

Arthur Diniz

Building a Debian Kubernetes Team

Packaging and Maintaining Kubernetes Tools

whoami

- Debian Contributor since 2019
- Debian Maintainer
- Systems Development Eng @ AWS
- @arthurbdiniz
- Kitesurfing



Slides



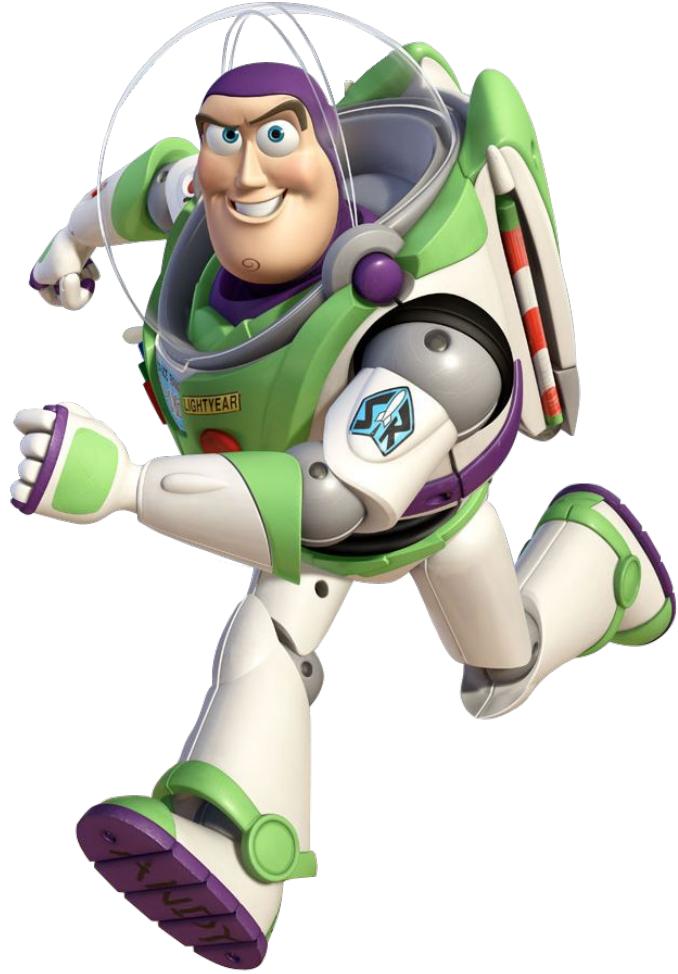
<https://arthurbdiniz.com/slides/building-debian-k8s-team.pdf>

Agenda

- Debian Community
- Packages
- Mirrors and Sources List
- Kubernetes on Debian
- Kubernetes Team

Debian

- Complete Free Operating System
- Exclusively from volunteers
- Ian Murdock 1993
- Around ~1028 members
- ~72.806 packages



Versions

- Debian 12 (Bookworm)
- Debian 11 (Bullseye)
- Debian 10 (Buster)
- Debian 9 (Stretch)
- Debian 8 (Jessie)
- Debian 7 (Wheezy)





