

Borg Backup 是目前最受欢迎，用户量最大的一个备份支持程序，支持去重和压缩，同时也支持认证加密。其主要目的是提供一个高效而且安全的方法用于数据备份。数据的去重技术用于每日增量备份。它支持Linux、MacOS和BSD，并遵循BSD许可协议

官网: <https://www.borgbackup.org/>

github: <https://github.com/borgbackup/borg>

## 安装

```
apt-get install borgbackup
```

验证安装: `borg --version`

## 使用

两个重要术语:

- 档案: 您的数据的备份副本 (快照) 将被称为档案。
- 存储库: 本地或远程文件系统中存储档案的目录。

### 初始化存储库

执行 `borg init` 命令初始化备份目录。备份目录可以在本地机器或远程机器中。

```
borg init --encryption=none /tmp/borg-backup
# --encryption 指定加密类型，当您使用加密类型为"None"时，不会应用任何加密，当您使用"repokey"和"keyfile"作为加密类型时，它使用AES-CTR-256进行加密
```

### 创建备份

初始化存储库后，可以通过运行以下命令来创建备份存档:

```
borg create --stats --progress --compression=lz4 /tmp/borg-backup::backup1 /tmp/sources
# --stats print statistics for the created archive
# --compression 指定压缩算法
```

```
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources# echo 1234 > a.txt
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources# borg create --stats --progress --compression=lz4 /tmp/borg-backup::backup1 /tmp/sources
-----
Repository: /tmp/borg-backup
Archive name: backup1
Archive fingerprint: 87fb2d3ccae8417ac5a60f93fcb37db578025cfe8207afb1c6b5f60285ed307
Time (start): Wed, 2023-07-12 04:09:12
Time (end): Wed, 2023-07-12 04:09:12
Duration: 0.00 seconds
Number of files: 1
Utilization of max. archive size: 0%
-----

```

	Original size	Compressed size	Deduplicated size
This archive:	546 B	509 B	509 B
All archives:	5 B	8 B	693 B

```
-----
Chunk index: Unique chunks 3 Total chunks 3
-----
```

可以使用 `--exclude` 参数指定不备份的文件

一个repo的结构示例如下，它是二进制形式保存的

```
root@ubuntu:/tmp/borg-backup# tree
.
├── config
├── data
│   └── 0
│       ├── 0
│       ├── 1
│       ├── 10
│       ├── 11
│       ├── 12
│       ├── 13
│       ├── 2
│       ├── 3
│       ├── 4
│       ├── 5
│       ├── 6
│       ├── 7
│       ├── 8
│       └── 9
├── hints.13
├── index.13
├── integrity.13
├── lock.roster
└── README

2 directories, 20 files
root@ubuntu:/tmp/borg-backup#
```

## 获取存档信息

您可以使用该info命令来获取有关特定存档的信息。

```
borg info /tmp/borg-backup/::backup1
```

```
root@ubuntu:/tmp/sources# borg info /tmp/borg-backup/::backup1
Archive name: backup1
Archive fingerprint: 87fb2d3ccae8417ac5a60f93fcb37db578025cfe8207afb1c6b5f60285ed307
Comment:
Hostname: ubuntu
Username: root
Time (start): Wed, 2023-07-12 04:09:12
Time (end): Wed, 2023-07-12 04:09:12
Duration: 0.00 seconds
Number of files: 1
Command line: /usr/bin/borg create --stats --progress --compression=lz4 /tmp/borg-backup::backup1 /tmp/sources
Utilization of maximum supported archive size: 0%
-----
                Original size      Compressed size    Deduplicated size
This archive:           5 B             8 B             693 B
All archives:           5 B             8 B             693 B
-----
                Unique chunks        Total chunks
Chunk index:              3              3
```

## 列出备份

使用list命令，您可以查询您的存储库以查找档案列表以及档案中包含哪些文件。

```
borg list /tmp/borg-backup/
```

可以使用该 `--json` 参数，它将以json格式输出信息

```
root@ubuntu:/tmp/sources# borg list /tmp/borg-backup/
backup1                                Wed, 2023-07-12 04:09:12 [87fb2d3ccae8417ac5a60f93fcb37db578025cfe8207afb1c6b5f60285ed307]
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources# borg list /tmp/borg-backup/ --json
{
  "archives": [
    {
      "archive": "backup1",
      "barchive": "backup1",
      "id": "87fb2d3ccae8417ac5a60f93fcb37db578025cfe8207afb1c6b5f60285ed307",
      "name": "backup1",
      "start": "2023-07-12T04:09:12.000000",
      "time": "2023-07-12T04:09:12.000000"
    }
  ],
  "encryption": {
    "mode": "none"
  },
  "repository": {
    "id": "e1ee833207f66475821adddf80a31466e29ef26de0416abc67db434f234fb2e5",
    "last_modified": "2023-07-12T04:09:12.000000",
    "location": "/tmp/borg-backup"
  }
}
```

指定标签，可以列出指定标签下的文件

```
borg list /tmp/borg-backup::backup1
```

```
root@ubuntu:/tmp/sources# borg list /tmp/borg-backup::backup1
drwxr-xr-x root    root          0 Wed, 2023-07-12 04:09:05 tmp/sources
-rw-r--r-- root    root          5 Wed, 2023-07-12 04:09:05 tmp/sources/a.txt
```

