



CNCF Project Harbor

Good container registries can do more than storing artifacts.

What is Harbor

Harbor is an open source container registry that secures artifacts with policies and role-based access control, ensures images are scanned and free from vulnerabilities, and signs images as trusted.

Agenda



Me and Open-Source



The CNCF Community & Project Harbor



What is Harbor?



Good container registries can do more than storing artifacts



Unpopular opinion: You likely don't need an artifact repository at all!

Me

- Software Engineering Background
- 20+ years of IT industry experience
 - ~1991 first Computer 386 SX 33
- Ex Siemens employee
 - Cloud Enablement
 - Contributed to Siemens ID

Vadim Bauer



github.com/Vad1mo



twitter.com/vad1mo

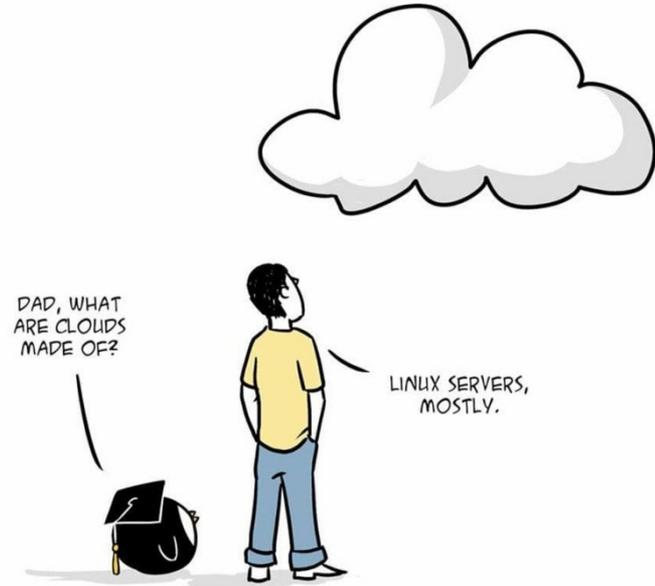
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My Current Focus

- Cloud and SaaS
 - Enablement
 - Transformation
- SaaS Factory
- Partner at 56K.Cloud GmbH



About Me

Hobby

- Snowboarding, Sports
- Professionalism and professionalization in IT
Eg. International Conference for Software Craft and Testing
 - socrates-ch.org
 - socrates-day.ch



github.com/Vad1mo



twitter.com/vad1mo

Open Source and Me

- Open-Source Software plays an important role in my professional career
 - User
 - Maintainer
 - Founder
- I earn my money with and through Open-Source Software

Why Am I Here?

- Contributor to Project Harbor
- We run and operate multiple Harbor based container registries
 - SaaS
 - OnPrem
 - Consulting and Commercial Support
 - Container management and distribution solutions
- Siemens is using Harbor



Dedicated Container Registry Service

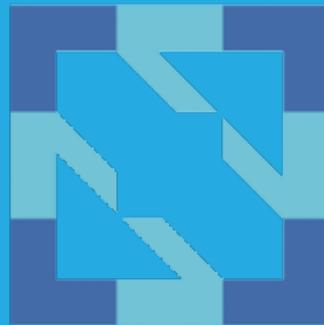
No frills and best-in-class Harbor based Container Management Solution for teams and organizations

container-registry.com

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- Siemens is using Harbor
- I was invited by Roger

**CNCF COMMUNITY
& PROJECT HARBOR**



**CLOUD NATIVE
COMPUTING FOUNDATION**

CNCF Cloud Native Landscape

CNCF Cloud Native Landscape
2021-05-26T05:29:19Z 2d749578

Overwhelmed? Please see the CNCF Trail Map. That and the interactive landscape are at l.cncf.io

