



Bacula Open Source Project

Bacula Systems (professional support)

The Enterprise Ready Open Source Network Backup Solution

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Introduction – What is Bacula?



- A network backup solution designed for *BSD, Linux, Mac OS X, Unix and Windows systems
- Project goals are to:
 - ✓ Backup any client from a Palm to a mainframe computer
 - ✓ Provide «Enterprise» features similar to the largest commercial applications in an Open Source solution
 - ✓ Assure data compatibility for 30 years (providing that appropriate hardware is available)
 - ✓ Use a Free and Open Source (GPLv2) license

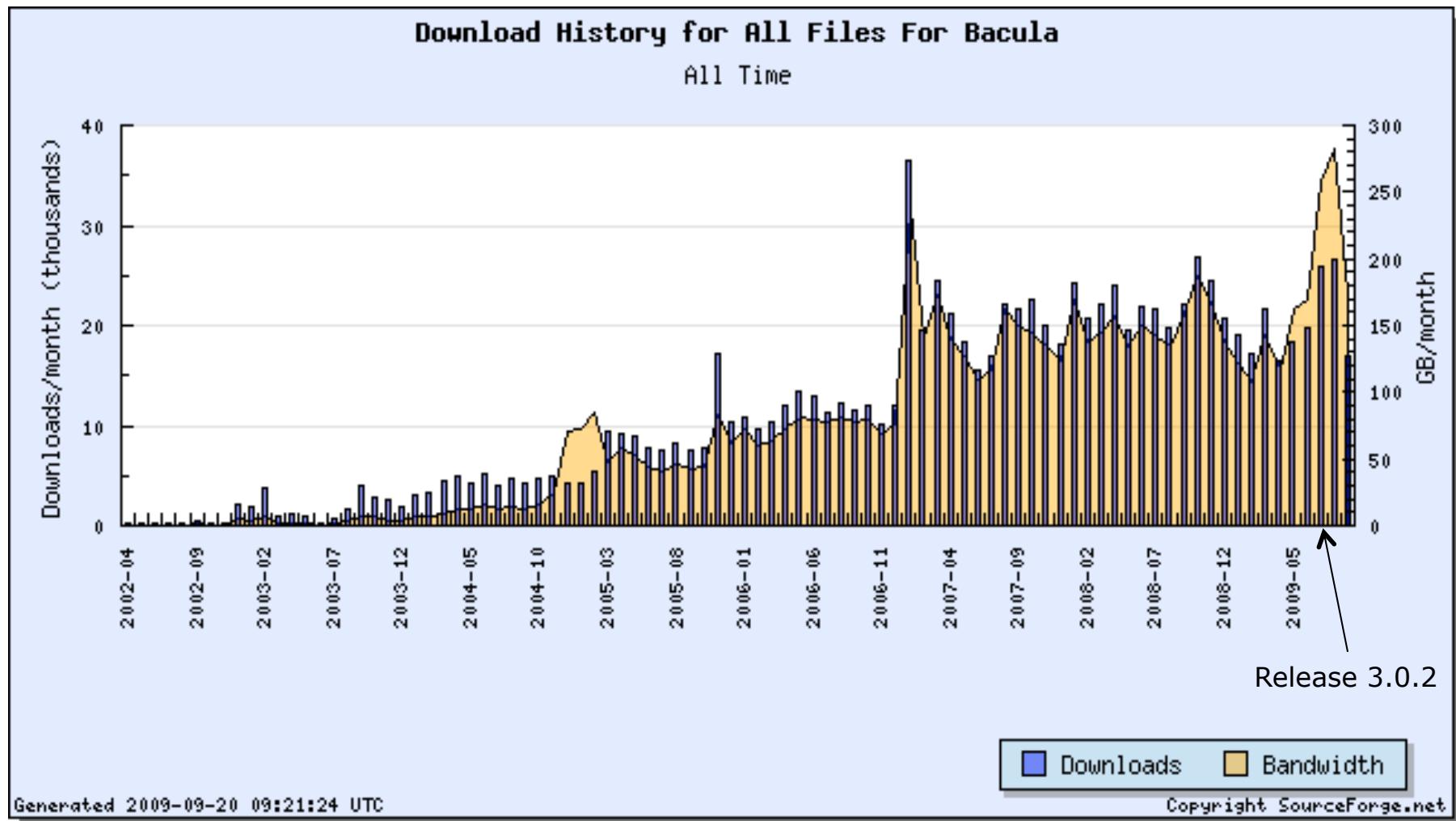
Introduction – Project History



- «Bacula» = Backup + Dracula
- ✓ It comes by night and sucks the vital essence from your computers.
- Time line
 - ✓ January 2000 – Project started
 - ✓ 14 April 2002 – First release to Source Forge (version 1.16)
 - ✓ 29 June 2006 – Release 1.38.11
 - ✓ January 2007 – Release 2.0.0
 - ✓ August 2007 – Release 2.2.0
 - ✓ June 2008 – Release 2.4.0
 - ✓ July 2009 – Current release 3.0.2
- Downloads to date: (Sep 2009)
 - ✓ 1,027,109 all versions
 - ✓ 6.9 TB



Bacula Download History





Why Backup?

- Hardware Failure Protection
- Unauthorized Intrusion (Hackers)
- Virus Protection
- User Error Protection
- Service Level Agreements
- Legal and/or Regulatory Requirements
- Business Cost of Time/Data Loss
- Disaster Recovery

What is «Backup»?

- Data protection
 - ✓ All files
 - ✓ Databases (MySQL, PostgreSQL, MSSQL, Oracle, DB2, ...)
 - ✓ Applications (E-mail: MS Exchange, Lotus, ...)
 - ✓ Groupware applications (Lotus Notes, etc.)
 - ✓ Enterprise Resource Planning (ERP)
 - ✓ CRM and sales order entry systems
 - ✓ Others...



What is «Backup»?

- Off-site backup
 - ✓ Storing copies off-site
- Disaster recovery plan (DRP)
 - ✓ Bare Metal recovery
 - ✓ Server configuration
 - ✓ Bacula Catalog database
 - ✓ Bacula binaries and configuration files
 - ✓ Key people to be contacted
 - ✓ Location of recovery media



What is «Backup»?



- Archiving
 - ✓ Compliance with regulatory requirements
 - ✓ Business requirements
 - ✓ Long retention (7-30 years)
 - ✓ Guarantees data are not changed or deleted
 - ✓ Audit requirements





Reflection – Key Questions

- Do you do backups?
 - ✓ No
 - ✓ Yes, I did one last month
 - ✓ Yes, tar files every week
 - ✓ Sometimes I rsync ...
 - ✓ Yes, CDs every week
 - ✓ I use custom scripts
- Have you encountered the typical problems?
 - ✓ Retrieving and restoring:
 - How to find the files you need to restore?
 - How to restore to a point in time?
 - Which files are on which medium?
 - ✓ Scalability:
 - Could the solution handle 2000+ machines?
 - ✓ Compliance:
 - Can the solution assure that all government regulations are met?

Introduction – the Bacula Solution



- Open Source (GPLv2)
- Centrally managed
- Network backup/restore
- Multi-platform support (*BSD, Linux, Mac OS X, Unix Win32, ...)
- Different media (Tape, disk, USB, CD/DVD)
- Reliable
- Tracks comprehensively what was backed up when and where
- Allows restoration of specific files required (Catalog + GUI)
- Restores to a point in time
- Scales to handle 10,000 machines



What is Bacula?