Debconf 24
Busan, South Korea

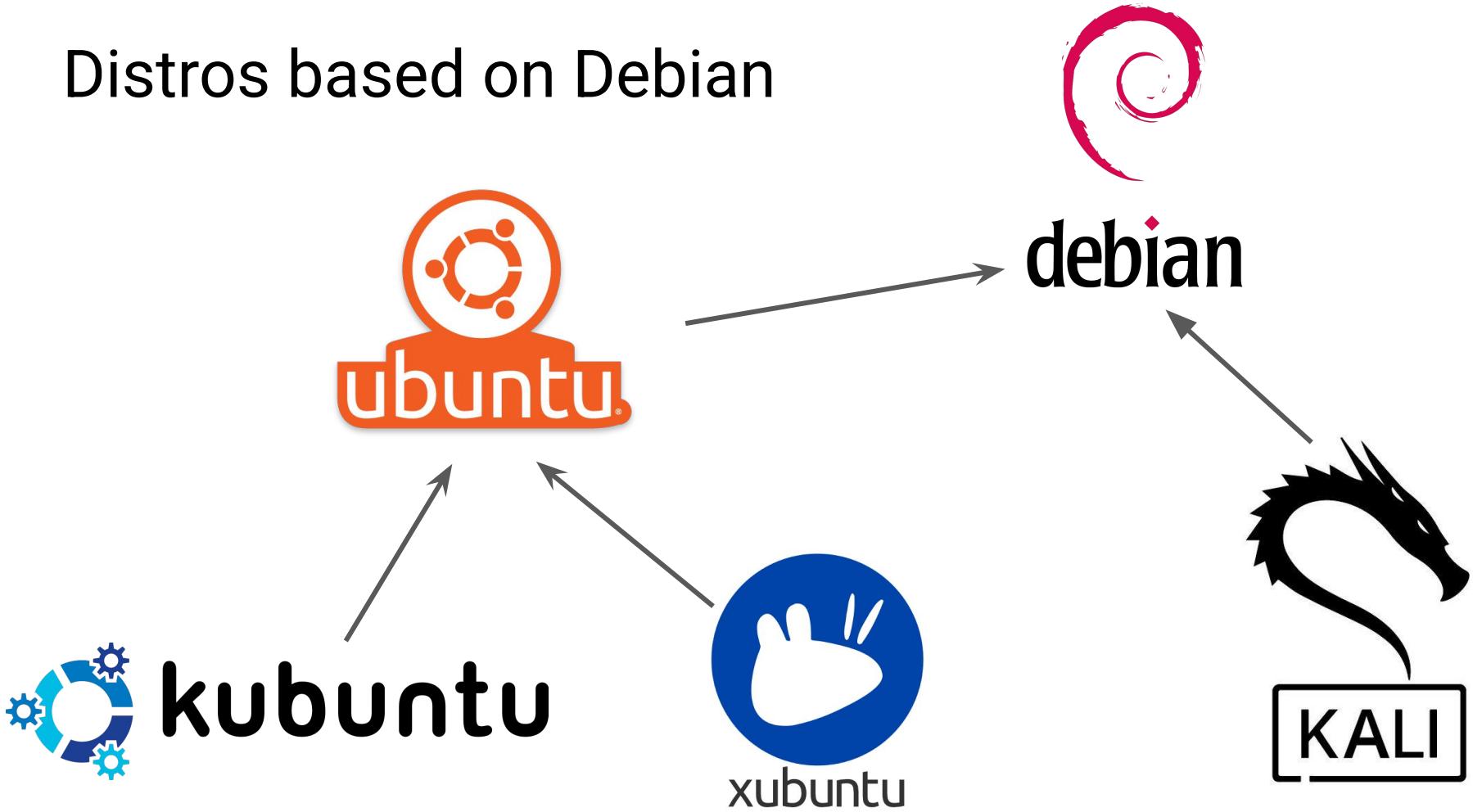
Debconf 24 conference Debuted on 2023-07-20 2024 Korea
Photographed by 42 people from 14 countries. CC-BY-SA or CC-BY-NC