Greyed logos are not open source

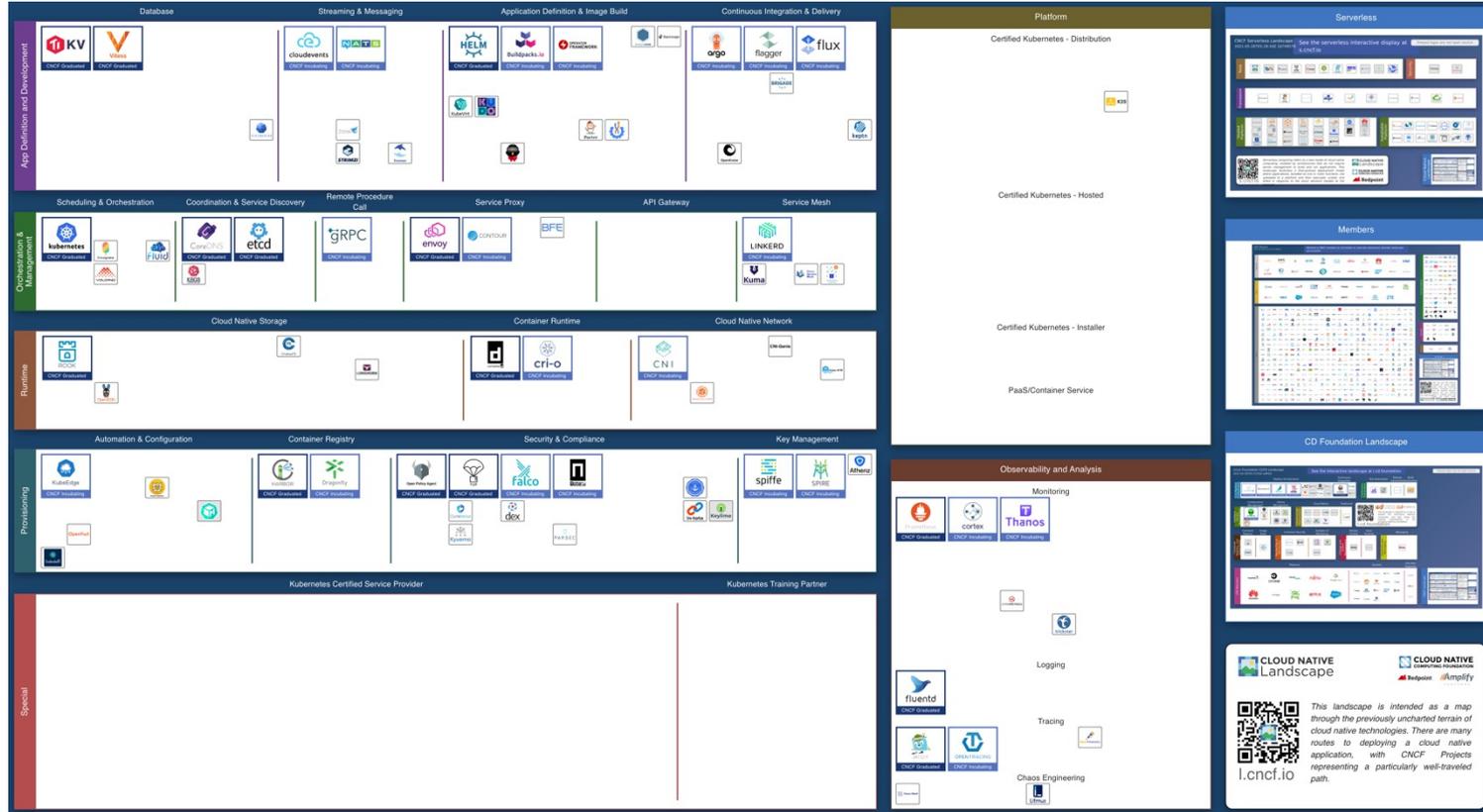
The landscape is organized into several functional categories:

- App Definition and Development:** Includes logos for KV, V, CloudEvents, HELM, and Flux.
- Database:** Includes logos for KV, V, and others.
- Streaming & Messaging:** Includes logos for CloudEvents, HELM, and Flux.
- Application Definition & Image Build:** Includes logos for HELM, Flux, and others.
- Continuous Integration & Delivery:** Includes logos for Origo, Flagger, and Flux.
- Platform:** Includes sections for Certified Kubernetes - Distribution, Hosted, and Installer.
- Serverless:** Includes a section for Serverless with a QR code.
- Members:** Includes a section for Members with a QR code.
- CD Foundation Landscape:** Includes a section for CD Foundation Landscape with a QR code.
- Observability and Analysis:** Includes sections for Monitoring, Logging, and Tracing.
- Automation & Configuration:** Includes logos for various automation tools.
- Container Registry:** Includes logos for container registries.
- Security & Compliance:** Includes logos for security and compliance tools.
- Key Management:** Includes logos for key management services.
- Cloud Native Storage:** Includes logos for storage solutions.
- Container Runtime:** Includes logos for container runtimes like CRI-O and CNV.
- Cloud Native Network:** Includes logos for network solutions.
- Provisioning:** Includes logos for provisioning tools like Chef, Puppet, and Ansible.
- Kubernetes Certified Service Provider:** Includes logos for CSPs.
- Kubernetes Training Partner:** Includes logos for training partners.
- Special:** Includes logos for special interest groups and partners.

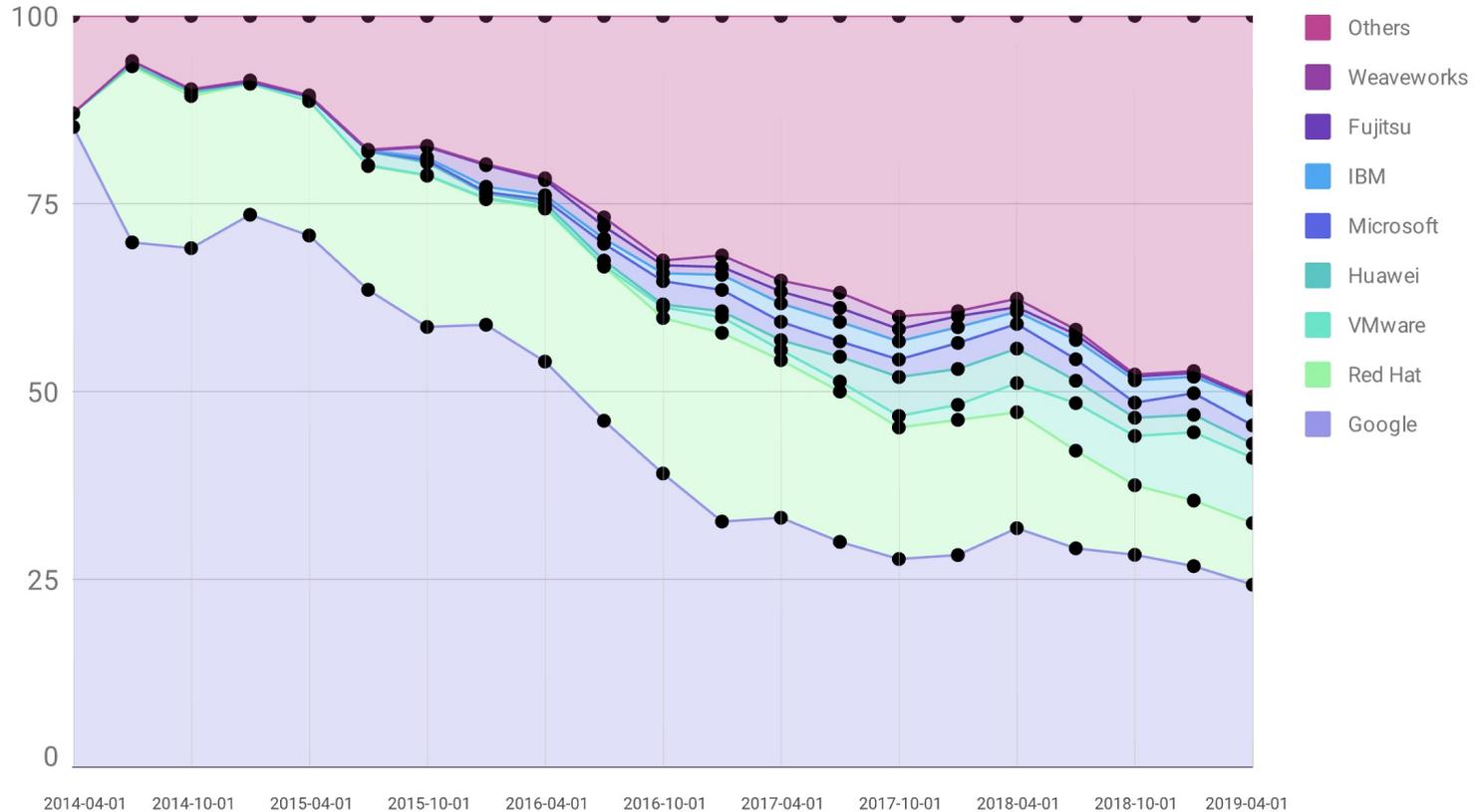
CLOUD NATIVE Landscape
This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path.

