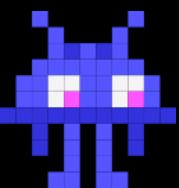


Radicle

Peer-to-Peer Code Collaboration



A Story of Conviction and Passion



2026-02-01

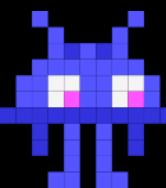
Radicle

2

Hey, I'm Lorenz!
I contribute to Radicle...

Why do you do this?

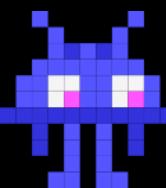
We need a future home for open source.



Lorenz



Git

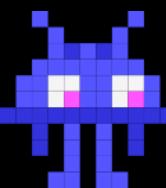


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Radicle

4

Lorenz ❤️ decentralized Git

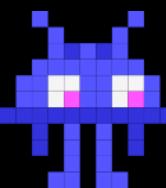


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Radicle

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Lorenz 💔 centralized Git

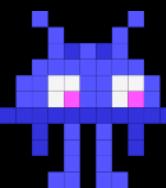


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Radicle

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Radicle ❤️ decentralized Git

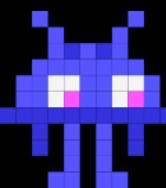


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Radicle

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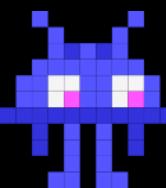
Lorenz ❤️ Radicle and Git



Why Radicle?

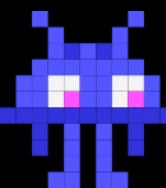
We need a future home for open source.

Radicle is the most advanced peer-to-peer forge I know.



Short Chronology

- Started 2018-01 in Berlin
- Development of current protocol foundation since 2022-07 (previously based on IPFS, not anymore).
- Radicle is developed *on Radicle* since 2023-01 .
- Released 1.0.0 on 2024-09-10
1.6.0 World Logic Day
1.6.1 2026-01-21

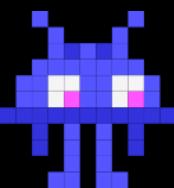


Local-First

- No roundtrips to servers, thus *fast*.
- Works offline.
- Social artifacts (patches, issues, governance) must be *conflict-free*.
- Listen to fintohaps 13:20 @ K.3.201 !

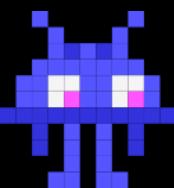
Peer-to-Peer

- No servers, but gossip between peers.
- No user database.
- Users share their storage and availability.
- User is always in control.



Interfaces

CLI , Desktop , Web



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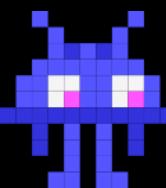
Radicle