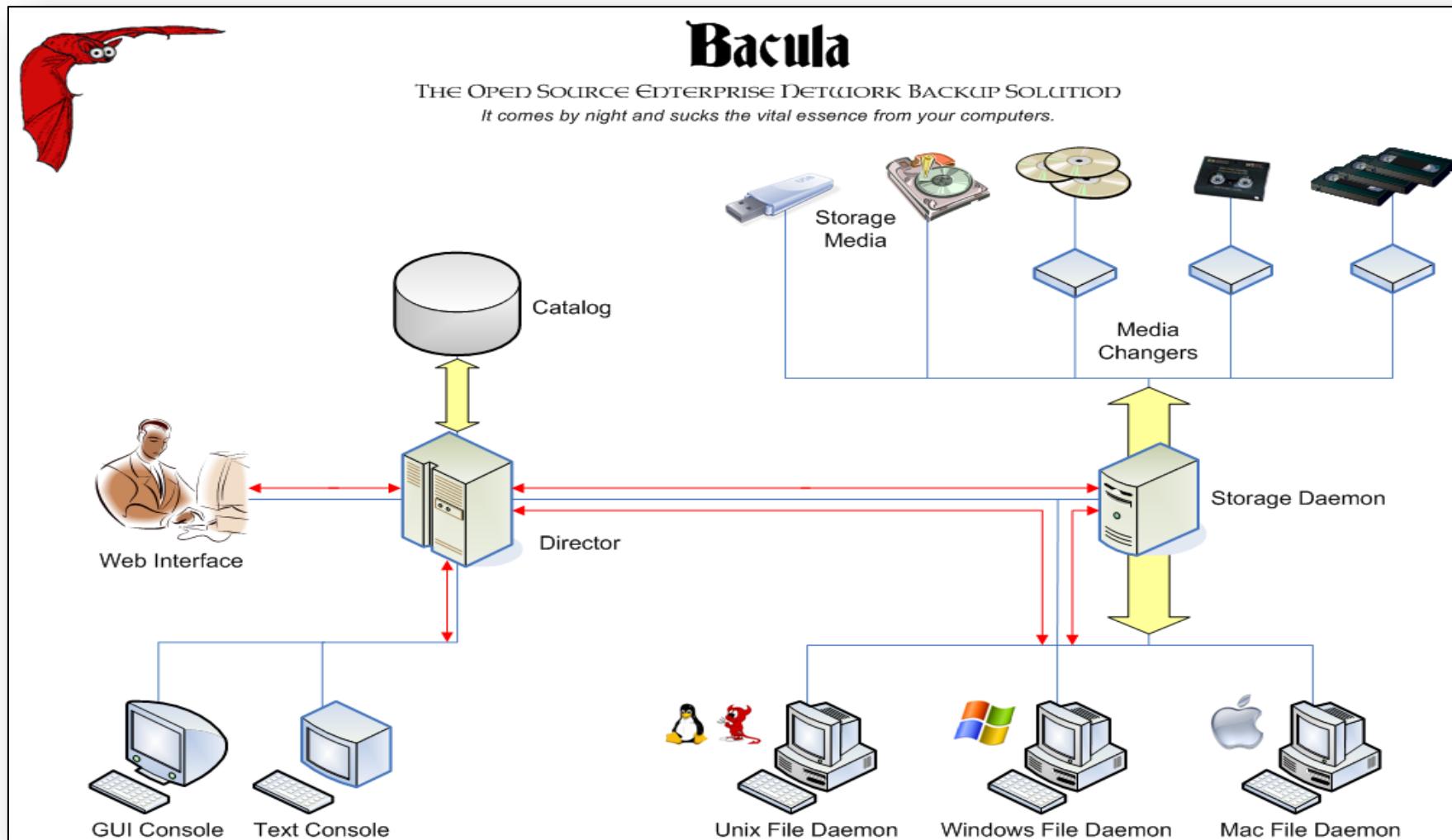
- Enterprise backup solution
 - ✓ Network based
 - ✓ Centralized Administration
 - ✓ Automatic operation
 - ✓ Performs bookkeeping
 - ✓ Multi-platform
 - ✓ Many high-end features
- Robust design built for high performance
 - ✓ Modular
 - ✓ Multiple Backup Media
 - ✓ Customizable
 - ✓ Reliable
 - ✓ Rapid Restores
 - ✓ Advanced Reporting, Notification, Monitoring

What is Bacula?



- Open Source
 - ✓ Zero-cost license
 - ✓ Large community of users and developers
 - ✓ Ability to customize to your specific requirements
 - Extensive configuration
 - Contribute to Bacula Project
 - ✓ Security of solution guaranteed
 - Users have the source code
 - No license audits

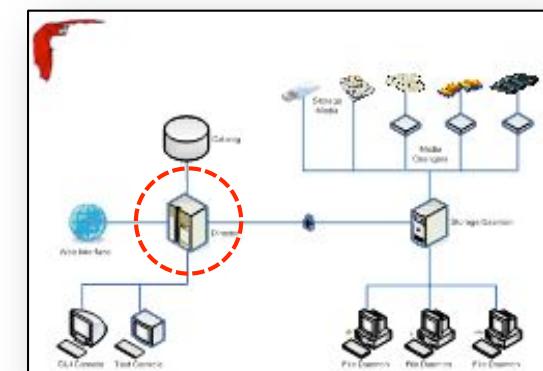
Architecture – 5 Bacula Components



Architecture – 5 Bacula Components



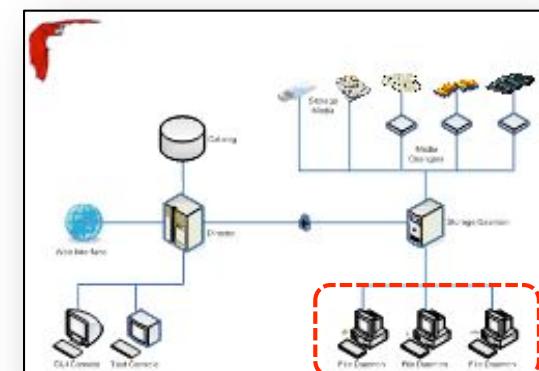
- Director (DIR)
 - ✓ Centralized control and administration for all functions
 - ✓ Basic unit is a Job (one client, one set of files, ...)
 - ✓ Schedules, initiates and supervises all Jobs
 - ✓ Maintains the catalog (SQL database)
- Typical installation
 - ✓ One Director per Bacula installation
 - ✓ Exception – very large environments that require additional coordination



Architecture – 5 Bacula Components



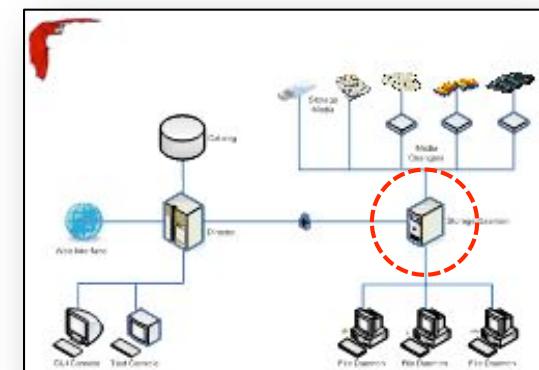
- File Daemon or Client (FD)
 - ✓ Performs file backup, restore and verification requested by Director
 - ✓ Installed on each machine as a service (daemon)
 - ✓ Communicates over network with Director and Storage daemon
 - ✓ Needs access to all files to be backed up (root, SYSTEM)
- Typical installation
 - ✓ Multiple File daemons per Director
 - One for each machine



Architecture – 5 Bacula Components



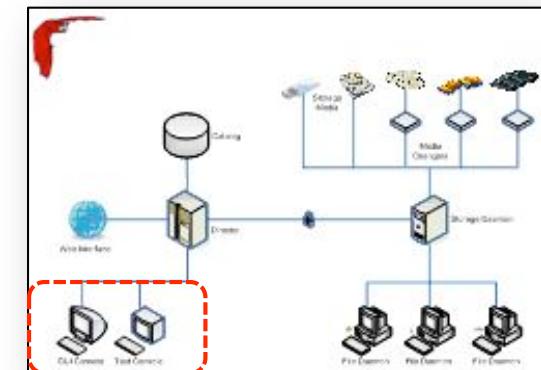
- Storage daemon (SD)
 - ✓ Reads and writes data to the physical medium
 - ✓ Disk, Tape, CD/DVD, USB, ...
 - ✓ Accepts orders and authorization from the Director
 - ✓ Accepts and returns data to/from File daemons (FD)
 - ✓ Sends file storage location to Director -> Catalog
 - ✓ Supports multiple devices per SD
- Typical installation
 - ✓ One SD per Director



