

APT Repositories

Why are we here?

- We would like to support multi-versioned packages for each channel.
- Currently, we only support `stable`.
- We use `aptly`, let's re-evaluate that tool in addition to several others.

Goals

- In addition to *main*, support *beta* and *nightly* distributions
- So, support 3 distributions and 1 component (*main*)
- If possible, don't change current process and what is currently documented:
 - `add-apt-repository "deb https://releases.algorand.com/deb/ stable main"`
 - `apt install algorand`

<https://developer.algorand.org/docs/run-a-node/setup/install/>

Goals (cont.)

- Add repository location

- `add-apt-repository "deb
https://releases.algorand.com/deb/ stable main"`
- `add-apt-repository "deb
https://releases.algorand.com/deb/ beta main"`
- `add-apt-repository "deb
https://releases.algorand.com/deb/ nightly main"`

Goals (cont.)

- Install latest package

- `apt install algorand`
- `apt install algorand-beta`
- `apt install algorand-nightly`

- Install previous package

- `apt install algorand=2.0.2`
- `apt install algorand-beta=2.0.10`
- `apt install algorand-nightly=1.9.118`

Basics of an APT repository

Typical entry in `sources.list`

- `deb https://releases.algorand.com/deb/ stable main`
 - **stable** = the distribution
 - For example, Debian has three:
 - *stable*
 - *testing*
 - *unstable*
 - **main** = the component
 - For example, Debian has the following package groupings:
 - *main*
 - *non-free*
 - *contrib*

Automatic architecture

```
deb https://releases.algorand.com/deb/ stable main
```

```
dists/  
├── stable  
│   ├── InRelease  
│   ├── Release  
│   ├── Release.gpg  
│   └── main  
│       ├── Contents-amd64.gz  
│       └── binary-amd64  
│           ├── Packages  
│           ├── Packages.bz2  
│           ├── Packages.gz  
│           └── Release
```

...

Two distributions, one component

```
deb https://releases.algorand.com/deb/ stable main
deb https://releases.algorand.com/deb/ beta main
```

```
dists/
├── beta
│   ├── InRelease
│   ├── Release
│   ├── Release.gpg
│   └── main
│       ├── Contents-amd64.gz
│       └── binary-amd64
│           ├── Packages
│           ├── Packages.bz2
│           ├── Packages.gz
│           └── Release
└── stable
    ├── InRelease
    ├── Release
    ├── Release.gpg
    └── main
        ├── Contents-amd64.gz
        └── binary-amd64
            ├── Packages
            ├── Packages.bz2
            ├── Packages.gz
            └── Release
```

One distribution, multiple components

```
deb https://releases.algorand.com/deb/ stable main 2.0.3 2.0.2 2.0.1
```

```
dists/  
├── algorand  
│   ├── 2.0.1  
│   │   ├── binary-amd64  
│   │   │   ├── Packages  
│   │   │   ├── Packages.gz  
│   │   │   └── Release  
│   ├── 2.0.2  
│   │   ├── binary-amd64  
│   │   │   ├── Packages  
│   │   │   ├── Packages.gz  
│   │   │   └── Release  
│   ├── 2.0.3  
│   │   ├── binary-amd64  
│   │   │   ├── Packages  
│   │   │   ├── Packages.gz  
│   │   │   └── Release  
│   ├── InRelease  
│   ├── Release  
│   ├── Release.gpg  
│   └── main  
│       ├── binary-amd64  
│       │   ├── Packages  
│       │   ├── Packages.gz  
│       │   └── Release
```

File structure of a distribution

beta

- |— InRelease
- |— Release
- |— Release.gpg
- └─ main
 - |— Contents-amd64.gz
 - └─ binary-amd64
 - |— Packages
 - |— Packages.bz2
 - |— Packages.gz
 - └─ Release

Control Files

- TODO

Let's dig into the files...

Release (beta/Release)

Origin: . beta

Label: . beta

Suite: beta

Codename: beta

Date: Mon, 9 Mar 2020 22:59:15 UTC

Architectures: amd64

Components: main

Description: Generated by aptly

MD5Sum:

| | |
|----------------------------------|------------------------------------|
| 3fbd64cdc18ac71e24061812a10a234 | 264 main/Contents-amd64.gz |
| 6ddc4fc89df4a8ea4c6f53e75a6229cc | 1328 main/binary-amd64/Packages |
| 572e59537e8383caa648ea6f3041c3ef | 725 main/binary-amd64/Packages.bz2 |
| 432e6642e24ee54e8a8395abd45b6362 | 649 main/binary-amd64/Packages.gz |
| 9973160583bcd5831e6dcb3d884fe5e | 79 main/binary-amd64/Release |

SHA1:

| | |
|--|------------------------------------|
| fcf0ac529a199e79062278896b56ae2cba99b853 | 264 main/Contents-amd64.gz |
| 85b11ac975f2cf4a53175755de022d8c23e34d17 | 1328 main/binary-amd64/Packages |
| 294cd6486e6a385a59b7244260f830aa539aa32b | 725 main/binary-amd64/Packages.bz2 |
| 5eeae26d86e5e52df95b4793cf3a20624f5ea6f1 | 649 main/binary-amd64/Packages.gz |
| e2ff5924846c6f46109a1c66acdab69977926248 | 79 main/binary-amd64/Release |

SHA256:

...