l.cncf.io

CNCF Projects – Graduated/Incubating/Sandbox



Kubernetes Code Diversity



Kubernetes Committers/Contributors

1	Google	622
2	Red Hat	523
3	Independent	493
4	VMware Inc.	205
5	Microsoft Corporation	183
6	IBM	150
7	Huawei Technologies Co. Ltd.	82
8	Intel	65
9	Amazon	63
10	SAP	60
11	Pivotal	57
12	Cisco	56
13	SUSE LLC	53
14	Mirantis Inc.	47
15	ZTE	46
16	CNCF	44
17	Alibaba	43
18	DaoCloud (Shanghai DaoCloud Network Technology Co LTD)	36
19	Fujitsu	34
20	Apple	31

1	Independent	999
2	Google	793
3	Red Hat	786
4	Microsoft Corporation	331
5	VMware Inc.	311
6	IBM	301
7	Amazon	112
8	Huawei Technologies Co. Ltd.	111
9	SAP	106
10	Cisco	100
11	Intel	97
12	SUSE LLC	93
13	Pivotal	84
14	Alibaba	65
15	CNCF	64
16	Mirantis Inc.	58
17	Docker Inc.	56
18	NetEase Inc	55
19	ZTE	53
20	Mesosphere	48

My Open Source Observation

Big Open Source Projects have 2 type of Contributors

1. Direction/Steering

- Team effort
- Full time employees funded by large Stakeholder

2. Improvements

- Bug Fixing
- Small Improvements
- Individual Contributor or small Organizations

Situation with Harbor

- VMWare is the main Contributor to Harbor
- VMWare ships their VMWare Stack together with Harbor
- ~ 16 Full time developer are working on Harbor
- 4th Project that graduated from CNCF
- ~ 255 Contributors over 5 years

Conclusion

- Majority of CNCF Projects are well funded
- Many CNCF Projects have one main contributor
- Maintaining and Contributing to Open Source is not a hobby!
- The developer community needs to part away from the idealistic view on open source software