Architecture – 5 Bacula Components



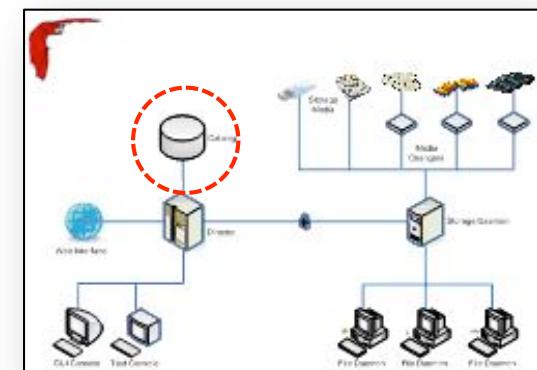
- Console
 - ✓ Allows user or administrator to control Bacula
 - ✓ Communicates with Director via network
 - ✓ Start jobs, review Job output, query/modify catalog
- Consoles available
 - ✓ TTY (bconsole)
 - ✓ bat a Qt 4 (GUI) – most comprehensive
 - ✓ wxWidgets (GUI) – Linux, Unix, Win32
 - ✓ Multiple web interfaces
 - bweb = most comprehensive
 - ✓ Restricted consoles
 - Users can restore their own files



Architecture – 5 Bacula Components



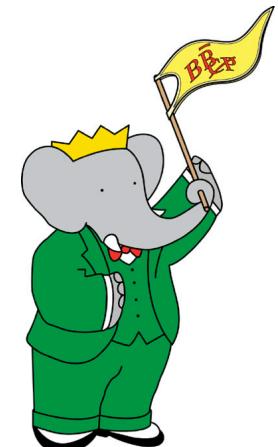
- Catalog database
 - ✓ Only component not written by Bacula team
 - ✓ SQL database (MySQL, PostgreSQL, or SQLite) – unique
 - ✓ Tracks Jobs run, Volumes used, File locations, ...
 - ✓ Permits rapid restores
 - ✓ Allows inquiry of when and where files were backed up
 - ✓ Old data automatically pruned by Director
 - ✓ Supports multiple databases for scaling



Bacula Release Files



- **bacula-3.0.2.tar.gz**
 - ✓ Primary Bacula source code release
- **bacula-docs-3.0.2.tar.bz2**
 - ✓ Prebuilt docs: HTML directory, single HTML file, and PDF file..
- **bacula-gui-3.0.2.tar.gz**
 - ✓ Non-core GUI programs
 - ✓ bweb
 - ✓ bacula-web
 - ✓ Bimagemgr
 - program for burning CDROM images with Bacula Volumes
- **bacula-rescue-3.0.2.tar.gz**
 - ✓ Bare Metal Recovery
 - ✓ CD-ROM depreciated
 - ✓ Replaced by USB key
- **winbacula-3.0.2.exe**
 - ✓ 32-bit installer for Windows® client (File Daemon)
- **win64bacula-3.0.2.exe**
 - ✓ 64-bit installer for Windows® client (File Daemon)



Bacula Administration Tool (BAT)



- GUI form of bconsole – with many additional features
- Key features
 - ✓ Graphical representation of Jobs run by Bacula
 - ✓ Ability to create reports more easily and quickly
 - ✓ Sorting of run/failed Jobs by clicking on the column header
 - ✓ Context sensitive menu with ready access to key features

The BAT Interface



bat - Bacula Admin Tool

File Edit Settings Help

Page Selector

Select Page

zog4-dir

- Console
- Clients
- FileSets
- Jobs
- JobList
- JobLog
- Media
- Storage

Volume Name Id Status Enabled Bytes Files Jobs Retention Media Type Slot Use Duration Max Jobs N

Pools

Default

Volume Name	Id	Status	Enabled	Bytes	Files	Jobs	Retention	Media Type	Slot	Use Duration	Max Jobs	N
TestVolume001	1	Error	Yes	2.05 GiB	0	2	1y	File		0s	0	
Vol0001	2	Append	Yes	163.54 MiB	0	3	1y	File		0s	0	
Vol0002	3	Error	Yes	699.05 MiB	0	0	1y	File		0s	0	
Vol0003	4	Error	Yes	524.29 MiB	0	0	1y	File		0s	0	
Vol0004	5	Error	Yes	419.43 MiB	0	0	1y	File		0s	0	
Vol0005	6	Error	Yes	349.52 MiB	0	0	1y	File		0s	0	
Scratch												

Console Command Line Entry

Command:

Bacula Administration Tool

The BAT Interface – Job List



Screenshot of the Bacula Admin Tool (BAT) interface showing the Job List page.

The interface includes a top menu bar with File, Edit, Settings, and Help, and a toolbar with various icons for managing jobs, clients, and storage.

The left sidebar, titled "Page Selector", shows a tree view of the system structure under "zog4-dir". The "JobList" node is highlighted with a blue selection bar and circled with a red dashed line.

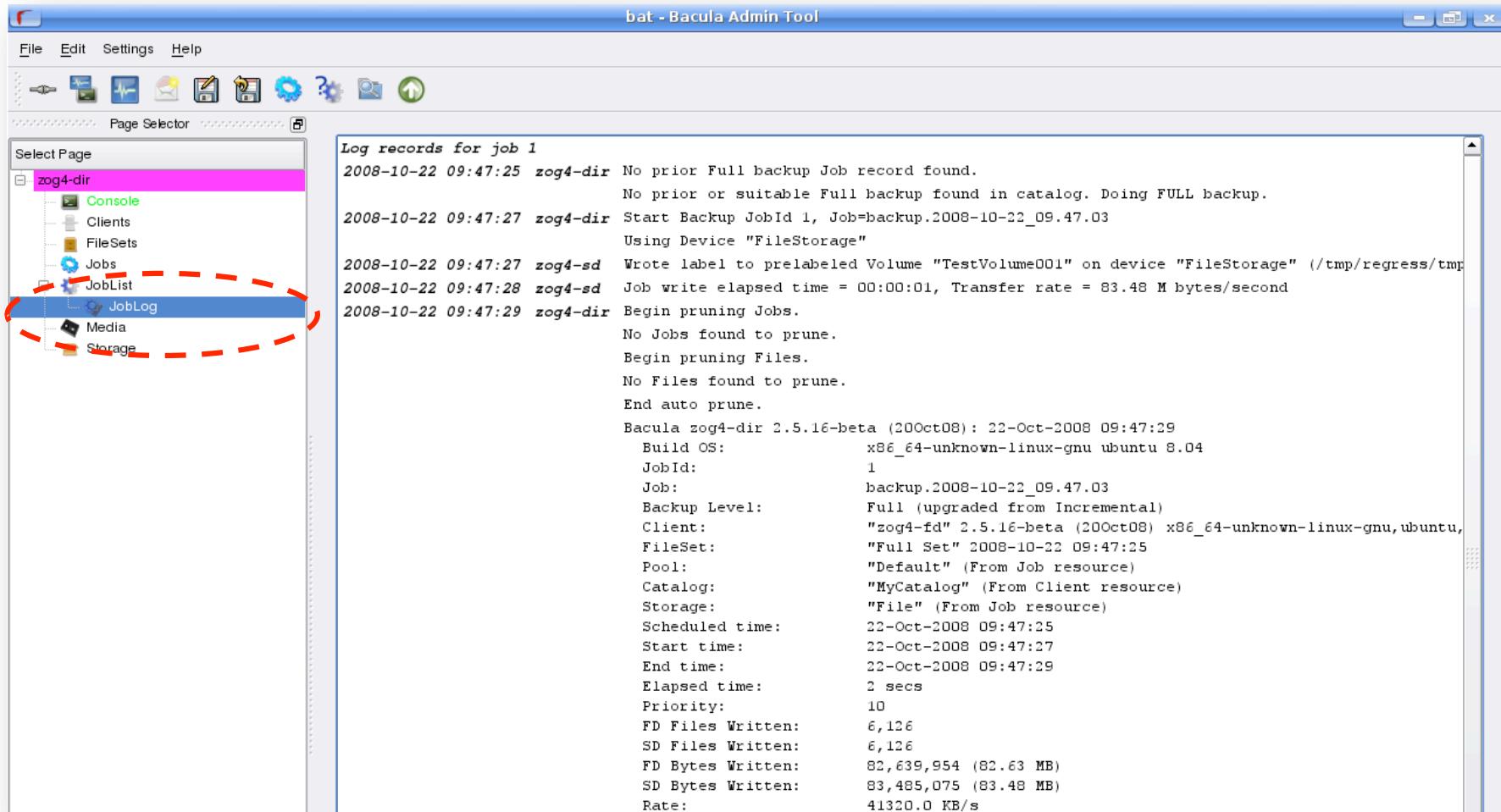
The main content area displays a table of job history:

Job Id	Job Name	Client	Job Starttime	Job Type	Job Level	Job Files	Job Bytes	Job Status	Purged	File Set
47	backup	zog4-fd	2008-08-03 10:06:22.400158	Backup	Incremental	4812	481.28 ...	Completed successfully	No	Full Set
45	backup	zog4-fd	2008-08-01 10:06:22.400158	Backup	Full	46080	921.60 ...	Completed successfully	No	Full Set
43	backup	zog4-fd	2008-07-30 10:06:22.400158	Backup	Incremental	4403	440.32 ...	Completed successfully	No	Full Set
41	backup	zog4-fd	2008-07-28 10:06:22.400158	Backup	Full	41984	839.68 ...	Completed successfully	No	Full Set
39	backup	zog4-fd	2008-07-26 10:06:22.400158	Backup	Incremental	3993	399.36 ...	Completed successfully	No	Full Set
37	backup	zog4-fd	2008-07-24 10:06:22.400158	Backup	Full	37888	757.76 ...	Completed successfully	No	Full Set
35	backup	zog4-fd	2008-07-22 10:06:22.400158	Backup	Incremental	3584	358.40 ...	Completed successfully	No	Full Set
33	backup	zog4-fd	2008-07-20 10:06:22.400158	Backup	Full	33792	675.84 ...	Completed successfully	No	Full Set
31	backup	zog4-fd	2008-07-18 10:06:22.400158	Backup	Incremental	3174	317.44 ...	Completed successfully	No	Full Set
29	backup	zog4-fd	2008-07-16 10:06:22.400158	Backup	Full	29696	593.92 ...	Completed successfully	No	Full Set
27	backup	zog4-fd	2008-07-14 10:06:22.400158	Backup	Incremental	2764	276.48 ...	Completed successfully	No	Full Set
25	backup	zog4-fd	2008-07-12 10:06:22.400158	Backup	Full	25600	512.00 ...	Completed successfully	No	Full Set
23	backup	zog4-fd	2008-07-10 10:06:22.400158	Backup	Incremental	2355	235.52 ...	Completed successfully	No	Full Set
21	backup	zog4-fd	2008-07-08 10:06:22.400158	Backup	Full	21504	430.08 ...	Completed successfully	No	Full Set
19	backup	zog4-fd	2008-07-06 10:06:22.400158	Backup	Incremental	1945	194.56 ...	Completed successfully	No	Full Set
17	backup	zog4-fd	2008-07-04 10:06:22.400158	Backup	Full	17408	348.16 ...	Completed successfully	No	Full Set
15	backup	zog4-fd	2008-07-02 10:06:22.400158	Backup	Incremental	1536	153.60 ...	Completed successfully	No	Full Set

Below the table, a context menu is open for the selected job (Job Id 1), listing options like Refresh Job List, ListJobid, List Files On Job, ListJobMedia, ListVolumes, Delete Single Job, Show Log for Job, PurgeFiles, Restore From Job, and Restore From Time.

On the right side, there are filters for Job, Status, FileSet, Level, and Purged, along with a Refresh button. A "Console Command Line Entry" field is also present.

The BAT Interface – Job Log



The BAT Interface – Volume Actions



bat - Bacula Admin Tool

File Edit Settings Help

Page Selector

Select Page

zog4-dir

- Console
- Clients
- FileSets
- Jobs
- JobList
- JobLog
- Media
- Storage

Volume Name Id Status Enabled Bytes Files Jobs Retention Media Type Slot Use Duration Max Jobs Max Files Max Bytes Recycle Recycle

Volume Name	Id	Status	Enabled	Bytes	Files	Jobs	Retention	Media Type	Slot	Use Duration	Max Jobs	Max Files	Max Bytes	Recycle	Recycle
TestVolume001	1	Error	Yes	2.05 GiB	0	2	1y	File		0s	0	0	0 B	Yes	
Vol0001	2	Append	Yes	163.54 MiB	0	3	1y	File		0s	0	0	0 B	Yes	
Vol0002				599.05 MiB	0	0	1y	File		0s	0	0	0 B	Yes	
Vol0003				524.29 MiB	0	0	1y	File		0s	0	0	0 B	Yes	
Vol0004				419.43 MiB	0	0	1y	File		0s	0	0	0 B	Yes	
Vol0005				349.52 MiB	0	0	1y	File		0s	0	0	0 B	Yes	

Default

Scratch

- Refresh Media List
- Edit Volume
- List Jobs On Volume
- Delete Volume
- Prune Volume
- Purge Volume
- Relabel Volume
- Volume From Pool

The BAT Interface – Running a Job



bat - Bacula Admin Tool

File Edit Settings Help

Page Selector

Select Page

zog4-dir

- Console
- Clients
- FileSets
- Jobs
- JobList
- JobLog
- Media

 - Media Edit
 - Storage

- Run

Run a Job

Job: backup Type: Backup

Client: zog4-fd Priority: 10

Level: Incremental

FileSet: Full Set

Pool: Default

Storage: File

Messages: Standard

When: 2008-10-22 10:57:06

Bootstrap:

OK Cancel

Console Command Line Entry

Command:

Bacula Administration Tool

The BAT Interface – Restoring Files



bat - Bacula Admin Tool

File Edit Settings Help

Page Selector

Select Page

- zog4-dlr
- Console
- Clients
- FileSets
- Jobs
- JobList
- Media
- Storage
- Version Browser

Jobs

End Time	Level
2008-10-22 14:20:14.367728	I b
2008-10-22 10:57:20	I b
2008-10-22 10:45:14	F b
2008-10-22 10:44:51	I b
2008-10-22 10:44:19	F E
2008-10-20 14:16:14.367728	F b
2008-10-18 14:12:14.367728	I b
2008-10-16 14:08:14.367728	F b
2008-10-14 14:04:14.367728	I b
2008-10-12 14:00:14.367728	F b
2008-10-10 13:56:14.367728	I b
2008-10-08 13:52:14.367728	F b
2008-10-06 13:48:14.367728	I b
2008-10-04 13:44:14.367728	F b
2008-10-02 13:40:14.367728	I b
2008-09-30 13:36:14.367728	F b
2008-09-28 13:32:14.367728	I b
2008-09-26 13:28:14.367728	F b
2008-09-24 13:24:14.367728	I b
2008-09-22 13:20:14.367728	F b

Directories

- /
- tmp/
- regress/
- build/
- autoconf/
- examples/
- manpages/
- patches/
- platforms/
- po/
- scripts/
- src/
- .svn/
- updatedb/

Files

- acconfig.h
- aclocal.m4
- aclocal.m4.save
- confdefs.h
- config.guess
- config.h.in
- config.h.in.save
- config.log
- config.rpath
- config.sub
- configure
- configure.in
- configure.in.orig
- install-sh
- install.sh
- lmain.sh
- Make.common
- Make.commo...
- mkinstalldirs
- python.conf.py

Versions of File

aclocal.m4

Job Id	Type	End Time
131	F	2008-10-22 10:45:14
130	I	2008-10-22 10:44:51
1	F	2008-06-18 10:08:14.367728

Bweb Management Interface



- Web based management tool
- Key features
 - ✓ Graphical representation of Jobs run by Bacula
 - ✓ Ability drill into problem areas
 - ✓ Restart failed jobs
 - ✓ Point and click autochanger control
 - ✓ Volume location tracking
 - ✓ Job grouping



Main Bweb Window

Bweb - Bacula Web Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://localhost:9180/cgi-bin/bweb/bweb.pl

Most Visited ▾

Bweb - Bacula Web Interface

Main Clients Jobs Media Storages Statistics Configuration About Logged as [search...]

