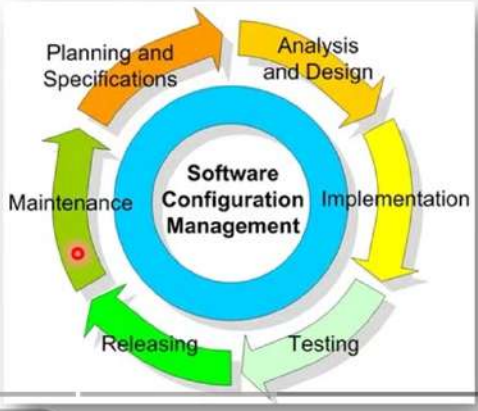
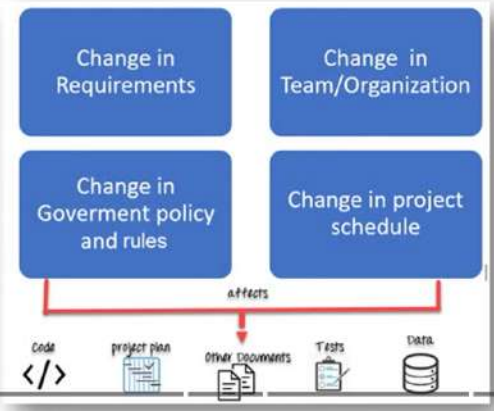
What is SCM?

- Software Configuration Management (SCM) is process to systematically manage, organize, & control changes in documents, codes & other entities during the Software Development Life Cycle.
- The primary goal is to increase productivity with minimal mistakes.
- **SCM Tools:** Puppet, ConfigHub, Saltstack, Ansible, Git, BitBucket, Docker & CHEF etc.

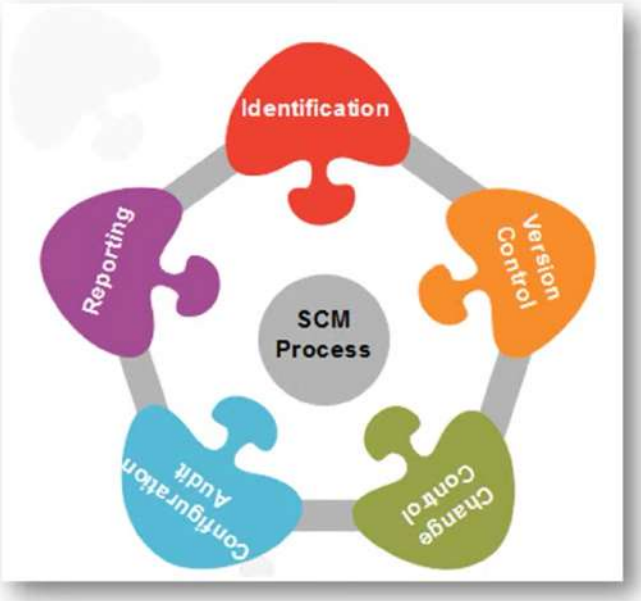




Importance of SCM

1. It ensure changes to software system are properly planned, tested & integrated into the final product.
2. Helps teams to collaborate & coordinate their work, everyone working from the same version of the software system.
3. It manage & track different versions of the system and to revert to earlier versions if necessary.
4. It ensure that software systems can be easily replicated & distributed to other environments such as test, production & customer sites.
5. It improve quality & reliability of software systems, as well as increase efficiency and reduce the risk of errors.

SCM Process


Identification
Version Control
Change Control
Configuration Audit
Reporting
SCM Process


Configuration Manger
Developer
Project Manager
User
SCM Operational Scenario

SCM Process

1. Planning & Identification:

- This method determining the scope of the software system.
- This is accomplished by having meetings and brainstorming sessions with your team.
- Identifying items like test cases, specification requirements, modules & schedule time.
- Identifying each computer software configuration items in the process.
- Group basic details of why, when and what changes will be made and who will be in charge of making them

Examples:

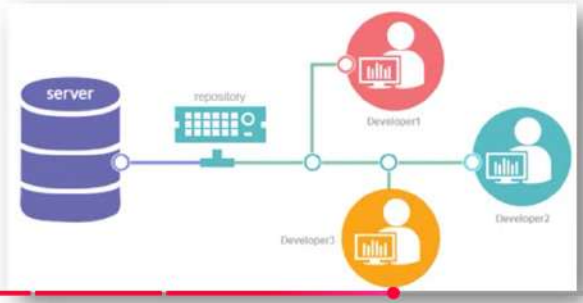
1. Instead of naming a File login.php its should be named login_v1.2.php where v1.2 stands for the version number of the file
2. Instead of naming folder "Code" it should be named "Code_D" where D represents code should be backed up daily.

