

Alire 2.0: a Quality-of-Life Update

<https://alire.ada.dev/>

CUD

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de la Defensa Zaragoza

CONTENTS

- Context
- Ecosystem
- Use cases
 - Novelties

PACKAGE MANAGERS



apt-get



PIP



SYSTEM vs **USER**

PLATFORM vs **LANGUAGE**

BINARY vs **SOURCE**

OFFICIAL vs **COMMUNITY**

<https://github.com/alire-project>

Alire

- Project as a whole
- Community index
 - <https://.../alire-index>
 - Project = “crate”

alr

- Command-line tool
 - <https://.../alire>
 - Source download
 - Dependency mngmnt
 - Build

Ada Library Repository



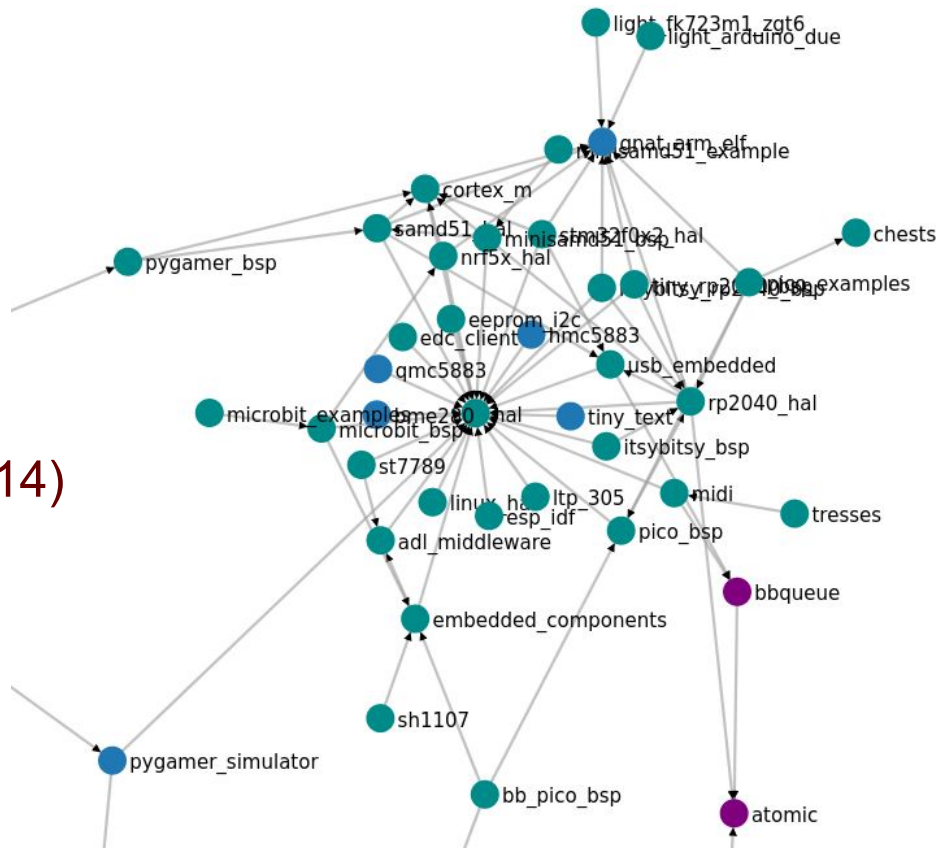
- **Feb 2016: 1st repo created (early ideas)**
- **Jun 2018: AEiC 2018 paper & current org+repo creation**
- **Aug 2019: Website online**
- **Feb 2021: 1.0**
- **Sep 2021: 1.1**
- **May 2022: 1.2**
- **Mar 2024: 2.0**

ECOSYSTEM

CRATES

- **407** crates (**1064** releases)
 - **56** Embedded
 - **16** SPARK
- Top 10 tags
 - **#embedded(56)** **#nostd(33)**
#web(26) **#linux(18)**
#database(17) **#spark(16)**
#game(15) **#orka(14)**
#gnatcoll(14) **#bindings(14)**