Informations

Total clients: 15 Total bytes stored: 6.5 TB Total media: 18
Database size: 0 B Total Pool: 2 Total Job: 2038
Job failed (last 7 days): 12

Running Jobs

JobId	Client	Job Name	Level	Start Time	Duration	Status	Select

[+ View] [X Cancel]

Statistics

Job sum : all/all

Last Jobs (limited to 10)

JobId	Client	Job Name	FileSet	Level	StartTime	Duration	JobFiles	JobBytes	Errors	Status
6487	Roxie	CatalogBackup	CatalogFile	F	2009-09-10 05:05:05	00:00:27	380	1.1 GB	0	✓
6486	Minou	Minou	Minou Full Set	D	2009-09-10 04:03:07	00:03:00	0		0	✗
6485	Tibs	Tibs	Win32 Full Set	I	2009-09-10 04:00:06	00:03:00	0		0	✗
6484	Rufus	Rufus	RufusAll	I	2009-09-10 03:11:42	00:48:08	30281	13.5 GB	1	⚠
6483	Matou	Matou	Matou Set	I	2009-09-10 03:05:04	00:06:35	9241	1.5 GB	0	✓
6482	Roxie	CatalogBackup	CatalogFile	F	2009-09-09 05:05:04	00:00:29	380	1.1 GB	0	✓
6481	Minou	Minou	Minou Full Set	I	2009-09-09 03:38:24	00:03:13	0		0	✗
6480	Tibs	Tibs	Win32 Full Set	I	2009-09-09 03:35:24	00:03:00	0		0	✗
6479	Rufus	Rufus	RufusAll	I	2009-09-09 03:10:59	00:24:23	405	8.8 GB	0	✓
6478	Matou	Matou	Matou Set	I	2009-09-09 03:05:01	00:05:49	9108	1.3 GB	0	✓

Done

Job Log for Failed Job



Bweb - Bacula Web Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://localhost:9180/cgi-bin/bweb/bweb.pl?action=job_zoom;jobid=6486

Most Visited ▾

Bweb - Bacula Web Interface

Main Clients Jobs Media Storages Statistics Configuration About search... Logged as

Information about job

JobId	Client	Job Name	FileSet	Level	StartTime	Duration	JobFiles	JobBytes	Errors	Pool	Volume Name	Status
6486	Minou	Minou	Minou Full Set	D	2009-09-10 04:03:07	00:03:00	0		0	Default		

Delete View media View jobs View stats View FileSet Run this job

Log: Minou on Minou (6486)

```
roxie-dir JobId 6486: Start Backup JobId 6486, Job=Minou.2009-09-10_03.05.04_17
roxie-dir JobId 6486: Using Device "LTO-Drive1"
roxie-sd JobId 6486: Job Minou.2009-09-10_03.05.04_17 marked to be canceled.
roxie-dir JobId 6486: Fatal error: No Job status returned from FD.
roxie-dir JobId 6486: Warning: bsock.c:129 Could not connect to Client: Minou on minou:9102. ERR=No route to host
Retrying ...
roxie-dir JobId 6486: Fatal error: bsock.c:185 Unable to connect to Client: Minou on minou:9102. ERR=No route to host
roxie-dir JobId 6486: Error: Bacula roxie-dir 3.0.3 (28Aug09): 10-Sep-2009 04:06:07
Build OS: i686-pc-linux-gnu suse 10.2
JobId: 6486
Job: Minou.2009-09-10_03.05.04_17
Backup Level: Differential, since=2009-09-03 03:19:36
Client: "Minou" 2.4.2 (26Jul08) Linux,Cross-compile,Win32
FileSet: "Minou Full Set" 2007-10-06 11:38:25
Pool: "Default" (From Job resource)
Catalog: "BackupDB" (From Client resource)
Storage: "LTO-changer" (From Job resource)
Scheduled time: 10-Sep-2009 03:05:04
Start time: 10-Sep-2009 04:03:07
End time: 10-Sep-2009 04:06:07
Elapsed time: 3 mins
Priority: 10
FD Files Written: 0
SD Files Written: 0
FD Bytes Written: 0 (0 B)
SD Bytes Written: 0 (0 B)
Rate: 0.0 KB/s
Software Compression: None
VSS: no
Encryption: no
Accurate: no
Volume name(s):
Volume Session Id: 34
Volume Session Time: 1251969843
Last Volume Bytes: 330,793,989,120 (330.7 GB)
Non-fatal FD errors: 0
SD Errors: 0
FD termination status: Error
SD termination status: Waiting on FD
Termination: *** Backup Error ***
```

Done

Job Log for Job with Warnings



Bweb - Bacula Web Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help
http://localhost:9180/cgi-bin/bweb/bweb.pl?action=job_zoom;jobid=6484

Most Visited ▾

Bweb - Bacula Web Interface

Information about job

JobId	Client	Job Name	FileSet	Level	StartTime	Duration	JobFiles	JobBytes	Errors	Pool	Volume	Name	Status
6484	Rufus	Rufus	RufusAll	I	2009-09-10 03:11:42	00:48:08	30231	13.5 GB	1	Default	BBN008L1		

Delete View media View jobs View stats View FileSet View file usage Run this job View only errors

Log: Rufus on Rufus (6484)

```
roxie-dir JobId 6484: Start Backup JobId 6484, Job=Rufus.2009-09-10_03.05.03_15
roxie-dir JobId 6484: Using Device "LTO-Drive1"
rufus-fd JobId 6484: DIR and FD clocks differ by 74 seconds, FD automatically compensating.
rufus-fd JobId 6484: '/var' is a different filesystem. Will not descend from / into /var
roxie-sd JobId 6484: Spooling data...
rufus-fd JobId 6484: '/dev' is a different filesystem. Will not descend from / into /dev
rufus-fd JobId 6484: '/lib/modules/2.6.24-24-generic/volatile' is a different filesystem. Will not descend from / into /lib/modules/2.6
rufus-fd JobId 6484: '/tmp' is a different filesystem. Will not descend from / into /tmp
rufus-fd JobId 6484: '/sys' is a different filesystem. Will not descend from / into /sys
rufus-fd JobId 6484: Could not stat "/home/kern/bacula/k/regress/working/bacula-dir.8101.pid": ER=No such file or directory
roxie-sd JobId 6484: Job write elapsed time = 00:38:00. Transfer rate = 6.388 M Bytes/second
roxie-sd JobId 6484: Committing spooled data to Volume "BBN008L1". Despooling 14,466,161,184 bytes ...
roxie-sd JobId 6484: Despooling elapsed time = 00:08:34. Transfer rate = 28.14 M Bytes/second
roxie-sd JobId 6484: Sending spooled attrs to the Director. Despooling 9,475,788 bytes ...
roxie-dir JobId 6484: Bacula roxie-dir 3.0.3 (28Aug09): 10-Sep-2009 03:59:50
Build OS:
  i686-pc-linux-gnu suse 10.2
  6484
Job:
  Rufus.2009-09-10_03.05.03_15
Backup Level:
  Incremental, since=2009-09-09 03:10:59
Client:
  "Rufus" 3.0.3 (28Aug09) x86_64-unknown-linux-gnu,ubuntu,8.04
FileSet:
  "RufusAll" 2009-04-10 03:05:01
Pool:
  "Default" (From Job resource)
Catalog:
  "BackupDB" (From Client resource)
Storage:
  "LTO-changer" (From Job resource)
Scheduled time:
  10-Sep-2009 03:05:03
Start time:
  10-Sep-2009 03:11:42
End time:
  10-Sep-2009 03:59:50
Elapsed time:
  48 mins 8 secs
Priority:
  10
FD Files Written:
  30,231
SD Files Written:
  30,231
FD Bytes Written:
  14,446,931,383 (14.44 GB)
SD Bytes Written:
  14,451,755,622 (14.45 GB)
Rate:
  5002.4 KB/s
Software Compression:
  None
VSS:
  no
Encryption:
  no
Accurate:
  no
Volume name(s):
  BBN008L1
Volume Session Id:
  52
Volume Session Time:
  1251969843
Last Volume Bytes:
  330,793,989,120 (330.7 GB)
Non-fatal FD errors:
  1
SD Errors:
  0
FD termination status:
  OK
SD termination status:
  OK
Termination:
  Backup OK -- with warnings
```