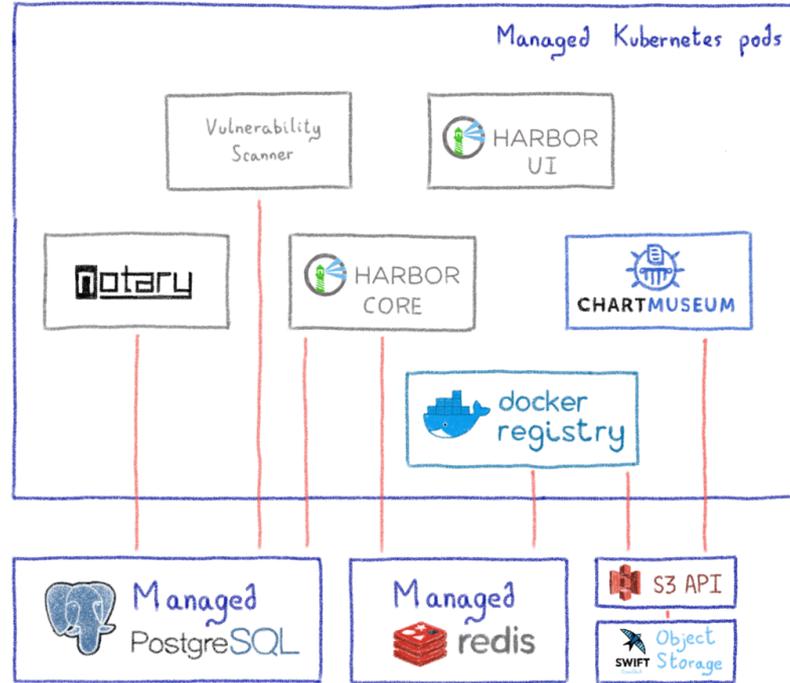
HARBOR



What is Harbor

Harbor is an open source container registry that secures artifacts with policies and role-based access control, ensures images are scanned and free from vulnerabilities, and signs images as trusted.

Harbor Component Overview



Harbor

8gears.container-registry.com/harbor/projects/5/repositories

Harbor Search Harbor English admin

Projects

examples *System Admin*

Summary Repositories Helm Charts Members Labels Scanner P2P Preheat Policy Robot Accounts Webhooks Logs Configuration

X DELETE PUSH COMMAND Q [] []

<input type="checkbox"/>	Name	Artifacts	Pulls	Last Modified Time
<input type="checkbox"/>	examples/plausible-analytics	1	1	5/13/21, 8:30 PM
<input type="checkbox"/>	examples/hello-world	1	9	2/24/21, 6:07 PM

Page size 15 1 - 2 of 2 items

EVENT LOG

DARK Harbor API V2.0

- Projects
- Logs
- Administration
 - Users
 - Robot Accounts
 - Registries
 - Replications
 - Distributions
 - Labels
 - Project Quotas
 - Interrogation Services
 - Garbage Collection
 - Configuration

Why Harbor over X

- Container Registries is a commodity service
 - Every Cloud Provider has a Container Registries
 - Every SCM has a container registry
 - Hub.docker.com is basically free or very low priced
- There is no need to switch if you don't know why
- For 80% of users the “default” is enough

- Harbor shines when it comes to containerized workflows and pipelines
- Multi-Cloud Rollout
- Customers and partner image access

What is special about Harbor

- **Flexibility**
 - Well suited for different environments - K8s, Docker, Native
- **Role based access control** Users access different repositories through 'projects' and a user can have different permission for images or Helm charts under a project
- **Policy based replication** - Images and charts can be replicated (synchronized) between multiple registry
- **Vulnerability Scanning**
- **Additional Security Layer**
- **Retention Policies** - Image deletion & garbage collection
- **Graphical user portal**
- **RESTful API**



Use Cases

CONTAINER REGISTRIES THAT CAN DO MORE

Typical Enterprise Use Cases for Harbor

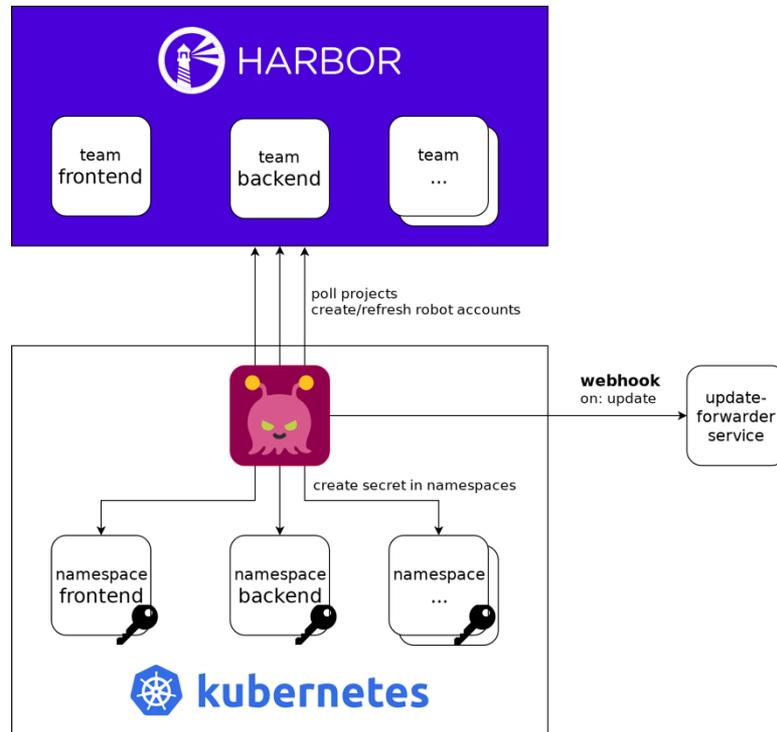
- Image distribution to K8s clusters around the globe
 - P2P Image Distribution with **Kraken** or **Dragonfly**
- Ship images to restricted regions
- Data Residency
- Integration with inhouse IAM Systems
- Multi Cloud Rollout

