Introduction

Oh My Zsh is an open source, delightful community-driven (with 1,300+ contributors) framework for managing your zsh configuration. Includes 200+ optional plugins (rails, git, OSX, hub, capistrano, brew, ant, php, python, etc), over 140 themes to spice up your morning, and an auto-update tool so that makes it easy to keep up with the latest updates from the community.

There are many types of shells. The default for Linux is bash. Although the function of bash is already very powerful, its hint function is not powerful enough, and the interface is relatively monotonous, it is not an ideal tool for programmer. Then zsh appeared but the configuration is too complicated. So Robby Russell started this open source project named Oh My Zsh. It is so powerful. It is compatible with bash and has a powerful history function. When using the or direction key to find historical commands, zsh supports limiting the search. Multiple terminal sessions share history. It can intelligently spell and correct, with various completion functions: path completion, command completion, command parameter completion, plug-in content completion, and more. It can intelligently jump and browse and jump through directories.

This chapter, our team aims to analyze and recover the architecture of this open source system Oh My Zsh. We start by first discussing its stakeholders and then takes on different viewpoints to analyze Oh My Zsh's performance to recover its architecture.

Stakeholders

To start with an analysis of its architecture, we talk about stakeholders to Oh My Zsh as an open source and widely used project. The definition for stakeholder was given as: A stakeholder in a software architecture is a person, group, or entity with an interest in or concerns about the realization of the architecture. Different types of stakeholders have different requirements and influences on the project. As an open source project, the category boundaries of React's stakeholders may not be very clear. So we try to state the stakeholders in our understanding.

stakeholder roles

As it is stated in the definition, we can classify stakeholders as ten roles according to their roles and concerns: Acquirers, Assessors, Communicators, Developers, Maintainers, Suppliers, Support staff, System administrators, Testers and Users. According this classification, we will analyze the stakeholders as following:

Acquirers

Acquirers oversee the procurement of the system or product.

Oh My Zsh was started by @Robby Russell in Aug 23, 2009 and he lead his team to develop this program so far. @Erica Tafavoti is one of the developers in 2009, and now the Digital Marketing Manager of On My Zsh. She can represent the commercial interests of users in negotiating with third-party suppliers and can also be investor representation in this group if a specific external investment is required to fund the project.

Assessors

Assessors oversee the system's conformance to standards and legal regulation.

They don't arrange a special person to be responsible for the legal regulation. All of the members in the core team are responsible for checking whether the pull-requests meet the standards of the Code of Conduct. In this case, assessors come from Oh My Zsh's Core Team instead of external legal entities.

Communicators

Communicators explain the system to other stakeholders via its documentation and training materials.

The member in the core team supply a lot of materials to help users understand the using method of Oh My Zsh. We can learn these materials from https://ohmyz.sh/community.html. We can find a lot of articles and videos in the website. The team member Robby Russell, Rachel M.Carmena, Brad Parbs and some others provide the link of articals. Team member Karl Hadwen, AJ O'Neal, Cyril Mougel .etc provide the videos for users to learn. So the communicators come from Oh My Zsh's core team too.

Developers

Developers are those people who construct and deploy the system from specifications.

The early developer of the Oh My Zsh is @Robby Russell and his team worker, with the popularity of React developing, more and more community developers join this development. Now we have over 1350 developers to improve the functions of Oh My Zsh. And the earliest update is submitted 25 days ago by the core developers.

Maintainers

Maintainers manage the evolution of the system once operational.

In Oh My Zsh, the core teams work as maintainers. They discuss the development

direction of Oh My Zsh and they accept and review pull-requests. From GitHub contributors, we view the main contributors and find those programmers who work for Oh My Zsh core team: @mcornella@robbyrusell@apjanke@fred-o@ncanceill.etc

Suppliers

Suppliers build or supply the hardware, software or infrastructure on which the system will run.

Oh My Zsh is integrated with many plugins to enrich its function, here We just list the most important ones:

Git: It is an open source version control software developed by Linus Torvalds to help manage

Linux kernel development, which can handle project management efficiently and at high speed.

PostgreSQL: It is a very free-featured object-relational database management system. PostgreSQL supports most of the SQL standards and provides many other modern features such as complex queries, foreign keys, triggers, views, transactional integrity, multi-version concurrency control, and more. Similarly, PostgreSQL can be extended in many ways, such as by adding new data types, functions, operators, aggregate functions, index methods, procedural languages, and more.

Ruby: It is a simple and fast object-oriented (object-oriented programming) scripting language

Python: Python is a cross-platform computer programming language. An object-oriented, dynamically typed language originally designed to write automated scripts (shells) that are increasingly being used for stand-alone, large-scale project development as versions are continually updated and new language features are added.

Django: Django is an open source web application framework written in Python. The MTV framework mode is adopted, namely model M, view V and template T.

Docker: Docker is an open source application container engine that allows developers to package their applications and dependencies into a portable image and then publish it to any popular Linux or Windows machine for virtualization. Containers are completely sandboxed and do not have any interfaces to each other.

React: React is a tool used to build UI. Its design philosophy is extremely unique, revolutionary innovation, outstanding performance, and code logic is very simple.

Support staff

Support staff is those who provide support to users for the product or system when it is running.

Github gives the project the greatest support, since this is an open source project, github provides such a platform that viewers can download the system to use or submit their unique insights to the development team in order to improve the performance of the system. This is the key to make the project widely used and more

and more sound.

System administrators

System administrators run the system once it has been deployed.
This project is an open source project which can be download and used by everyone. The users administrate the whole system after the project was deployed. If the users are private user, they will administrate the system themselves. When come to team users or corporate users, it is more likely to allocate a specified person to act as the system administrator.

