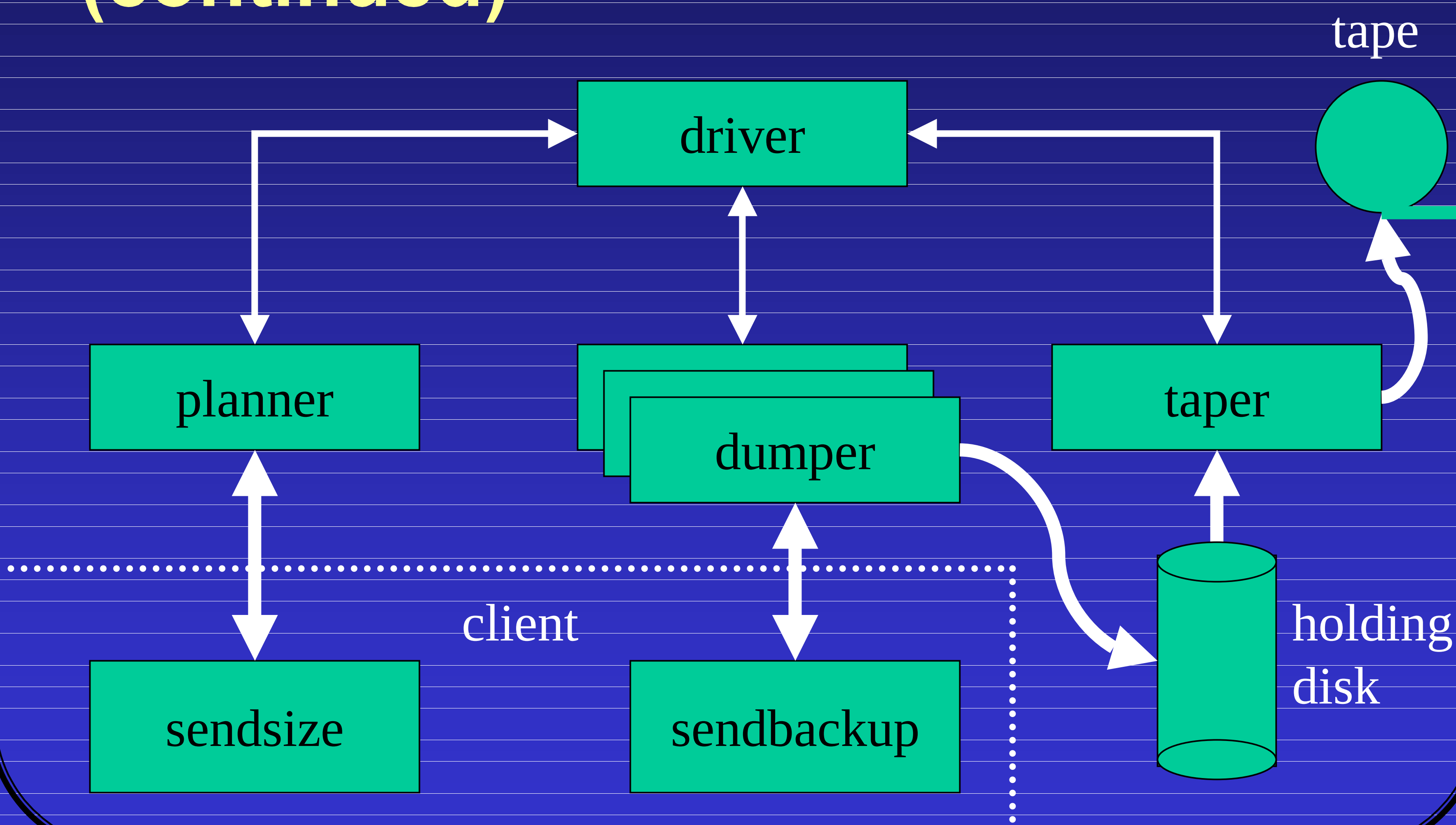
AMANDA
Under the Hood

John R. Jackson
Purdue University Computing Center
jrj@purdue.edu

Overview

- Not a backup program itself
- Manages other standard backup programs
  - System dump
  - GNU tar
  - smbtar
- Optimized schedule
  - Dump cycle
  - Tape cycle
  - Estimated image sizes