The Community

Next year:
Debconf 25
Brest, France



Distros based on Debian



How to Contribute

- Packaging
- Translations
- Organizing Events
- Development of Internal Tools

Package

- Instructions
 - Build
 - Install
 - Manpages
 - Completion

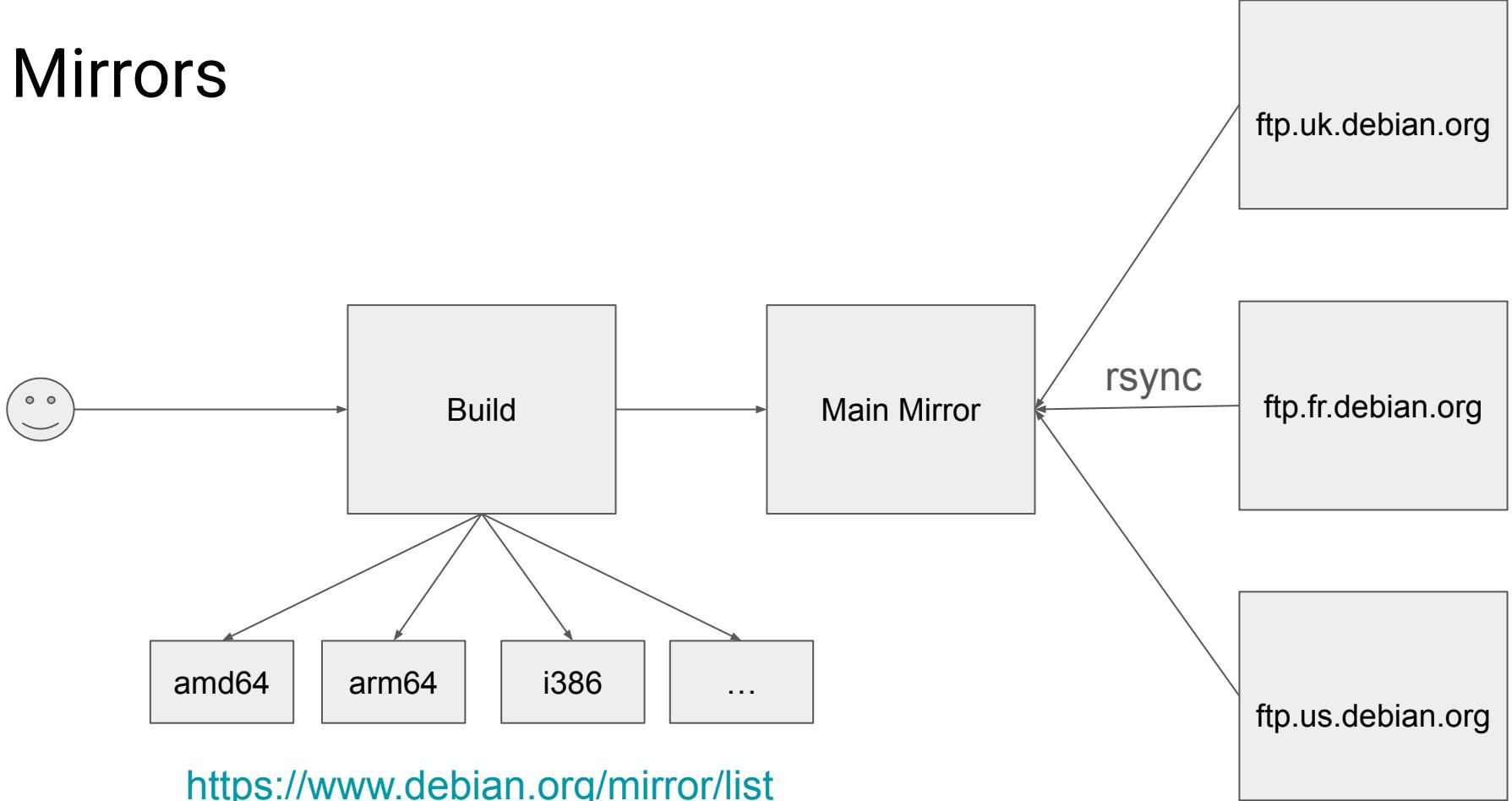


```
arthurbdiniz@debian:~$ dpkg -L kubectl
/.
/usr
/usr/bin
/usr/bin/kubectl
/usr/share
/usr/share/bash-completion
/usr/share/bash-completion/completions
/usr/share/bash-completion/completions/kubectl.bash
/usr/share/doc
/usr/share/doc/kubectl
/usr/share/doc/kubectl/TODO.Debian
/usr/share/doc/kubectl/changelog.Debian.gz
/usr/share/doc/kubectl/changelog.gz
/usr/share/doc/kubectl/copyright
/usr/share/fish
/usr/share/fish/vendor_completions.d
/usr/share/fish/vendor_completions.d/kubectl.fish
/usr/share/man
/usr/share/man/man1
/usr/share/man/man1/kubectl.1.gz
/usr/share/zsh
/usr/share/zsh/vendor-completions
/usr/share/zsh/vendor-completions/kubectl.zsh
```

```
arthurdiniz@debian:~$ apt-file list debian-package-book-en-us
debian-package-book-en-us: /usr/share/doc-base/debian-package-book-en-us.debian-package-book-en-us
debian-package-book-en-us: /usr/share/doc/debian-package-book-en-us/changelog.gz
debian-package-book-en-us: /usr/share/doc/debian-package-book-en-us/copyright
debian-package-book-en-us: /usr/share/doc/debian-package-book-en-us/docs/BuildWithGBP.pdf
```

```
arthurdiniz@debian:~$ apt show debian-package-book-en-us
Package: debian-package-book-en-us
Version: 0.0~git20241008+67f93e629
Priority: optional
Section: doc
Source: dpb
Maintainer: Debian Documentation Project <debian-doc@lists.debian.org>
Installed-Size: 2,756 kB
Recommends: pdf-viewer | atril | evince | mupdf
Homepage: https://ddp-team.pages.debian.net/dpb/BuildWithGBP.pdf
Download-Size: 2,469 kB
APT-Sources: http://deb.debian.org/debian testing/main amd64 Packages
Description: How to package for Debian (in English)
The information in this book is of particular interest to users of the
script. But also people who are generally interested in packaging for a
distribution will find information in this book.
.
This book does not want to be a "textbook" for building Debian packages.
It is more of an experience report, where the experiences have been
"moulded into code".
.
The book describes how Debian packages are created using a git
repository with the programs from the package git-buildpackage and
other useful commands. Afterwards, the reader should be able to use the
program as shown and the descriptions of the individual steps to build
"production quality" Debian packages.
.
The book is not yet finished, so some chapters are incomplete or not
yet proof-read.
```

