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Please read this file before emailing us with questions.

In particular pay attention to information about accounts
and passwords as we have received many unnecessary queries
about such.  Please direct any questions to whoever directed
you to these resources or to training@linuxfoundation.org.

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0) Virtual machines contained:

The primary virtual machines here given are all 64-bit and are:

    CentOS 7
    Ubuntu LTS (16.04)
    Ubuntu LTS (14.04)
    OpenSUSE-Leap-15

We also provide 64-bit VM's for the latest releases of:

    Fedora
    GENTOO

New VM's are generally uploaded with upstream Linux kernel
release, i.e., with version 4.17, 4.18 etc.  We also
have subdirectoriesy containing VM's for a number of previous
kernel versions.

As of the time of uploading these images were fully updated
using their appropriate packaging systems (yum, zypper, dnf,
apt-get, emerge, etc.), and barring accidental omissions,
contained the required software for Linux Foundation
Courses.

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1) Extraction:

The contained virtual machine images are given in tar.xz
format
Extraction from the command line is done as in:

    tar xvf A_VIRT_MACHINE.tar.xz

If you use the embedded unzip program in Windows it may fail
as it is brain dead and uses ancient formats.  The file is
_not_ corrupted.  Use a newer archive program such as 7zip
which can be freely downloaded.

The file MD5SUMS contains checksums. You can check the
integrity of your downloaded file by doing:

md5sum A_VIRT_MACHINE.tar.xz

and comparing values.

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2) Hypervisors:

The contained virtual machine images were created using
VMWARE and have been tested with VMware Player (freely
available at vmware.com) and VMware Workstation. (For the
MacOS you have to get VMWare Fusion at low cost, there is no
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free version.)  They have also been tested on Oracle Virtual Box.

The VM's have been confirmed to work on Linux, Windows and
MacOS host machines.

You can also use on other hypervisors which may prefer or require
other image formats.  For example, they can be converted to
.vdi format for Oracle Virtual Box although .vmdk works fine.

For Microsoft Hyper-V you will have to convert to .vhd format.
An example of how to do this can be found at
http://www.askme4tech.com/how-convert-vmware-virtual-machine-hyper-v

They can also be converted to be used on KVM, the native
Linux hypervisor, with conversion to qcow2 format such as
in:

qemu-img convert A_VIRT_MACHINE.vmdk -O qcow2 A_VIRT_MACHINE.qemu

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3) Importing the images to the hypervisor

The tar balls include large vmdk format files which are a
virtual machine disk image.

On VMWARE import the appliance with the supplied vmx file.
(You can import by selecting selecting "Open a Virtual
Machine" and then navigating to the directory where you
untarred the virtual machine and selecting the .vmx file.)
Select "was copied" when prompted when first opening.

On VirtualBox create a new appliance and select the vmdk
file as a pre-existing disk.

For KVM follow the conversion procedure described above.

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4) Accounts:

The virtual machines have two pre-created accounts:

student (passwd=student)
root (passwd=LFtrain)

Note: Ubuntu machines do not have a real root account and
only use sudo to elevate privilege.  Other distributors,
such as Mint, may do the same.

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5) sudo

sudo is enabled without password required.  This is rotten
for security purposes but convenient for classes with
disposable machines. Note you can keep a root shell alive
indefinitely with "sudo su".

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6) /home/student/LFT directory

Each virtual machine contains a /home/student/LFT directory
with SOLUTION files, kernel configuration files, and some
other useful things.  These are packaged in at time of VM
creation and sometimes updated Solutions can be found on our
website.

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    7) Linux Kernel Git Repository

    These virtual machines may contain under /usr/src/linux-stable, a
    "shallow clone" of the Linux kernel source repository, and
    it should have checked out the current version at time of
    preparation.

    However, note a shallow clone has its limitations.  It can
    not be used to "push" changes upstream, and it will fail
    when trying to do a "bisection" as it does not contain the
    complete history.  The reason a shallow clone was used was
    to save space -- about 1 GB compressed -- and works well in
    class where we do not do these operations.  Beware that if
    you update these repos with "git pull" they will get much
    larger in size and still not be complete, so we do not
    recommend that in class.

    NOTE: instead of having a git clone, you may just have a
    directory, such as /usr/src/linux-4.1, containing the kernel
    source, depending on details of when the virtual machine was
    created.

    Most classes (particularly Enterprise LFS classes) do not
    need the kernel source repository, but we prefer to use only
    one image for all classes.  It does no harm to have it,
    except wasting space.

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    8) Kernel Versions

    Each machine contains at least two kernels that can be booted from:

    1) the latest stock kernel for the distributor.
    2) the latest upstream version from kernel.org -- 3.17.0 for example

    All machines have been set up to boot from the stock kernel
    by default.  Except for the CentOS6 machine, they have been
    configured so that IF YOU SELECT A KERNEL a boot through the
    grub menu, THAT CHOICE WILL PERSIST FOR THE NEXT BOOT.

    Enterprise course students (LFS classes) will likely want to choose
    the stock version at boot.

    Developer course students (LFD) class will likely opt for the
    kernel.org choice at boot.

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