<https://alire.ada.dev/network>



DOWNLOADS

- Almost **100k** downloads
 - <https://hanadigital.github.io/grev/?user=alire-project&repo=alire>

v2.0.1

4325 /downloads

alr-2.0.1-bin-x86_64-linux.zip	1949
alr-2.0.1-bin-x86_64-macos.zip	676
alr-2.0.1-bin-x86_64-windows.zip	308
alr-2.0.1-full-sources.zip	32
alr-2.0.1-installer-x86_64-windows....	1068
alr-2.0.1-x86_64.AppImage	292

Total Downloads

98850 /downloads

Nightly	0
v2.0.1	4325
v2.0.0	1799
v2.0.0-rc1	125
v2.0.0-beta1	182
v1.2.2	30544

NEW PLATFORMS

- Tested
 - Homebrew/MacPorts on macOS (Simon Wright)
 - x86_64 arch
- Untested (no GH workflow runs)
 - SUSE/openSUSE/zypper (John Serock)
 - Docker image needed
 - FreeBSD (Stephane Carrez)

New Contributors

- [@AJ-lanozi](#) made their first contribution in [#1141](#)
- [@reznikmm](#) made their first contribution in [#1179](#)
- [@serock](#) made their first contribution in [#1173](#)
- [@Orzech](#) made their first contribution in [#1249](#)
- [@godunko](#) made their first contribution in [#1292](#)
- [@timlag1305](#) made their first contribution in [#1265](#)
- [@mgrojo](#) made their first contribution in [#1313](#)
- [@corinthian13](#) made their first contribution in [#1343](#)
- [@atalii](#) made their first contribution in [#1408](#)
- [@rowan-walshe](#) made their first contribution in [#1525](#)
- [@dalybrown](#) made their first contribution in [#1541](#)
- [@rocher](#) made their first contribution in [#1619](#)

Full Changelog: [v1.2.2...v2.0.0](#)

→ **257** pull requests

Contributors



JeremyGrosser, timlag1305, and 17 other contributors

NEW FEATURES **through Use Cases**

GENERAL USE CASES

CRATE RETRIEVAL

Retrieve crate for learning/testing

NEW: nested report

```
$ alr get umwi
```

umwi=0.1.0 successfully retrieved.

① Found 2 nested crates in ./umwi_0.1.0_34abe384:
demo/demo=1.0.0: Demo of default and corner cases
generator/generator=1.0.0: Generate the proper
bodies based on Unicode spec

CRATE INSPECTION

NEW: describe projects under current location

```
$ alr show --nested
```

① Found 80 nested crates in /home/user/prog:

...

wordle_ada/wordle=0.1.0: Wordle for the terminal

wordlist_ada/wordlist=0.1.3: An English word list

wordlist_ada/demo/demo=0.1.0-dev: Demo project

yeison/yeison=0.1.0-dev: A JSON-like data
structure using Ada 2022 features

INITIALIZATION & EDITION

NEW: interactive initialization (optional)

```
$ alr init --bin myproject
```

Enter a short description of the crate:

```
> Cool program
```

Select a software license for the crate?

1. MIT OR Apache-2.0 WITH LLVM-exception

9. Other...

Enter a comma (',') separated list of tags:

```
> cool,executable
```

✓ myprogram initialized successfully.

NEW: lets you pick editor the 1st time

```
$ alr init --bin myprogram
```

```
$ cd myprogram
```

```
$ alr run
```

```
$ alr edit
```

① Please select your preferred editor

1. VS Code

2. GNAT studio

3. Other

INSTALLATION

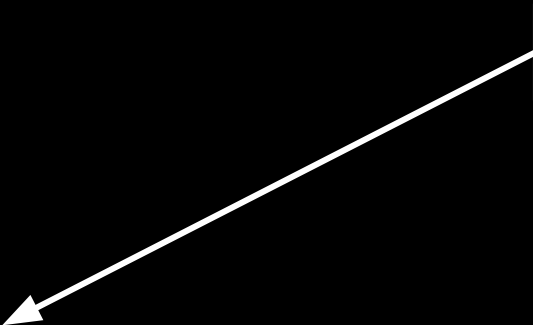
```
$ alr install wordle # new command 'install'
```

```
$ tree ~/.alire/
```

```
$HOME/.alire/
```

```
├── bin/
│   └── wordle
└── share/
    └── wordlist/
        ├── large.toml
        ├── small.toml
        └── wordle.txt
```