Mirrors



<https://www.debian.org/mirror/list>

Sources List

- Made by the upstream
- <https://pkgs.k8s.io/core>
- Update apt package index, then install kubectl:
 - sudo apt update
 - sudo apt install -y kubectl

1. Update the `apt` package index and install packages needed to use the Kubernetes `apt` repository:

```
sudo apt-get update
# apt-transport-https may be a dummy package; if so, you can skip that package
sudo apt-get install -y apt-transport-https ca-certificates curl gnupg
```

2. Download the public signing key for the Kubernetes package repositories. The same signing key is used for all repositories so you can disregard the version in the URL:

```
# If the folder `/etc/apt/keyrings` does not exist, it should be created before
# sudo mkdir -p -m 755 /etc/apt/keyrings
curl -fsSL https://pkgs.k8s.io/core:/stable:/v1.32/deb/Release.key | sudo gpg -
sudo chmod 644 /etc/apt/keyrings/kubernetes-apt-keyring.gpg # allow unprivileged
```

Note:

In releases older than Debian 12 and Ubuntu 22.04, folder `/etc/apt/keyrings` does not exist by default, and it should be created before the `curl` command.

3. Add the appropriate Kubernetes `apt` repository. If you want to use Kubernetes version different than v1.32, replace v1.32 with the desired minor version in the command below:

```
# This overwrites any existing configuration in /etc/apt/sources.list.d/kubernetes.list
echo 'deb [signed-by=/etc/apt/keyrings/kubernetes-apt-keyring.gpg] https://pkgs.k8s.io/core:/stable:/v1.32/deb/' | sudo tee /etc/apt/sources.list.d/kubernetes.list >> /dev/null
sudo chmod 644 /etc/apt/sources.list.d/kubernetes.list # helps tools such as
```

Sources List

- Upstream Missing
 - Manpages
 - Completions
- Debian Quality Assurance
- Can be Dangerous

Optional kubectl configurations and plugins

Enable shell completion

kubectl provides completion support for Bash, Zsh, Fish, and PowerShell, which can save you a lot of typing.

Below are the procedures to set up completion for Bash, Fish, and Zsh.

Enable kubectl completion

Bash

You now need to ensure that the kubectl completion script gets sourced in all your shell sessions. There are two ways in which you can do this:

User System

```
echo 'source <(kubectl completion bash)' >>~/.bashrc
```

If you have an alias for kubectl, you can extend shell completion to work with that alias:

```
echo 'alias k=kubectl' >>~/.bashrc
echo 'complete -o default -F __start_kubectl k' >>~/.bashrc
```

Note:

bash-completion sources all completion scripts in /etc/bash_completion.d.

Package



kubernetes

Kubernetes client binary (kubectl)

general	
source:	kubernetes (main)
version:	1.20.5+really1.20.2-1.1
maintainer:	Janos Lenart (DMD)
arch:	amd64 arm64 armel armhf i386 s390x
std-ver:	4.5.0
VCS:	unknown

versions	
oldstable :	1.20.5+really1.20.2-1
stable :	1.20.5+really1.20.2-1.1
testing :	1.20.5+really1.20.2-1.1
unstable :	1.20.5+really1.20.2-1.1

versioned links	
1.20.5+really1.20.2-1 :	
1.20.5+really1.20.2-1.1 :	

binaries	
kubernetes-client	(2 bugs: 0, 1, 1, 0)

action needed

- ▼ Problems while searching for a new upstream version high
- ▼ 2 security issues in trixie high
- ▼ 2 security issues in sid high
- ▼ lintian reports 1 error and 228 warnings high
- ▼ 1 bug tagged patch in the BTS normal
- ▼ Does not build reproducibly during testing normal
- ▼ 1 low-priority security issue in bullseye low
- ▼ 1 low-priority security issue in bookworm low
- ▼ Issues found with some translations low
- ▼ Standards version of the package is outdated. wishlist

