

DNF5

**THE NEW ERA IN RPM SOFTWARE MANAGEMENT
HOW WE REWROTE THE CODEBASE AND STARTED
LOVING THE COMMUNITY**

Aleš Matěj - Nicola Sella - Jan Kolárik

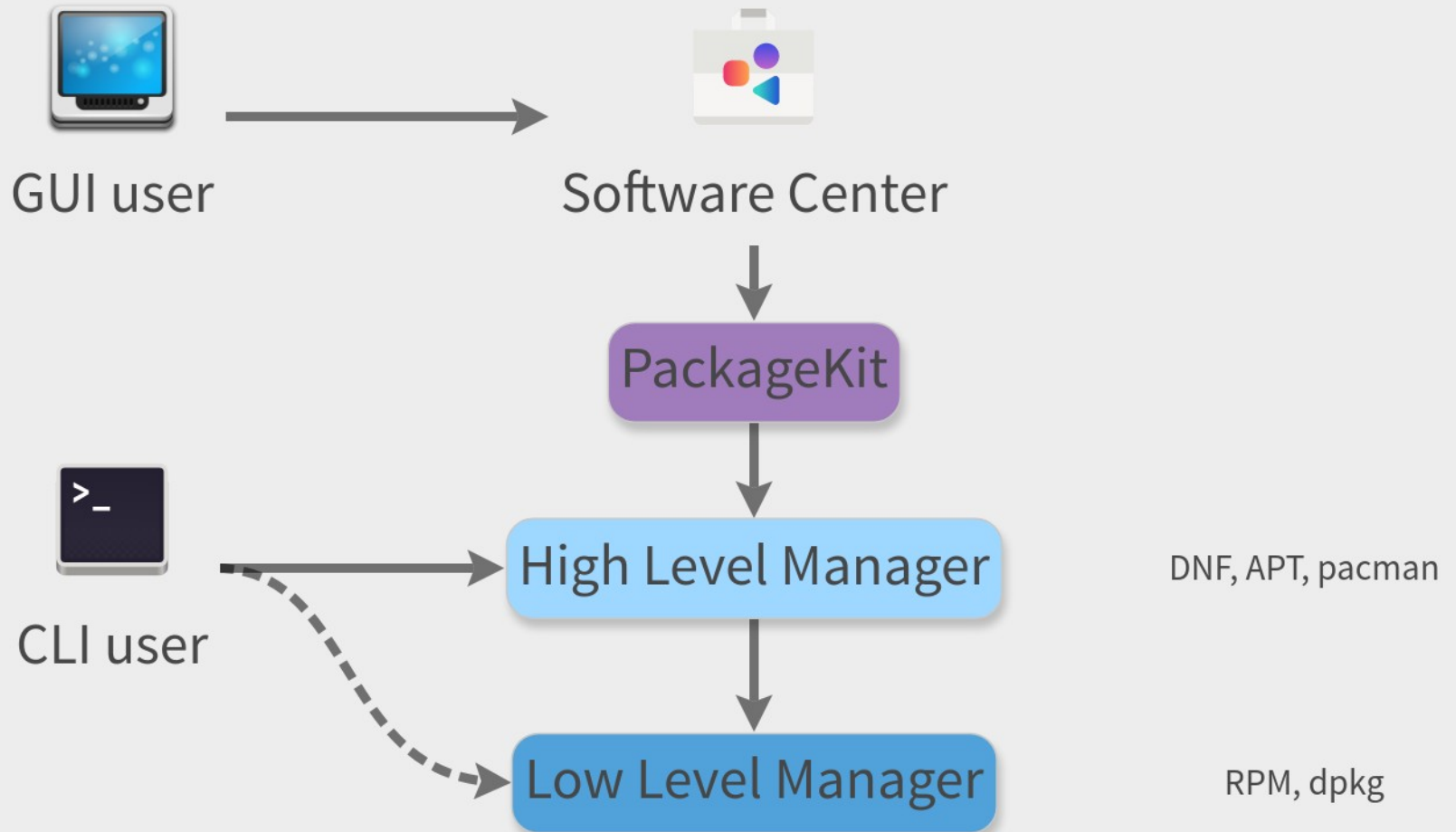
INTRODUCTION