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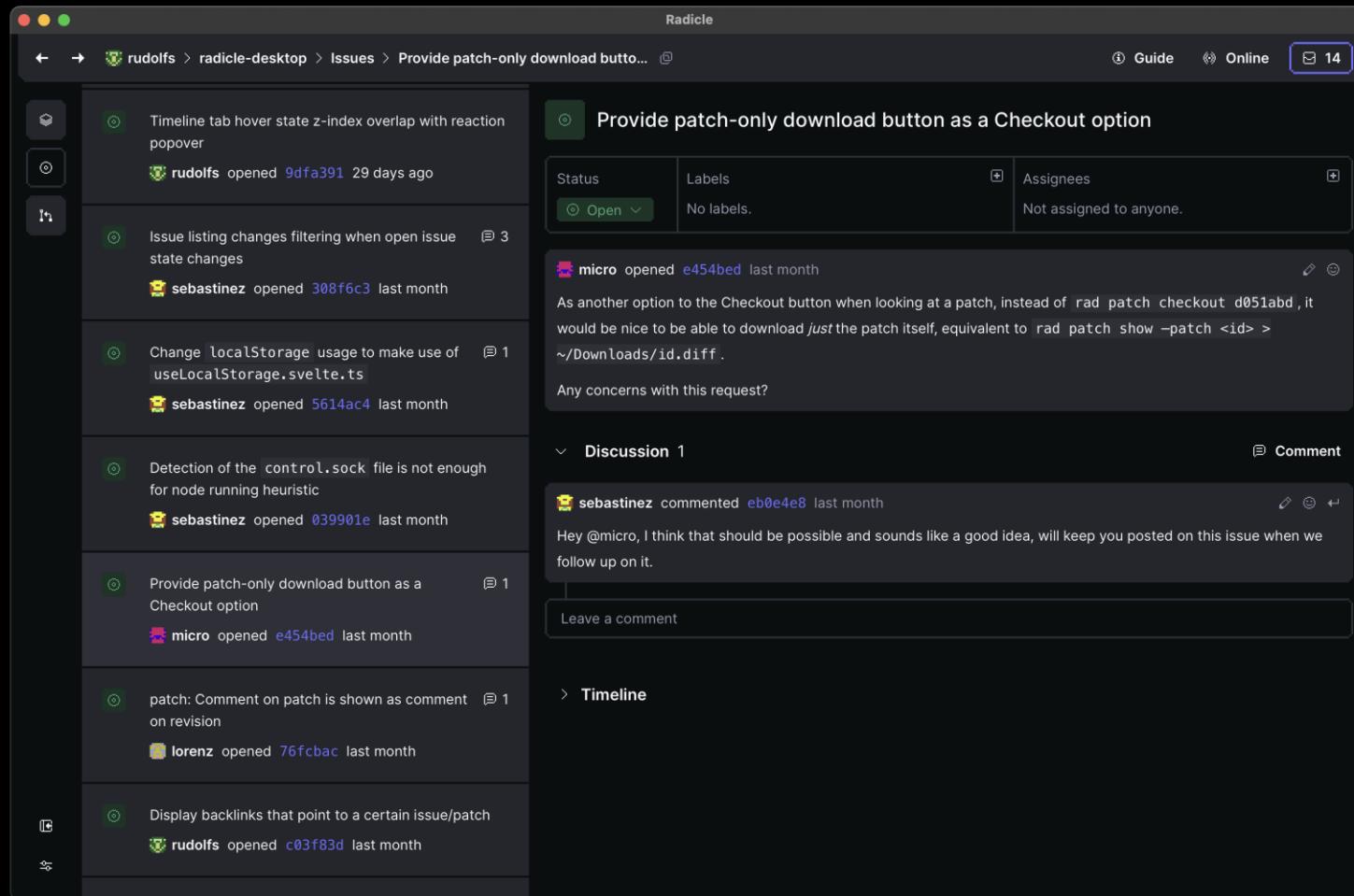
Radicle CLI

[I] lorenz@wsl ~ rad ls

Name	RID	Visibility	Head	Description
experiment	rad:zHFjVxWCFEHW2uED43oh7gSsJ8SP	private	7e7ce96	
heartwood	rad:z3gqcJUoA1n9HaHKufZs5FCGazv5	public	91eb6fc	Radicle Heartwood Protocol & Stack
infra	rad:zDKA4hxFpFeJPp2mvXQFpqNHQmFt	public	2d56704	The NixOS infrastructure configurations
nur	rad:z3WFXKNQgDcHHATJx1PxL1XhDot9u	public	084e5b5	Nix User Repository
rad-ix	rad:z2PJNraeUwrbiKchmoecVMVQjj3Rf	public	98a7f19	The Radicle Indexer
radicle-desktop	rad:z4D5UCArarfTzTQpDZNQRuqswh3ury	public	e48cc10	Radicle desktop app
radicle-explorer	rad:z4V1sjrXqjvFdnCUbxFPqd5p4DtH5	public	1416286	Radicle web interface
radicle-git	rad:z6cFWeWpnZNHh9rUW8phgA3b5yGt	public	f70012f	Git libraries for Radicle
radicle-infra	rad:z254T5p17bdFPmzfDojsdjo4HjpoZ	public	48e0466	Radicle Infrastructure as Code (NixOS, OpenTofu, ...)
radicle-link	rad:z4GaM5EUGJm462FQg4RtWyMt7NaqX	public	99f4255	The second iteration of the Radicle code collaboration protocol.
radicle-nix	rad:zTGn5tnYJgf8qd6KDudURvUvvLe	public	d7bb432	Packages, Modules etc. for using Nix and Radicle together.
radicle-scripts	rad:z2UsLkj3UXjbwZMGpQ9VeVLDCYUQ	public	93a4c46	
radicle-tui	rad:z39mP9rQAAgMERfUMPULfPUi473tY	public	d4484a8	Radicle terminal user interface
radicle.xyz	rad:z371PVmDHdjJucejRoRYJcDEvD5pp	public	3ef1a1f	Radicle website including documentation and guides
radicle.xyz-desktop	rad:z4Rxw3J2gX8SJgUYJ3h1KvQCAYoKS	public	9075ef9	Radicle Desktop Landing page and Documentation
rips	rad:z3trNYnLWS11cJWC6BbxDs5niGo82	public	329dee9	Radicle Improvement Proposals (RIPs)