news

- [2022-04-15] [kubernetes 1.20.5+really1.20.2-1.1 MIGRATED to testing](#) (Debian testing watch)
- [2022-04-09] [Accepted kubernetes 1.20.5+really1.20.2-1.1 \(source\) into unstable](#) (Florian Ernst)
- [2022-04-01] [kubernetes REMOVED from testing](#) (Debian testing watch)
- [2021-07-14] [kubernetes 1.20.5+really1.20.2-1 MIGRATED to testing](#) (Debian testing watch)
- [2021-06-13] [Accepted kubernetes 1.20.5+really1.20.2-1 \(source\) into unstable](#) (Janos Lenart)
- [2021-03-31] [Accepted kubernetes 1.20.5-1 \(source\) into unstable](#) (Janos Lenart)
- [2021-01-23] [kubernetes 1.20.2-1 MIGRATED to testing](#) (Debian testing watch)
- [2021-01-14] [Accepted kubernetes 1.20.2-1 \(source\) into unstable](#) (Janos Lenart)

Challenges

- Keep the Distribution Archives health
- New releases 3 times per year (k8s)
- Fix CVEs and backports
- Upstream Vendor Folders

/vendor

Application dependencies (managed manually or by your favorite dependency management tool or the built-in [modules](#) feature).

Don't commit your application dependencies if you are building a library.

[kubernetes / vendor](#) / 

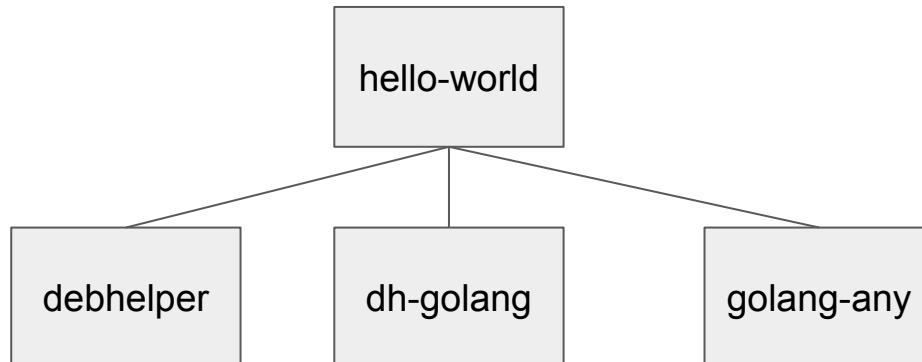
Name	Last commit message
 ..	
 bitbucket.org/bertimus9/systemstat	Switch to release tag v0.5.0 of systemstat
 cel.dev/expr	hack/pin-dependency.sh github.com/google/cel-go v0.22.0
 github.com	Websocket HTTPS proxy support
 go.etcd.io	Add etcd kubernetes interface package to vendor
 go.opentelemetry.io	update go.opentelemetry.io dependencies to v1.33.0/v0.58.0
 go.uber.org	dependencies: logr v1.4.2, zap v1.27.0
 golang.org/x	Bump x/oauth2 and x/crypto