Overview (continued)



Planner

- Get estimated image sizes
  - sendsize on client
  - Level 0
  - Same level as last time
  - Next level
  - etimeout * number of disks
- Analyze and pick initial level
- Delay full dumps if total size too big
- Promote full dumps if total size too small
- Sort by “priority”, then size

Strategy

- standard
- nofull
- noinc
- incronly
- skip

Driver

- Gets sorted list from planner
  - Normal level
  - Degraded mode level
- Starts one or more dumpers (inparallel)
- Starts one taper

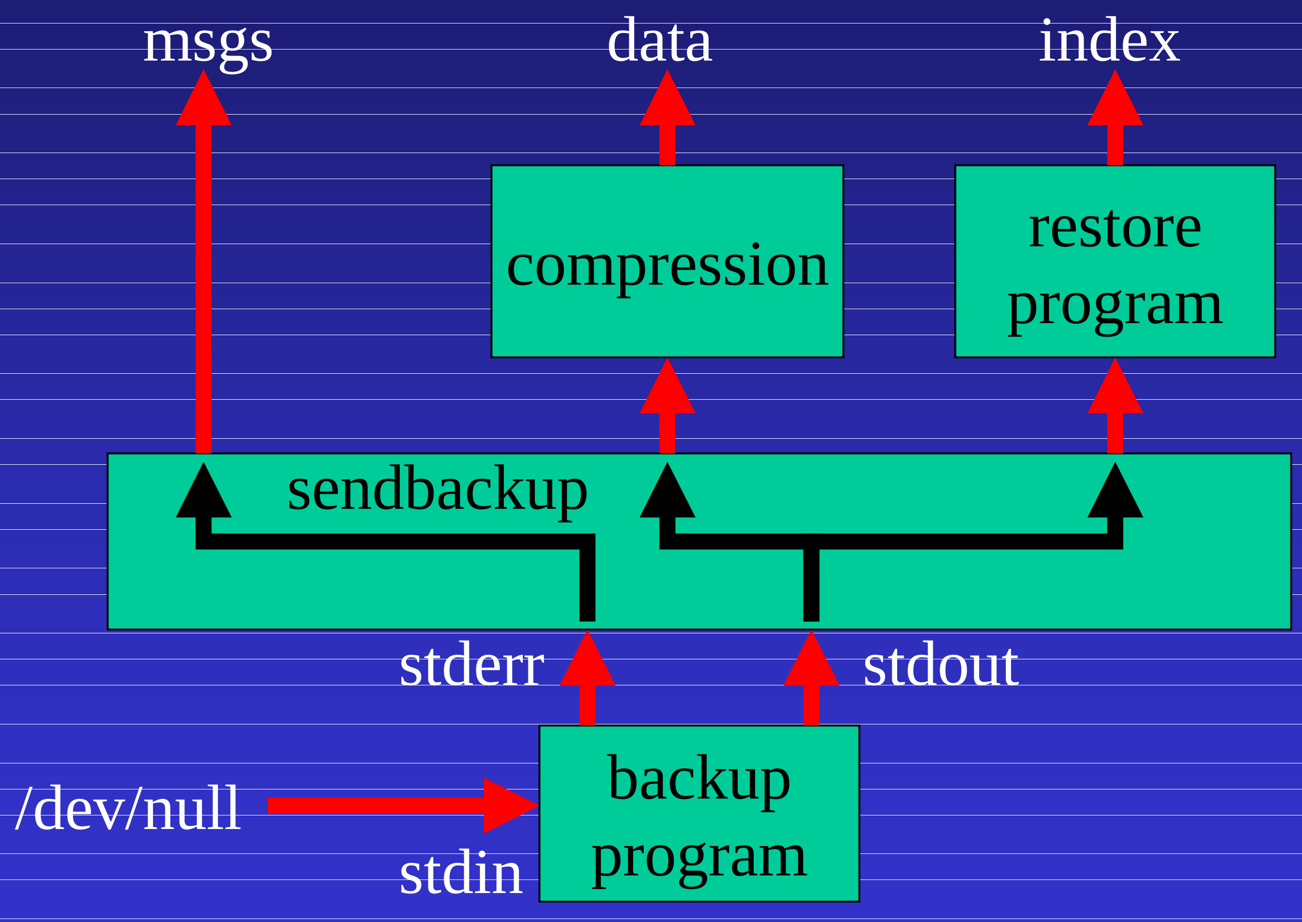
Driver (continued)