Radicle Desktop

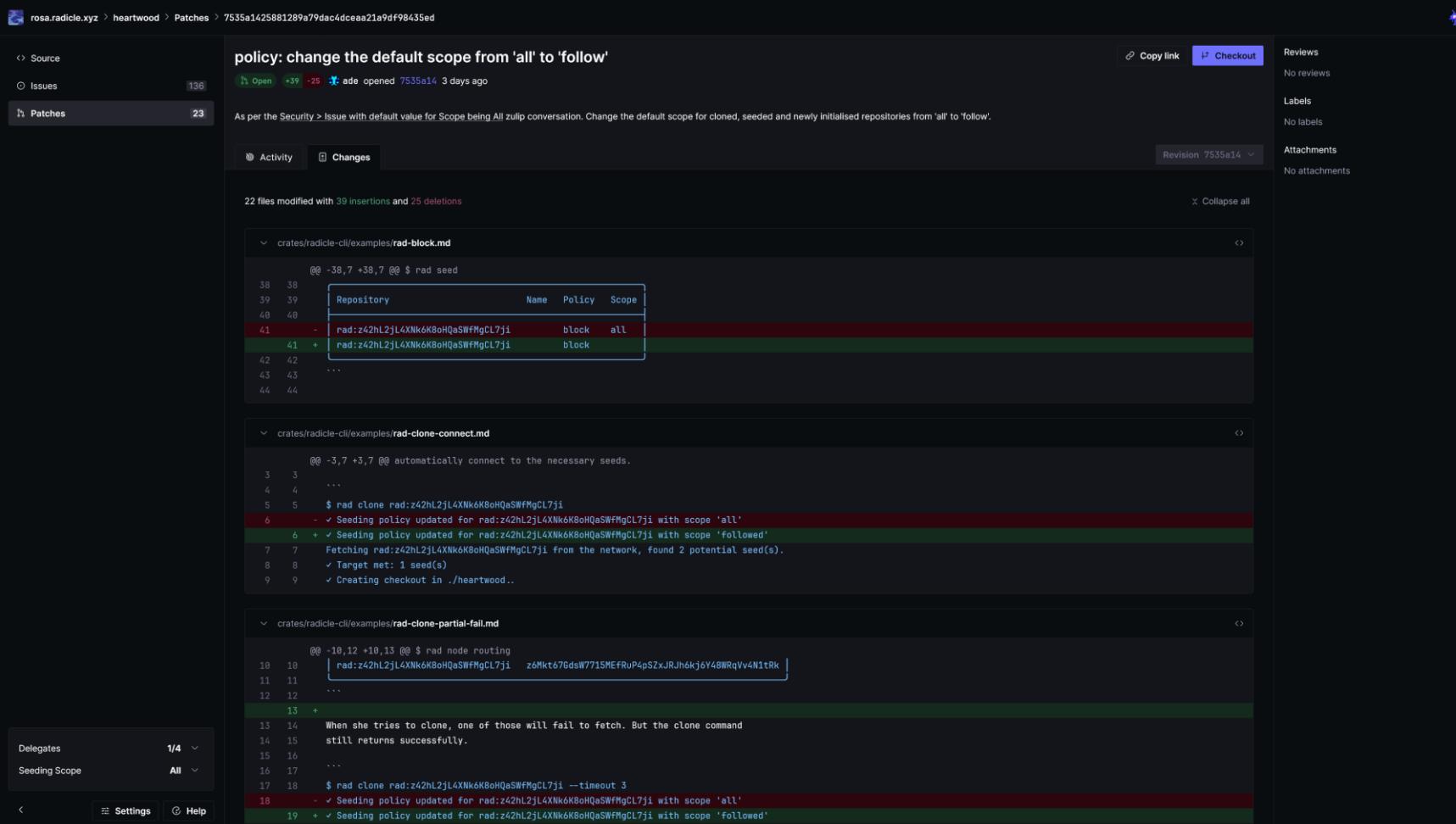


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Radicle

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Radicle Explorer (Web App)



The screenshot shows a detailed view of a patch in the Radicle Explorer web application. The URL is rosa.radicle.xyz/heartwood/Patches/7535a1425881289a79dac4dceaa21a9df98435ed.

