



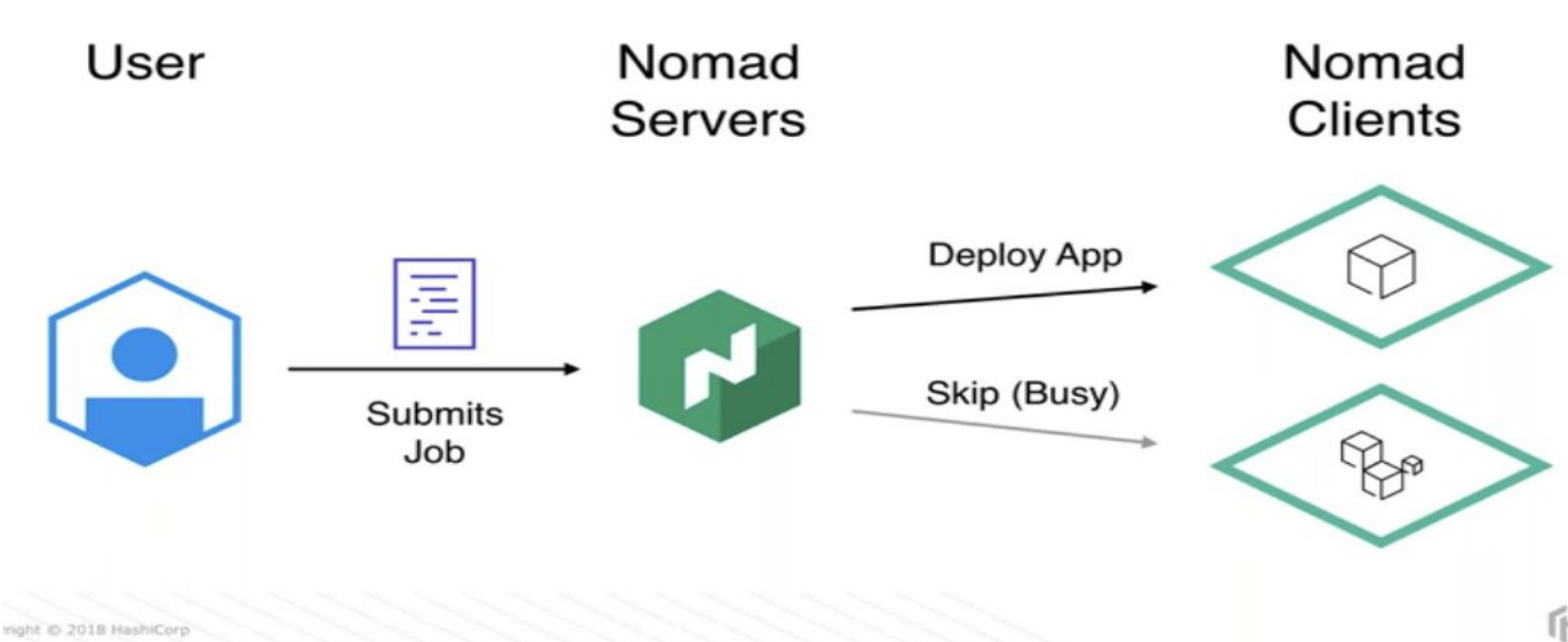
NOMAD DEPLOYMENT RECIPES FOR HashiCorp.



STUDENTS: RIZHENG TAN, ZIHENG LIN, KAI TAN

INTRODUCTION

- Managing and deploying complex end-to-end application tasks is a difficult and challenging task.
- The team's work is to bring the collaborative, single-command deployment experience to Nomad, HashiCorp's workload orchestration and scheduler.
- Using Helm v3 as a reference, which is a package manager for Kubernetes.