"Resources"



```
$ alr install gnatprove
```

```
$ alr install # installs current workspace crate
```

```
$ alr test # tests current workspace crate
```

PUBLISHING

PUBLISHING

Complete command-line workflow (--> automatable)

\$ export GH_TOKEN=... # GitHub Personal Access Token

\$ alr publish

...

✓ Pull request created successfully

❗ Visit <https://.../alire-index/pull/4> for details



The submission is in draft mode.

Please request a review once automated checks
have succeeded.

PUBLISHING

Complete command-line workflow (--> automatable)

```
$ alr publish --status
```

	PR REFERENCE	STATUS	URL
8	mosteo:release/umwi-2.0.0	Checks_Ongoing	https://...
5	mosteo:release/dashera-0.15.1	Checks_Failed	https://...
2	mosteo:release/rxada-0.1.2	Checks_Passed	https://...

```
$ alr publish --request-review=2
```

```
$ alr publish --cancel=5 --reason="Obsolete"
```

DEPENDENCY-related

FINDING LIBRARIES

Enhanced default search with match identification

\$ alr search emoji

NAME	VERSION	DESCRIPTION	MATCHES
emojis	1.0.1	A library to replace names between colons with emojis	Description, Name, Tag, Website
keypadder	0.3.0	Programmable virtual keypad for your Linux desktop	Long_Description
umwi	0.1.0	Unicode Monospace Width Information	Tag

FINDING DEPENDENTS

```
$ alr show ada_toml --dependents[=direct]
```

Direct dependents

CRATE	VERSION	DEPENDENCY
clic	0.2.1	~0.2.0 ~0.3.0
wordlist	0.1.3	~0.3.0

```
$ alr show ada_toml --dependents=shortest
```

Shortest dependency path for every dependent

CRATE	VERSION	DEPENDENCY	CHAIN
clic	0.2.1	~0.2.0 ~0.3.0	clic=0.2.1»ada_toml=0.3.0
wordle	0.1.1	~0.3.0	wordle=0.1.1»wordlist=0.1.3»ada_toml=0.3.0
wordlist	0.1.3	~0.3.0	wordlist=0.1.3»ada_toml=0.3.0

```
$ alr show ada_toml --dependents=all
```

Every dependency path for every dependent

SHARED BUILDS

OLD BEHAVIOR

```
$ alr init --bin myprogram && cd myprogram
$ alr settings --set dependencies.shared false
$ alr with hello # hello depends on libhello
$ tree .
```

```
myprogram/
├── alire
│   ├── alire.lock
│   ├── cache
│   │   └── dependencies
│   │       ├── hello_1.0.1_dcc36a2f
│   │       └── libhello_1.0.0_7bc7dcfd
├── alire.toml
├── myprogram.gpr
├── src
│   └── myprogram.adb
```

NEW DEFAULT BEHAVIOR

```
$ alr init --bin myprogram && cd myprogram
```

```
$ alr with hello
```

```
$ tree .
```

```
myprogram/
```

```
|  
├── alire  
│   └── alire.lock  
├── alire.toml  
├── myprogram.gpr  
└── src  
    └── myprogram.adb
```

NEW DEFAULT BEHAVIOR

```
$ tree $HOME/.local/share/alire/  
$HOME/.local/share/alire/
```

```
├── builds  
│   ├── hello_1.0.2_5715870b    # For each release in VAULT,  
│   │   ├── f049a4cc2ce09      # SHARED build locations  
│   │   └── 64359f1082c9d      # having unique config.  
│   └── libhello_1.0.1_3c15bc7f  
│       ├── 4ec0aaac3c670  
│       └── 6a8aaea7927c8  
└── releases                    # “VAULT” of r/o releases  
    ├── hello_1.0.2_5715870b    # downloaded just once,  
    └── libhello_1.0.1_3c15bc7  # kept pristine.
```

