



Software Configuration Management

What is Software Configuration Management?

In Software Engineering, Software Configuration Management(SCM) is a process to systematically manage, organize, and control the changes in the documents, codes, and other entities during the Software Development Life Cycle

What is Software Configuration Management?

GOAL OF SCM - To increase productivity with minimal mistakes

SCM is part of the larger cross-disciplinary field of configuration management. Using SCM tools and practices, If something goes wrong, SCM can determine what was changed and who changed it.

Why do we need Software Configuration Management?

- There would be more than one person working on software which is continually updating
- There may be multiple versions, branches, authors are involved in a software project, and the teams could be geographically distributed and working concurrently
- Changes in user requirement, policy, budget, schedule would need to be accommodated.
- Helps to develop coordination among stakeholders
- SCM process is also beneficial to control the costs involved in making changes to a system

Any change in the software configuration Items will affect the final product. Therefore,

Change in
Requirements

Change in
Team/Organization


Change in
Government policy
and rules

Change in project
schedule

affects

code
</>

project plan


other Documents


Tests


Data

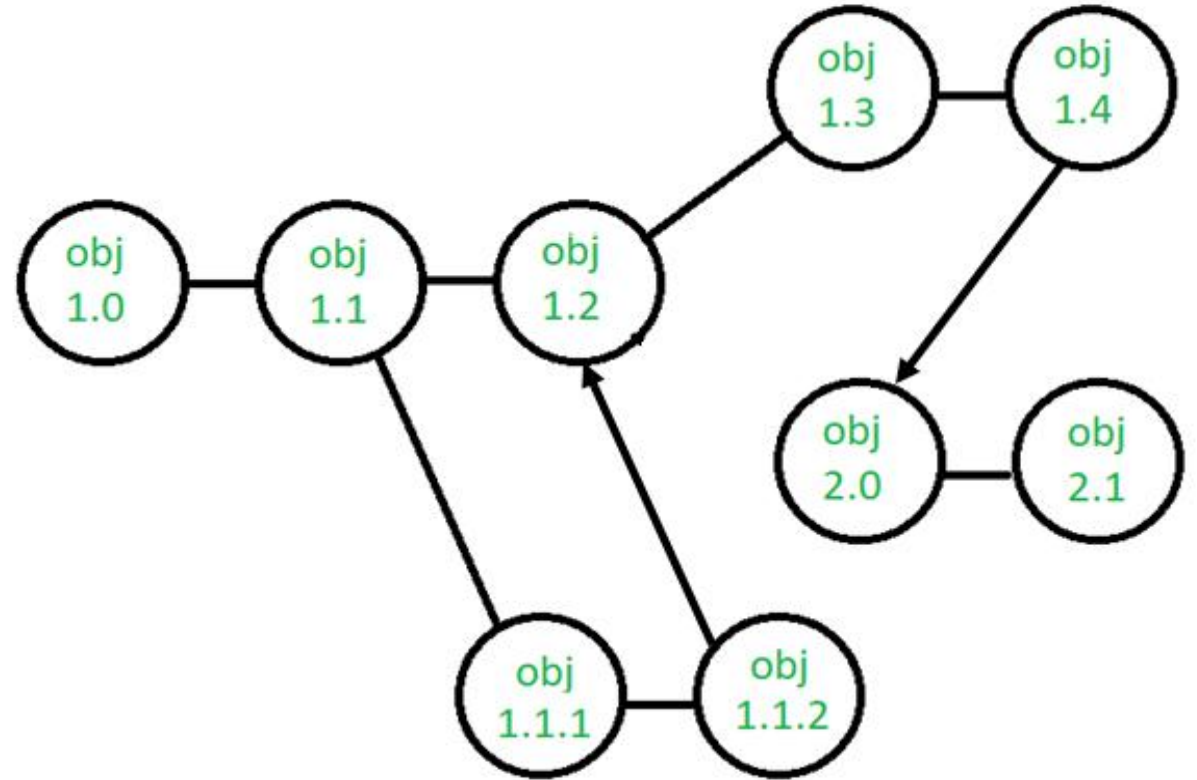

- Whenever a software is built, there is always scope for improvement and those improvements brings changes in picture.
- Changes may be required to modify or update any existing solution or to create a new solution for a problem. Requirements keeps on changing on daily basis and so we need to keep on upgrading our systems based on the current requirements and needs to meet desired outputs.
- Changes should be analyzed before they are made to the existing system, recorded before they are implemented, reported to have details of before and after, and controlled in a manner that will improve quality and reduce error. **This is where the need of System Configuration Management comes.**
- **System Configuration Management (SCM)** is an arrangement of exercises which controls change by recognizing the **items** for change, setting up connections between those things, controlling the changes being executed in the current framework, inspecting and reporting on the changes made.
- It is essential to control the changes because if the changes are not checked legitimately then they may wind up undermining a well-run programming. **In this way, SCM is a fundamental piece of all project management activities.**

Processes involved in SCM –

Identification and Establishment -- Identifying the configuration items from products that compose baselines at given points in time (a baseline is a set of mutually consistent Configuration Items, which has been formally reviewed and agreed upon, and serves as the basis of further development). Establishing relationship among items, creating a mechanism to manage multiple level of control and procedure for change management system.

Version control -


- Creating versions/specifications of the existing product to build new products from the help of SCM system.
- Suppose after some changes, the version of configuration object changes from 1.0 to 1.1. Minor corrections and changes result in versions 1.1.1 and 1.1.2, which is followed by a major update that is object 1.2. The development of object 1.0 continues through 1.3 and 1.4, but finally, a noteworthy change to the object results in a new evolutionary path, version 2.0




Change control - Controlling changes to Configuration items (CI)

A change request (CR) is submitted and evaluated to assess technical merit, potential side effects, overall impact on other configuration objects and system functions, and the projected cost of the change. The results of the evaluation are presented as a change report, which is used by a change control board (CCB) —a person or group who makes a final decision on the status and priority of the change. An engineering change Request (ECR) is generated for each approved change

Also, CCB notifies the developer in case the change is rejected with proper reason. The ECR describes the change to be made, the constraints that must be respected, and the criteria for review and audit. The object to be changed is “checked out” of the project database, the change is made, and then the object is tested again. The object is then “checked in” to the database and appropriate version control mechanisms are used to create the next version of the software.

A series of overlapping yellow triangles and squares of varying sizes, creating a dynamic geometric pattern in the top right corner.

Configuration auditing - A software configuration audit complements the formal technical review of the process and product. It focuses on the technical correctness of the configuration object that has been modified. The audit confirms the completeness, correctness and consistency of items in the SCM system and track action items from the audit to closure.

A series of overlapping blue triangles and squares of varying sizes, creating a dynamic geometric pattern in the bottom left corner.

Reporting - Providing accurate status and current configuration data to developers, tester, end users, customers and stakeholders through admin guides, user guides, FAQs, Release notes, Memos, Installation Guide, Configuration guide etc .