IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 4, April 2021

DOI: 10.17148/IARJSET.2021.8433

Review on the working and Future of Version Control System

Nithish Kandepi[1], **Sreenidhi K**[2], **Manchala Rithik**[3], **Shivi Sharma**[4]

School of Computer Science and Engineering, Lovely Professional University, India[1-4]

Abstract: Version control system is also called source control, which helps to manage and modify files, storing these alterations in one place. You can use VCS to version code in a big project done by a team and digitalize assets. It allows team members,multiple developers, designers to work each other on a single project. These systems make it possible for every person in the team to have availability of the latest modifications done on the project.

Due to progress, large projects will have multiple copies of the product. At the low level, developers will hold multiple sets of the different versions of the program, and label them accordingly. This method improves the efficiency in handling any small or large software projects. While this method will work but this method is inefficient because in this many copies of those programs should be maintained,It is not that easy to maintain.In order to do so, there are chances of numerous mistakes.
Since the code is similar, it also requires permissions like read-write-execute to a particular group of developers, and it also adds up intensity to manage the permissions so the code is not altered,which will add more complexity.[1]
VCS is important to keep track of changes and make sure every team member is working off the latest modification. VCS should be used for all code files and multiple assets which multiple team members collaborate.

Keywords: Centralized Version Control System, Distributed Version Control System Open Source Systems.

I.INTRODUCTION

Version control system is a command line tool that helps software developers to maintain the versions of their code files and share them with fellow developers . VCS is available as an executable file and one can install it and start working . VCS is an interactive command line tool with flexible commands. A developer has to commit after making a significant amount of changes to their code and decides that they need a snapshot of the current version of their code .The version of code will be automatically saved by the VCS and assigns a reference number to that particular version so that can access

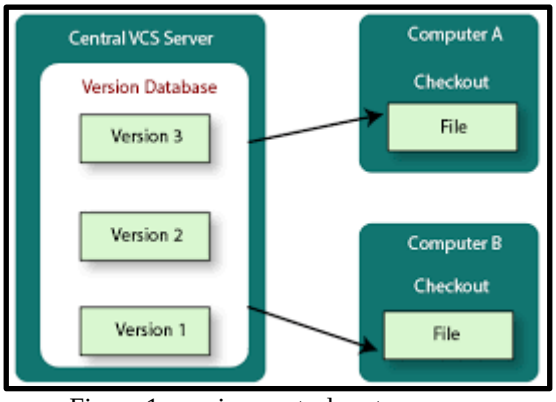


Figure 1: version control system server

that version in future . VCS also provides various functionalities that help software developers to write code faster such as showing the difference between two versions and allow branching i.e., work on two separate versions of code at same time[1] .VCS has two types of repositories .A local repository that resides in users machine and a remote repository that is present in server .VCS allows users to share their code with others and maintain permissions such as who can make changes to their code and who can read their code. Whenever a user wants to share his code to others he can upload it using a specific code in vcs so that vcs uploads his code to the server and vcs software in other user's machines will download the current version of their code. The centralized server helps developers work concurrently .One user can have multiple projects and one project can have multiple developers working on it. Before creating a remote repository

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 4, April 2021

DOI: 10.17148/IARJSET.2021.8433

a user has to create an account with his username and password and login to it.Whenever user wants to add more people to his/her project it can be easily done with a command.All the notifications and pull requests of the user can be accessed on vcs command line tool with specific command.

II.LITERATURE REVIEW

Marc Rochkind in 1972 proposed the **source code control system** which was the first version control system (VCS). It is also known as a system that records any changes made by the software developers during development. He also said that by using it in software development it makes the development process quick and easy.Version control System(VCS) is also known as Revision control system(RCS), Software Configuration Management and Source Code Management (SCM).[2]
Version control system mainly focuses on efficiently communicating between the team about the changes that have been made to the source code.
In the development of any software, it is common for every software developer to continuously make changes in the code and other files that involve adding and removing any feature. As there will be several revisions made before producing the final revision,there will be lots of adding and deleting codes or files during development.[2] This is generally done by maintaining all the modified copies of the code whereas a version control system will collect each record of every version of the modified code. Software developers need to work as a team to make a better project.

Software developers need to work as a team to make a better project. The Version Control System supports a collaborative framework which makes it easy for them. There are two approaches in VCS:

- Centralized Version Control System (CVCS)
- Distributed Version Control System (DVCS)

The **Centralized Version Control System** has a single repository which is the SERVER. Files can be accessed from the local systems by everyone when they are kept here.
In the **Distributed Version Control System**, the complete codebase which includes its entire version and history is available on every developer's computer. Changes made are tracked between the computers. Unlike CVCS, users will locally modify their work and this is way faster than accessing a remote server for every command.

III.METHODOLOGY

The **Centralized Version Control System** has one repository which is the "SERVER". Files can be accessed from the local systems by everyone when they are kept here. The developers make the changes against this repository through a checkout taken from it but the last version of the files only are retrieved. As all the files will be stored in the server, So any changes made in the files will be automatically shared with all other developers in order to keep them updated on the latest modifications.
However, the CVCS has its own drawback. As the total resources are stored in one place, there is a need for the whole team to discuss every change made in the project. Also, this will affect the collaborative work of the team if the developers are not able to access the server while modifying the code. This drawback gave rise to the idea of a distributed system.