Done

Media View (in Catalog)



Bweb - Bacula Web Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Most Visited

Bweb - Bacula Web Interface

Main Clients Jobs Media Storages Statistics Configuration About search... Logged as

Filter

Media Type
Location
Status
Pool
Name
Expired media
Number of items 100
Update

Media

Volume Name	Online	Vol Bytes	Vol Usage	Vol Status	Pool	Media Type	Last Written	When expire ?	Select
BBN001L1	●	337.7 GB	██████	Full	Default	LTO-2	2009-01-28 13:56:35	2010-01-28 13:56:35	<input type="checkbox"/>
BBN002L1	●	458.5 GB	██████	Full	Default	LTO-2	2008-11-19 03:39:32	2009-11-19 03:39:32	<input type="checkbox"/>
BBN003L1	●	342.2 GB	██████	Full	Default	LTO-2	2009-02-23 06:11:35	2010-02-23 06:11:35	<input type="checkbox"/>
BBN004L1	●	438.1 GB	██████	Full	Default	LTO-2	2008-12-18 03:10:34	2009-12-18 03:10:34	<input type="checkbox"/>
BBN005L1	●	340.9 GB	██████	Full	Default	LTO-2	2009-01-07 12:10:17	2010-01-07 12:10:17	<input type="checkbox"/>
BBN006L1	●	323.8 GB	██████	Full	Default	LTO-2	2009-08-10 03:30:31	2010-08-10 03:30:31	<input type="checkbox"/>
BBN007L1	●	316.7 GB	██████	Full	Default	LTO-2	2009-07-17 03:30:25	2010-07-17 03:30:25	<input type="checkbox"/>
BBN008L1	●	309.2 GB	██████	Append	Default	LTO-2	2009-09-10 05:05:30	2010-09-10 05:05:30	<input type="checkbox"/>
BBN009L1	●	1 B	██████	Recycle	Default	LTO-2	2008-08-04 04:57:19	2009-08-04 04:57:19	<input type="checkbox"/>
BBN010L1	●	474.5 GB	██████	Full	Default	LTO-2	2008-08-26 03:51:19	2009-08-26 03:51:19	<input type="checkbox"/>
BBN011L1	●	467.4 GB	██████	Full	Default	LTO-2	2008-09-12 05:05:08	2009-09-12 05:05:08	<input type="checkbox"/>
BBN012L1	●	517.1 GB	██████	Full	Default	LTO-2	2008-10-04 03:36:13	2009-10-04 03:36:13	<input type="checkbox"/>
BBN013L1	●	444.4 GB	██████	Full	Default	LTO-2	2008-10-18 05:06:01	2009-10-18 05:06:01	<input type="checkbox"/>
BBN014L1	●	445.6 GB	██████	Full	Default	LTO-2	2008-11-03 04:50:02	2009-11-03 04:50:02	<input type="checkbox"/>
BBN015L1	●	320.8 GB	██████	Full	Default	LTO-2	2009-03-16 04:19:40	2010-03-16 04:19:40	<input type="checkbox"/>
BBN016L1	●	382.9 GB	██████	Full	Default	LTO-2	2009-04-25 03:27:10	2010-04-25 03:27:10	<input type="checkbox"/>
BBN017L1	●	407.1 GB	██████	Full	Default	LTO-2	2009-05-23 03:23:52	2010-05-23 03:23:52	<input type="checkbox"/>
BBN018L1	●	335.3 GB	██████	Full	Default	LTO-2	2009-06-24 03:32:27	2010-06-24 03:32:27	<input type="checkbox"/>

Eject Load Edit View Prune

Done

Autochanger View (in changer)



Bweb - Bacula Web Interface - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://localhost:9180/cgi-bin/bweb/bweb.pl?action=ach_view;ach=LTO-changer

Most Visited

Bweb - Bacula Web Interface

Main Clients Jobs Media Storages Statistics Configuration About search... Logged as

Autochanger: LTO-changer (2 Drives)

Tools

Label Update

Mount Umount

Drives:

Index	Drive Name	Volume Name	Select
0	LTO-changer	BBN008L1	<input type="checkbox"/>
1		empty	<input type="checkbox"/>

Content:

Real Slot	Slot	Volume Name	Vol Bytes	Vol Status	Media Type	Pool Name	Last Written	When expire ?	Select
1	1	BBN001L1	337.7 GB	Full	LTO-2	Default	2009-01-28 13:56:35	2010-01-28 13:56:35	<input type="checkbox"/>
2	2	BBN002L1	458.5 GB	Full	LTO-2	Default	2008-11-19 03:39:32	2009-11-19 03:39:32	<input type="checkbox"/>
3	3	BBN003L1	342.2 GB	Full	LTO-2	Default	2009-02-23 06:11:35	2010-02-23 06:11:35	<input type="checkbox"/>
4	4	BBN004L1	438.1 GB	Full	LTO-2	Default	2008-12-18 03:10:34	2009-12-18 03:10:34	<input type="checkbox"/>
5	5	BBN005L1	340.9 GB	Full	LTO-2	Default	2009-01-07 12:10:17	2010-01-07 12:10:17	<input type="checkbox"/>
6	6	BBN006L1	323.8 GB	Full	LTO-2	Default	2009-08-10 03:30:31	2010-08-10 03:30:31	<input type="checkbox"/>
7	7	BBN007L1	316.7 GB	Full	LTO-2	Default	2009-07-17 03:30:25	2010-07-17 03:30:25	<input type="checkbox"/>
8	8	BBN008L1	309.2 GB	Append	LTO-2	Default	2009-09-10 05:05:30	2010-09-10 05:05:30	<input type="checkbox"/>
9	9	BBN013L1	444.4 GB	Full	LTO-2	Default	2008-10-18 05:06:01	2009-10-18 05:06:01	<input type="checkbox"/>
10	10	BBN014L1	445.6 GB	Full	LTO-2	Default	2008-11-03 04:50:02	2009-11-03 04:50:02	<input type="checkbox"/>
11	11	BBN015L1	320.8 GB	Full	LTO-2	Default	2009-03-16 04:19:40	2010-03-16 04:19:40	<input type="checkbox"/>
12	12	BBN016L1	382.9 GB	Full	LTO-2	Default	2009-04-25 03:27:10	2010-04-25 03:27:10	<input type="checkbox"/>
13	13	BBN017L1	407.1 GB	Full	LTO-2	Default	2009-05-23 03:23:52	2010-05-23 03:23:52	<input type="checkbox"/>
14	14	BBN018L1	335.3 GB	Full	LTO-2	Default	2009-06-24 03:32:27	2010-06-24 03:32:27	<input type="checkbox"/>
15		empty							<input type="checkbox"/>
16		empty							<input type="checkbox"/>
17		empty							<input type="checkbox"/>