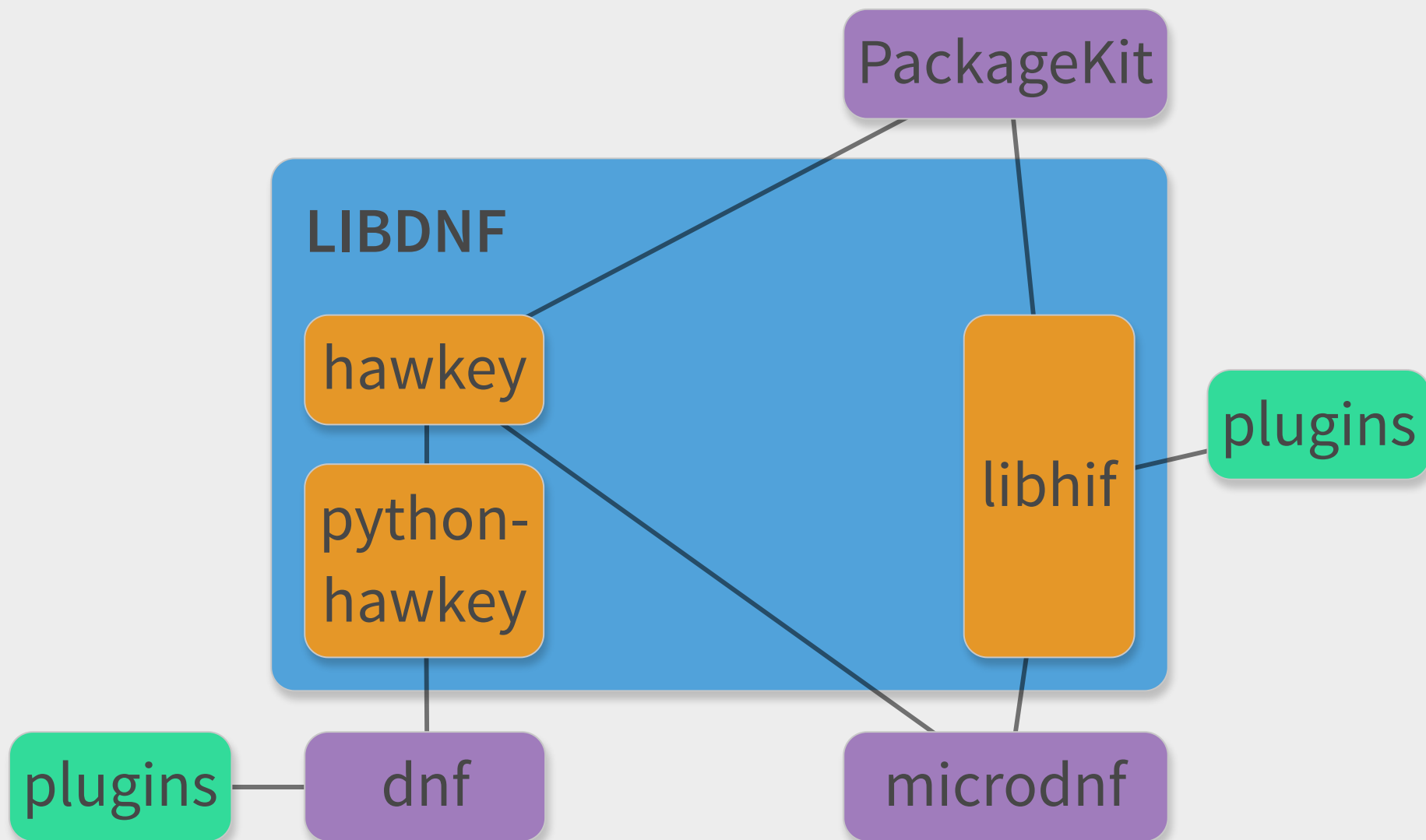
1. Technical overview of DNF5 - Aleš Matěj
2. Community, history and action items - Nicola Sella
3. Live demo - Jan Kolárik

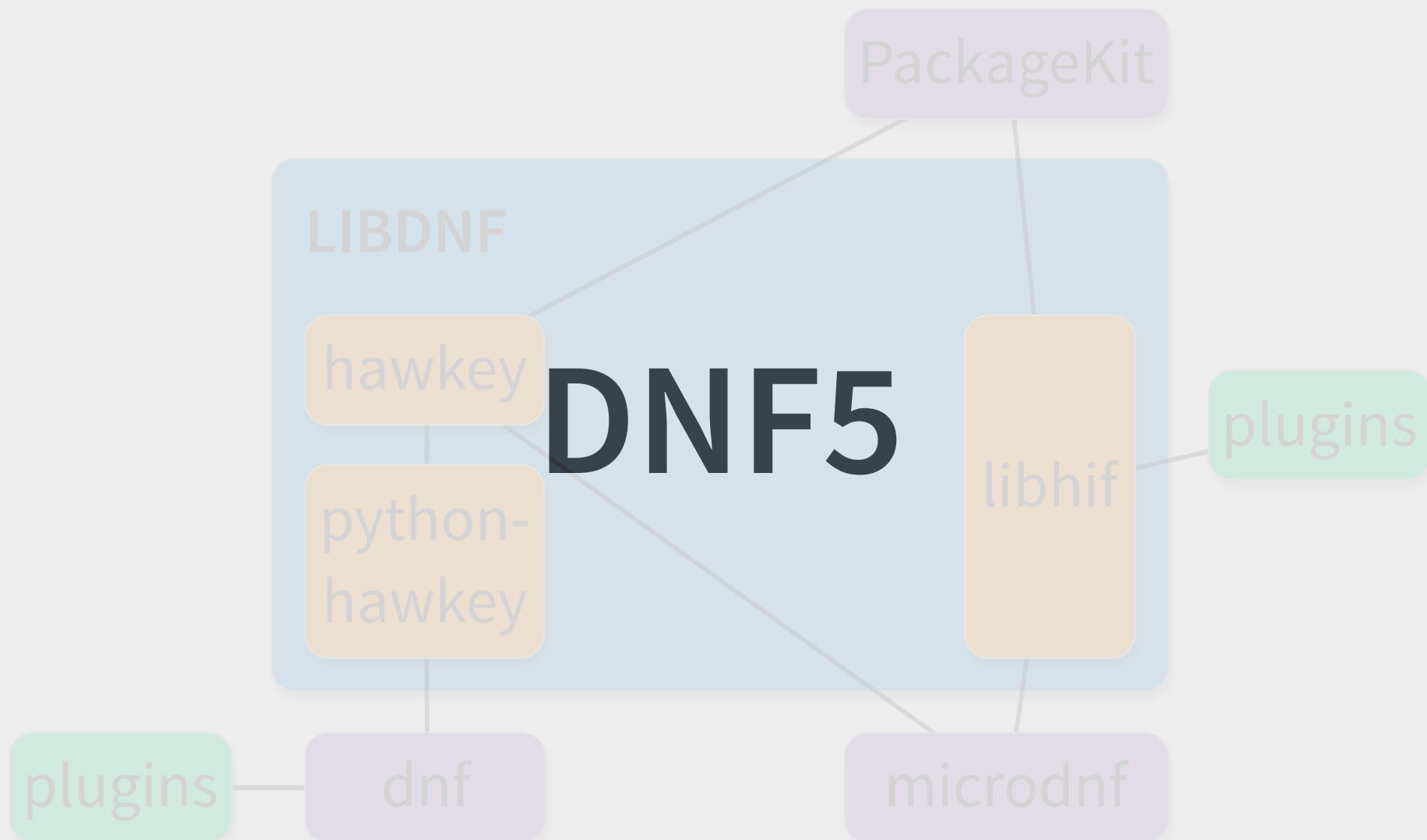
WHAT IS A PACKAGE MANAGER?

