XenServer and GNOME on USB Disk

HowTo

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General Points

This tutorial is aimed at all Citrix administrators or those who want to become one. Basic experience with Linux is advantageous but not a requirement. To accomplish all tasks in this tutorial, the user requires a high speed internet access.

I used an IBM ThinkPad T60 for this tutorial, but any 64bit capable notebook with a processor that allows the activation of Intel VT, or AMD-V should be sufficient.

This tutorial is based on XenServer 5.5.0-15119p, but I hope it will work with newer versions too.

This document was written and reviewed with great care. Anyway it is not possible to guarantee for 100% accuracy and absence of errors. I therefore disclaim liability for any damage that could arise by following the steps outlined in this tutorial.

Thanks to:

http://ctxblog.gutzeit.ch

The Problem

To install XenServer on a notebook isn't very difficult, but the notebook can't be used for other things then.

The installation onto a USB hard disk is a step in the right direction but is not enough to become completely happy.

The XenCenter console needed to manage the virtual machines running on XenServer is still not available with this setup. You therefore need a second machine to run this tool.

The Solution

It is possible to install X server and GNOME on a XenServer USB disk, which in fact allows us to fire up an RDP client to connect to a virtual machine with XenCenter installed, that is running on the same XenServer.

This way, we can run a complete test environment, including all management tools, on a single notebook.

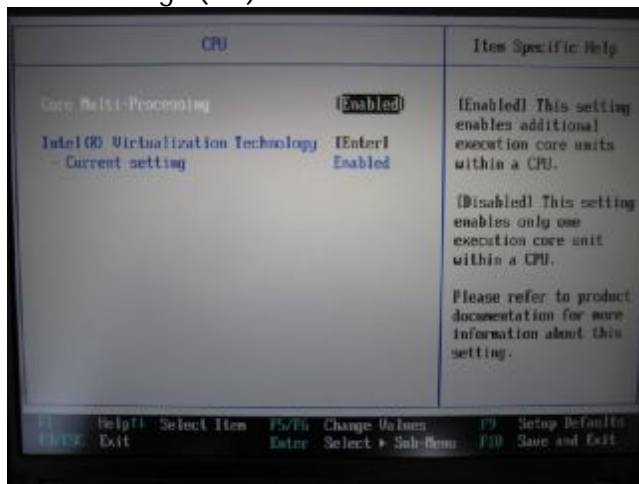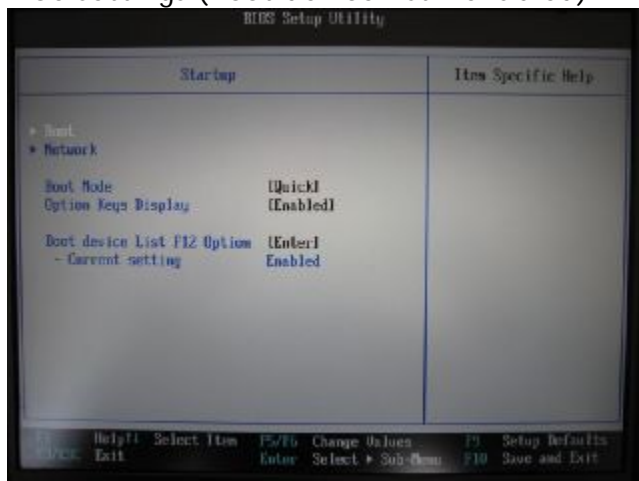This tutorial will show you, how to do that **J**

Instructions

Preparation of the notebook

The notebook used must be capable to run 64bit code and the processor and the
BIOS must be able to allow the use of virtualization technologies from Intel (VT), or
AMD (AMD-V). I used an IBM/Lenovo ThinkPad T60 for this setup.

BIOS settings (VT)

BIOS settings (Boot device list - enabled)

Before you start installing XenServer onto the USB disk, it is highly recommended to
remove your built in hard disk. Missing that step could destroy your Windows
installation and all data on your internal disk.

After inserting the XenServer installation CD you can start up your notebook. You
should then hit F12 (with IBM/Lenovo) to get to the boot device list. You should
choose your CD drive there. Other vendors might use other keys to get to the boot
device list but you should be able to find that information in their documentation.

