Bareos Expert Circle 27.03.25

bareos

open source data protection

AGENDA

- Highlights Bareos 24

- RoadMap Bareos 25

DEDUPABLE STORAGE BACKEND

STANDARD STORAGE FORMAT

- the storage format is the same for **tape** and for **file**

- It was designed as format for tapes, so it can be streamed

- No random access is required

- Efficient usage of storage space

- Restore is possible with commandline tools

STANDARD STORAGE FORMAT

- The format consists of records and blocks

- records and blocks have headers with checksums and other data

- identical original blocks look different if backed up twice

- not suitable for fixed block deduplication

`storage/Full-0001`
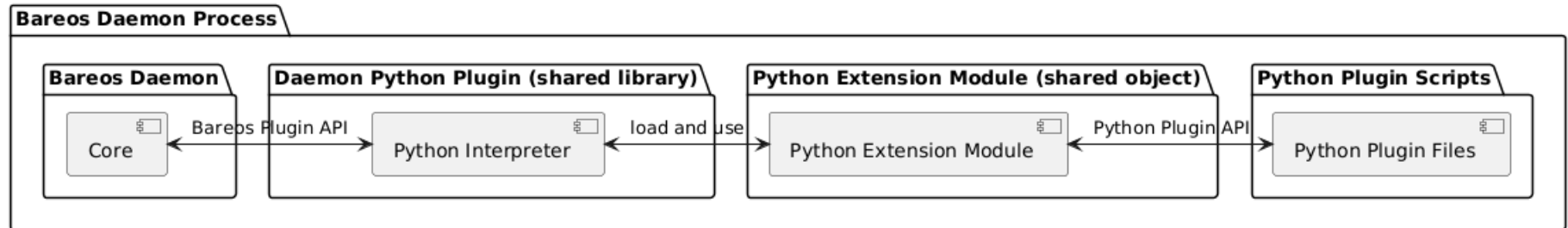
DEDUPABLE STORAGE FORMAT

- creates a subdirectory with multiple files for each volume

- writes the data into multiple files

- writes blocks on block borders

- supports different blocksizes

DEDUPABLE VOLUME SUBDIRECTORY

```
storage/Full-0001
storage/Full-0001/blocks
storage/Full-0001/unaligned.data
storage/Full-0001/aligned.data
storage/Full-0001/records
storage/Full-0001/config
```

SEPARATE PYTHON PROCESS

CURRENT ARCHITECTURE

Bareos Daemon Process

Bareos Daemon	Daemon Python Plugin (shared library)	Python Extension Module (shared object)	Python Plugin Scripts
Core	Python Interpreter	Python Extension Module	Python Plugin Files

Bareos Plugin API — load and use — Python Plugin API

- plugin runs python subinterpreter for every job

- runs in the process space of the filedaemon

- interpreters share one GIL

- subinterpreters are rarely used

NEW ARCHITECTURE
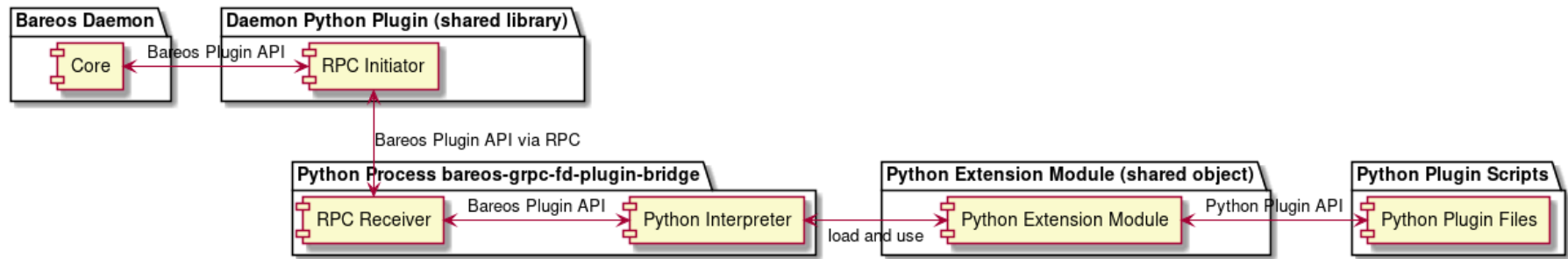
- independent process for the python interpreter

- A full python interpreter (not subinterpeter) is run

- plugin API calls via RPC

- API stays the same

JUST-IN-TIME DEVICE RESERVATION

CURRENT RESERVATION LOGIC

- bareos jobs reserve the devices very early

- a long time can pass between the reservation of the device until data is written

- sometimes even nothing needs to be written

- expensive tape drives are reserved for a long time and cannot be used by other jobs

JUST-IN-TIME LOGIC

- reserves the device **when data needs to be written**

- the drive is reserved while data is written

- no reservation is done when job has no data

WORM TAPE SUPPORT

- WORM = **W**rite **O**nce **R**ead **M**any

- Media that cannot be overwritten

TAPE LABELING PROCESS

- volume labeling logic in Bareos 23 prevents the use of WORM tapes

- volume labeling has two phases:

  - first a **pre-label** is written during labeling

  - then a **final** label is written on first write

- this is an overwrite of the label block which is impossible on WORM media

NEW TAPE LABELING PROCESS

- one-phase labeling instead of two-phase labeling

- a **final** label is written on first write

- WORM tapes can be used

ROADMAP BAREOS 25

The following new features are currently being evaluated:

PROXMOX PLUGIN

- Proxmox is has its own backup tools for VMs

- Full Backup can be easily implemented

- Incremental Backups is ongoing research

HYPER-V PLUGIN

- Microsoft has multiple APIs to make backups

- Ongoing research which API is the right one

THANK YOU VERY MUCH!

- Documentation: docs.bareos.org

- Mailinglist: bareos-users@googlegroups.com

- x.com/bareos_backup

- Sourcecode: github.com/bareos/bareos

- subscription, support, consulting available via: www.bareos.com

- philipp.storz@bareos.com