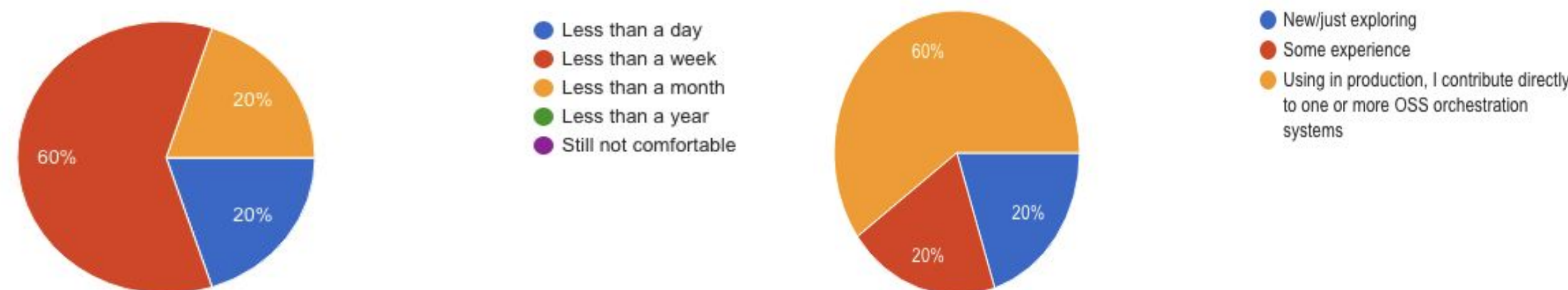


OBJECTIVE

- Develop an open source command-line utility and API to support single-command application deployment and service catalogs (chart repositories) on Nomad.
- The scope of the project would be to release a workable version that can be integrated into the nomad ecosystem and society.