- Something like a command line app-store (backend)
- It installs, upgrades and removes packages, handles metadata, resolves dependencies...)
- Examples: DNF, microdnf, Zypper, APT, PACMAN

WHAT IS A PACKAGE MANAGER?







```
graph TD; LIBDNF5[LIBDNF5] --- plugins1[plugins]; LIBDNF5 --- dnf5[dnf5]; LIBDNF5 --- daemon[daemon]; dnf5 --- plugins2[plugins];
```

LIBDNF5

plugins

plugins

dnf5

daemon

WHY BREAK API?



**WHY BACKWARDS
INCOMPATIBLE?**

LIBDNF5

- Complete restructure of API → safer and unified
- Repositories are downloaded and loaded at the same time
- Filelists metadata not downloaded by default
- Faster in general
- SWIG bindings for: **Python**, Perl, Ruby, Go

DNF5 (CLI)

- Python is not required
- Commands are mostly the same
- Outputs of commands did change
- DNF CI tests are the same for DNF5

DNF5 DAEMON

- Accessible by D-Bus
- Same functionality as dnf5

LIST OF ADDITIONAL DNF5 IMPROVEMENTS:

- Configurable aliases
- Fully integrated Modularity in LIBDNF5 workflows
- Single configuration for LIBDNF5 users
- Separation of system state from history DB and module state
- Autocomplete built in
- ...

COMMUNITY

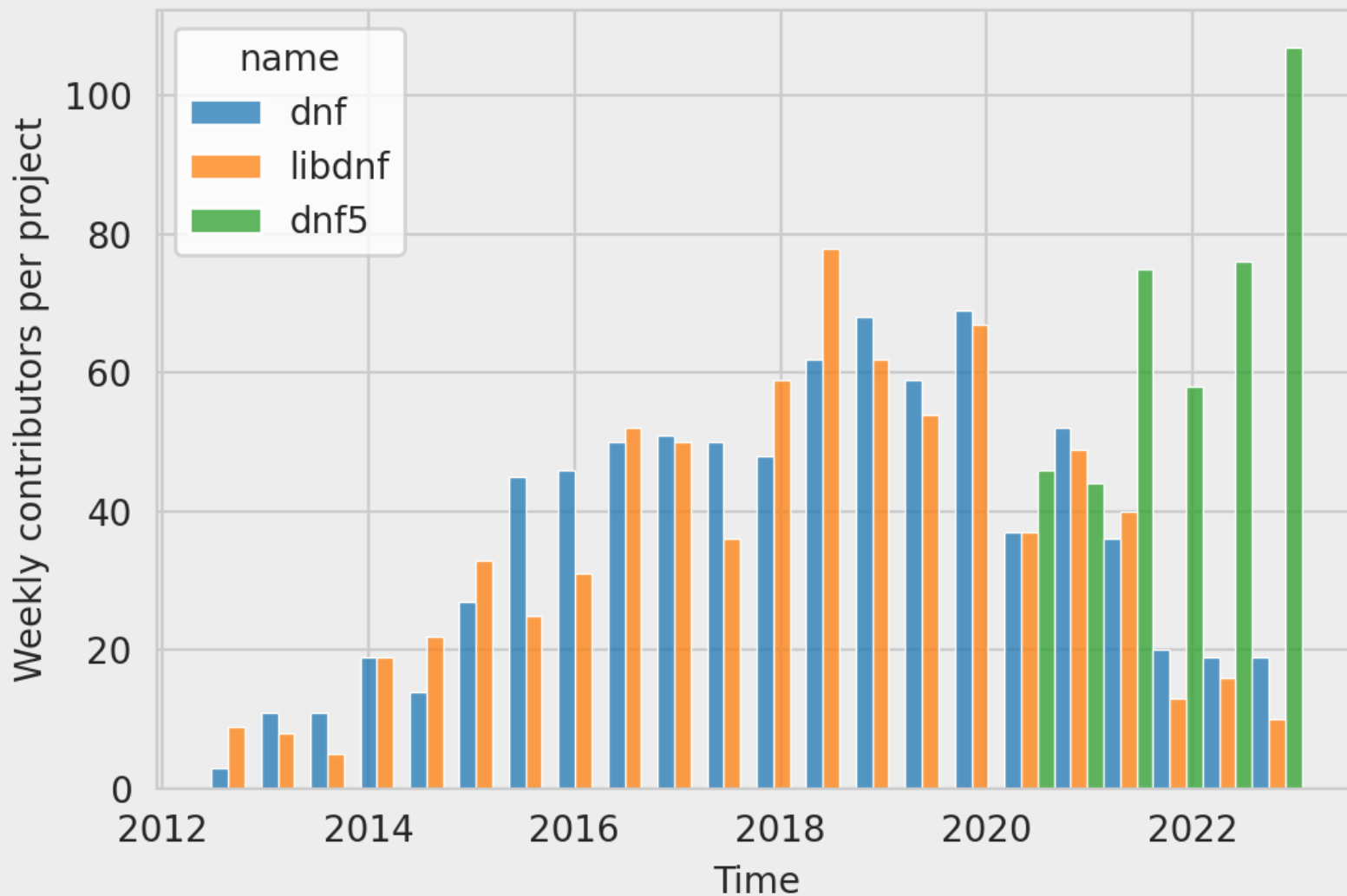
The Upstream: [rpm-software-management/dnf5](#)

HOW DO WE PLAN TO WORK CLOSER WITH THE COMMUNITY?