SHA512:

...

Contents-amd64.gz (beta/main/Contents-amd64.gz)

FILE LOCATION

etc/apt/apt.conf.d/51algorand-upgrades algorand-beta

lib/systemd/system/algorand.service algorand-beta

lib/systemd/system/algorand@.service algorand-beta

usr/bin/algoconfig algorand-beta

usr/bin/algod algorand-beta

usr/bin/algokey algorand-beta

usr/bin/algokey algorand-beta

usr/bin/carpenter algorand-beta

usr/bin/catchupsrv algorand-beta

usr/bin/ddconfig.sh algorand-beta

usr/bin/diagcfg algorand-beta

usr/bin/goal algorand-beta

usr/bin/kmd algorand-beta

usr/bin/msgpacktool algorand-beta

usr/bin/node_exporter algorand-beta

usr/lib/algorand/find-nodes.sh algorand-beta

usr/lib/algorand/updater algorand-beta

usr/share/doc/algorand/copyright algorand-beta

var/lib/algorand/config.json.example algorand-beta

var/lib/algorand/genesis.json algorand-beta

var/lib/algorand/system.json algorand-beta

Release (beta/main/binary-amd64/Release)

Origin: . beta

Label: . beta

Archive: beta

Architecture: amd64

Component: main

Packages (beta/main/binary-amd64/Packages)

Package: algorand-beta

Maintainer: Algorand developers <dev@algorand.com>

Architecture: amd64

Version: 2.0.64923

Recommends: unattended-upgrades

Filename: pool/main/a/algorand-beta/algorand_2.0.64923_amd64.deb

Size: 104334184

MD5sum: ff1138bc04c3bc4262a595fa40025f56

SHA1: 9789280fd6ea7819abda15bb5579a2327b3d5bbb

SHA256: 71efb60daecbfd99817a4f912eadcbd3371956a5eb6ee128809bb9eda6d4ee7d

SHA512: 9f60aae9640f790085fc5f664ec94404fc588d9bb9d94c301f1f191f5ae7248b01f856988355fc576e9430b0472912aad4d1684310293a3a8ec1a9c74ba4e660

Description: Algorand node software

This package provides an implementation of the Algorand protocol.

Homepage: <https://www.algorand.com/>

Package: algorand-beta

Maintainer: Algorand developers <dev@algorand.com>

Architecture: amd64

Version: 2.0.64818

Recommends: unattended-upgrades

Filename: pool/main/a/algorand-beta/algorand_2.0.64818_amd64.deb

Size: 104341260

MD5sum: b8ee2e877f001838b7cdb650b1d6e1ee

SHA1: 306c0210064ffac7e000b014b7d119d13176784c

SHA256: a8a6ed047aaeb4fecfd5f63d956134d3e65b0f4a3cc5b7cec79f68dab5a6539e

SHA512: a03e783af2da192cde0bedb08d0c57ab8a331f9d3f7d82316b2254e87f51cf468bec38cb4dfe3a86afc4f2693df3df3107067da900879381b6b1db5b36747df4

Description: Algorand node software

This package provides an implementation of the Algorand protocol.

Homepage: <https://www.algorand.com/>

APT tools

- reprepro
- aptly
- dpkg-scanpackages
 - Trivial architecture
- Artifactory?

Bootstrap

```
sudo apt-get install rng-tools -y
```

```
sudo rngd -r /dev/urandom
```

```
gpg -full-generate-key
```

```
gpg -export derp.com | sudo apt-key add -
```

reprepro

reprepro - setup

Create expected directory and files.

```
sudo mkdir -p /srv/repos/conf  
  
cd !$
```

Create /srv/repos/conf/distributions

```
cat | sudo tee distributions  
  
Origin: releases.algorand.com  
  
Label: releases.algorand.com  
  
Codename: algorand  
  
Components: main 2.0.3 2.0.2 2.0.1  
  
Architectures: amd64  
  
SignWith: 6F0CAF8BE9B6960B34246CCA77C69712438B211E
```

```
Origin: releases.algorand.com  
  
Label: releases.algorand.com  
  
Codename: algorand-beta  
  
Components: main 2.0.10 1.0.0  
  
Architectures: amd64  
  
SignWith: 6F0CAF8BE9B6960B34246CCA77C69712438B211E
```