- Pick from beginning or end of queue?
- Is it time to start this host?
- Is it time to start this disk?
- Is there enough bandwidth?
- Is there enough holding disk space?
- Is use of a holding disk allowed?
- Are we below the client maxdumps limit?
- Is this a different spindle?

Dumper

- Start sendbackup on client
  - Messages port
  - Data port (possibly encrypted)
  - Index port (optional)
- Insert server side compression if requested
- If “FILE-DUMP”:
  - Write tape header to holding disk chunk
  - Write data stream to holding disk chunk
  - Request new holding disk chunks from driver as needed
- Else (“PORT-DUMP”):
  - Pass image to taper via localhost TCP connection

Sendbackup


msgs
data
index
compression
restore
program
sendbackup
stderr
stdout
/dev/null
stdin
backup
program

Taper

- Run tape changer
- Validate proper tape is mounted and rewrite label
- Handle FILE-WRITE and PORT-WRITE commands
- Write image to tape in 32 Kbyte chunks
- Fail or advance to next tape on error

Taper (continued)

- Split into reader and writer
- Shared memory buffer (e.g. 20 * 32 Kbytes)
- Writer waits for all buffers full (or done)
- Writer outputs as fast as possible for streaming
- On error:
  - Advance to next tape if changer
  - Driver starts whole image over again

Amandad

- UDP for now
- Client has no access to amanda.conf
- Security checks
- Run requested “service”
  - selfcheck
  - sendsize
  - sendbackup

Files

- Curinfo
- Tapelist

  200000525 B00116 reuse

  200000524 B00115 reuse

  ...
- log.<YYYYMMDD>.<n>
  - Updated by driver, dumper and taper
  - Used by amreport to generate E-mail
- amdump.<n>
  - detailed status
  - stdout/stderr from all programs
  - used by amstatus
- /tmp/amanda/*.debug

Administrative Tools

- amcheck
- amdump
- amflush
- amadmin
- amstatus
- amplot
- amverify

Administrative Tools (continued)

- amtoc
- amlabel
- amrmtape
- amtape
- amcleanup
- amreport

Tape Format

Label
Tapemark
Header
Image
Tapemark
Header
Image
...

Tape Format (continued)

- No rewind!!!
- System-V access method, not BSD
- Tape label

  AMANDA: TAPESTART DATE 20000525 TAPE B00116
- Image header

  AMANDA: FILE 20000525 fortress.cc.purdue.edu / lev 1 comp N program /usr/sbin/ufsdump

  To restore, position tape at start of file and run:

  ```
  dd if=<tape> bs=32k skip=1 | /usr/sbin/ufsrestore –f… -
  ```

Amrestore

- Takes host, disk and datestamp patterns
- Scans for all or first match
- Usually gives back image ready for restore
- Does not use any other AMANDA information

Amrecover

- Runs on client
- Talks to amindexd on server to get file data
- Talks to amidxtaped on tape host to read images
- FTP-like interface and protocol

Typical Problems

- Check/Estimate/Data timeouts
- Access not allowed
- Host down
- Disk offline
- I/O error
- port NN not secure
- Broken pipe