this is controllable without needing to use the pointing device.

It was also observed that a search facility would be useful. While catfish is available within the BunsenLabs distro, the gnome-search-tool seems more suited to the people using the DanceBox, and it was installed. That is

```
sudo apt-get install gnome-search-tool
```

To add this to the menus, we need to edit `.config/openbox/menu.xml` to add the command, and `.config/openbox/rc.xml` to add the keyboard shortcut. The file `/.conkyrc` (that is, `/home/dancing/.conkyrc`) needs a menu display line to tell users on the main screen how to get the search tool. This line looks like

```
Super+v$alignr Search for files
```

We need to copy `.config` and `.conkyrc` to `/usr/share/bun-sen/skel/` in the (virtual) machine used to build the ISO with `crunchmaster` or these changes will not be implemented in the live-ISO and hence live-USB. The results were tested on two different USB sticks on two different laptops (the Acer and the Asus UL30A), as well as in a virtual test environment (which is, however, unable to test the keyboard shortcuts easily).

11 Going forward

Version 2016B of DanceBox is now in the hands of George Cherepon in Ogdensburg and appears to be working. Since then, I have actually installed a version of the software on a small Asus EEE 701 Surf (only 512 MB of RAM and 2 GB of SSD “disk”). The caller for whom I prepared this asked how to search for files. Generally I use the command-line (terminal) tool **find**, but that is generally quite unfriendly for most general computer users. I therefore intend to include the `gnome-search-tool` in future versions of DanceBox.

As indicated above, there are some further investigations I would like to make:

- complete the Arch Linux live USB;
- explore the Refracta tools for remastering;
- improve documentation of the **crunchmaster** remastering script.