Dependencies

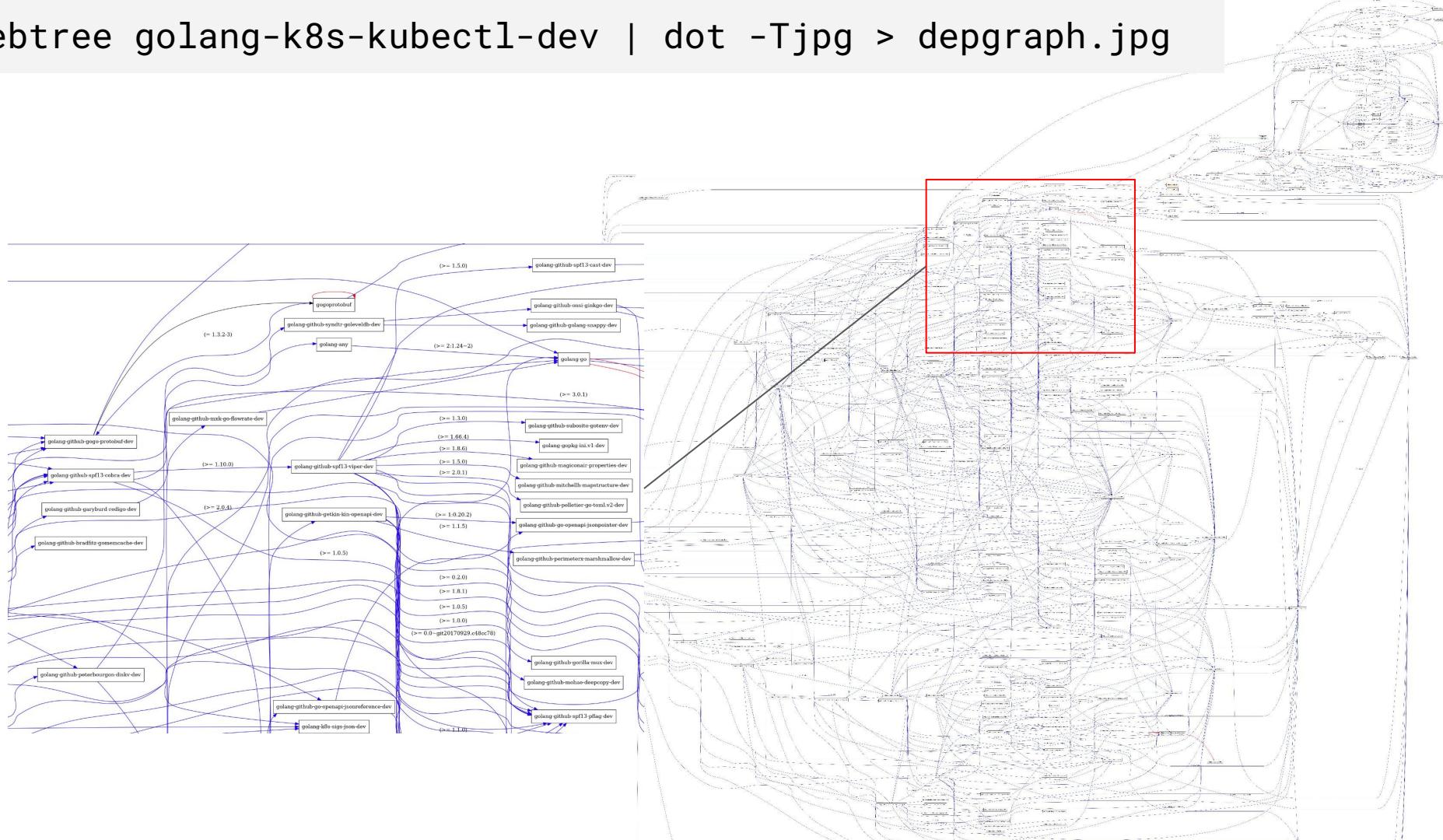
~\$ go hello-world.go 📁 73 B

```
1 package main
2
3 import "fmt"
4
5 func main() {
6     fmt.Println("Hello World!")
7 }
8
```

Source: hello-world
Maintainer: Arthur Diniz <arthurbdiniz@gmail.com>
Section: golang
Testsuite: autopkgtest-pkg-go
Priority: optional
Build-Depends: debhelper-compat (= 13),
 dh-golang,
 golang-any

