Belenix Usage and Install Guide

Usage Notes

BeleniX boots from a CD and it is pretty much self-explanatory. Nevertheless a few notes will help:

1. When booting up it will ask for 2 bits of input: Selecting the keyboard layout and selecting whether a XWindows GUI or a command line mode are preferred.
2. After booting it is possible to switch between command-line and GUI. The command "startgui" starts the Xserver services and brings up the XFce desktop. The command "stopgui" will stop the Xserver service and fall back to command-line mode.
3. BeleniX asks for a Username/Password in command-line login. The default Username is root and default password is belenix. The GUI desktop does not yet ask for username or password.
4. While booting to GUI desktop for the first time a trace displaying "Call Stack of Bad Caller" will be dumped on the screen. This does not cause harm and is a known issue with the aperture driver using an obsolete kernel API.
5. BeleniX will automatically mount recognized hard disk partitions under /mnt. The first FAT partition will be mounted under /mnt/fat0 and so on. Similarly UFS slices will also be mounted under /mnt/solaris0..n. This is a recovery feature.
6. BeleniX will also try to use a swap slice on the hard disk if a Solaris partition already exists with swap configured.
7. BeleniX is built on top of OpenSolaris Build 20. This build has a bug that can cause a Kernel panic on non-acpi machines. To avoid this the Non-ACPI boot option should be selected in the GRUB boot screen. This bug has been fixed in later builds of OpenSolaris.
8. The zoneadm and zonecfg commands in OpenSolaris can be used to create a new Zone in BeleniX as well. A very simple supporting Perl script (/usr/bin/createzone) has been provided to partly fill in the missing functionality that zoneadm depends on. However this script is beta quality and probably has bugs. For an excellent intro to creating zones on Solaris/OpenSolaris by Dennis Clarke please visit:
    http://www.blastwave.org/docs/Solaris-10-b51/DMC-0002/dmc-0002.html

    In addition the following items apply to BeleniX:

      * Creating a zone requires at least 29MB of diskspace so it cannot be created on the minimal ramdisk or root filesystem of the LiveCD. A hard disk partition formatted with either UFS or FAT(pcfs) is required.
      * While executing "zoneadm -z <zonename> install" several error messages may be visible. These can be ignored.
9. Support for Network Profiles exists on BeleniX. To create new profiles or edit existing ones please look at the files under /etc/netprof. These files are very simple and self-explanatory. To activate a profile run /usr/bin/netprof or click on "Network Profiles" from the Panel menu.
10. A simple Service Management (SMF) GUI is provided. Just select "Services" from the pop-up menu. It lists all available services or daemons and allows to start,stop,view details of the services.
11. A command line audio/volume control tool is provided. Execute "/usr/foss/bin/audioctl" without any arguments or "man audioctl" to see the options.

Installing BeleniX to harddisk

BeleniX 0.3 onwards includes a harddisk installer that makes it easy to install the LiveCD to harddisk (A manual install used to be quite cumbersome). To start the installer just execute "hdinstaller" from a terminal window. This is an interactive Curses based utility that can also be navigated using the mouse if you are running the GUI Xfce desktop.

*** WARNING for DeveloperIQ readers. You *Must* refer to this page for install instructions ***

Hdinstaller is mostly self-explanatory however a few notes are not out of place here:

   1. OpenSolaris requires a primary partition. It cannot be installed in an extended partition. This is due to a limitation in the ata driver. This will change in the future. For now you need to have a free slot in one of the four primary partitions.
   2. If there is no Solaris2 partition already present then the installer will run the fdisk utility that will display the existing partitions and allow you to add or removed partitions. To create a partition in which BeleniX can be installed you must select the partition type to be "SOLARIS2" when fdisk displays a list in the create partition menu.
   3. OpenSolaris uses it's own subpartitions within a primary partition. These are officially called "slices". You must have a root slice or "/". In addition you can have a slice for "/usr", "/opt", swap and so on. Hdinstaller allows you to create your own slices or put everything in "/". This is different from the way Linux handles it's filesystems. Linux uses primary and extended partitions to store the various filesystems including swap. OpenSolaris uses it's own definition of slices stored in a Virtual Table of Conents (VTOC) within one primary partition. The VTOC defines all the individual OpenSolaris filesystems within the OpenSolaris partition.
   4. At present the hdinstaller will install GRUB as the default bootloader (in MBR). If you have other Windows and Linux OSes installed on the same system then you will need to edit /boot/grub/menu.lst and add entries to boot the other OSes as well.
      This will be made more flexible in 0.3.1 where option will be provided to install GRUB in either the MBR or within the Solaris2 partition. In addition we are looking at adding auto-detection to the installer so that it will be able to determine the other OSes and automatically add GRUB entries.
   5. Starting Xfce after harddisk installation: At present a GUI display manager is not yet part of the CD image, so to start Xfce you will need to login from command line and execute "startxfce". This will change in the next release.
   6. In addition the installer creates a mountpoint for "/home" in "/etc/vfstab". Even then this is not mounted during bootup because /home is actually used by the automounter to mount home directories via NFS. Please change this /home entry in /etc/vfstab to /export/home and create the /export/home directory. This will be fixed in the next release.

BootTime Reductions (Faster Boot)

The following enhancements have been added in an attempt to reduce the time required to boot from the CD:

1. Several unnecessary services have been disabled.

2. The initial Perl-Curses based keyboard and desktop selection UI has been replaced with a similar interface based on dialog (written in C) which starts much faster.

3. Use the "crle" utility to create a runtime linker cache to speed up shared library resolution by the linker.

4. Used a smaller background JPEG for the Xfce desktop.

5. Implemented transparent decompression support in the loopback file module that will decompress data on the fly. The /usr filesystem on the CDROM is now compressed using zlib level 9 compression. This high level of compression condenses more data in a smaller amount of space resulting in les seeking of the CDROM head and transferring of more data per I/O transaction. This greatly reduces boottime. /usr is not created as an ISO image which is compressed into a specially formatted file vi a command line tool. This file can be used by the modified lofi module.

6. Used the "-sort" feature of mkisofs to speed up loading of Xfce and KDE. The iosnoop.d script from DTrace Toolkit was used to trace I/O during a startup of KDE and Xfce. This gave me a list of files in the order that they were accessed. I used this list and generated a sequence of weights for /usr and the files in this specific list. This list was subsequently passed to "mkisofs -sort". This resulted in a CDROM layout where KDE file data occupy the innermost tracks followed by Xfce files and then the rest of the OS files. Data sitting in the innermost CDROM tracks is physically more condensed than data on the periphery. So head seeking on the CDROM is less. Also the file data is presented mostly in the order that they are requrested which is turn again reduces CDROM head seeking.

7. However the previous feature is not yet perfect and there is scope for more improvement in the file placement optimization.