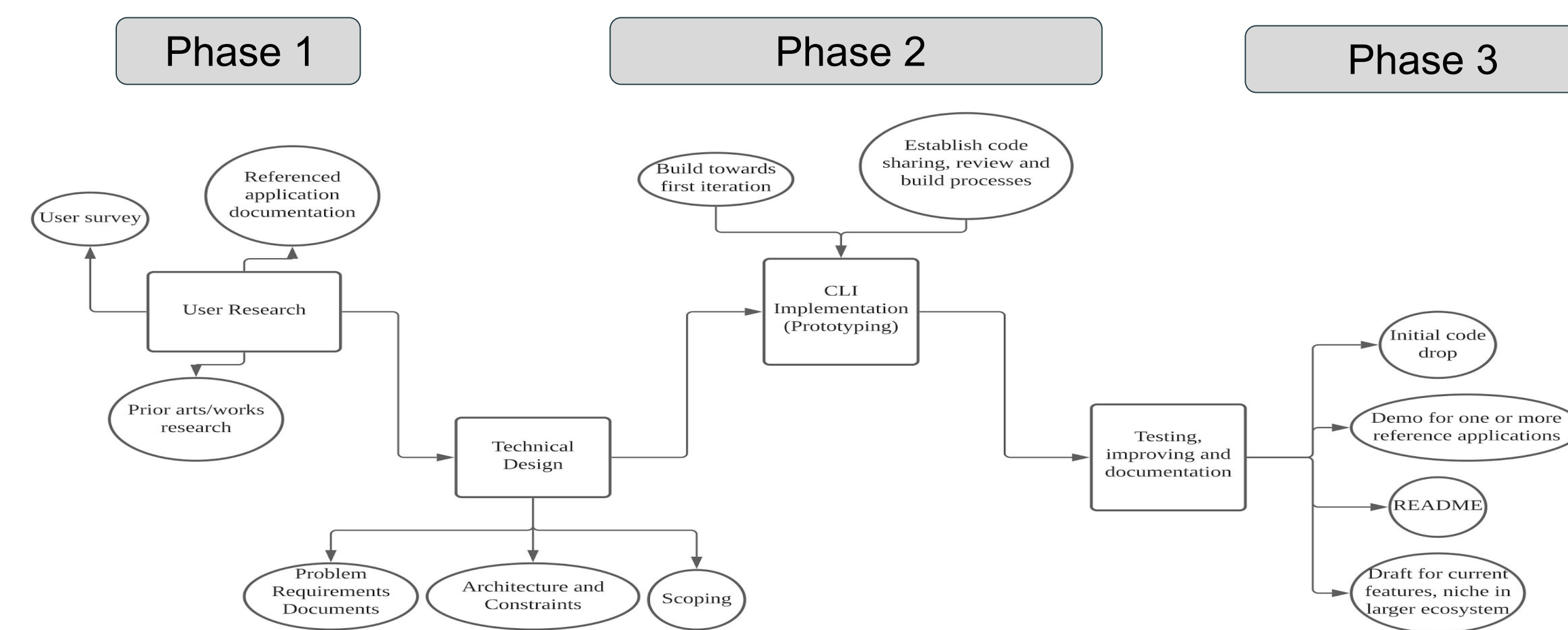
USER SURVEY RESEARCH

- We have conducted a survey for our new workflow deployment tool of Nomad. Here are some feedbacks.
- (Survey Link: <https://forms.gle/2N4FS5gWMMaX71VCP7>)
- Q: How long does it take for you to feel comfortable using nomad for deploying?
- Q: How experienced are you with open source cloud and data center management tools (incl. Nomad, Kubernetes, OpenStack, Cloud Foundry, etc.) in general?