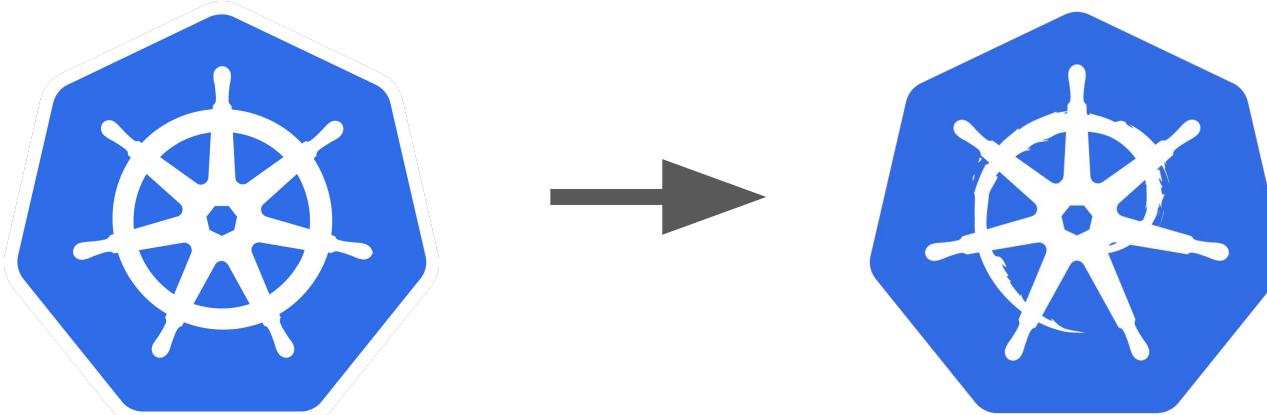


debtree golang-k8s-kubectl-dev | dot -Tjpg > depgraph.jpg



Debian Kubernetes Team

- Have a place for the Ecosystem
- Joint effort to create and maintain packages
- Stop vendoring dependencies and work on packaging them
 - Took ~2 years
 - Packaged a **LOT** of dependencies
 - 7 people that helped
- Partnership with go-team



QA

main (11)

Source Package	Bugs						Version						Ubuntu	VCS	Binary Package	Buildd	Lintian E+W	Deb check	Piu parts	CI Rep	Popcon	Watch			
	All	RC	I&N	M&W	F&P		oldstable	stable	testing	unstable	exp														
golang-k8s-cli-runtime*	-	☒	-	-	-	-						0.31.4-2	-	0.31.4-2	Git ✓	1	Buildd Logs	✓	✓	✓	✓✓		-	0.32.3	
golang-k8s-sigs-kustomize-api*	-	☒	-	-	-	-						0.18.0+ds-4 Excuse	0.19.0+ds-1	-	0.18.0+ds-4	Git ✓	1	Buildd Logs	✓	✓	✓	✓(✓) FTBFS		-	0.19.0
golang-k8s-sigs-kustomize-cmd-config*	-	☒	-	-	-	-						0.15.0+ds-2 Excuse	0.19.0+ds-1	-	0.15.0+ds-2	Git ✓	1	Buildd Logs	✓	✓	✓	✓(✓) ✓		-	0.19.0
golang-k8s-sigs-kustomize-kyaml*	-	☒	-	-	-	-						0.18.1+ds-2 Excuse	0.19.0+ds-1	-	0.18.1+ds-2	Git ✓	1	Buildd Logs	✓	✓	✓	✓(✓) ✓		-	0.19.0
kind*	-	☒	-	-	-	-						0.26.0-1 Excuse	0.27.0-1	-	0.26.0-1	Git ✓	1	Buildd Logs	✓	✓	✓	✓(✓) FTBR	11	0.27.0	
kubectx*	-	☒	-	-	-	-		0.9.3-1				0.9.5-2	-	0.9.5-2	Git ✓	1	Buildd Logs	✓	§	✓	✓✓	209	0.9.5		
kubernetes*	3	☒	-	1	2	-	1.20.5+really1.20.2-1	1.20.5+really1.20.2-1.1	Excuse	1.31.4+ds-2	-	1.0 3 bugs	Git ✓	1 2 3	Buildd Logs	✓	✓	✓	- (⊖)	1981	1.32.3				
kubernetes-split-yaml*	-	☒	-	-	-	-		0.3.0-1				0.4.0-1	-	0.4.0-1	Git ✓	1	Buildd Logs	✓	✓	✓	✓✓	9	0.4.0		
kubetail*	1	☒	-	1	-	-	1.6.5-2				1.6.20-1	-	1.6.20-1	Git failed	1	Buildd Logs	✓	✓	✓	--	69	1.6.20			
kustomize*	-	☒	-	-	-	-					5.5.0+ds-4	-	5.5.0+ds-4	Git !1	1 2	Buildd Logs	✓	✓	✓	--	11	5.6.0			
tfk8s*	-	☒	-	-	-	-					0.1.10-2	-	0.1.10-2	Git ✓	1	Buildd Logs	✓	✓	✓	✓✓	1	0.1.10			

<https://qa.debian.org/developer.php?email=team%2Bkubernetes%40tracker.debian.org>