Title: policy: change the default scope from 'all' to 'follow'

Activity: 1 Open, +39 -25, ade opened 7535a14 3 days ago

Patches: 23

Description: As per the Security > Issue with default value for Scope being All zulip conversation. Change the default scope for cloned, seeded and newly initialised repositories from 'all' to 'follow'.

Changes: 22 files modified with 39 insertions and 25 deletions

Repository: crates/radicle-cli/examples/rad-block.md

Repository	Name	Policy	Scope
rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji		block	all
rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji		block	follow

Repository: crates/radicle-cli/examples/rad-clone-connect.md

```
@@ -3,7 +3,7 @@ automatically connect to the necessary seeds.
3 3 ...
4 4 ...
5 5 $ rad clone rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji
6 - ✓ Seeding policy updated for rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji with scope 'all'
6 + ✓ Seeding policy updated for rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji with scope 'followed'
7 7 Fetching rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji from the network, found 2 potential seed(s).
8 8 ✓ Target met: 1 seed(s)
9 9 ✓ Creating checkout in ./heartwood..
```

Repository: crates/radicle-cli/examples/rad-clone-partial-fail.md

```
@@ -10,12 +10,15 @@ $ rad node routing
10 10 | rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji | z6Mkt67dsW7715MEFRuPcpSzJRJh6kj6Y48WRqVv4NltRk |
11 11 ...
12 12 ...
13 13 +
14 14 When she tries to clone, one of those will fail to fetch. But the clone command
15 15 still returns successfully.
16 16 ...
17 17 ...
18 18 $ rad clone rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji --timeout 3
18 - ✓ Seeding policy updated for rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji with scope 'all'
19 19 + ✓ Seeding policy updated for rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji with scope 'followed'
19 ...
20 20 Extending rad:z42hL2jL4XNk6K8oHQaSWfMgCL7ji from the network, found 2 potential seed(s)
```

Delegates: 1/4

Seeding Scope: All

Copy link **Checkout**

Reviews: No reviews

Labels: No labels

Attachments: No attachments



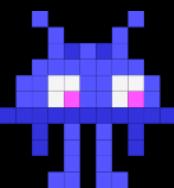
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Radicle

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High-Level Design

Git + x



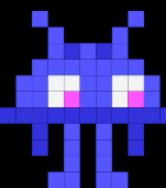
2026-02-01

Radicle

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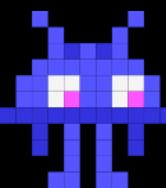
Take Git

- Content Addressability
- Immutability of Data
- Efficient Sync Protocol
- Wide Acceptance



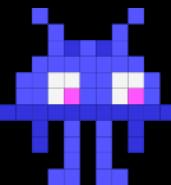
Add On

- Globally unique repository addresses
- Repository metadata including permissions
- Discovery of replicas
- Self-certifying, sovereign, user identity (like PGP)
- Lots more for social artifacts like patches and issues (fintohaps' talk, 13:40 @ K.3.201)



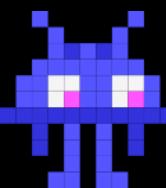
git push is a ~~lie~~ local first

1. ~/.../foo\$ git push rad://z3gqcJUoA1n...CSGazv5 main
2. A Git remote helper sends objects across your filesystem to ~/.radicle/storage/z3gqcJ...Gazv5
That's fast.
3. A long-running process, called Radicle Node, picks up your changes and announces the new references to the network.
 - Retains mental model of pushing to send over the network.



Radicle Node

- Clients (CLI, Desktop, TUI, HTTP Daemon) interact with:
 - Radicle Storage via the filesystem (git push)
 - Radicle Node via JSON over Unix socket (commands)
- Peers to other nodes
 - Currently bootstrapped via {iris,rosa}.radicle.xyz (both also reachable as Onion services).
 - In the future DNS-SD combined with DHT?



