

Bacula: No Silver Tapes, Please....

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Agenda

- Bacula: What Is It?
- Bacula Components and Structure
- Capabilities
- Special Notes for Linux on zSeries Implementation
- mtX-changer.pl and the VM Tape Mount Daemon
- zSeries tape changer support
- ANSI/IBM Standard Label Support
- Other Work in Progress at SNA on Bacula
- Q&A

Bacula: What Is It?



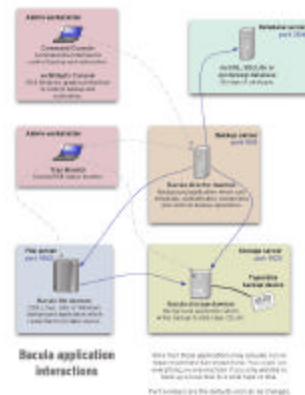
It comes by night and sucks the vital essence from your computers.

Bacula is a open-source network based backup program that supports a large number of operating systems and client types.

Bacula is designed to scale from small installations to enterprise-class deployments, depending only on the hardware and network bandwidth available.

Bacula Structure

- 5 Major Components
 - Director/Scheduler
 - Database Server
 - Storage Daemon
 - Admin Console
 - File Daemon (Client)
- Component interaction via TCP
- Storage daemon is the only component that actually requires access to storage volumes (disk, tape, CD, DVD, etc)



Bacula Parts: Director

- Schedules and manages dispatch of backup jobs
- Media selection from predefined pools
- Job dependency management and reporting

Bacula Parts: Database Server

- Selection of databases:
 - Flat files
 - SQLite (embedded DB for small sites)
 - PostGRES
 - MySQL
 - Oracle
 - DB/2 UDB (in test)

Bacula Parts: Storage Daemon

- Controls access to actual drives and media
- Mounts and dismounts volumes
- Catalogs volumes and provides label management
 - Note: default is a private label format
- Details of actual storage media hidden from the rest of the Bacula components
- Usually one SD per storage device (drive, autochanger, etc)
- Calls external program to operate autochanger; uses mtx to manipulate tape while mounted.

Bacula Parts: Admin Console

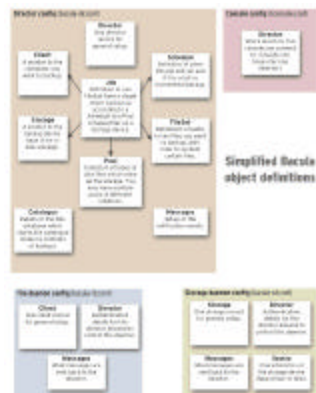
- Operator console for:
 - Job management
 - Tape mount messages
 - Volume management operations (labeling, library management, etc)
 - Status information
- Line mode and GUI versions available
 - Line mode works on all platforms
 - GUI requires Tcl/TK libraries and Wx toolkit to build (not required to run).
 - GUI is not very sophisticated (essentially an expert system over the line-mode client).

Bacula Parts: File Daemon

- Installed on every client system to be backed up (backup client).
- Unique to each OS and system backed up
- Supported systems (partial list):
 - Linux (on all architectures)
 - Solaris (SPARC and x86)
 - AIX
 - HP/UX (PA-RISC and x86)
 - Windows 9x/Windows 2000/Windows XP
 - CrayOS/UNICOS
 - Tru64
 - Others (see later on...)

Bacula Configuration

- Each component has a separate configuration file
- Each component implements mutual authentication
- Whenever possible, data flows directly from file daemon to storage daemon w/o additional interference



Scheduling and Capabilities

- Fairly simplistic JCL-like job definition
 - Syntax is based on TOPS-10 Galaxy JCL, not z/OS!
 - Job dependency is implemented
 - Selecting backup volumes from pools is supported
- Backups attempt to fill physical volumes by appending to existing volumes before using new ones
- Single admin console can manage multiple directors
- All data and control connections can be encrypted via SSL or TLS

Special Notes for S/390

- If you have FCP SCSI tape, CDRW or DVDRW drives available, Bacula can use them directly
- Backup to NFS-mounted disk is supported in the mainline code. Use of the NFS to SMS interface I described with Amanda is much simpler, as the SD is the only piece that needs to know about the NFS mount, and filenames are defined when creating the volume (eliminating the patch needed to Amanda for long dataset names)
- Since we still don't have Linux-based autochanger support for common tape silos on VM, some additional code is necessary, as well as separating the SD from the other Bacula components.

Tape Mount Daemon

- <http://www.sinenomine.net/vm/tapemount>
- In case you missed this gadget, it provides a simple wrapper around the Linux 'mtx' command that intercepts the mount/unmount/list operations generally sent to SCSI-based libraries. The intercepted commands are sent via TCP to a CMS DVM and are implemented by REXX execs in the DV M, allowing support for ANY CMS-based tape management system.
- The CMS tape management system uses the volume ID and virtual address passed from the wrapper to mount the appropriate tape and return a status back to the Linux script to indicate success or failure.
- Any VM supported tape device can be used.
- While written for Bacula, the script and DVM are general purpose enough to use for simple tape management outside of the Bacula arena

Autochanger Support

- The open-source package includes only the support for CP tape support.
- The commercially supported version includes support for CA VM:Tape, Dynam/T, LARS Tape, DFSMS/VM RMS, and the new IBM Tape Manager, plus documentation and defect support

ANSI/IBM Standard Labels

- Version 1.37.4 contains support for ANSI and IBM standard labels
- Debian build is current, builds for other OS lag behind a bit
- CVS located at bacula.sourceforge.net to build from current source

Work In Progress at SNA

- Prebuilt backup system (DDR and go!)
- VTS support
- z/OS port of storage daemon
- CMS file daemon
- SFS file daemon
- BFS file daemon
- Commercial support (available now!)

Summary

- If you're trying to solve the problem of backup for your Linux guests, you should have a close look at Bacula
- Integration with zSeries devices and environments is proceeding rapidly, and the solution scales better than most of the commercial backup tools with fewer restrictions
- Solid commercial support is available for a genuinely robust piece of code (and you get the complete source code).
- Terrific proof of concept project for zLinux

Q&A

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