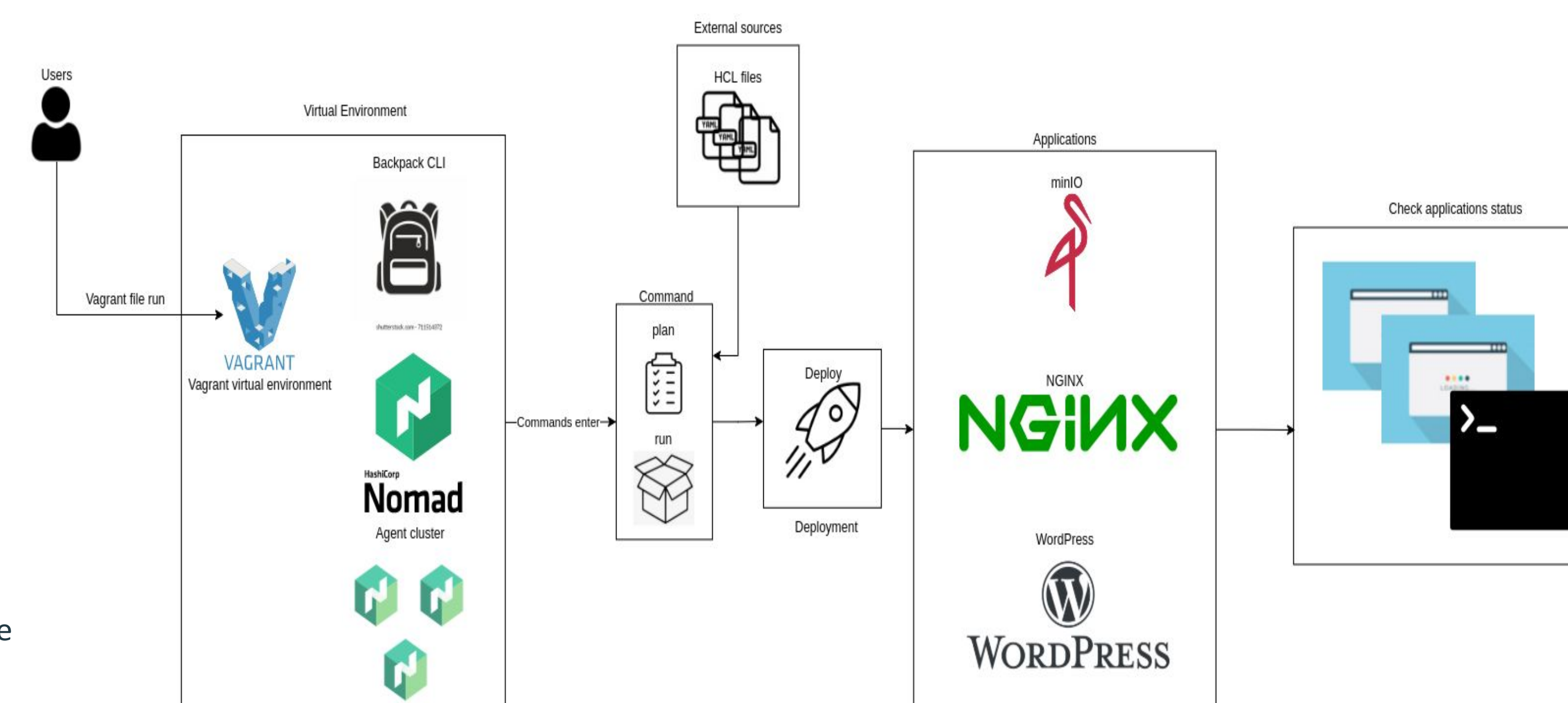


- Conclusion:
 - Nomad is a light software. Hence our new tool for Nomad should be easy to learn and use too.
 - Our target users are experienced engineers. Hence we can assume they have basic knowledge of application deployment and containers management.

DESIGN PHASE



TOOL USAGE WORKFLOW



Vagrant: Provides portable virtual software development environments for testing the tool's usage

Backpack: packaging system for Hashicorp Nomad

- Helps to define and install complex jobs configuration
- Helps building reproducible jobs across multiple Nomad clusters
- Simplifies updates to new version of jobs
- Allows you to publish and share packages of applications

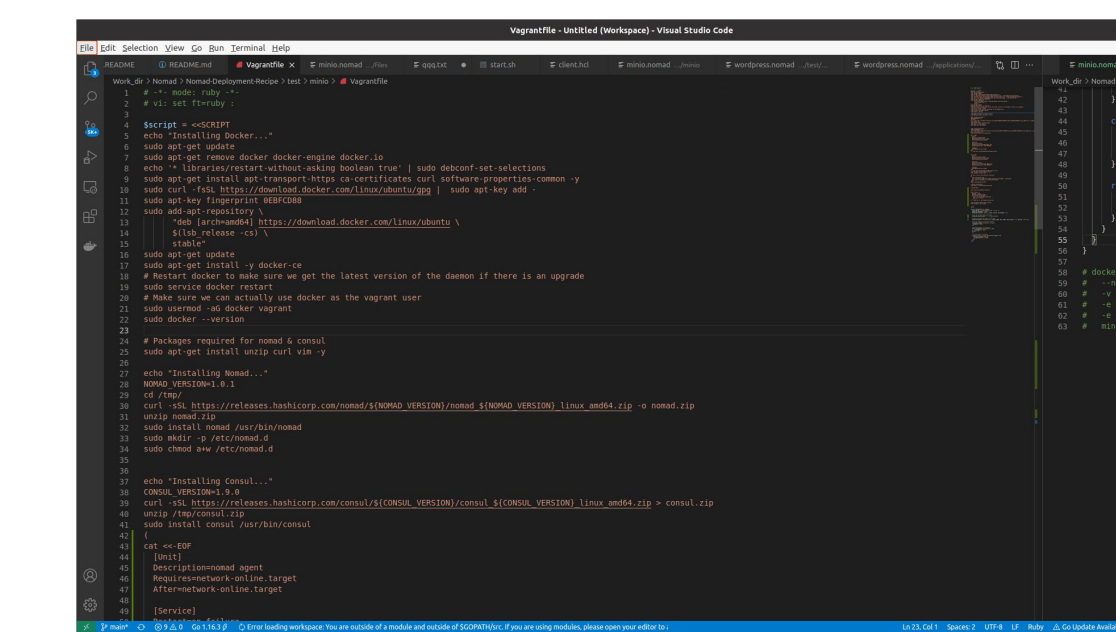
Nomad: The simple and flexible workload orchestrator to deploy and manage containers and non-containerized applications across on-prem and clouds at scale.