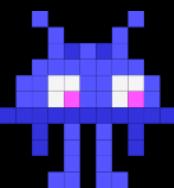
Radicle Peer-to-Peer Connections

- Noise_XK_25519_ChaChaPoly_SHA256 over TCP
- Simple multiplexer (inspired by QUIC) over two sub-protocols:
 - Git (for syncing)
 - Gossip (metadata about nodes and repositories)
- Supports Tor via SOCKS out of the box.
- That's it!



Messages

- Announcements (3)
- Subscriptions (1)
- Informational (1)
- Keepalive (ping and pong)



Announcement Messages

- Node

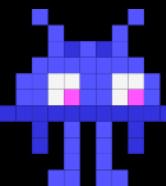
Introduces the node to the network.

- Inventory

Lists the available repositories.

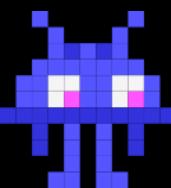
- Refs

Git references changed, e.g. user pushed.

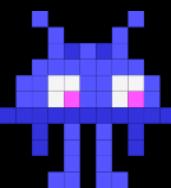


Subscription Messages

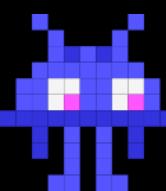
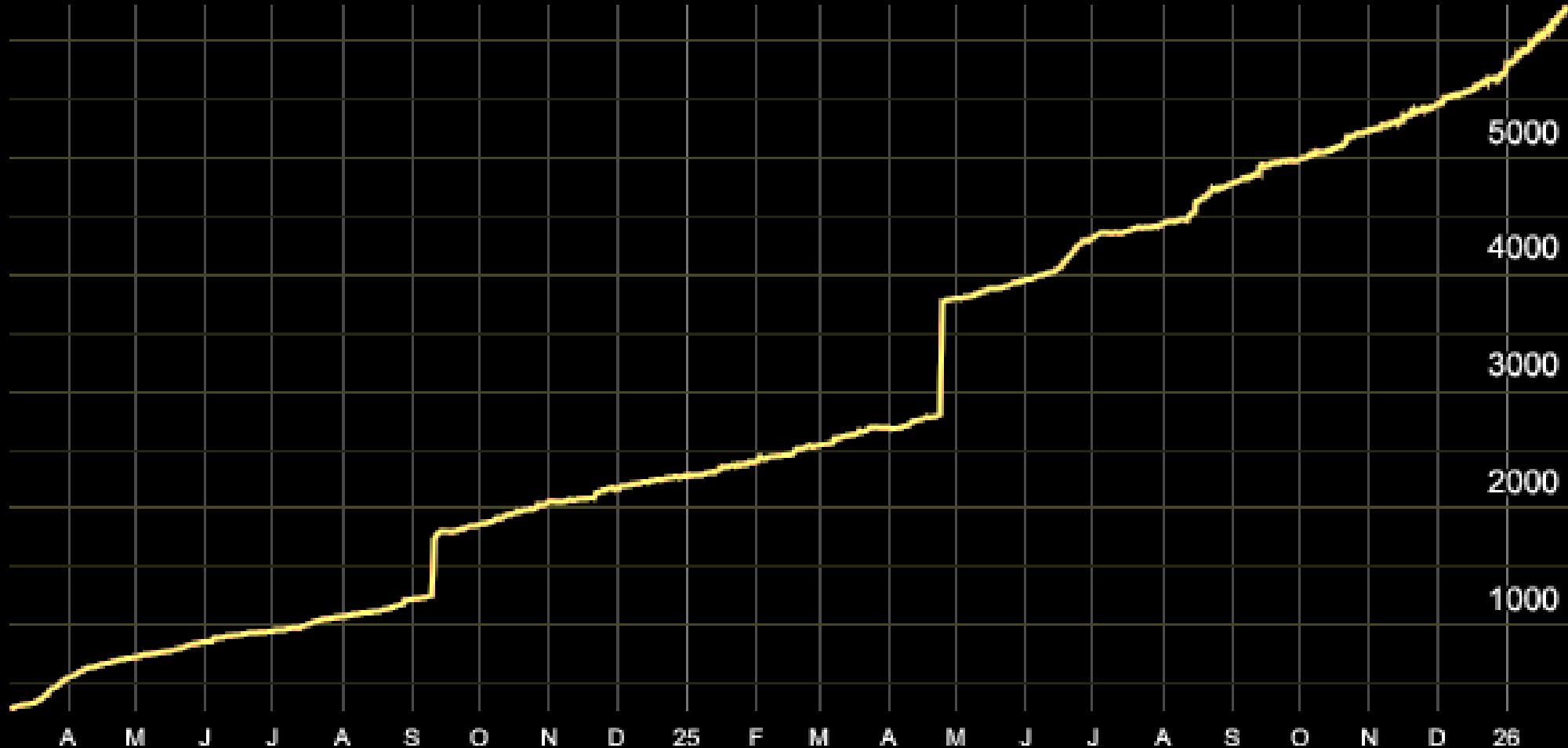
- Subscribe to updates for repositories by sending a bloom filter.
- Includes start and end point in time.