Testers

Since Oh My Zsh is an open-source library and has been posted on the Github, a huge number of programmers have the access to test it. Therefore it is tested by the staff of Oh My Zsh and the contributors on the Github. When bugs are found, they can send emails or issue them on the Github for the staff to solve.

Users

As we know, Oh My Zsh is a JavaScript Library to create a shell in the cmputer. Thus, every student or programmer who is a front-end engineer may find it convenient and easy to use and learn the programming of a shell.

@Kacey Cornell is one of the developers in 2009, and now the Project Manager of On My Zsh because of her ability to marry her creative side with management in an agecy setting. She is responsible for the management of the entire life cycle of Oh MyZsh, including staff assignment, project schedule, project quality control and so on.
Oh My Zsh was started by @Robby Russell in Aug 23, 2009. He is the VP Engineering/Partner @planetargon, Old-timer Ruby on Rails developer, host of Maintainable Software Podcast he/him/his, and of course, the creator of @ohmyzsh.

Quality attributes

The table below illustrates seven scenarios of Oh My Zsh quality attributes:

Table 2: Quality attributes analysis

Quality Attribute	Scenery	Stimulus	Stimulation	Product	Environment	Response
Availability	An unexpected thing happens	Inside the system or outside the system	Error or delay	Process	Normal operation	The system pauses and outputs diagnostic information
Mutability	Add a new function for the structure or perfect current system	Developers and other contributors	Further need for the functions of the structure	A better usable oh-my-zsh	During testing, designing and running	Change the part of the structure and test after changing
Usability	A zsh user is trying to learn to install and use oh-my-zsh	Zsh users	Need for knowing how to install and use oh-my-zsh	The oh-my-zsh system	During using or configuring	Provide detailed readme.md to introduce how to install and use oh-my-zsh.
Security	An attacker is trying to invade oh-my-zsh service on user's PC	Vicious attacker	An attempt to do something vicious by violating oh-my-zsh process	Safety verification	Oh-my-zsh process is under attack	Verify the access attempt and report to user
Testability	After a new part of the structure was developed	Developers and testers	A newly developed structure	A new version of the structure	During designing, developing and deploying	Take enough tests

Performance	A user downloads a plugin or theme through oh-my-zsh to apply on his zsh	Users	Download and application	The oh-my-zsh system	Normal operation	Deal with user's command

Context View

The context view describes the relationships, dependencies, and interactions between the system and its environment (the people, systems, and external entities with which it interacts). This section examines oh-my-zsh's scope, its dependencies on others and the interaction with other parties.

System scope & responsibilities

Oh My Zsh is a community-dirven command line tool, as its home page says, Oh My Zsh is a way of life.

> *Oh My Zsh is just a configuration wrapper for the zsh command line environment, but it doesn't provide a command line window, not a standalone APP. It is an extended toolset based on the zsh command line that provides rich extensions. In short, Oh My Zsh is not a substitute for a command-line tool, but complements them.*

Oh My Zsh functions are mainly to make command-line tool more beautiful and more efficient. It has the following three aspects of responsibilities in general:

 • Provide various theme configurations
 • Provide plugin mechanism
 • Built-in convenient operation

External entities and interfaces

Below, these are elaborated upon and afterwards visualized in Figure 1.

 • Written in Shell
 • Unix-like operating systems (macOS or Linux) and Windows are supported.
 • Supports many programming languages(Python, php, etc.)
 • Robby Russel and more than 1350 contributors from the open source community.

• Users are individual developers.

• A GitHub repository filled with code, plugins and many issues is used to host the code base.

• Communication and support is provided via GitHub.

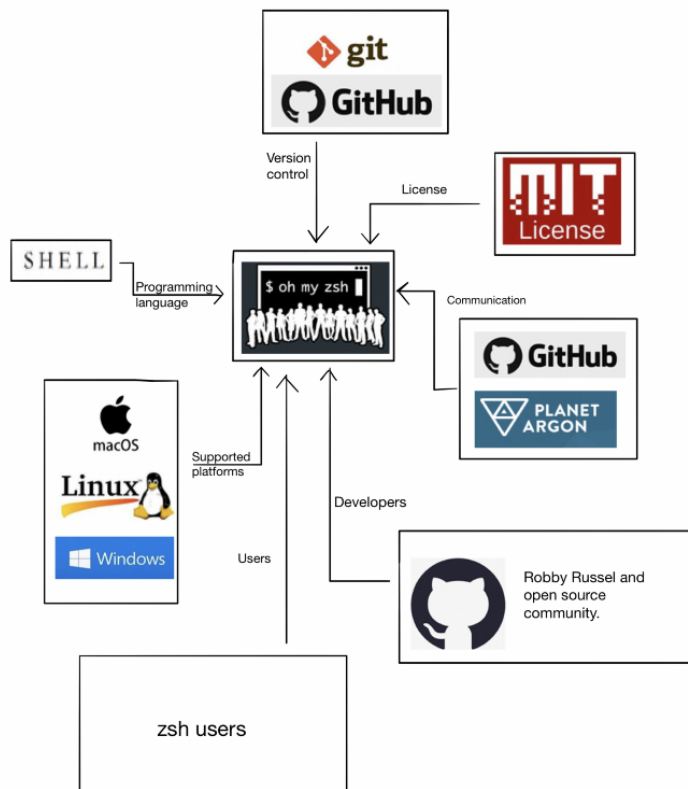• The project is licensed under the MIT License, a permissive free software license originating at the Massachusetts Institute of Technology.

Figure 1: The Context View of oh-my-zsh