Installation of XenServer onto a USB disk

First of all we run a standard setup of XenServer. Once again, make sure you use the right disk. I recommend for the last time, to remove your internal disk before proceeding. Failing to do so can lead to data loss.

You can simply hit „Enter" at the XenServer setup boot prompt. I will not go through the whole setup of XenServer here, because it is already well documented.

The fun begins after the first reboot, following the installation of XenServer. To boot up successfully XenServer is missing some USB support and ends up in an endless kernel panic-reboot-loop. USB support is not preloaded by the mkinitrd image, so we have to fix that.

To get USB support into initrd we have to start once again from the CD drive, but now we have to hit F2 at the boot prompt to boot into advanced mode.

Here are a few hints for Linux newbies at the beginning:

The shell by default utilizes the en-us key layout. If you use another keyboard layout you have to find out the location of several special characters first. Here are some hints for users with a swiss german keyboard: / = -, z =y, -='

Most of the time you don't have to type all commands completely because the Linux shell has an auto completion mechanism built in. As soon as you have typed in the first two or three characters of a command you can hit the "Tab" key to complete the command.

Instead of typing „initrd-2.6.18-53.1.13.el5.xs4.1.0.254.273xen.img" completely, which would be very error-prone, it is sufficient to type in the following keys:

in + Tab + . + Tab + x + Tab

Other than Windows, Linux does cares about UPPER and lower case, so take care of what you type.

So let's start now…

1. At the boot prompt hit F2 to boot into advanced mode

2. Now enter „shell" at the boot prompt followed by the „Enter" key

3. After the boot process is done you have to enter the following command to create a folder where you can mount the USB hard disk temporarily:

   ```
   mkdir /tmp/sda
   ```

4. Now you can mount the USB disk into the directory you just created. I assume that you heard my plea so that the USB disk is the only disk in the system and can be addressed as /dev/sda.

```
mount -t ext3 /dev/sda1 /tmp/sda/
```

5. After that, the drivers located below /sys/block/ have to be copied from the CD to the USB disk. First of all you have to change the driver file permissions:

```
chmod -R 664 /sys/block
```

6. You are now able to copy the files with the following command:

```
cp -R /sys/block/ /tmp/sda/sys/block/
```

Note: You can safely ignore the „Input/output error" messages!

7. No we change the root location to the USB disk:

```
chroot /tmp/sda
```

8. Next step is a dirctory change to the directory /boot:

```
cd /boot
```

9. We have to rename the original initrd image first, since the modified version has to be named exactly the same. We achieve this with the following command (remember the "Tab" key):

```
mv initrd-2.6.18-128.1.6.el5.xs5.5.0.496.1012xen.img initrd-2.6.18-
128.1.6.el5.xs5.5.0.496.1012xen.img.ori
```

10. Now we can create a new initrd image with USB support. To get this done, you have to type the following command:

```
mkinitrd --with-usb initrd-2.6.18-128.1.6.el5.xs5.5.0.496.1012xen.img
2.6.18-128.1.6.el5.xs5.5.0.496.1012xen
```

11. You can check the result with the „ls" command. Somewhere in the listing you should be able to locate the following files:

```
…
initrd-2.6-xen.img
initrd-2.6.18-128.1.6.el5.xs5.5.0.496.1012kdump.img
initrd-2.6.18-128.1.6.el5.xs5.5.0.496.1012xen.img
initrd-2.6.18-128.1.6.el5.xs5.5.0.496.1012xen.img.ori
…
```

12. You are now able to successfully boot from your USB disk. Leave the CHROOT environment by typing „exit"+ "Enter" and reboot the notebook by typing „reboot" + "Enter".

13. Don't forget to go to the boot device list (F12 with IBM/Lenovo), to boot up from the USB hard drive.

Here we go, XenServer is now booting from our USB hard disk **J**

Starting from now, it is safe to put back in your internal hard drive, but don't forget to power your notebook down first ;-) The start of XenServer is now controlled through the boot device list (F12) and XenServer will not touch, or modify your Windows partitions, as long as you don't want it to do so.

This is great so far, but there is still X Window and a window manager like GNOME missing. So read on…

Installation of X Window and GNOME onto the USB disk

To be able to install X Window and GNOME onto your USB hard disk, we have to unlock the CentOS repositories in your XenServer system first. The easiest way to accomplish this is to use WinSCP, a freeware tool that is even available as a portable application that runs without installation.