The Network Today



Repositories



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Radicle

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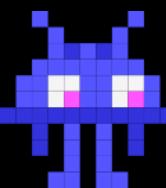
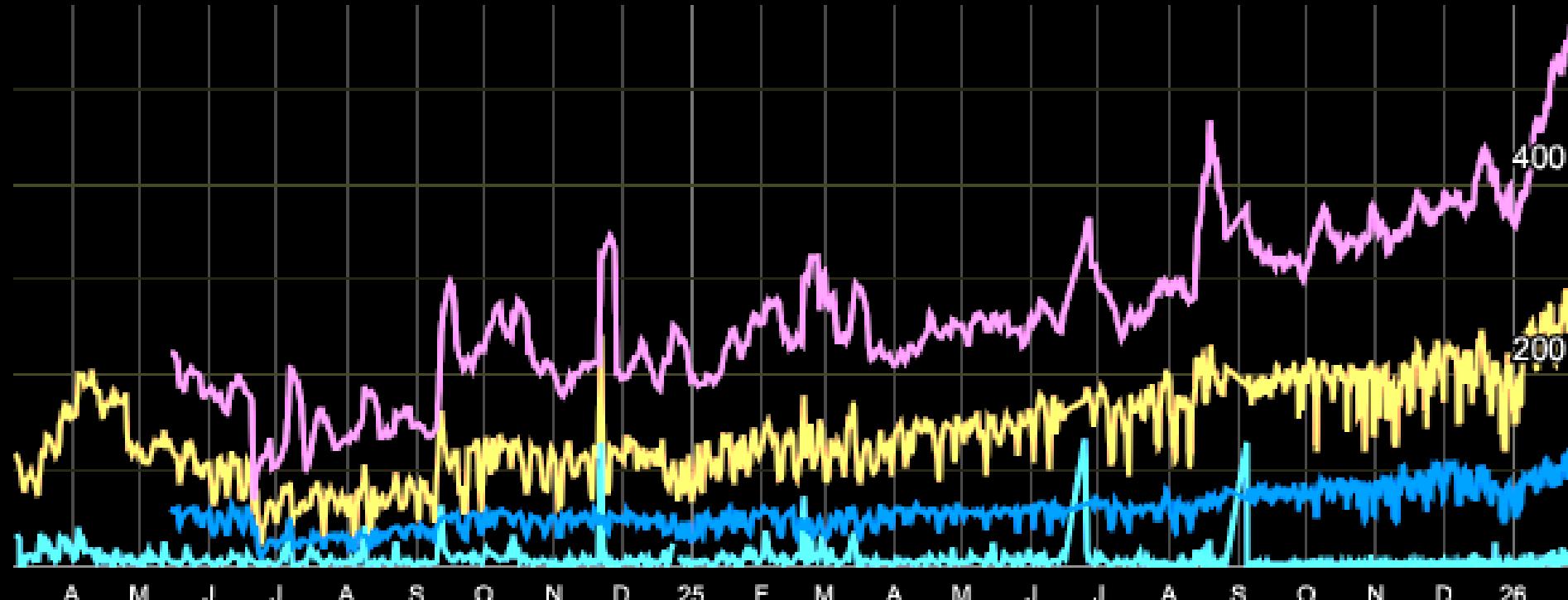
Nodes