Salsa

 packages 

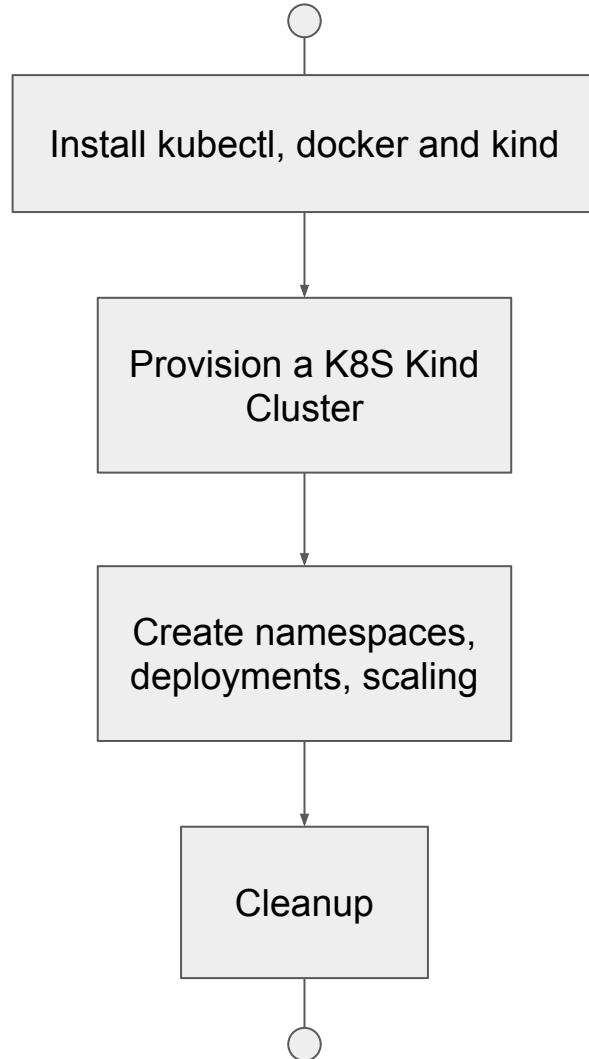
[Subgroups and projects](#) [Shared projects](#) [Inactive](#)

  [Name](#) 

 golang-k8s-cli-runtime 	Utility for building command-line tools for Kubernetes	 0	46 minutes ago
 golang-k8s-sigs-kustomize-api 	Core API components and utilities for Kustomize	 0	46 minutes ago
 golang-k8s-sigs-kustomize-cmd-config 	Utilities for managing Kubernetes configurations	 0	46 minutes ago
 golang-k8s-sigs-kustomize-kyaml 	Reading and writing Kubernetes Resource configuration as YAML	 0	46 minutes ago
 kind 	Kubernetes IN Docker - local clusters for testing Kubernetes	 1	9 hours ago
 kubectx 	Fast way to switch between clusters and namespaces in kubectl	 1	23 hours ago
 Kubernetes 	Kubernetes is an open-source container orchestration system for automating software deployment, scaling, and management	 1	23 hours ago
 kubernetes-split-yaml 	Split a giant yaml file into one file per Kubernetes resource	 1	1 year ago
 kubetail 	Aggregate logs from multiple Kubernetes pods into one stream	 1	1 year ago
 kustomize 	Customization of Kubernetes YAML configurations	 1	3 hours ago
 tfk8s 	Tool for converting Kubernetes YAML manifests to Terraform HCL	 1	1 hour ago

autopkgtest

```
debian > tests > ! control
1  Tests: kubectl.sh
2  Depends: ca-certificates,
3          | docker-cli,
4          | docker.io,
5          | kind,
6          | kubectl
7  Restrictions: isolation-machine,
8          | needs-internet,
9          | needs-root
10
```



Documentation

<https://debian-kubernetes.org>

Debian Kubernetes

Search

Home

Packages

Contributing



Debian Kubernetes Team

About

The **Debian Kubernetes Team** maintains and provides Kubernetes-related packages for Debian, ensuring these packages stay up to date, fix security issues, and improve reliability. The goal is to make it easier for users to run and manage Kubernetes on Debian.

- [QA](#)
- [Tracker](#)
- [Wiki](#)
- [Backlog](#)

Ultimate Debian Database (UDD)

- [HTML](#)
- [JSON](#)

Links

- Tracker: <https://tracker.debian.org/teams/kubernetes>
- IRC: #debian-kubernetes on irc.debian.org (OFTC)
- Wiki: <https://wiki.debian.org/Teams/pkg-kubernetes>
- Salsa: <https://salsa.debian.org/kubernetes-team>

Coming next

- kubeadm
- kompose
- k9s
- Helm
- (And more)

Please reach out to us or create issues in Salsa so we can track more tools

Takeaways

- **kubectl** now available in Debian unstable **1.31.4**
 - Will be available in testing soon (± 3 days)
 - Will be available on the next Debian stable
 - Manpages
 - Completions
- Update to **1.32.3** is in progress
- No need for external sources list

Thank You