Get it from here:
http://portableapps.com/apps/internet/winscp_portable

In the right window of WinSCP go to the folder /etc/yum.repos.d/ and edit the file CentOS-Base.repo:
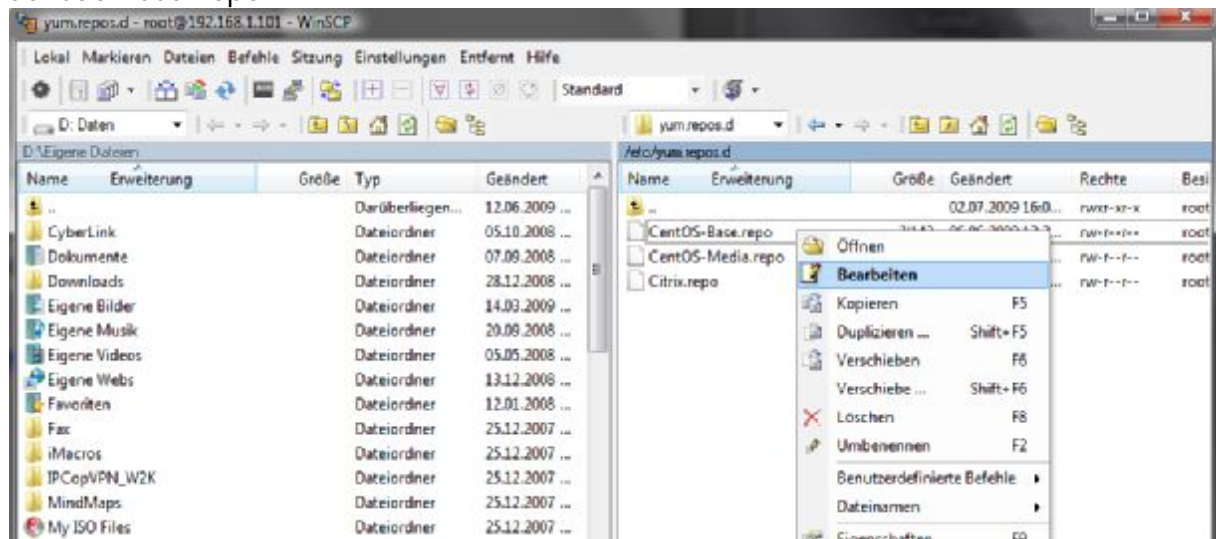
You have to enable at least the following repositories:

[base] and [updates]

Please change the entry per repository from enabled=0 to enabled=1.

```
[base]
name=CentOS-$releasever - Base
mirrorlist=http://mirrorlist.centos.org/?release=$releasever&arch=$basearch&repo=os
#baseurl=http://mirror.centos.org/centos/$releasever/os/$basearch/
gpgcheck=1
gpgkey=http://mirror.centos.org/centos/RPM-GPG-KEY-CentOS-5
exclude=kernel-xen*, *xen*
enabled=1

#released updates
[updates]
name=CentOS-$releasever - Updates
mirrorlist=http://mirrorlist.centos.org/?release=$releasever&arch=$basearch&repo=updates
#baseurl=http://mirror.centos.org/centos/$releasever/updates/$basearch/
gpgcheck=1
gpgkey=http://mirror.centos.org/centos/RPM-GPG-KEY-CentOS-5
exclude=kernel-xen*, *xen*
enabled=1
```

Don't forget to save your changes ;-)

With the key combination Alt+F3 you can now switch from the semi graphical XenServer console to an additional console with a standard Linux shell.

After the login as user "root" (Tip: while typing the password you will not see any stars, don't let this confuse you, this is OK…) you are now able to install additional packets trough the packet manager YUM, provided, the XenServer is able to connect to the internet.

1. First we will install the X Window system. All you need is the following command:

   ```
   yum groupinstall "X Window System"
   ```

   If internet access is available, you will see some hundred lines scroll by. Finally you will see a summary of the packages that need to be installed and YUM asks you to confirm the next step.

   ```
   Transaction Summary
   =================================================================
   Install    243   Package(s)
   Update       9   Package(s)
   Remove       0   Package(s)

   Total download size: 116 M
   Is this ok [y/N]:
   ```

   With y + „Enter" you can start the download and the installation.

