Citrix XenServer Recovery Guide

Version 8.2

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The purpose of this document is to provide the steps necessary to perform system recovery when using **Citrix XenServer** and to define the aspects of system recovery that are and are not supported. This guide does not include all the features and options available with SBAdmin, but is intended to be used as an addendum to the *SBAdmin User Guide* and the *SBAdmin Linux System Recovery Guide*.

SBAdmin provides support for **Citrix XenServer** versions 5.6 and 6.0.

System Backup and Restore of Citrix XenServer (dom0)

Citrix XenServer is based on Xen virtualization technology. Therefore, you will see the server referred to as *dom0* in this and other documents. The virtualized guest machines that run on the server are referred to as *domU* systems.

Performing a system backup of the Citrix XenServer(dom0) is done much in the same manner as any other Linux system. Refer to the *SBAdmin User Guide* for additional details. However, the following considerations deserve mention because they are specific to Citrix XenServer dom0 systems:

Including domU Systems in dom0 Full System Backup

You may perform a full system backup of the Citrix XenServer (dom0) that will include all virtualized (domU) systems. However, it is good practice to either shutdown the domU systems or use the SBAdmin *snapshot backup feature* on the logical volumes that store the domU images. This will ensure the domU systems are in a stable state at the time of the backup.

To include the domU systems in a system backup, it is necessary to understand how the domU systems are stored on dom0. When the domU is created, a logical volume will be created on the dom0. While the domU is running this logical volume will be available to the dom0. However, the dom0 never mounts any file systems for the domU. To include the data for the domU it is necessary to ensure that raw logical volumes are included in the backup. This option is configured in the profile, note the option to include raw logical volumes is NOT configured by default.

To include domU systems that are not running at the time of the backup, it may be necessary to activate the logical volumes that contain domU data. To determine the logical volume on the dom0 associated with the data for the domU. Use the "xe vm-disk-list" command. The output will be similar to the following.

```
# xe vm-disk-list
Disk 0 VDI:

uuid ( RO)              : 477479e2-e5b5-4e3e-bf99-ad82e5263c67

name-label ( RW): Red Hat Enterprise Linux 6 (64-bit) (experimental) (1) 0

sr-name-label ( RO): Local storage

virtual-size ( RO): 8589934592
```

Here we can see the uuid used to identify the disk. Using the "lvdisplay" command we can see all logical volumes on the dom0 system.

```
   # lvdisplay

 --- Logical volume ---

 LV Name                /dev/VG_XenStorage-f8d9b6cb-6a94-5340-0cc9-5182785b1391/VHD-
477479e2-e5b5-4e3e-bf99-ad82e5263c67

 VG Name                VG_XenStorage-f8d9b6cb-6a94-5340-0cc9-5182785b1391

 LV UUID                lTJBQp-7qML-SY3T-Oz8j-b6nk-O5DE-y3wgOR

 LV Write Access        read/write

 LV Status              NOT available
```

Activate the volume with the following command.

```
   # lvchange -ay /dev/VG_XenStorage-f8d9b6cb-6a94-5340-0cc9-5182785b1391/VHD-477479e2-
e5b5-4e3e-bf99-ad82e5263c67
```

After the backup completes, the logical volume can be restored to its original state as follows.

```
   # lvchange -an /dev/VG_XenStorage-f8d9b6cb-6a94-5340-0cc9-5182785b1391/VHD-477479e2-e5b5-
4e3e-bf99-ad82e5263c67
```

Further information about backup profiles and snapshot backups can be found in the *SBAdmin User Guide*

Making CDROM type bootmedia on dom0

When creating **CDROM** type boot media it is necessary to have either the **mkisofs** or **genisoimage** command available on the system creating the boot media. By default Citrix XenServer (dom0) does not ship with this installed. It is possible to get the command by enabling the Centos base repositories and using yum to install the command.

To enable the repository edit the file **/etc/yum.repos.d/CentOS-Base.repo** change the option from **enabled=0** to **enabled=1**. Then use the following command to install **mkisofs**.

```
   # yum install mkisofs
```

For further information about creating boot media please refer to the *SBAdmin User Guide*.

Determining Hypervisor File Used by dom0 (multiboot file)

The SBAdmin process to create a system backup of dom0 requires knowing the *Xen hypervisor file* dom0 is running under. You may also see the Xen hypervisor file referred to as the *multiboot file*. It will be required that the user manually specify the file. Note that this file must also be updated if the hypervisor is changed with system updates.