Daily Active Nodes

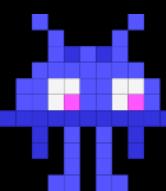
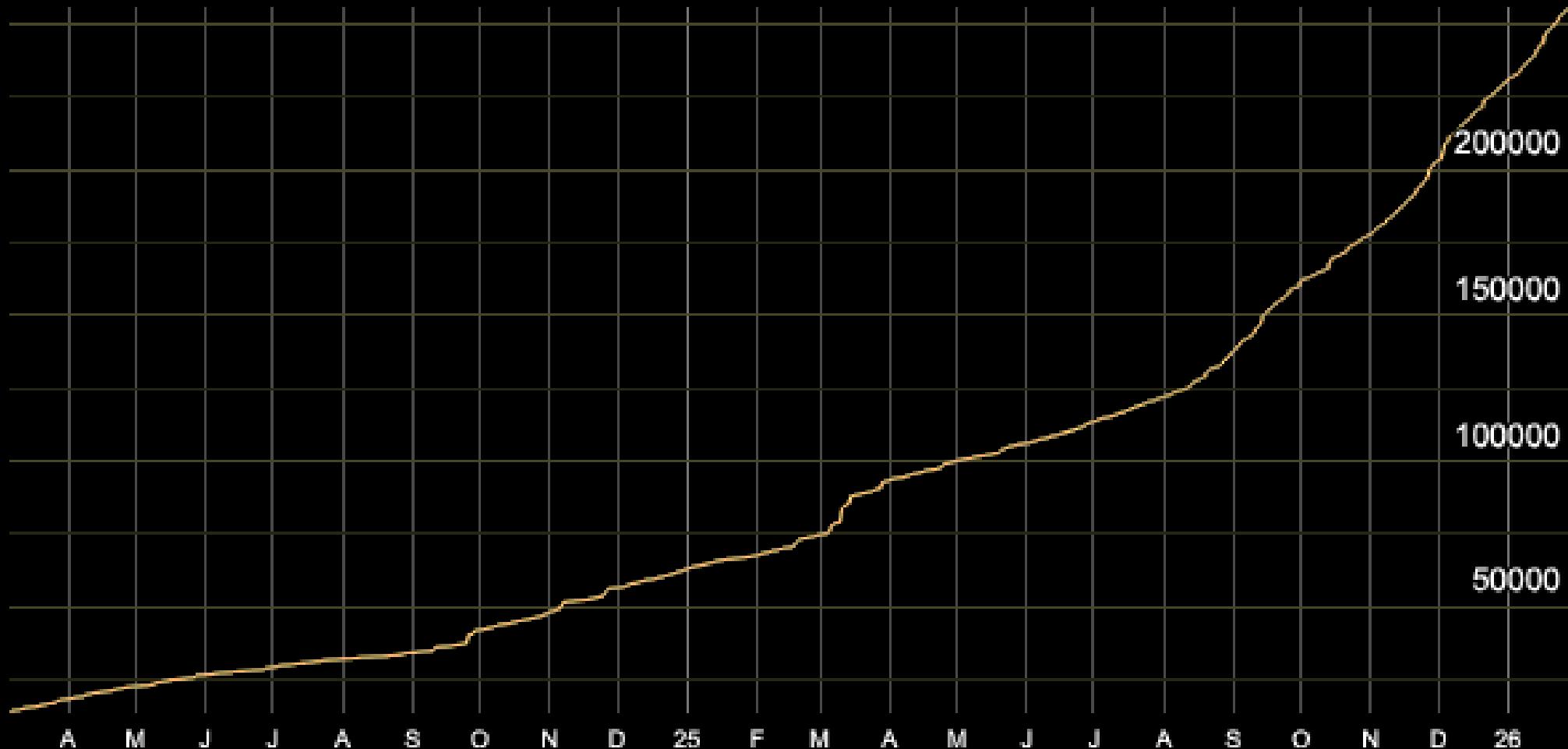
Daily New Nodes