   Some error messages are perfectly possible while downloading the needed packages. YUM will automatically choose an alternative download site if a package can't be downloaded from the first site. So don't worry.

   When you see a warning message that a signing key is missing, you can pass this message by typing y + „Enter".

   Finally you should see a „Complete!" message at the bottom of your screen. You have now successfully installed X Windows.

2. Now we can proceed to the installation of GNOME. All you need is the following command:

    ```
    yum groupinstall "GNOME Desktop Environment"
    ```

    If internet access is available, you will see some hundred lines scroll by. Finally you will see a summary of the packages that need to be installed and YUM asks you to confirm the next step.

    ```
    Transaction Summary
    ================================================================
    Install     122   Package(s)
    Update        2   Package(s)
    Remove        0   Package(s)

    Total download size: 148 M
    Is this ok [y/N]:
    ```

    With y + „Enter" you can start the download and the installation.

    Some error messages are perfectly possible while downloading the needed packages. YUM will automatically choose an alternative download site if a package can't be downloaded from the first site.

    When you see a warning message that a signing key is missing, you can pass this message by typing y + „Enter".

    Finally you should see a „Complete!" message at the bottom of your screen. You have now successfully installed GNOME.
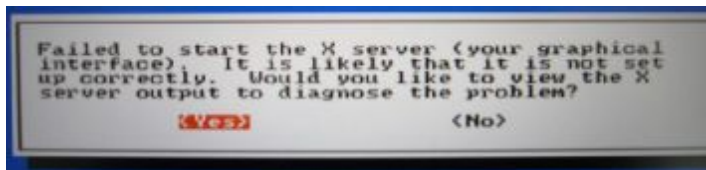
    We are almost done **J**

Finalizing the setup

X Window and GNOME are now installed and can be started for the first time.

All you need is to type „gdm" at the prompt and hit „Enter". Depending on the video hardware used by your notebook you might see the following error message:

Hit „Enter" and confirm the next message with „OK".

The next error message asks for „Enter" again and the following message needs another „OK".

Now we are finally able to configure the X server according to our needs. After entering the "root" password, the X server should finally start and present us a dialog for the display configuration. The safest way is to accept the defaults and to close the dialog hitting "Apply" twice. After the restart of the X server you will probably see two error messages first which have to be acknowledged:
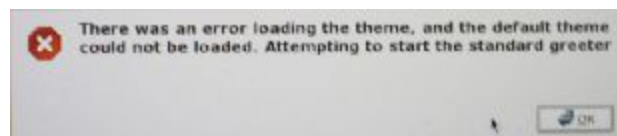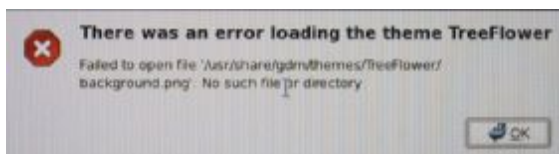
To get rid of these messages you can connect again with WinSCP to the XenServer and copy the file „background.png" from the directory /usr/share/gdm/themes/CentOSCubes into the directory /usr/share/gdm/themes/TreeFlower (copy it to you local client first, then move it to the TreeFlower directory). Now the error messages should be gone and you will see a standard CentOS logon screen.

To be able to start an RDP session from your GNOME desktop, you need to install the „tsclient" package from the GUI. After the login as user "root" you can accomplish that by going to „Add/Remove Software" in the start menu. A search for "tsclient" will offer you the needed package which can be installed simply by selecting the package and hitting "Apply". Now you can find the RDP client in the start menu below„Applications / Internet / Terminal Server Client". Please don't forget to change the protocol to "RDPv5". Else your connection attempts to a Windows XP / Vista will fail.

The last thing you need is a Windows VM with XenCenter installed. This machine should be configured for auto start in the XenCenter in order to be available immediately after the XenServer starts. As soon as this machine has booted, you are able to start the Terminal Server Client and use RDP to go to their desktop and fire up XenCenter.

Voilà, here is your demo in a box **J**

Handling

Some hints how to handle the X server:

Start GNOME: /usr/sbin/gdm

Stop GNOME: /usr/sbin/gdm-stop

Restart GNOME: /usr/sbin/gdm-restart

End GNOME, go back to XenServer console: Logoff from GNOME desktop, then hit
                                            Ctrl+Alt+F1

„Happy Testing"

Regards
Ecki