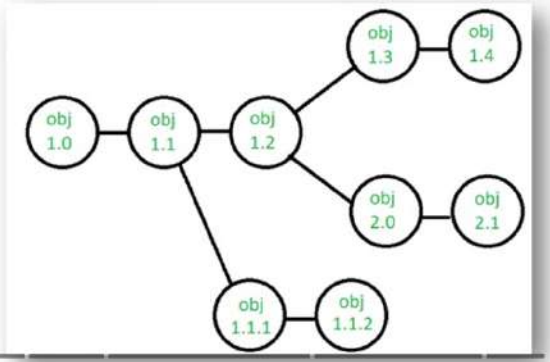
SCM Process

2. Version Control Process or Baselines:

- The aim of this step is to control the alteration and modification done to the product.
- It handle different version of configuration objects that are generated during the software process.
- Also focuses on developing way to track the hierarchy of different versions of the software.
- Developing standardized label scheme for all products, revisions and files so that everyone is on the same page.

Example:





SCM Process

3. Change Control Process:

- This method used to ensure that any changes that are made are consistent with the rest of the project.
- **Examples**: To add or edit various configuration items, Change user permissions or Changing requirements of clients.

Process:

1. Software Team send changes to the Software Configuration Manager (SCM).
2. SCM checking examining the overall impact they will have on the project.
3. Making approved changes or explaining why change requests were denied to the team.
4. If it is approved them implement all necessary changes.
5. After that Review or Reporting it.

SCM Process

4. Configuration Auditing Process:

- This process is used to ensure that application will develop as per the project plan and test/verify the application as per scope.
- The audit confirms the completeness, correctness and consistency of modified items in the SCM system and track action items from the audit to closure.
- It mentioned what is new in each version and why the changes were necessary.
- It ensures that what is built is what is delivered.

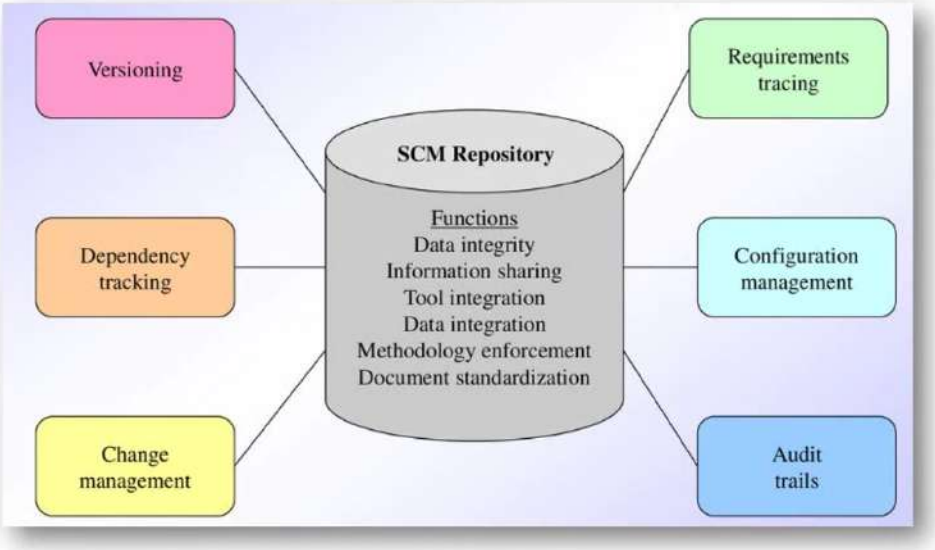
SCM Process

5. Review and Status Reporting Process:

- It is a technical review on the Application workflow, Process, Configuration items and Change requests etc.
- It generate the accurate status report in every phase of SDLC process.
- Configuration Status report provide to the Developers, Testers, End users, Customers and Stakeholders.
- It develop some application-related documents like User manual, Installation process guide, Configuration guide, Do's and Don't Do's etc.

SCM Repository

- SCM Repository is a set of control process & data structure that allow software team to manage change in effective manner.
- It manage version control, change control & release control process.



SCM Repository Functions

1. **Data Sharing:** Ensure consistent & accurate information, Validates entries.
2. **Information Sharing:** Mange & Control multi user access, Share with among developers.
3. **Tool Integration:** Establish data models by using SE tools.
4. **Data Integration:** SCM task can be perform using one or more resources.
5. **Methodology Enforcement:** Define Entity Relationship model of repository.
6. **Document Standardization:** There is standard approach for creating Software Engineering documents.

SCM Repository Tools

1. **Versioning:** Save & retrieve all repository object based on there version number.
2. **Dependency Tracking & Change Management:** Track & manage to the changes in relationship of all objects in repository. Ex. UML diagram.
3. **Requirement Tracing:** Trace design & construction of components & there deliverable result (Forward Tracing). As per the work product, which requirement is responsible for which feature. (Backward Tracing).
4. **Configuration Management:** Track a series of configuration representing specific project milestone or production release.
5. **Audit Trails:** Establish information when, why & by whom changes are made in the repository.