Done

Bacula Reliability



- Reliability designed in from the beginning
- Low level memory clobber and buffer loss checking
- Own code for vprintf – avoids exploits
- 10 – 20% of code cleaned up (refactored) each release
- Extensive regression testing
- User regression testing posted on dashboard nightly from many machines

Bacula Test Dashboard



CDash - bacula - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://regress.bacula.org/index.php?project=bacula

Most Visited

CDash - bacula

Login | Dashboards Friday, September 11 2009 20:44:05 CEST

BACULA Dashboard

DASHBOARD CALENDAR PREVIOUS CURRENT PROJECT

No file changed as of Friday, September 11 2009 00:00:00 CEST

Help

Nightly

Site	Build Name	Update		Configure			Build			Test			Build Time
		Files	Min	Error	Warn	Min	Error	Warn	Min	NotRun	Fail	Pass	
langille_polo_bacula_trunk	3.0.3-15Aug09-postgresql-freebsd-7.2-STABLE	0	0	0	0	0	0	0	0	1 +1	73 -1	57.4	2009-09-11T16:43:24 CEST
kern-maous-rhel64	3.1.3-06Sep09-sqlite3-centos-Enterprise	0	0	0	0	0	0	0	0	0 -1	76 +1	65	2009-09-11T00:12:30 CEST
tmu-bacula-debian-lenny	3.1.4-10Sep09-mysql-debian-5.0.3	0	0	0	0	0	0	0	0	0	76	42.9	2009-09-11T00:06:30 CEST
tmu-debian	3.1.4-10Sep09-mysql-debian-squeeze/sid	0	0	0	0	0	0	0	0	0	1	0	2009-09-11T00:06:02 CEST
fsweetser-bacula-test	3.1.4-10Sep09-mysql-fedora-8	0	0	0	0	0	0	0	0	0	76	45.5	2009-09-11T01:03:00 CEST
dasslT-bacula-regression-sles10-32	3.1.4-10Sep09-mysql-suse-10	0	0	0	0	0	0	0	0	0	76	41.6	2009-09-11T00:02:49 CEST
dasslT-bacula-regression-sles10-64	3.1.4-10Sep09-mysql-suse-10	0	0	0	0	0	0	0	0	0	76	42.1	2009-09-11T00:03:21 CEST
dasslT-bacula-regression-sles11-32	3.1.4-10Sep09-mysql-suse-11	0	0	0	0	0	0	0	0	0	76	41.8	2009-09-11T00:03:08 CEST
dasslT-bacula-regression-sles11-64	3.1.4-10Sep09-mysql-suse-11	0	0	0	0	0	0	0	0	0	76	42.6	2009-09-11T00:03:41 CEST

Done

Failed Job



CDash : bacula - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://regress.bacula.org/viewTest.php?onlyfailed&buildid=9208

Most Visited CDash : bacula

Login | Dashboards Friday, September 11 2009 20:46:06

BACULA Dashboard

DASHBOARD BACK CALENDAR PREVIOUS CURRENT PROJECT

Testing started on 2009-09-11 14:43:24

Site Name: langille_polo_bacula_trunk
Build Name: 3.0.3-15Aug09-postgresql-freebsd-7.2-STABLE
Total time: 57:25:00
OS Name: FreeBSD
OS Platform: amd64
OS Release: 7.2-STABLE
OS Version: FreeBSD 7.2-STABLE #0: Mon Aug 17 09:31:39 EDT 2009 dan@polo.unixathome.org:/usr/obj/usr/src/sys/PHENOM
Compiler Name: unknown
Compiler Version: unknown

1 tests failed.

Name	Status	Time Status	Time	Details	Labels
disk:accurate-test	Failed	Passed	156.00	Completed (Failed)	

Kitware

Generated in 0.014 seconds

CDash 1.4.2 © 2009 Kitware Inc.
[report problems]

Done

Failed Job Details



CDash : bacula - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://regress.bacula.org/testDetails.php?test=479562&build=9208

Most Visited CDash : bacula

Login | Dashboards Friday, September 11 2009 20:46:32

BACULA Dashboard

DASHBOARD BACK CALENDAR PREVIOUS CURRENT PROJECT

Site Name: langille_polo_bacula_trunk
Build Name: 3.0.3-15Aug09-postgresql-freebsd-7.2-STABLE
Build Date: 2009-09-11 16:43:24
Test Timing: Passed
disk:accurate-test Failed

Execution Time (s) 156.00 (mean:160.84 std:5.35)
Command Line /usr/home/dan/src/BaculaRegressionTesting-TRUNK/regress/tests/accurate-test
Completion Status Completed (Failed)
Exit Value 1

[Show Test Time Graph]
[Show Failing/Passing Graph]

Test output

```
==== Starting accurate-test at 10:43:52 ===

Starting the Bacula Storage daemon
Starting the Bacula File daemon
Starting the Bacula Director daemon
Connecting to Director localhost:8101
1000 OK: localhost-dir Version: 3.0.3 (15 August 2009)
Enter a period to cancel a command.
@output /dev/null
Connecting to Director localhost:8101
1000 OK: localhost-dir Version: 3.0.3 (15 August 2009)
Enter a period to cancel a command.
@tee /usr/home/dan/src/BaculaRegressionTesting-TRUNK/regress/tmp/log1.out
Done
```

Open Bugs Database



- Bugs database open to everyone
- Can find fixes to unusual problems
- <http://bugs.bacula.org>

Bacula Bugs Database



View Issues - Mantis - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://bugs.bacula.org/view_all_bug_page.php

Logged in as: kern (administrator) 2009-09-20 09:57 BST Project: bacula

Main | My View | View Issues | Report Issue | Change Log | Roadmap | Summary | Docs | Manage | Edit News | My Account | Logout Issue # Jump

Recently Visited: 0001359

Search: Apply Filter

Viewing Issues (1 - 16 / 16) [Print Reports] [CSV Export]

P	ID	#	Category	Severity	Status	Updated▼	Summary
<input type="checkbox"/>	0001359	8	Storage Daemon	major	feedback	2009-09-20	Doesn't compile on Alpha
<input type="checkbox"/>	0001376	1	bsmtp	minor	new	2009-09-17	bsmtp does not create a valid FROM field when a friendly name is used
<input type="checkbox"/>	0001362	4	Director	minor	feedback	2009-09-17	Cancel waiting jobs
<input type="checkbox"/>	0001371	13	Storage Daemon	crash	feedback	2009-09-16	Storage daemon crash during backup
<input type="checkbox"/>	0001374		dbcheck	tweak	new	2009-09-10	Cannot use -v -b -f unattended
<input type="checkbox"/>	0001372		Director	crash	new	2009-09-08	Director crash when "show jobs"
<input type="checkbox"/>	0001348	4	fd-plugin	major	assigned (james harper)	2009-09-07	Restoring to Exchange Recovery Storage Group crashes file daemon
<input type="checkbox"/>	0001368	1	File Daemon	crash	feedback	2009-09-06	ASSERT name_max+1 > (int)sizeof(struct dirent) + (int)NAMELEN(entry) in find_one.c fails
<input type="checkbox"/>	0001367	3	PostgreSQL	minor	feedback (Dan Langille)	2009-09-03	use of DISTINCT in query.sql yields poor results
<input type="checkbox"/>	0001343	20	Storage Daemon	crash	feedback	2009-09-01	SD segfaults and dies during jobs
<input type="checkbox"/>	0001356	7	Director	major	feedback	2009-09-01	Failure to recycle volumes and SD reads FD data as a command.
<input type="checkbox"/>	0001352	1	Win32 File Daemon (client)	crash	acknowledged	2009-08-31	Windows FD crashes with double free in smartall.c when doing directory listing
<input type="checkbox"/>	0001361	2	Storage Daemon	minor	new	2009-08-31	Storage daemon does not issue umount command for File backup devices
<input type="checkbox"/>	0001332	8	Storage Daemon	minor	feedback	2009-08-14	AlwaysOpen does not act as expected for Full-Backups with 3.0.1
<input type="checkbox"/>	0001288	6	Storage Daemon	major	feedback	2009-07-30	Concurrent jobs fail
<input type="checkbox"/>	0001297	10	Director	major	feedback	2009-07-16	Bacula pulls too many volumes from Scratch pool