UNIQUE BUILD HASH

```
$ cat ../builds/hello.../f049a4cc2ce09/alire/build_hash_inputs
```

```
dependency:libhello=1.0.1=5075676debf3
```

```
external:HELLO_LIBRARY_TYPE=default
```

```
external:LIBRARY_TYPE=default
```

```
profile:hello=VALIDATION
```

```
switches:hello=-O3,-fdata-sections,-ffunction-sections,-g,  
-gnatVa,-gnatW8,-gnata,-gnatn,-gnato,-gnatw.X,-gnatwa,  
-gnatwe,-gnaty-d,-gnaty3,-gnatyA,-gnatyB,-gnatyI,-gnatyO,  
-gnatyS,-gnatya,-gnatyb,-gnatyc,-gnatye,-gnatyf,-gnatyh,  
-gnatyi,-gnatyk,-gnatyl,-gnatym,-gnatyn,-gnatyp,-gnatyr,  
-gnatyt,-gnatyu,-gnatyx
```

```
version:gnat_native=14.1.3
```

SHARED BUILDS ENVIRONMENT

```
$ alr printenv
```

```
export
```

```
GPR_PROJECT_PATH="$HOME/.local/share/alire/builds/hello_1.0.2  
_5715870b/830a733e5eab:$HOME/.local/share/alire/builds/libhel  
lo_1.0.1_3c15bc7f/eb3958dc41730:/tmp/a/myprogram
```

IMPLICATION: the hash cannot be computed unless all inputs (configuration values, environment variables, compiler to be used) are known.

IMPLEMENTATION:

- VAULT → BUILD sync is delayed until build time

- post-fetch is run only once after sync, not on fetch

SHARED BUILDS PATHS

```
$ alr version
```

CONFIGURATION

```
settings folder:      ~/.config/alire  
cache folder:         ~/.local/share/alire  
vault folder:         ~/.local/share/alire/releases  
build folder:         ~/.local/share/alire/builds  
toolchain folder:     ~/.local/share/alire/toolchains
```

cache and toolchain folders can be relocated with settings

cache.dir

toolchain.dir

MISCELLANEA

INDEX IMPROVEMENTS

- Indexes are loaded on demand and piecemeal
 - Decreased latency for many commands
- Community index is refreshed once a day
 - Asks for permission on first refresh
- Indexes can be accessed over ssh+git
 - Daly Brown/Rowal Walshe

BREAKING CHANGES

- Unicode enabled by default (-gnatW8)
 - UTF-8-encoded sources created and expected
 - No significant trouble to date
- Cache locations
 - Manual cleanup needed
- Toolchain export through `alr toolchain`
 - Removed `--install/--uninstall/--install-dir`
 - Use `alr install` (or `alr get` for the old behavior)

PLANS for 2024

🕒 **Structured output** cost: 2-medium semver: minor type: feature

#1600 opened on Feb 29 by mosteo ➡ 2024

🕒 **Interactive command-line** cost: 4-extreme semver: major type: feature
type: usability

#1601 opened on Feb 29 by mosteo ➡ 2024

🕒 **Fallback origins** cost: 3-high semver: minor type: feature

#1603 opened on Feb 29 by mosteo ➡ 2024

🕒 **Crate signing** cost: 3-high semver: minor type: feature type: security

#1604 opened on Feb 29 by mosteo ➡ 2024

🕒 **pkg-config support** cost: 3-high semver: minor type: feature

#1605 opened on Feb 29 by mosteo ➡ 2024

THANKS FOR YOUR INTEREST



<https://github.com/alire-project>

<https://alire.ada.dev>

<https://gitter.im/ada-lang/Alire>

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