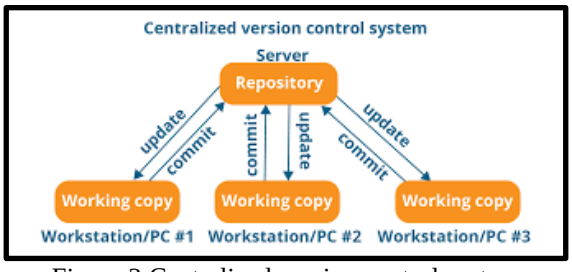


Figure 2:Centralized version control system

In the **Distributed Version Control System**, the complete codebase which includes its entire version and history is available on every developer's computer. Changes made are tracked between the computers. Unlike CVCS, users will locally modify their work and this is way faster than accessing a remote server for every command. Each developer gets the original repository to their local system and works on the changes and later merges it into the master repository with the changes made. This process of getting a cloned copy of the master repository is known as "**pulling**" and merging back the local repository is called "**pushing**". Apart from this mechanism, the DVCS is the same as the centralized.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 4, April 2021

DOI: 10.17148/IARJSET.2021.8433

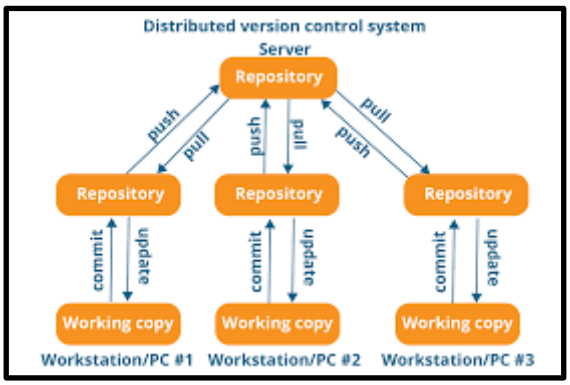


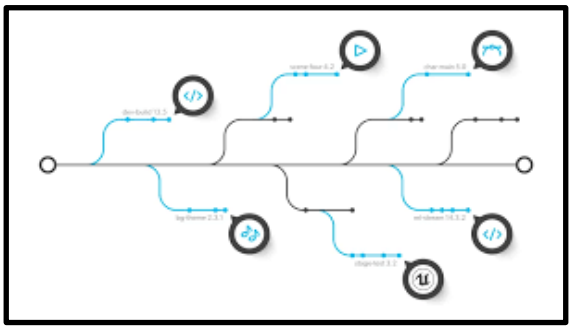
Figure 3:Distributed Version Control System

Open Source Software is that type where the product is available to the public, where the code can be owned for free and modified later. The Open Source Software development process combines with various applicable features in such a way that would be helped within the development and maintenance of high-quality, also faster and cheaper software within a rapidly changing Internet environment.

Open source development is an alternative method which helps in telling us the usage of the internet to create, access and modify projects. It offers useful information about common problems as well as some possible solutions for globally distributed product development.[3]

IV.RESULT AND DISCUSSION

Version control systems help multiple people of the same team to parallely work on a project. Everyone edits their own copy of work and selects those changes to share with the rest of the team.This helps in less interference of work between the members of the same team. We can branch and merge them.This will help to complete the task in less time. When there are any changes,we can know who made the changes.



V.FUTURE WORK

Automotive software is being developed at an extraordinary scale. Future vehicles contain lines of code and it is estimated as 50% of future vehicle's value being derived from their software capabilities, it is also a valuable investment. And it's not that more code going into vehicles.

There are many chips in these vehicles which are expected to be triple as autonomous vehicles integrate with additional ECUs with SoCs, microcontrollers for cameras, sensors, LiDAR, mapping, and many more. Combining with the software and hardware teams is important to create innovative solutions to support future connectivity.

Version control is the key part of this solution. It allows everyone in the team to work all of them together. And can store all the digital assets to deliver better products easier and faster.

Challenges facing in this new automotive environment.

Cybersecurity

As technology is increasing in vehicles.There are many chances for hackers to hack.You have to protect and secure code from internal and external cyberattacks. You need to protect and secure your codebase and workflows to ensure that no one can enter and collect the data without any access.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 8, Issue 4, April 2021

DOI: 10.17148/IARJSET.2021.8433

Safety and Compliance

Compliance is very important for every part of hardware and software in a vehicle. Functional safety standards like ISO 26262 sets some of the specific requirements that need to be met and every team should have the auditability and traceability to prove it.

Collaboration

Collaborating Hardware and software teams because they need fast access to files. This helps them to avoid wastage of time waiting or looking for what they need. And it also helps them to collaborate better.

VI.RELEVANCE

This study helps to design and develop a gaming application using Unity Game Engine. Through this breakout for a new beginning on Game Development, we have conveyed our views and ideas on promoting education via innovation. The functions that support Unity3D are very high. All game developers can fulfill the demand of users according to the need.

REFERENCES

[1]Nazatul Nurlisa Zolkifli, Amir Ngah*, Aziz Deraman School Of Informatics And Applied Mathematics,UniversitiMalaysiaTerengganu, 21030 Kuala Nerus, Terengganu, Malaysia In 3rd International Conference On Computer Science And Computational
Intelligence 2018
[2] Fabio Gomes Rocha, Trident University. Ieee Journal 2
[3]Nindya Kotwal, Vineeta Bassi A Comprehensive Study Of Version Control System In Open Source Software.
International Journal Of Scientific & Engineering Research, Volume 3, Issue 4, April-2012
[4]Pratik P Bhoir, Harshali Patil Evolution Of Version Control Systems And A Study On Tortoisesvn International Research Journal Of Engineering And Technology (Irjet) Volume: 05 Issue: 06 | June-2018
[5]Pro Git by Scott chacon and Ben straub