Select All

new feedback acknowledged confirmed assigned resolved closed

E-Mail - Kon View Issue 16°C 1

Bacula Bugs Database



0001359: Doesn't compile on Alpha - Mantis - Mozilla Firefox

File Edit View History Bookmarks Tools Help

<http://bugs.bacula.org/view.php?id=1359>

 MANTIS

Logged in as: kern (administrator)

2009-09-20 09:58 BST

Project: bacula Switch RSS

Main | My View | View Issues | Report Issue | Change Log | Roadmap | Summary | Docs | Manage | Edit News | My Account | Logout

[Issue #] [Jump]

Recently Visited: 0001359

Viewing Issue Advanced Details		Jump to Notes Send a reminder		[>]		[Issue History] [Print]	
ID	Category	Severity	Reproducibility	Date Submitted	Last Update		
0001359	[bacula] Storage Daemon	major	always	2009-08-28 22:52	2009-09-20 07:20		
Reporter	jgoerzen	View Status	public				
Assigned To							
Priority	normal	Resolution	open	Platform	alpha		
Status	feedback				OS	debian	
Projection	none				OS Version	unstable	
ETA	none	Fixed In Version				Product Version	3.0.2
		Target Version				Product Build	
Summary	0001359: Doesn't compile on Alpha						
Description	<p>During the attempt to autobuild bacula 3 on Debian, this error was reported:</p> <pre>make[1]: Entering directory '/build/builddd-bacula_3.0.2-3-alpha-1PGthy/bacula-3.0.2/debian/tmp-build-sqlite3/src/stored' Compiling dev.c dev.c: In member function 'void DEVICE::init_backend()': dev.c:307: error: invalid conversion from 'int (*)(int, long unsigned int, ...)' to 'int (*)(int, int, ...)' make[1]: *** [dev.o] Error 1 make[1]: Leaving directory '/build/builddd-bacula_3.0.2-3-alpha-1PGthy/bacula-3.0.2/debian/tmp-build-sqlite3/src/stored' make: *** [build-stamp-sqlite3] Error 2</pre> <p>The full error log is available at https://buildd.debian.org/etch/cgi?pkg=bacula_ver=3.0.2-3;arch=alpha;stamp=1251420917 [^]</p> <p>The line of source in question is</p> <pre>d_ioctl = ::ioctl;</pre> <p>Version 2.4.4 successfully built on this platform.</p>						
Steps To Reproduce							
Done							

Development Roadmap



- Version 3.0.3 bug fix to be released by mid-October
- Version 3.2.0 to be released after 1 January 2010
- New 3.2.0 features
 - ✓ Maximum Concurrent Jobs for Devices
 - ✓ Enhancements to Accurate backup
 - ✓ Restore from multiple Storage daemons
 - ✓ File deduplication with Base Jobs
 - ✓ Bacula virtual catalog filesystem API
 - ✓ Enhanced tape drive testing functionality

Development Roadmap (cont)



- New 3.2.0 features
 - ✓ Disable block checksums (performance)
 - ✓ New Bat functionality
 - ✓ Restart failed Jobs recovering what was already save
 - ✓ File daemon drops root permission but can backup all files



Future Projects

- Deduplication
 - ✓ Base Job deduplication
 - ✓ “rsync” to server tree
 - ✓ Rdiff using precomputed hash codes
 - ✓ Laptop backup (similar to BackupPC)
- Archive
 - ✓ Jobs kept forever
 - ✓ Partitioned catalog
 - ✓ Move catalog data to another database
- Management Console (perhaps bweb)
 - ✓ Control of multiple Directors
- Write to multiple Storage daemons



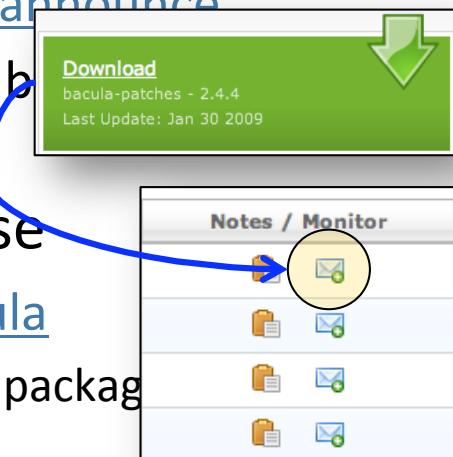
Resources – Email lists

- **bacula-users**
 - ✓ General forum to ask or respond to questions about Bacula from other users.
 - All users are encouraged to subscribe and participate
 - ✓ **Sign up at:** <http://lists.sourceforge.net/lists/listinfo/bacula-users>
 - ✓ Once subscribed, send email to the Bacula Users List at:
 - bacula-users@lists.sourceforge.net
- **bacula-devel**
 - ✓ For communication directly with developers
 - ✓ **Sign up at:** <http://lists.sourceforge.net/lists/listinfo/bacula-devel>
 - ✓ Email address: bacula-devel@lists.sourceforge.net



Typical Open Source Resources

- Bugs database (<http://bugs.bacula.org>)
- Bacula Wiki (<http://wiki.bacula.org>)
- Bacula Email Lists
 - ✓ <http://www.bacula.org> ↳ Email Lists
- **Recommended:** bacula-announce
 - ✓ Sign up at:
<http://lists.sourceforge.net/lists/listinfo/bacula-announce>
 - ✓ Read-only low volume list for users who wish to be informed about important events (bugs, new releases, ...)
- For email notification of new package release
 - ✓ Sign up at: <http://sourceforge.net/projects/bacula>
 - Click on Download, then Monitor next to desired package





Resources – Email lists

- **Recommended:** bacula-bugs (Notification about new bugs)
 - ✓ <http://bugs.bacula.org>
 - ✓ **Sign up at:** <http://lists.sourceforge.net/lists/listinfo/bacula-bugs>
- bacula-beta (Notification of new beta releases)
 - ✓ **Sign up at:** <http://lists.sourceforge.net/lists/listinfo/bacula-beta>
- Bacula-commits (diff of each commit to the SVN)
 - ✓ Normally used only by developers
 - **Sign up at:** <http://lists.sourceforge.net/lists/listinfo/bacula-commits>
- Archives (Available on Source Forge, and Gmane)
 - ✓ <http://news.gmane.org/search.php?match=bacula>



Resources

- Support options
 - ✓ Professional support – from Bacula Systems or authorized partners
 - ✓ Other professional support
 - ✓ Free support – from the Bacula community
- Bacula Systems Support
 - ✓ Professional support on a fee-paid basis:
 - <http://www.baculasystems.com>
- Bacula Community Support
- On an as-available basis (users), by email:
 - ✓ bacula-users@lists.sourceforge.net

Bacula Systems Support



- If the code is free why do I need a support contract?
 - ✓ Insurance policy in case of problems
 - ✓ Ticket system
 - ✓ Guaranteed response to questions and problems
 - ✓ Priority bug fixing
 - ✓ Funded development
 - ✓ Configuration verification
 - ✓ Advanced information on development projects
 - ✓ Input to development project priorities
 - ✓ Direct contact with the Bacula developers
 - ✓ Bacula Enterprise Edition binaries

Thank You



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