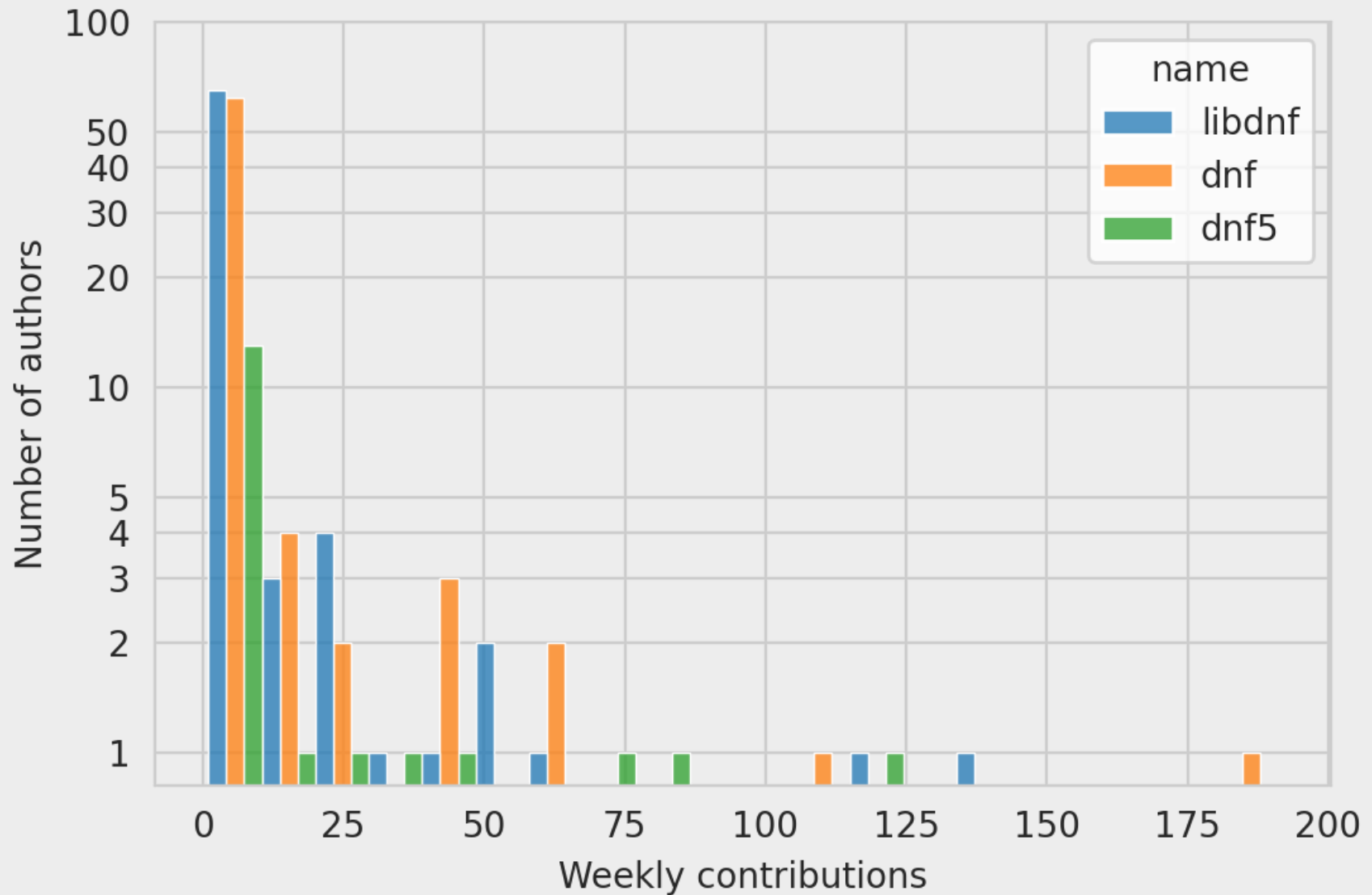
- Looking at the past of the projects
- Looking at the future of our contributors
- Our action items