Daily Public IP Nodes

Weekly Active Nodes



Pushes

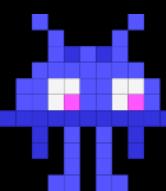
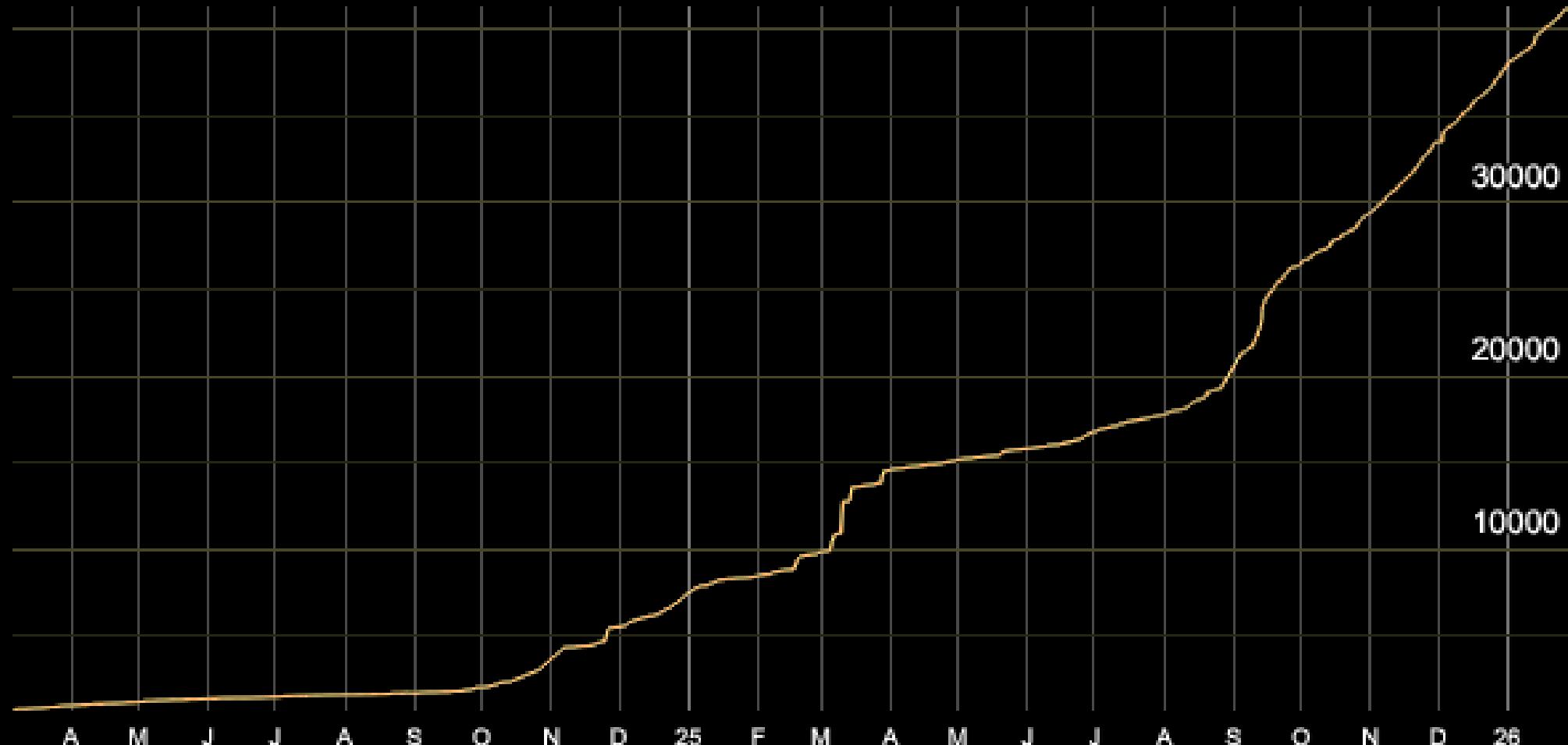


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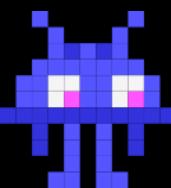
28

Patches



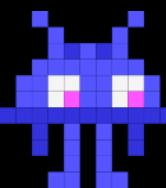
Operating a Node

- Nodes are persistently address by their Ed25519 key.
- You decide which repositories you want to replicate (“seed”) and can change your mind any time.
- You can join the global de facto main network or roll your own.
- Nodes can announce change of their IP address, TCP port.



The Road Ahead

- Separation of user and node concepts.
- Multi-Device Support
- Identities that allow key rotation.
- Fine-Grained Replication Policies
- Hole Punching (iroh?)
- Discovery via DNS-SD and mDNS.



Free your code!

radicle.xyz

Read

app.radicle.xyz

Surf

radicle.zulipchat.com

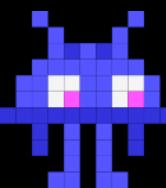
Chat

@radicle@toot.radicle.xyz

Toot

Open Local First After Party

Talk



Private Repositories and Networks

- Majority of repository owners (“delegates”) decides which nodes (specified by their Ed25519 key) may fetch and replicate the repository.
- Users can configure nodes to connect with, forming their own, private, Radicle network.