^D

Create /srv/repos/conf/options

```
cat | sudo tee options  
  
ask-passphrase  
  
basedir /srv/repos  
  
priority standard  
  
verbose  
  
^D
```

reprepro – add packages

Add packages to *algorand* distribution.

```
sudo reprepro -S algorand -C main includedeb algorand ~/deb/algorand_stable_linux-amd64_2.0.4.deb
```

```
sudo reprepro -S algorand -C 2.0.3 includedeb algorand ~/deb/algorand_stable_linux-amd64_2.0.3.deb
```

```
sudo reprepro -S algorand -C 2.0.2 includedeb algorand ~/deb/algorand_stable_linux-amd64_2.0.2.deb
```

```
sudo reprepro -S algorand -C 2.0.1 includedeb algorand ~/deb/algorand_stable_linux-amd64_2.0.1.deb
```

Add packages to *algorand-beta* distribution.

```
sudo reprepro -S algorand-beta -C main includedeb algorand-beta ~/deb/algorand_2.0.10_amd64.deb
```

```
sudo reprepro -S algorand-beta -C main includedeb algorand-beta ~/deb/algorand_1.0.0_amd64.deb
```

reprepro – install packages

```
sudo add-apt-repository "deb http://127.0.0.1:8111 algorand main 2.0.3 2.0.2 2.0.1"
```

```
sudo add-apt-repository "deb http://127.0.0.1:8111 algorand-beta 2.0.10 1.0.0"
```

```
sudo apt-get update
```

```
sudo apt-get install algorand
```

```
sudo apt-get install algorand=2.0.1
```

```
sudo apt-get install algorand-beta
```

```
sudo apt-get install algorand-beta=1.0.0
```

reprepro - notes

- Does not support multi-versioned packages
 - One option is to create a component for each version.
- Does not support snapshots?
- Needs an external tool to publish
- Setup is more verbose than other tooling
- Large projects such as [postgres](#) and [mariadb](#) use reprepro

aptly

aptly - setup

Create ~/.aptly.conf

```
cat << EOF > ~/.aptly.conf
{
  "rootDir": ~/.aptly",
  "downloadConcurrency": 4,
  "downloadSpeedLimit": 0,
  "architectures": [],
  "dependencyFollowSuggests": false,
  "dependencyFollowRecommends": false,
  "dependencyFollowAllVariants": false,
  "dependencyFollowSource": false,
  "dependencyVerboseResolve": false,
  "gpgDisableSign": false,
  "gpgDisableVerify": false,
  "gpgProvider": "gpg",
  "downloadSourcePackages": false,
  "skipLegacyPool": true,
  "ppaDistributorID": "ubuntu",
  "ppaCodename": "",
  "skipContentsPublishing": false,
  "FileSystemPublishEndpoints": {},
  "S3PublishEndpoints": {},
  "SwiftPublishEndpoints": {}
}
EOF
```

Create distributions.

```
aptly repo create -distribution="stable" -
architectures="amd64" -component="main" -comment="mainnet"
algorand
```

```
aptly repo create -distribution="beta" -architectures="amd64"
-component="main" -comment="betanet" algorand-beta
```

```
aptly repo create -distribution="nightly" -
architectures="amd64" -component="main" -comment="devnet"
algorand-nightly
```

aptly – add packages

```
aptly repo add algorand ~/deb/algorand_stable_linux*.deb
```

```
aptly repo add algorand-beta ~/deb/algorand_beta*.deb
```

aptly – install packages

```
sudo add-apt-repository "deb http://127.0.0.1:8080 algorand main"
```

```
sudo add-apt-repository "deb http://127.0.0.1:8080 algorand-beta main"
```

```
sudo apt-get update
```

```
sudo apt-get install algorand
```

```
sudo apt-get install algorand=2.0.1
```

```
sudo apt-get install algorand-beta
```

```
sudo apt-get install algorand-beta=1.0.0
```

aptly - notes

- Supports multi-versioned packages
- Support snapshots
- Natively supports publishing to S3 and other platforms
- Setup is minimal
- ``aptly serve``

dpkg-scanpackages

dpkg-scanpackages

```
sudo apt install dpkg-dev
```

```
cd path/to/deb/packages
```

```
dpkg-scanpackages -m . | gzip -c > Packages.gz
```

```
# Start web server.
```

```
sudo add-apt-repository "deb [trusted=yes]  
http://127.0.0.1:8111 ./"
```

```
sudo apt update
```

What about Artifactory?

- GUI driven
- REST API
 - PUT
"http://SERVER_HOSTNAME:8081/artifactory/{debianRepoKey}/pool/{debianPackageName};deb.distribution={distribution};deb.component={component};deb.architecture={architecture}"
- Cedes a lot of control to Artifactory
- Wants to manage GPG keys

References

- <https://www.debian.org/doc/manuals/repository-howto/repository-howto>
- <https://wikitech.wikimedia.org/wiki/Reprepro>
- <https://www.aptly.info/doc/overview/>
- <https://linux.die.net/man/1/dpkg-scanpackages>
- <https://apt.postgresql.org/pub/repos/>
- <http://mariadb.mirror.globo.tech/repo/>
- <https://www.jfrog.com/confluence/display/JFROG/Debian+Repositories>