To manually determine the hypervisor that was used to boot dom0, it will be necessary to know which EXTLINUX entry was chosen at boot time. You will need to determine the stanza found in the file **/boot/extlinux.conf** that was used to boot the system. Within the stanza there will be a line similar to the following which identifies the Xen hypervisor file:

```
append /boot/xen-3.4.2.gz  dom0_mem=752M lowmem_emergency_pool=1M crashkernel=64M@32M
console= vga=mode-0x0311  --- /boot/vmlinuz-2.6.32.12-0.7.1.xs5.6.100.307.170586xen
root=/dev/sda1 xencons=hvc quiet vga=785 splash --- /boot/initrd-storix-sda1.img
```

To specify the hypervisor to SBAdmin, create the file ***/storix/config/multibootfile*** (assuming /storix is your Storix data directory). Within this file, specify the path to the Xen hypervisor. In this case it would be as follows.

```
/boot/xen-3.4.2.gz
```

You may now create a system backup.

System Backup of Citrix XenServer virtualized guests(domU)

Performing a system backup of a Citrix XenServer virtual machine (domU) is done much in the same manner as any other Linux system. Refer to the ***SBAdmin User Guide*** for additional details.

Creating Boot Media

In order to perform system recovery of a Citrix XenServer virtual machine (domU), you will need a SBAdmin system backup and SBAdmin boot media. The boot media is used to provide the system you wish to recover with an environment and interface to perform the recovery. Boot media type supported for performing recovery of domU is **CDROM.** Performing hard disk or network boot (PXE) of a domU is not supported.

When creating CDROM boot media on an exiting domU it will be necessary to edit the following configuration files so that the boot media will recognize the cdrom device.

The first step is to make a copy of device_info into the SBAdmin install directory, this will make changes persist through software updates.

```
# cp /opt/storix/config/device_info /storix/config/device_info
```

(Note, the destination will be the SBAdmin data directory, change /storix/ in the destination accordingly)

The next step is to edit the /storix/config/device_info file changing the following line.

```
#cdrom:xvd:a-h:Xen Virtual Block Device CDROM
```

to

```
cdrom:xvd:a-h:Xen Virtual Block Device CDROM
```

Finally, for paravirtualized guests, boot media must be created using the **ISOLINUX** boot loader. The following command will create **CDROM** boot media named guest.iso in the /tmp directory. Note, boot media may only be made from the command line. It is not possible to do this from the Web or GUI interfaces.

```
# stmakeboot -t cdrom -S -b ISOLINUX -o /tmp/guest.iso
```

For more information on creating SBAdmin boot media please refer to the ***SBAdmin User Guide***

System Recovery of Citrix XenServer virtualized guests(domU)

The steps to perform system recovery of a Citrix XenServer virtual machine (domU) using SBAdmin are very similar to the steps for any other Linux system. Refer to the *SBAdmin Linux System Recovery Guide* for additional details. However, the following considerations deserve mention because they are specific to Citrix XenServer:

Determining virtualization type

Citrix XenServer is capable of doing both HVM and PV virtualization. HVM (hardware virtual machine) technology is similar to a system running on real hardware. PV (paravirtualization) technology is a type of virtualization specific to Xen. This type of virtualization requires the guest kernel to be modified to run in the virtual machine.

The type of virtualization used is set at the time the virtual machine is created (please refer to Citrix documentation for further information on creating new virtual machines). The profile used to create the virtual machine will determine which type of virtualization is used. This is not immediately clear when using the XenServer graphical interface.

The type of virtualization technolgy used by the domU, can be determined by logging into the XenServer and running the following command.

```
#xe vm-list params=HVM-boot-policy,uuid,name-label
```

You will see output similar to the following:
```
uuid ( RO)                 : 8f7f2b5c-57d1-ff53-c4b5-d9b0a716cdd4

name-label ( RW)          : Red Hat Enterprise Linux 5

HVM-boot-policy ( RW):


uuid ( RO)                 : 732588a6-f7e7-11f0-484a-d7c4100b19da

name-label ( RW)           : Custom Linux

HVM-boot-policy ( RW)     : BIOS order
```

The output indicates that the virtual machine named "Custom Linux" is using HVM because the HVM-boot-policy is set to "BIOS order". The machine named "Red hat Enterprise Linux 5" is using PV.

When restoring a backup to a new virtual machine (domU), the newly created virtual machine must use the same type of virtualization as the system that was backed up.

Booting a paravirtualized domU

When booting a paravirtualized domU there are two boot loader options *pygrub* and *eliloader*. Pygrub is used to boot from a harddisk device and eliloader is used to boot from a cdrom. When recovering a domU that had been previously installed it may be necessary to change this option before booting the SBAdmin boot media.

To determine which boot loader is in use, the following command may be run on the XenServer. Replacing the uuid for the domU to be booted.

```
#xe vm-list params=PV-bootloader uuid=94012487-6bfa-306d-6e92387682eb9b0f
```

You will see output similar to the following.

PV-bootloader (RW) : pygrub

You can change the boot loader with the following command. Replacing the uuid for the domU.

#xe vm-list param-set uuid=94012487-6bfa-306d-6e92387682eb9b0f PV-bootloader=eliloader

Once the bootloader has been set, the domU can be booted to the SBAdmin boot media and recovery can take place. Further information about system recovery can be found in the *SBAdmin Linux System Recovery Guide.*