找出档案之间的差异

使用diff命令来比较两个存档

```
borg diff /tmp/borg-backup/::backup1 backup2
```

```
root@ubuntu:/tmp/sources# echo abcdefg > b.txt
root@ubuntu:/tmp/sources# echo aaaaaaa > a.txt
root@ubuntu:/tmp/sources# mkdir test1
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources# borg create ^C
root@ubuntu:/tmp/sources# borg create --stats --progress --compression=lz4 /tmp/borg-backup::backup2 /tmp/sources
Repository: /tmp/borg-backup
Archive name: backup2
Archive fingerprint: 1dcd8a75c710fcd8b11ff7ae230e5c9638814e67c70f0098758d87c02ef86f47
Time (start): Wed, 2023-07-12 04:18:56
Time (end):   Wed, 2023-07-12 04:18:56
Duration: 0.00 seconds
Number of files: 2
Utilization of max. archive size: 0%
-----
This archive:      Original size   Compressed size   Deduplicated size
All archives:      557 B             523 B             523 B
                   21 B             30 B             1.48 kB
-----
Unique chunks      Total chunks
Chunk index:       7              7
-----
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources#
root@ubuntu:/tmp/sources# borg diff
a.txt b.txt test1/
root@ubuntu:/tmp/sources# borg diff /tmp/borg-backup/::backup1 backup2
+8 B      -5 B tmp/sources/a.txt
added     8 B tmp/sources/b.txt
added directory tmp/sources/test1
```

重命名档案

创建存档后，如果您想重命名它，您可以使用该 `borg rename` 命令来完成。

```
borg rename /tmp/borg-backup/::oldname newname
```

## 恢复文件（从存档中提取数据）

使用 `borg extract` 命令从档案中检索数据，它会将数据提取到您从中运行提取命令的当前工作目录。

```
borg extract -v --list /tmp/borg-backup/::backup1
```

```
root@ubuntu:/tmp# mkdir test
root@ubuntu:/tmp# cd test/
root@ubuntu:/tmp/test# borg extract -v --list /tmp/borg-backup/::backup1
tmp/sources
tmp/sources/a.txt
root@ubuntu:/tmp/test# ls -alh
total 12K
drwxr-xr-x  3 root root 4.0K Jul 12 04:24 .
drwxrwxrwt 16 root root 4.0K Jul 12 04:24 ..
drwx----- 3 root root 4.0K Jul 12 04:24 tmp
root@ubuntu:/tmp/test# tree
.
├── tmp
│   └── sources
│       └── a.txt
2 directories, 1 file
root@ubuntu:/tmp/test#
```

可以通过传递目录名称从存档中提取特定目录。

```
borg extract -v --list /tmp/borg-backup/::backup2 tmp/sources/test1/
```

可以使用 `--exclude` 在提取目录时省略文件

```
borg extract -v --list /tmp/borg-backup/::backup2 --exclude="a"
```

## 挂载和卸载存储库和档案

可以将存储库或特定存档挂载为文件系统，然后，您可以使用恢复特定的文件

```
mkdir /tmp/mnt/
borg mount /tmp/borg-backup/ /tmp/mnt/
ls -alh /tmp/mnt/
```

```

root@ubuntu:/tmp/test# mkdir /tmp/mnt
root@ubuntu:/tmp/test# borg mount /tmp/borg-backup/ /tmp/mnt/
root@ubuntu:/tmp/test# cd /tmp/mnt/
root@ubuntu:/tmp/mnt# ls -alh
total 4.0K
drwxr-xr-x  1 root root    0 Jul 12 04:33 .
drwxrwxrwt 17 root root 4.0K Jul 12 04:33 ..
drwxr-xr-x  1 root root    0 Jul 12 04:09 backup1
drwxr-xr-x  1 root root    0 Jul 12 04:18 backup2
drwxr-xr-x  1 root root    0 Jul 12 04:28 backup3
root@ubuntu:/tmp/mnt# tree
.
├── backup1
│   └── tmp
│       └── sources
│           └── a.txt
├── backup2
│   └── tmp
│       └── sources
│           ├── a.txt
│           ├── b.txt
│           └── test1
└── backup3
    └── tmp
        └── sources
            ├── a.txt
            ├── b.txt
            └── test1
                └── aaa

11 directories, 6 files

```

也可以挂载指定的标签

```
borg mount /tmp/borg-backup/::backup1 /tmp/mnt/
```

使用 `borg umount` 命令可以取消挂载。

```
borg umount /tmp/borg
```

## 删除存储库和存档

使用 `borg delete` 命令删除存档或整个存储库。

```

# 删除单个存档
borg delete /tmp/borg-backup/::backup1

# 删除整个存档
borg delete /tmp/borg-backup

```

## 使用远程存储库

Borg 还支持远程存储库，您可以在其中备份任何远程机器上的数据。远程主机应该可以通过 SSH 访问。

```

# 初始化存储库
borg init ssh://user@hostname:/path/to/repo

# 创建远程备份
borg create --stats --progress --compression=lz4
user@hostname:/path/to/repo::backup1 /tmp/sources

```

## 另外的命令

benchmark	benchmark command
break-lock	break repository and cache locks
check	verify repository
compact	compact segment files / free space in repo
config	get and set configuration values
create	create backup
debug	debugging command (not intended for normal use)
delete	delete archive
diff	find differences in archive contents
export-tar	create tarball from archive
extract	extract archive contents
info	show repository or archive information
init	initialize empty repository
key	manage repository key
list	list archive or repository contents
mount	mount repository
prune	prune archives
recreate	Re-create archives
rename	rename archive
serve	start repository server process
umount	umount repository
upgrade	upgrade repository format
with-lock	run user command with lock held
import-tar	Create a backup archive from a tarball