LOOKING AT THE PAST OF THE PROJECTS

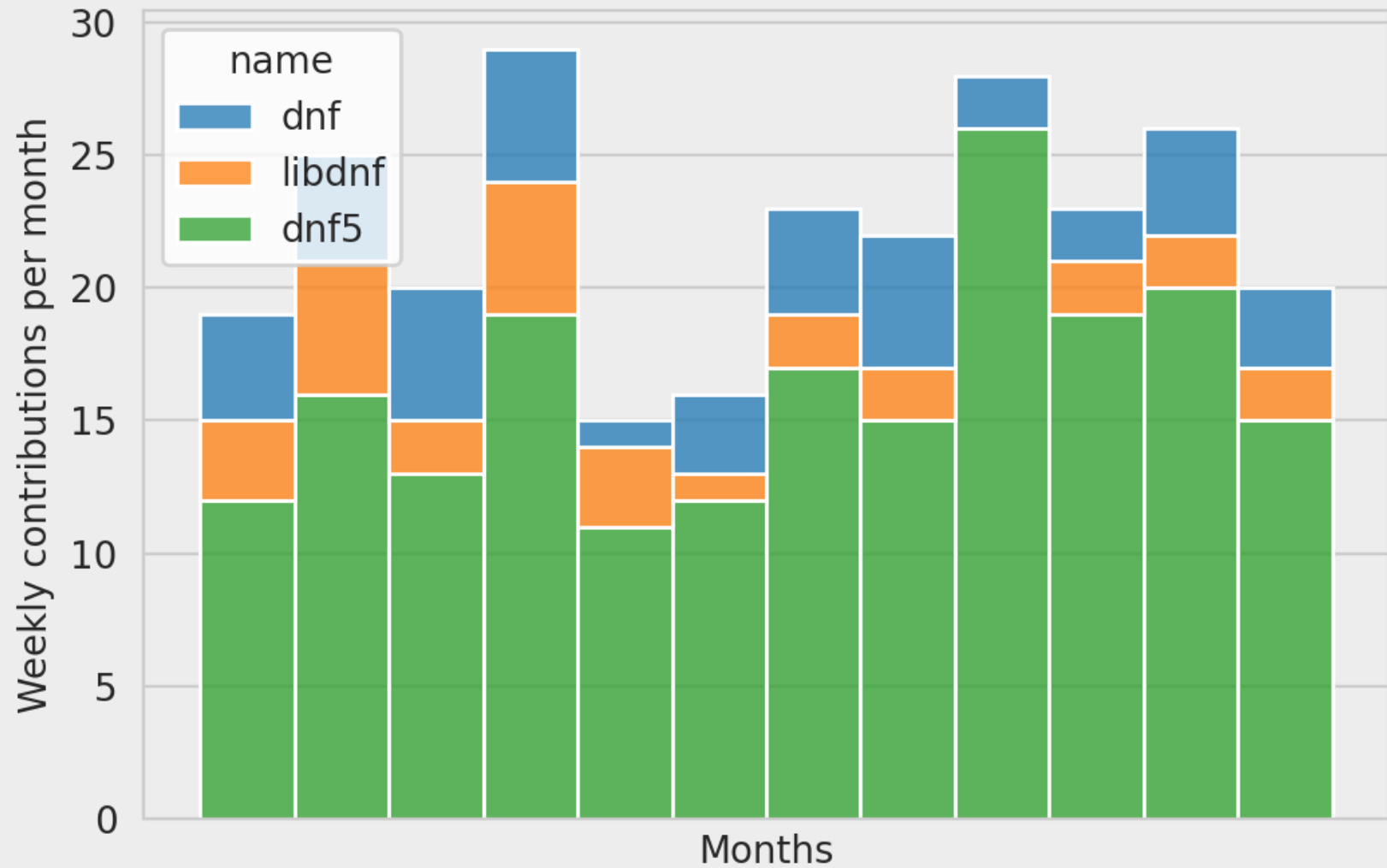
LOOKING AT THE PAST OF THE PROJECTS



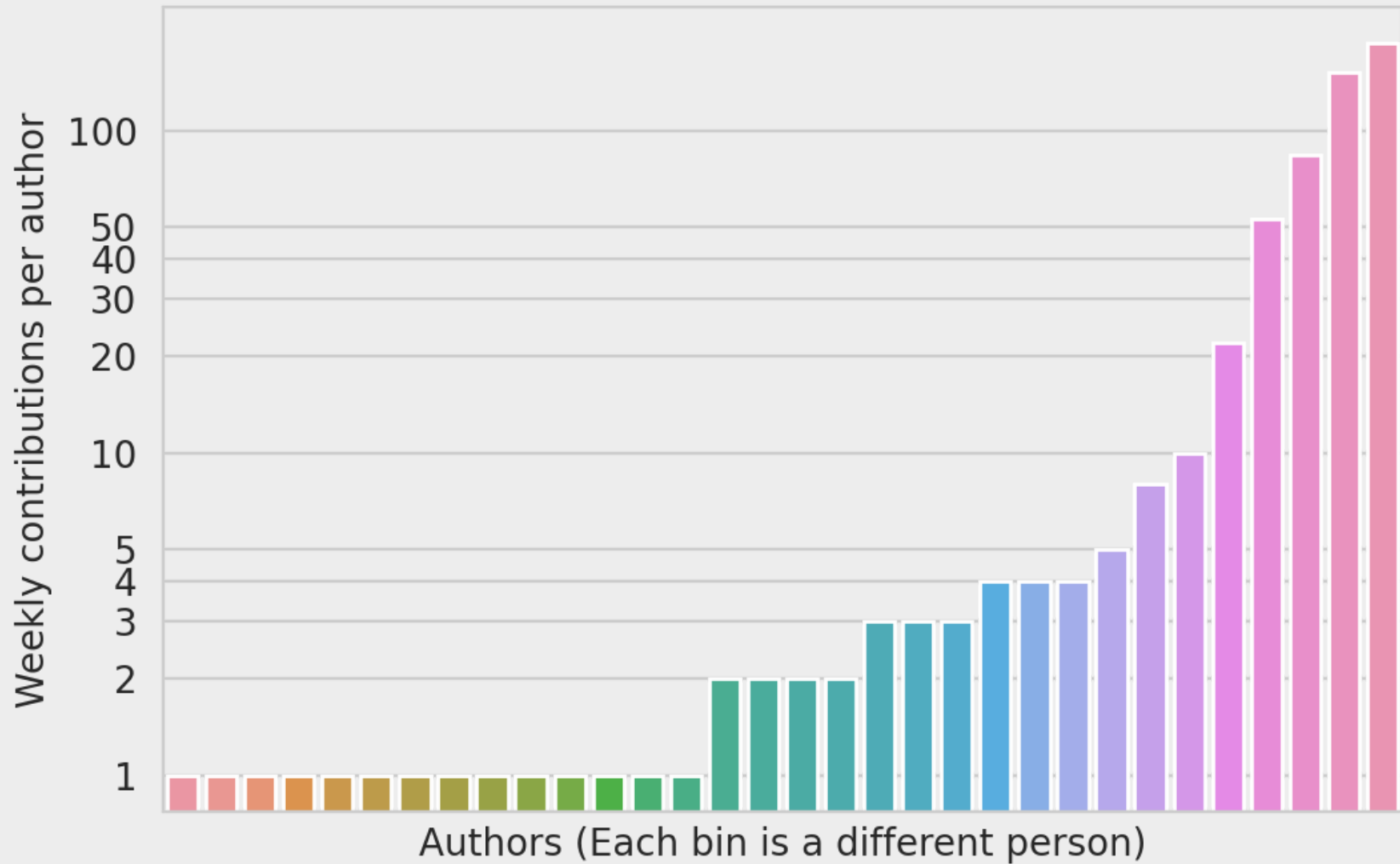
VERY FEW PEOPLE ARE DOING ALL THE WORK



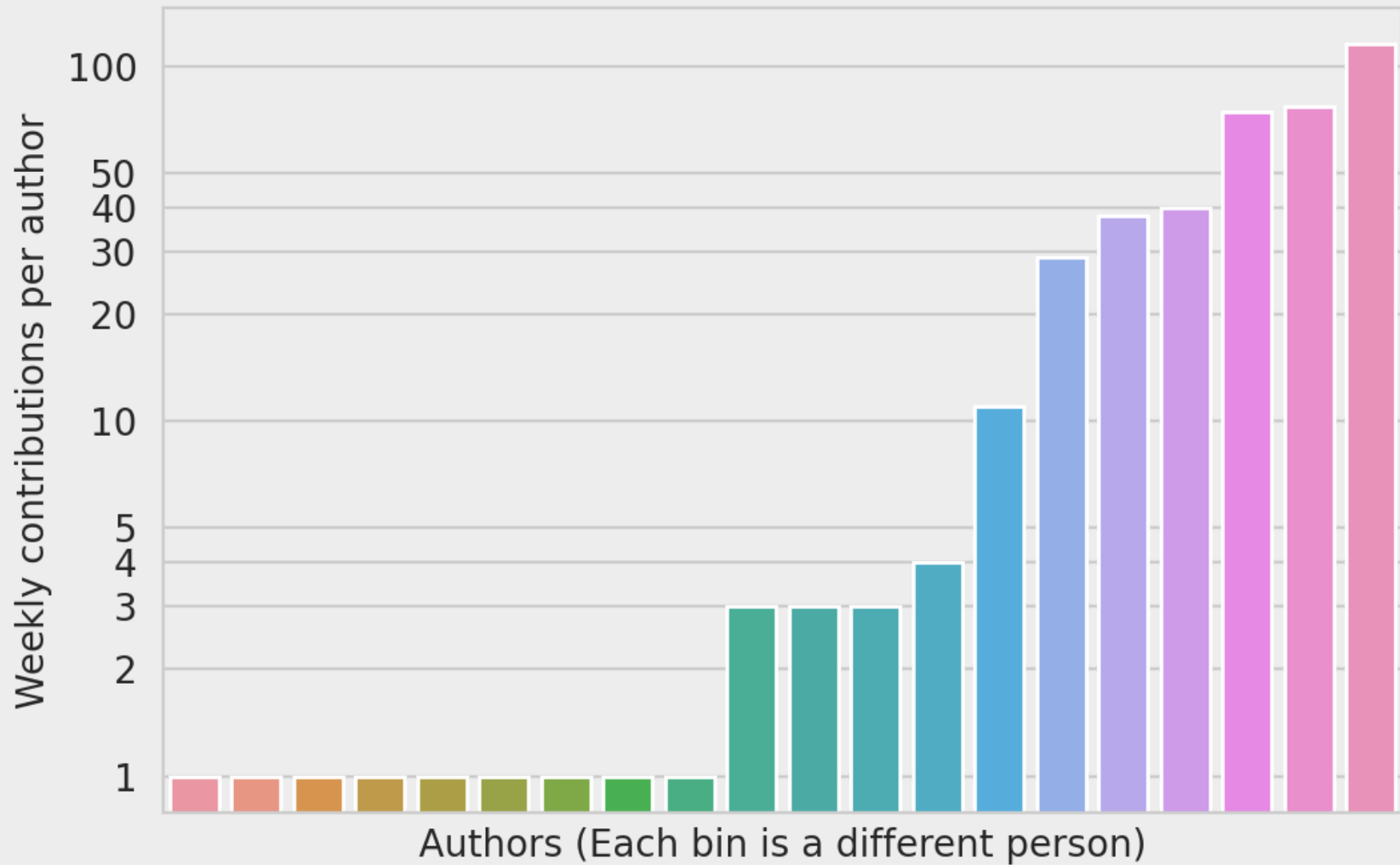
HOW THE EFFORTS ARE SHIFTING FROM 2022



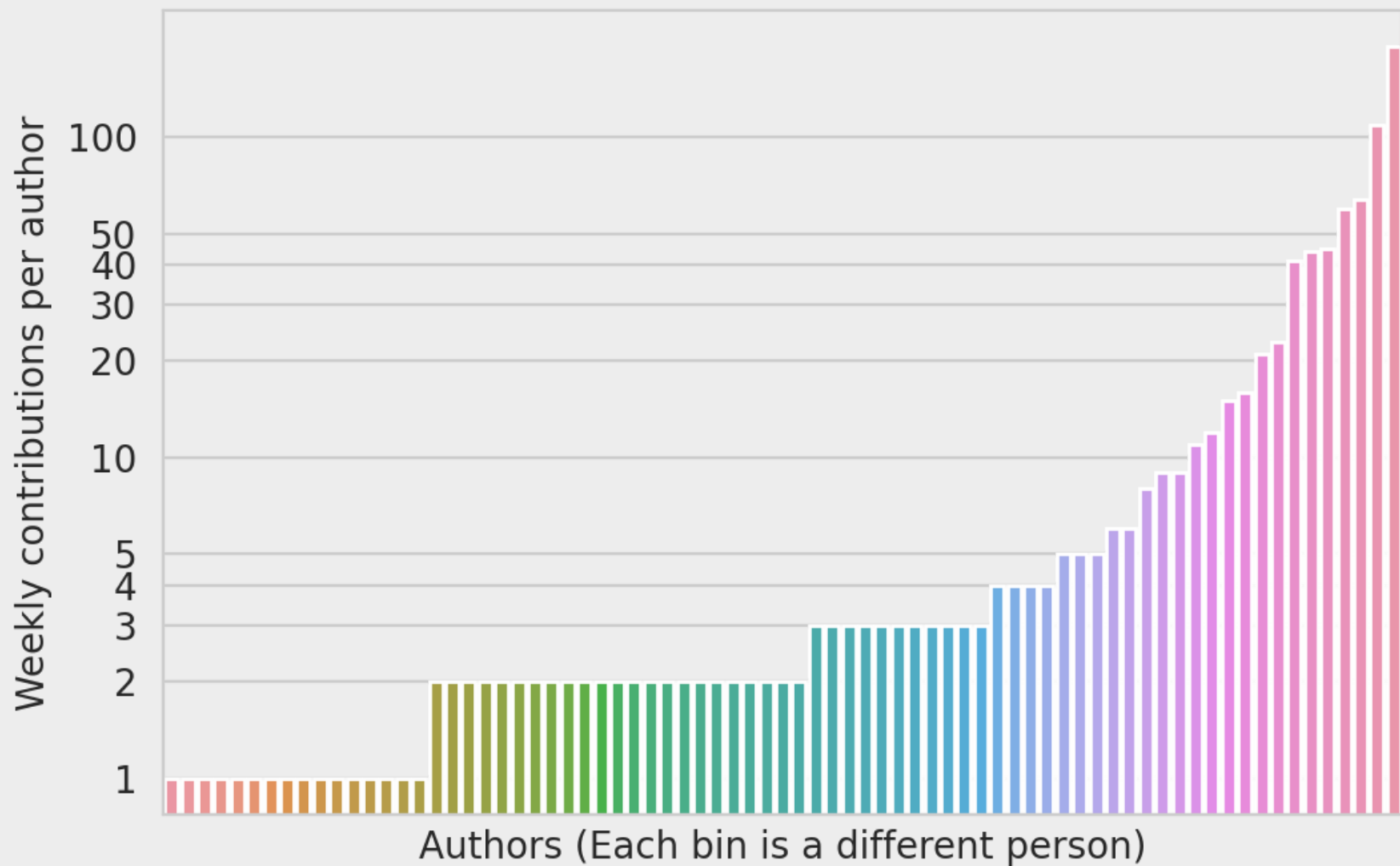
LIBDNF (2012-TODAY)



DNF5 (2020-TOMORROW?)







DNF (2012-TODAY)




**WHERE DO WE WANT TO GO? LOOKING AT THE
FUTURE OF OUR CONTRIBUTORS**



WHERE DO WE WANT TO GO? LOOKING AT THE FUTURE OF OUR CONTRIBUTORS

-  Authors, Owners ~10% commits
-  Co-Authors, Paid programmers ~100 commits
- : **The People in the Middle**
- : Beginners, one timers

DNF WEEKLY CONTRIBUITONS

	All (225)	 4 (1.7%)	 19 (8%)
	9347	3944	1156
To be in 1%	~80	~40	~11
To be in 5%	~500	~190	~50

DNF5 WEEKLY CONTRIBUTIONS

All (19)  5 (26%)  6 (31%)

1981

336

197

To be in 1%

~20

~<4

~<2



To be in 5%

~100

~16

~10

LIBDNF WEEKLY CONTRIBUTIONS


	All (95)	 3 (3%)	 8 (8%)
	3140	1597	1005
To be in 1%	32	18	10
To be in 5%	150	83	50


ACTION ITEMS: TRANSPARENT WORKFLOW...



- Issues: triaged weekly, divided in milestones
- Discussions: opinions, announcements, questions
- Bugzilla: bug tracking, downstream requests

