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Protecting Linux Systems from the Zombie Apocalypse

When severe weather, a natural disaster, or any other catastrophe occurs, your first thoughts will not be about recovering and restoring your company's critical data, which is why you want to be prepared for the unexpected. "If you are generally well equipped to deal with a zombie apocalypse you will be prepared for a hurricane, pandemic, earthquake, or terrorist attack," says Dr. Ali Khan, director of the Centers for Disease Control and Prevention. You probably are not worried about a zombie apocalypse, but if you are, the CDC offers suggestions for which items to include in your personal emergency kit. When it comes to preparing your business for catastrophe, your professional emergency kit should include a solid bare-metal restore and disaster recovery (DR) plan.

DOES YOUR BUSINESS HAVE A PLAN?

What will downtime cost your company? To calculate how much your business loses when your systems go down, you will need to factor in employee salaries and benefits, lost revenue, and how much it costs to restore your systems.

According to the Symantec 2011 SMB Disaster Preparedness Survey, disasters can have a significant financial impact on SMBs, costing an average of \$3,000 for small businesses per day and \$23,000 for medium-sized organizations per day.

Perhaps the downtime will have a ripple effect and hurt your company's image and reputation, which is even harder to calculate in terms of cost. Symantec's report says that 29% of SMB customers lost data as a result of disasters impacting their vendors. In fact, 54% of the SMB customers have switched vendors as a result of downtime, a 12% increase over the previous year. Clearly, you want downtime to be minimal, if your systems go down at all. Not only is downtime costly from a financial perspective, but it could mean the complete demise of the business, Symantec reports.

Assume your company will need to recover from a total system failure with loss of all data and the entire operating system, applications, settings, and patches back from bare-metal.

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Recovering from a bare-metal disaster could be a complex operation that takes anywhere from hours to weeks. Does your company know:

- » All user accounts and passwords?
- » The names, types, and attributes of all filesystems?
- » All network settings?
- » How the firewall settings were configured?
- » Which third-party applications need to be re-installed?

Even the most experienced, competent admin would need to complete an arduous, step-by-step process to prepare the system before the actual application data can be restored.

STEPS COULD INCLUDE:

- » Reinstall the Linux operating system
- » Recreate users and groups
- » Remake volume groups, logical volumes, and file systems
- » Reinstall additional packages and third-party software; apply patches and run software updates

- » Reconfigure the network, firewall rules, printers, and other peripherals
- » Reinstall and reconfigure Web, FTP, and email servers
- » Reinstall backup software
- » Restore data from the backup

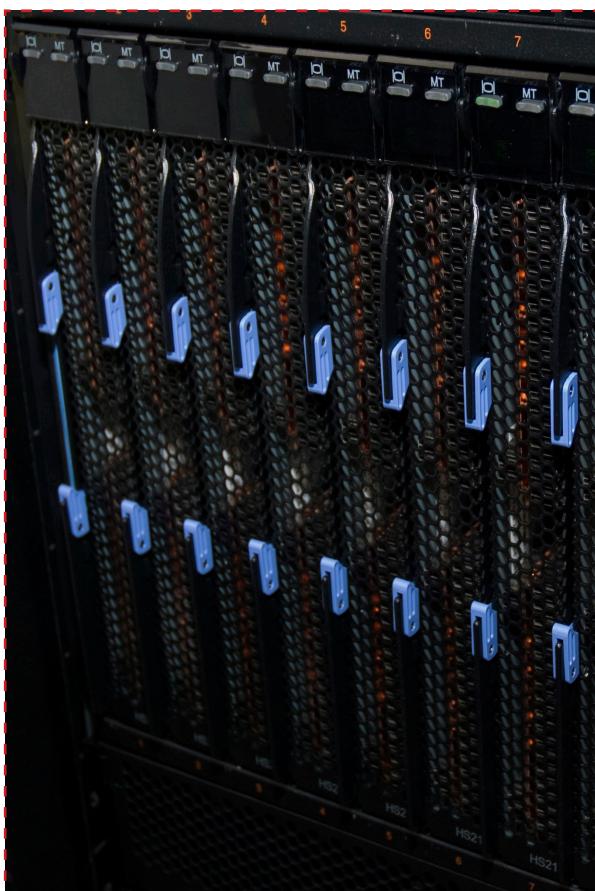
Unlike other Unix systems, Linux does not come with native utilities capable of backing up and restoring the entire Operating System and configurations data.

FILE-LEVEL VS DISK-IMAGE BACKUPS

There are two ways to back up the entire system: disk-image or file-level backups. A disk image backup solution views the hard drive simply as a group of sectors and backs up all blocks on the hard drive containing the data to create an exact image. In some instances, this method can offer the fastest way to back up and restore a disk, but its inflexibility can also cause grief during a system restore.



Picture a disk-image backup as a solid block that will only fit properly into its original container. If anything has changed, such as a different disk size, type, or location, the data will no longer fit and the backup is unusable. Even if the disk matches, if any of the hardware controllers change, the backup is also useless because you will be unable to alter which hardware drivers are loaded at boot time. Good luck trying to



purchase hardware with the exact same controllers a year after the original purchase.