Deployment: Use declarative infrastructure-as-code for **deploying** applications.

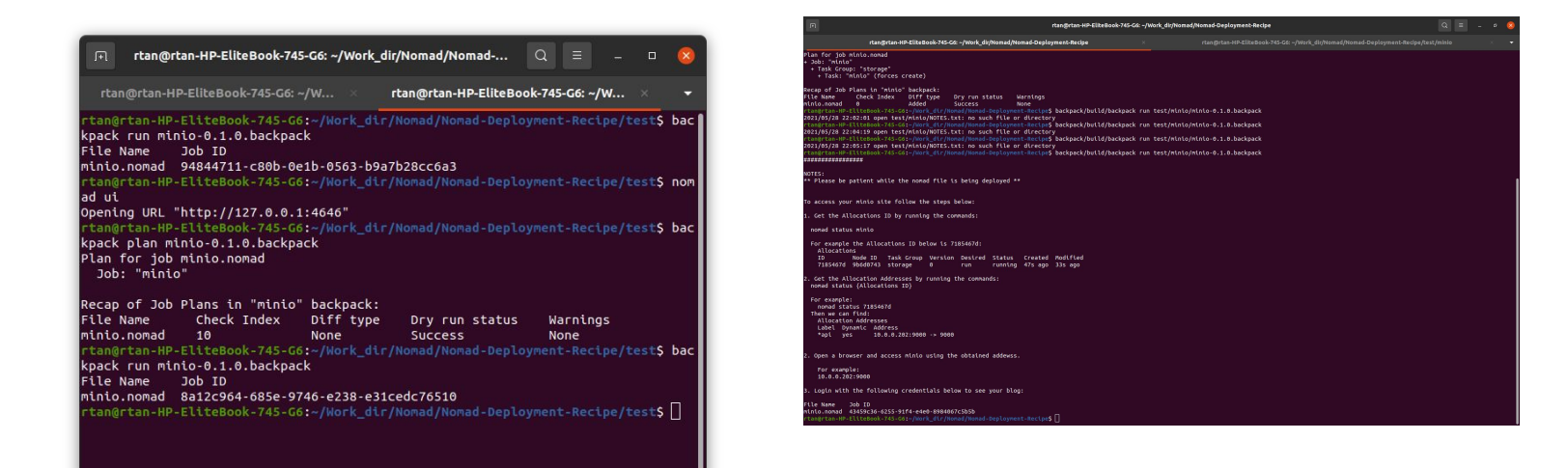
RESULTS

- Following images show the common user workflow for using our tool to deploy a task

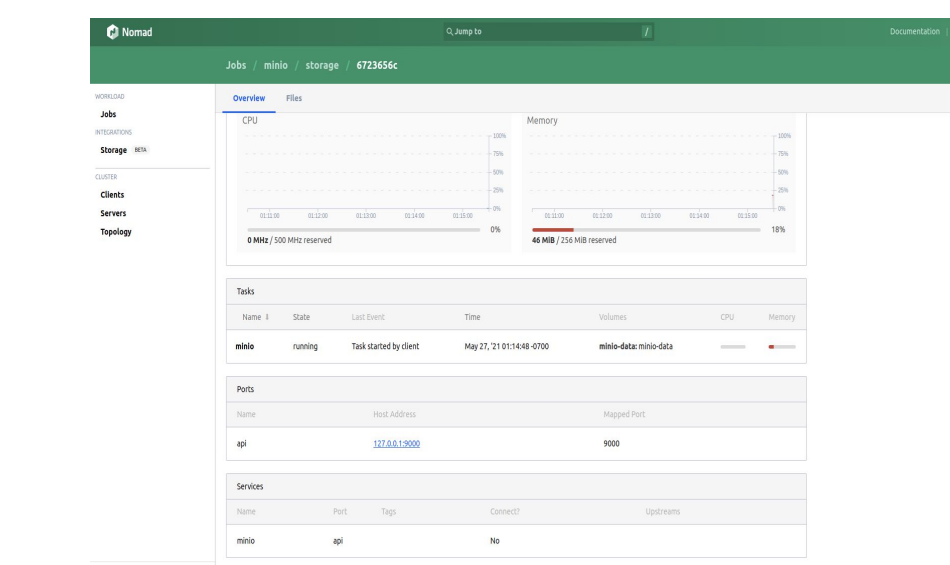
Vagrant file to provide test environment



