CLOUD NATIVE COMPUTING FOUNDATION

CLOUD NATIVE TRAIL MAP

The Cloud Native Landscape https://github.com/cncf/landscape has a growing number of options. This Cloud Native Trail Map is a recommended process for leveraging open source, cloud native technologies. At each step, you can choose a vendor-supported offering or do it yourself, and everything after step #3 is optional based on your circumstances.

HELP ALONG THE WAY

A. Training and Certification

Consider training offerings from CNCF and then take the exam to become a Certified Kubernetes Administrator

https://www.cncf.io/training

B. Consulting Help

If you want assistance with Kubernetes and the surrounding ecosystem, consider leveraging a Kubernetes Certified Service Provider

http://cncf.io/kcsp

C. Join CNCF's End User Community

For companies that don't offer cloud native services externally

http://cncf.io/enduser

WHAT IS CLOUD NATIVE?

- **Operability:** Expose control of application/system lifecycle.
- **Observability:** Provide meaningful signals for observing state, health, and performance.
- **Elasticity:** Grow and shrink to fit in available resources and to meet fluctuating demand.
- **Resilience:** Fast automatic recovery from failures.
- **Agility:** Fast deployment, iteration, and reconfiguration.

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1. CONTAINERIZATION

- Normally done with Docker containers
- Any size application and dependencies (even PDP-11 code running on an emulator) can be containerized
- Over time, you should aspire towards splitting suitable applications and writing future functionality as microservices

2. CI/CD

- Setup Continuous Integration/Continuous Delivery (CI/CD) so that changes to your source code automatically result in a new container being built, tested, and deployed to staging and eventually, perhaps, to production
- Setup automated rollouts, roll backs and testing

3. ORCHESTRATION

- Pick an orchestration solution
- Kubernetes is the market leader and you should select a Certified Kubernetes Platform or Distribution
- https://www.cncf.io/ck

kubernetes — CNCF Graduated

4. OBSERVABILITY & ANALYSIS

- Pick solutions for monitoring, logging and tracing
- Consider CNCF projects Prometheus for monitoring, Fluentd for logging and Jaeger for Tracing
- For tracing, look for an OpenTracing-compatible implementation like Jaeger

Prometheus — CNCF Incubating
fluentd — CNCF Incubating
JAEGER — CNCF Incubating
OPENTRACING — CNCF Incubating

5. SERVICE MESH

- Connects services together and provides ingress from the Internet
- Service discovery, health checking, routing, load balancing
- Consider Envoy, Linkerd and CoreDNS

envoy — CNCF Incubating
CoreDNS — CNCF Incubating

6. NETWORKING

To enable more flexible networking, use a CNI-compliant network project like Calico, Flannel, or Weave Net.

CNI — CNCF Incubating

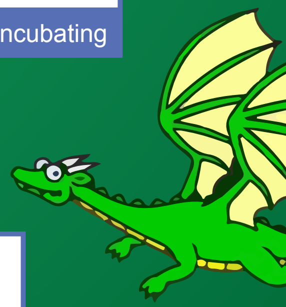
7. DISTRIBUTED DATABASE

When you need more resiliency and scalability than you can get from a single database, Vitess is a good option for running MySQL at scale through sharding.

Vitess — CNCF Incubating

8. MESSAGING

When you need higher performance than JSON-REST, consider using gRPC.



GRPC — CNCF Incubating

9. CONTAINER RUNTIME

You can use alternative container runtimes. The most common, all of which are OCI-compliant, are containerd, rkt and CRI-O.

containerd — CNCF Incubating
rkt — CNCF Incubating

10. SOFTWARE DISTRIBUTION

If you need to do secure software distribution, evaluate Notary, an implementation of The Update Framework.

Notary — CNCF Incubating
TUF — CNCF Incubating