Everything in one place

- Additional Security Layer
- Force all users to only use internal container registry
- Proxy images from Docker Hub, GitLab, gcr and ghcr etc.
- Total Visibility
 - Control and Monitor every image used in your organization

Deep K8s Integration

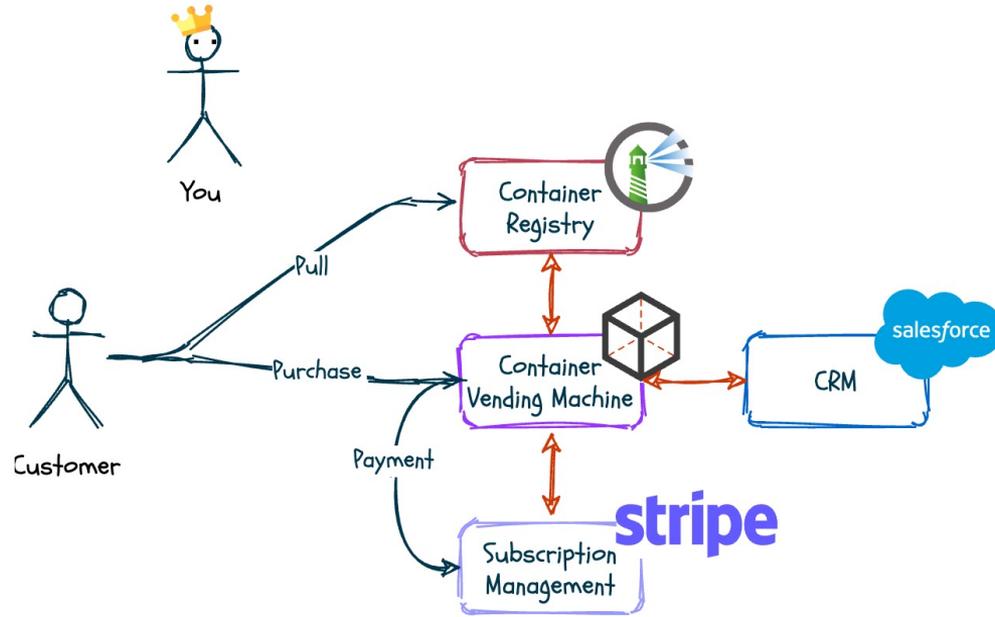
- Synchronize Harbor with K8s instances to automatically issue
 - Pull/Push Secrets
 - Create Harbor Projects from K8s Namespaces and visa versa
- Only allow images from your registry
- Only allow scanned and vulnerable free container images



Distributing Commercial Software Through Container Images

- ISVs can distribute container images to customers/partners
- No need for downloadable binaries, ZIPs, or other type of compressed delivery

Sell Container Images



See who is using your software

- Analytics on software usage and adoption
 - See who is pulling your software
 - Which Version
 - How often

OCI Registry as a Storage

- Push any artifact to an OCI compliant Container Registry

The logo for ORAS (OCI Registry As a Service) is displayed in a stylized, 3D font. The letters are colored as follows: 'O' is red, 'R' is teal, 'A' is yellow, and 'S' is lime green. Each letter has a blue shadow underneath, giving it a three-dimensional appearance.

Unpopular Opinion

- Most Companies that build software don't need an artifact repository
 - Trend toward Git as the source of truth
 - Trend towards GitOps
 - PaaS
- The only reason to have an artifact repository is when you want to internally distribute and reshare internally used libraries.

Get in tuch with me

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