Xen Recovery Guide

Version 8.2

SBAdmin and Xen Recovery Guide

The purpose of this guide is to provide the steps necessary to use SBAdmin in a Xen environment and to define what aspects of system recovery are and are not supported when using SBAdmin in a Xen environment. 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*.

Full System Backup and System Recovery of dom0

You may perform a full system backup of dom0 that will include all domU systems. However, it is good practice to either shutdown the domU systems or use the SBAdmin snapshot backup feature to ensure the domU systems are in a stable state.

Performing a system backup and recovery of dom0 is done much in the same manner as 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 dom0 systems:

Including domU Systems in dom0 Full System Backup

To include domU systems a system backup you must understand how the systems are configured and stored on dom0. If the domU is stored within a file on dom0 then you must only assure that the filesystem and file are not excluded from the backup. If the domU is stored in a raw partition or raw logical volume on dom0, then you must ensure that the appropriate raw device type is included in the backup. The option to include raw partitions and/or logical volumes is found in the backup profile. Note that the default is NOT to include raw data in a full system backup. For more information about backup profiles refer to the SBAdmin User Guide.

Creating Boot Media

In order to perform system recovery you will need SBAdmin boot media. Boot media types supported for performing recovery of dom0 are CDROM and hard disk. Performing a network boot (PXE) of a dom0 is not supported. For more information on creating SBAdmin boot media please refer to the *SBAdmin Linux System Recovery Guide*.

Manually Determining Hypervisor

The SBAdmin process to create a full system backup and boot media of dom0 requires knowing the running Xen hypervisor. Under most circumstances SBAdmin will be able to determine the booted hypervisor file. In the case that SBAdmin is unable to determine which hypervisor was used at boot time, it will be required that the user manually specify the file. Note that this file must also be updated if the hypervisor changes.

To manually determine the hypervisor that was used to boot dom0, it will be necessary to know which GRUB entry was chosen at boot time. You will need to determine the stanza found in the file */boot/grub/menu.lst* 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:

```
kernel      /boot/xen-3.0-i386.gz
```

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-3.0-i386.gz
```

You may now create a system backup and boot media.

Full System Backup and Recovery of a Paravirtualized domU

In a paravirtualized Xen environment, the Xen hypervisor is responsible for loading a modified kernel. For SBAdmin to properly create a full system backup and perform recovery of this type of environment the following requirements must be met.

1. There is a copy of the kernel used by domU in the */boot* directory of domU. This may need to be copied over from dom0.

2. There are kernel modules for the domU kernel in */lib/modules/$(uname -r)* on domU. This may need to be copied over from dom0 if the domU does not boot using the pygrub or pvgrub boot loaders.

3. If the domU does not contain a bootloader it will be necessary to specify "LILO" in the /.stdefaults file.
   ```
   BOOTLOADER=LILO
   ```

4. If the dom0 system is not using pygrub or pvgrub there must be a copy of the domU kernel on dom0. Check for the presence of the pygrub or pvgrub command on your dom0 system, or consult your Xen documentation.

Typically, SBAdmin provides support for migrating virtual systems to physical systems and vice versa. However, because of the limitations of a paravirtualized domU kernel, this may or may not be possible. In order to migrate a paravirtualized system, the domU kernel must support PVOPS. Most Linux distributions running a kernel newer than 2.6.37 support this option. Most Linux distributions will include a kernel configuration file in the /boot directory. The following command illustrates a supported kernel.

```
grep PARAVIRT /boot/config-$(uname -r)
CONFIG_PARAVIRT_GUEST=y
```

For further detail please consult your distribution documentation.

Performing a system backup of domU is done much in the same manner as any other Linux system. However, steps specific to paravirtualized domU systems during system recovery are detailed here:

Creating Boot Media for Paravirtualized domU

Depending on your dom0 platform you may or may not be able to present ISO images to boot a domU. For further information about your dom0 options please consult your vendor documentation.

Initrd Boot Media

If your Xen environment does not support attaching an ISO image or using a network boot path with paravirtualization. You will need to create an initrd image to be presented to the domU for system recovery.

To create a SBAdmin install initrd image, run the following command on a configured domU client:

```
stmakeboot -t initrd-install -o /storix/temp/initrd-domUinstall.img
```

After the image has been created on the domU, you will copy it to the domU's boot directory, as defined by the configuration file on dom0. You may also need to copy the running domU kernel to dom0 as well.

CDROM Boot Media

If your Xen environment allows you to boot from an ISO image, or using a network path. You may create a CDROM ISO image for system recovery. Please refer to the *SBAdmin User Guide* for additional information about CDROM ISO images.

Paravirutalization requires that the ISOLINUX bootloader is used when booting from an ISO image. The following command will create a bootable CDROM ISO image using the ISOLINUX boot loader.