DISCUSSIONS


Community opinions


 2



**Name for commandline software management tool - DNF or DNF5?**
j-mracek started on Dec 22, 2022 in General

  12


Announcements


 3



**DNF5 release to Fedora rawhide**
j-mracek announced on Nov 4, 2022 in Announcements

  0

Questions from the community

 1

**Setting \$releasever, \$arch, and \$basearch with Python bindings**
gotmax23 asked 2 weeks ago in Q&A · **Answered**

  3

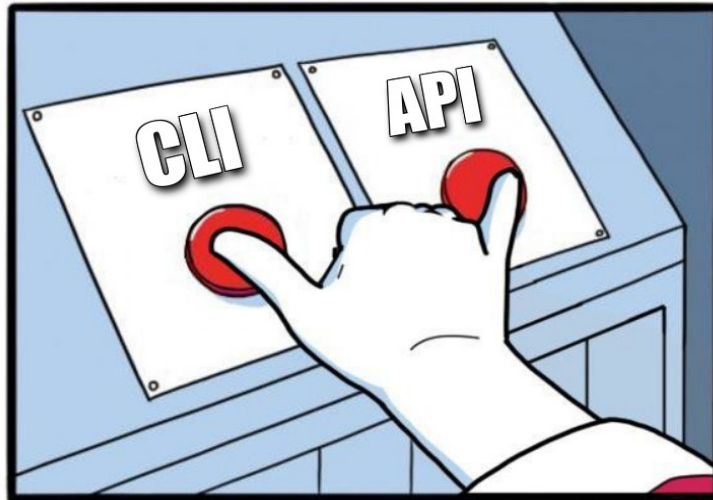
...IN ADDITION

- Documentation: generated from codebase, tested, includes code templates and tutorials
- Contributing guides: first time issues

SO, WHO IS THE COMMUNITY?

- People who create issues, add code, take part in discussions
- People who raise questions, use dnf5
- People who help, ask for help

DEMO



API DEMO 1

```
1 import libdnf5 as dnf
2
3 base = dnf.base.Base()
4 base.setup()
5
6 for release in ['35', '36', '37']:
7     base.get_vars().set('releasever', release)
8
9     sack = base.get_repo_sack()
10    sack.create_repos_from_system_configuration()
11    sack.update_and_load_enabled_repos(False)
12
13    query = dnf.rpm.PackageQuery(base)
14    query.filter_name(["kernel"])
15    query.filter_latest_evr()
16
17    found = next(iter(query), None)
18    pkg_name = found.get_nevra() if found else "N/A"
19    print(f'{release}: {pkg_name}')
```


API DEMO 2

```
1 import libdnf5 as dnf
2
3 base = dnf.base.Base()
4 base.setup()
5
6 sack = base.get_repo_sack()
7 sack.create_repos_from_system_configuration()
8 sack.update_and_load_enabled_repos(False)
9
10 goal = dnf.base.Goal(base)
11 goal.add_rpm_install("zlib")
12 ts = goal.resolve()
13
14 downloader = dnf.repo.PackageDownloader()
15 for pkg in ts.get_transaction_packages():
16     if dnf.base.transaction.\
17         transaction_item_action_is_inbound(pkg.get_action()):
18         downloader.add(pkg.get_package(), "download")
19
20 downloader.download(True, True)
21 print("Download finished.")
```

DEPLOYING A SIMPLE DNF5 PLUGIN

What do we need?

- Devel and bindings packages
- Template sources
- Build tools (f.e. CMake)

DEPLOYING A SIMPLE DNF5 PLUGIN

How to write it?

- Definition
- Implementation
- Adapter A.K.A. boilerplate

DEPLOYING A SIMPLE DNF5 PLUGIN

Implementation

```
1 #include "example.hpp"
2 #include <iostream>
3
4 namespace dnf5 {
5
6 using namespace libdnf::cli;
7
8 void ExampleCommand::set_parent_command() {
9     auto argument_parser = get_session().get_argument_parser();
10    auto parent_command = argument_parser.get_root_command();
11    auto this_command = get_argument_parser_command();
12    parent_command->register_command(this_command);
13 }
14
15 void ExampleCommand::set_argument_parser() {
16     get_argument_parser_command()->set_description("Example command");
17 }
18
19 void ExampleCommand::configure() {
20     get_context().set_quiet(true);
21 }
22
23 void ExampleCommand::run() {
24     std::cout << "YES !!! We did it!" << std::endl;
25 }
```

DEPLOYING A SIMPLE DNF5 PLUGIN

Adapter

```
1 #include "example.hpp"
2
3 #include <dnf5/iplugin.hpp>
4
5 using namespace dnf5;
6
7 namespace {
8
9 constexpr const char * PLUGIN_NAME {"example"};
10
11 constexpr PluginVersion PLUGIN_VERSION {
12     .major = 1, .minor = 0, .micro = 0
13 };
14
15 constexpr const char * attrs[] {
16     "author.name", "author.email", "description", nullptr
17 };
18
19 constexpr const char * attrs_value[] {
20     "Some Excited Guy", "sponsor@dnf5.com", "example"
21 };
22
23 class ExamplePlugin : public IPlugin {
24 public:
25     using IPlugin::IPlugin;
26
27     PluginAPIVersion get_api_version() const noexcept override {
```

THANK YOU FOR JOINING US!



THANK YOU FOR JOINING US!

Where are we?

	Link
GitHub Repo	https://github.com/rpm-software-management/dnf5
GitHub Issues	https://github.com/rpm-software-management/dnf5/issues
GitHub discussions	https://github.com/rpm-software-management/dnf5/discussions
Documentation	https://dnf5.readthedocs.io

How to try dnf5?

Where	How
Fedora 36/37	<code>dnf copr enable rpmsoftwaremanagement/dnf5-unstable</code>
Fedora 38	<code>dnf install dnf5</code>

THANK YOU FOR JOINING US!

Where are we?

	Link
GitHub Repo	https://github.com/rpm-software-management/dnf5
GitHub Issues	https://github.com/rpm-software-management/dnf5/issues
GitHub discussions	https://github.com/rpm-software-management/dnf5/discussions
Documentation	https://dnf5.readthedocs.io

When will DNF5 land in Fedora?

When	What	Where
Fedora 36/37	DNF5 is available in Copr	
Fedora 38	DNF5 will replace microdnf	Major Upgrade Of Microdnf
Fedora 39	DNF5 will replace DNF	Replace Dnf With Dnf5