File-level system backup solutions are better at understanding the operating system on which they are running. Generally, these solutions re-

cord the system, disk, and filesystem configuration, and then use this information to rebuild the storage and restore the system file-by-file.

Whereas a disk image backup is like a solid block, imagine a file-level backup as a liquid that can pour into any container. As a result, disks, partitions, filesystems, and other storage tools can be altered for the new hardware, then data files simply can be restored onto the new configuration.

This process of altering and then building a new storage configuration can be a sophisticated task in which most DR solutions show their limitations. Although most of the solutions will allow alterations of disk partition tables, they fail to understand more advanced and increasingly common disk configuration tools, such as the Logical Volume Management (LVM), Software RAID or Device-Mapper Multi-Path. These logical disks must also be altered to match the new hard disk configuration before the data can be restored. If the DR software is not capable of understanding and guiding the user through the process, it forces the user to alter and build the configuration manually, usually through command-line utilities and editing configuration files. If the DR solution does not truly adapt to dissimilar hardware, you also will be left with manually updating which storage and network drivers need to be loaded at boot time.

If all is well, the files are restored and the system disk is made bootable once again. The new system, even with new disks, should operate the same or perhaps better than the original.

ADAPTABLE SYSTEM RECOVERY WITH SYSTEM BACKUP ADMINISTRATOR

After a disaster strikes, you might not know what system type, controllers, drives, or other peripherals will be available to replace your system, which is why an Adaptable System Recovery (ASR) solution is the easiest way to get systems up fast.

Regardless of changes in the hardware, storage, and networking, SBAadmin makes sure the system is rebuilt correctly and that it will work.

Storix System Backup Administrator (SBAadmin) performs a file-level system backup capable of being restored onto different hardware, while also supporting all popular Linux storage configuration tools, such as LVM, Software Raid or DM Multi-Path. SBAadmin backs up

and restores virtually any Linux distribution, regardless of disk complexity and I/O configuration. The solution accounts for both the original and new devices and adapters, and it automatically reconfigures the operating system to support them. Other disaster recovery solutions will restore the previous configurations but make little attempt to correct problems if the system was moved to new hardware.

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The SBAadmin system installation process makes it easy for even novice Linux admins to reconfigure the system to match new hardware. The easy-to-use menu interface warns users if the backup cannot be installed onto the new hardware without change. Then SBAadmin guides admins through the process of altering the configuration as needed.

SBAadmin can restore individual files, file-systems, or directories from the backup. The backup might contain raw device data, so the software can restore data to individual partitions, logical volumes, or RAID devices. Any selective data restore can be performed from the intuitive GUI, Web, or command-line interfaces. This eliminates the need to have separate backups for full system recovery and restoration of user files. SBAadmin recreates and restores the system from the ground up, so there is no fragmentation when the restore is completed. This often results in increased I/O performance, even when no changes are made to the configuration.

FLEXIBLE LINUX PROVISIONING

Because SBAdmin does not limit restoring a backup to the same hardware, users can easily restore or clone a system to different hardware even if the disks, adapters, and other devices differ. Many current users of SBAdmin have found that they can create a backup of a base system install with patches and third-party applications installed and use that backup as a way to provision an entire datacenter from a single backup. SBAdmin will even change the hostname and network configuration during the install so that the restored system does not reboot using the same IP address as the original system. SBAdmin supports network booting so the entire provisioning process can be accomplished without moving around distro DVDs in a fraction of the time it takes to install a Linux distribution from scratch.

PHYSICAL RECOVERY IN THE CLOUD

In addition to the ability to restore a backup to new hardware, SBAdmin's flexible bare-metal recovery process allows backups of physical systems to be installed to virtual environments, such as VMware, RHEV, and Citrix XenServer.



Most sys admins are realizing that the costs of the data center includes more than just the cost of the server hardware. Reducing your company's power consumption and cooling costs associated with a lot of physical servers reduces your overall IT expenses. One of the largest barriers to migrating to virtualized environments is the time and effort to reinstall and rebuild the servers in the VM. Most P2V migration solutions suffer from the same limitations that disk-image backup solutions face the inability to adapt the storage to the new environment. SBAdmin allows you to re-tailor the storage configuration designed for virtual and cloud-based environments. And if you are a sys admin tasked with supporting a legacy server running an older OS that cannot be reinstalled onto new hardware, migrating to a virtual machine solves the inevitable problem of old hardware failing.

APOCALYPSE EMERGENCY KIT

SBAdmin is a practical, reliable solution for daily sys admin duties of physical to virtual migrations (P2V), system cloning, provisioning, or storage migrations.

Don't wait for a disaster or zombie apocalypse. Be ready and running with SBAdmin.

RESOURCES:

- » Storix SBAdmin: <http://www.storix.com/>
- » Zombie Preparedness: <http://www.cdc.gov/phpr/zombies.htm>
- » Symantec 2011 SMB Disaster Preparedness Survey:
http://www.symantec.com/about/news/resources/press_kits/detail.jsp?pkid=dpsurvey