```
stmakeboot -t cdrom -b ISOLINUX -o /tmp/domU.iso
```

Please note that SBAdmin does not privide the ISOLINUX package and it may be necessary to install via your distribution.

Performing System Recovery of Paravirtualized domU

CDROM Boot Media

If your Xen environment allows attaching a CDROM ISO image or booting from a network path. You should consult your documentation for presenting the ISO image.

If you are using Citrix XenServer 6 the procedure may be done from the GUI or command line interface. Below are the steps to attach the ISO image via the command line. Make sure to change the <SYSTEM-UUID> and <CDROM-UUID> fields to the actual uuid's for your domU.

First attach the ISO image to the virtual machine.

```
xe vm-cd-add vm-uuid=<SYSTEM-UUID> cd-name="domU.iso" device=3
```

Next, get the uuid for the cdrom device that was just added.

```
xe vbd-list vm-uuid=<SYSTEM-UUID> type=CD params=uuid –minimal
```

Finally, make the cdrom device bootable and set the installation repository type.

```
xe vbd-param-set uuid=<CDROM-UUID> bootable=true
```

```
xe vm-param-set uuid=<SYSTEM-UUID> other-config:install-repository=cdrom
```

At this point the system can be booted and recovery can be performed. Refer to the *SBAdmin Linux System Recovery Guide* for additional details.

Initrd Boot Media

If you are not able to present an .iso image to your domU. In order to perform system recovery of a paravirtualized domU, it must boot using a SBAdmin initrd-install image from the same or similar domU. Below is a sample configuration file that can be used to start a domU into the SBAdmin recovery screens (SuSE systems typically keep the configurations in */etc/xen/vm).*

```
# /etc/xen/sample
# Sample Xen configuration file for SBAdmin boot media
name = "storix"                             # Xen name
kernel = "/boot/vmlinuz-2.6.19-4-generic"        # domU kernel
ramdisk = "/boot/initrd-domUinstall.img"      # SBAdmin initrd image
memory = 128                              # Memory to be used
vif = ['mac=aa:00:00:00:00:11','bridge=xenbr0']      # DomU interface
disk = ['phy:/dev/sdb5,hda,w']                 # Disk resource
```

Boot the domU and attach a console with the following command:

```
xm create -c /etc/xen/sample
```

When booting this domU the normal SBAdmin recovery screens will appear, and the system will have disk and network resources as specified in the configuration file. After the recovery completes, the domU must be shut down and the configuration file changed to use the standard initrd for the corresponding kernel.

Booting the recovered system:

For systems **without the pygrub boot loader**, a configuration similar to the following will allow you to specify the kernel and initrd to be used to boot. This kernel and initrd must be present in the **/boot** directory of dom0.

```
# /etc/xen/sample
# Sample Xen configuration file for a restored system
name = "storix"                             # Xen name
kernel = "/boot/vmlinuz-2.6.19-4-generic"      # domU kernel
ramdisk = "/boot/initrd-2.6.19-4-generic"      # Original initrd
memory = 128                              # Memory used
vif = ['mac=aa:00:00:00:00:11','bridge=xenbr0'] # domU interface
disk = ['phy:/dev/sdb5,hda,w']                 # Disk resource
```

IMPORTANT: The above instructions utilize the original initrd which assumes no changes were made to the storage configuration during the recovery. If changes were made to the storage configuration during the recovery, then you will need to copy the SBAdmin generated initrd from the domU to dom0.

For systems that **with the pygrub boot loader**, the following configuration is appropriate. **pygrub** will allow the domU to have a GRUB-like menu system upon reboot. All kernels and initrd's contained on the domU will be presented as boot options.

```
# /etc/xen/sample
# Sample xen configuration file for a restored system
name = "storix"                             # Xen name
bootloader="/usr/bin/pygrub"                   # Bootloader
memory = 128                              # Memory used
vif = ['mac=aa:00:00:00:00:11','bridge=xenbr0'] # domU interface
disk = ['phy:/dev/sdb5,hda,w']                 # Disk resource
```

Full System Backup and Recovery of a Full-virtualized domU

In a fully virtualized environment the guest operating system is running its own un-modified kernel. Therefore, there are no special considerations and should be treated just as any other Linux system. You should refer to the *SBAdmin User Guide* and *SBAdmin Linux System Installation Guide* for further details.