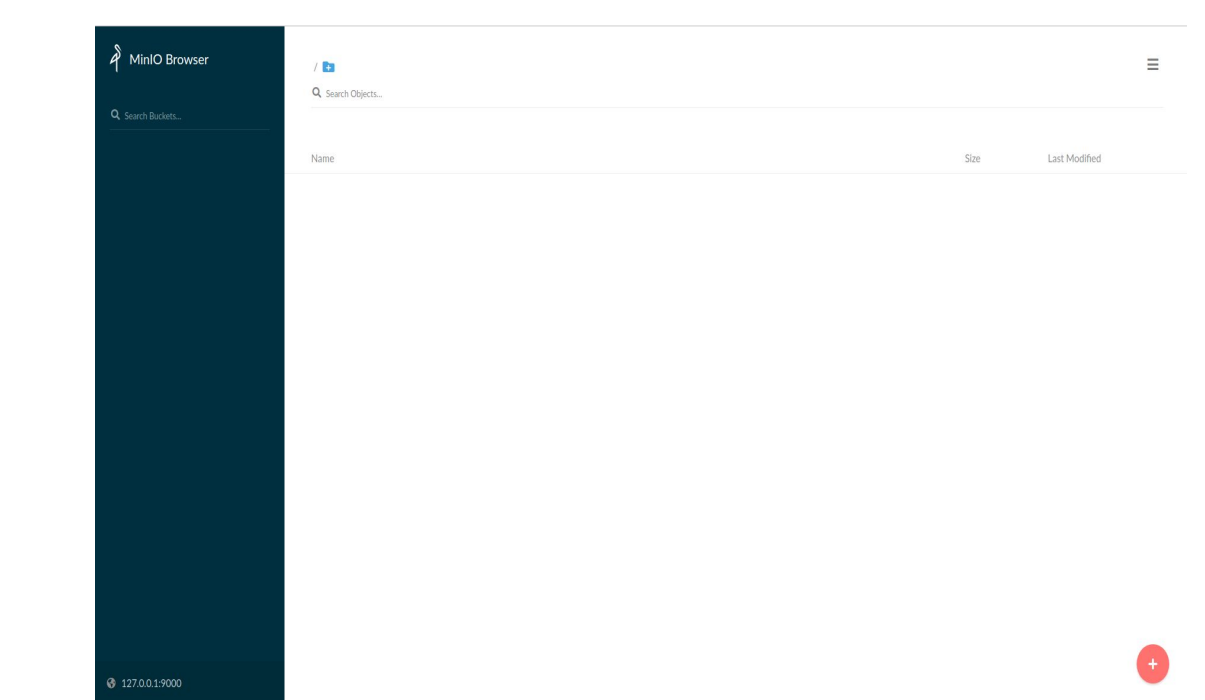
Commands to launch the reference applicatoin using backpack



Detail logs for instuctions



Visual results of the deployment



FUTURE WORK

- Persistence storage volume for running tasks
- Inter-communication for running tasks
- Keep building and maining the tool on the github repo
- Deployments of reference applications with different architecture on our tool(e.g microservice)
- Build the tool upon feedbacks from the community

CONCLUSION & CONTRIBUTION

- Developed an open source command-line utility and API to support single-command application deployment and service catalogs (chart repositories) on Nomad.
- Tested this tool on wordpress, nginx, minio, horizontal-app-scaling to prove the validity of our tool and provide the detailed get started guide for potential users.
- Did User survey research to investigate the target users' requirements and feedback on our proposed tool.

