Software Configuration Items & Baseline

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INTRODUCTION

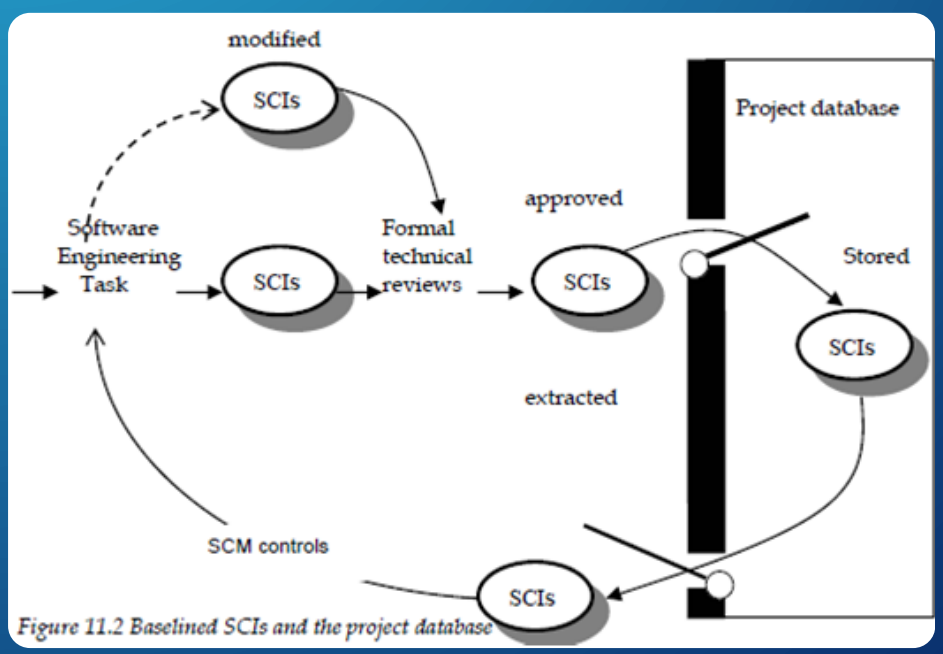


Figure 11.2 Baselined SCIs and the project database

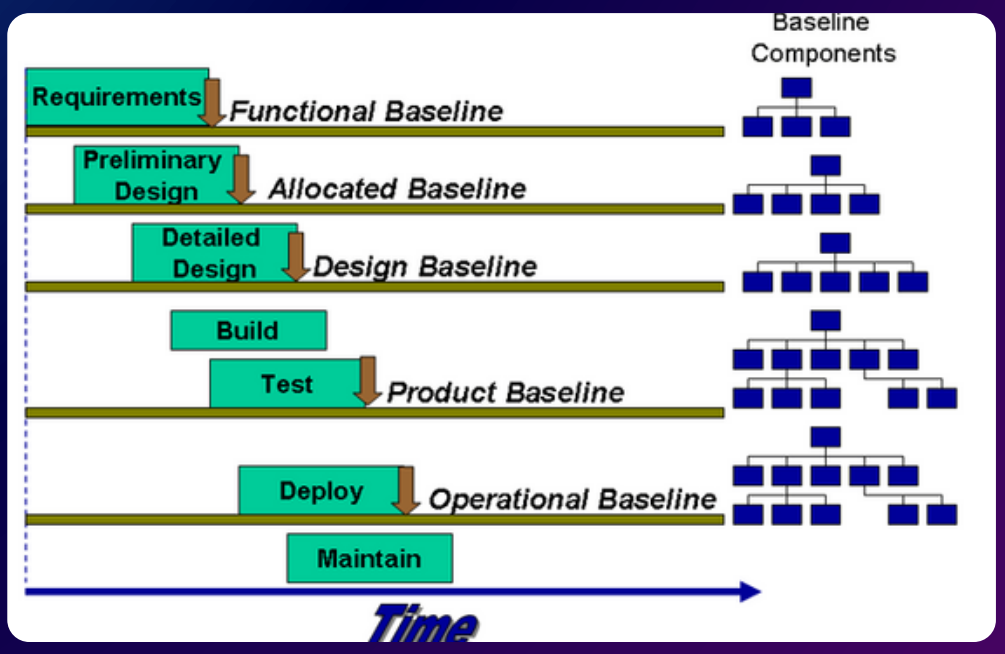
Software Configuration Items (SCIs) are individual components of a software system that are uniquely identified and managed as separate entities.

- The image depicts the concept of Software Configuration Items (SCIs) and their relationship with the project database in a software engineering context.
- **Software Engineering Task:** This task produces modified SCIs that undergo formal technical review.
- **Formal Technical Review:** The reviewed SCIs are then approved and added to the project database.
- **Project Database:** The approved SCIs are stored in the project database.
- **SCM Controls:** The SCM (Software Configuration Management) controls the flow of SCIs, approving, extracting, and modifying them as necessary.
- **Stored SCIs:** The approved and controlled SCIs are stored in the project database.

BASELINE

Baselines provide a stable and consistent foundation for software development, allowing changes to be tracked, controlled, and audited.

- The timeline runs from left to right, with the progression of the software development life cycle.
- The stages include Requirements, Preliminary Design, Detailed Design, Build, Test, Deploy, and Maintain.
- At each stage, a specific baseline is established, such as Functional Baseline, Allocated Baseline, Design Baseline, Product Baseline, Operational Baseline.
- The Baseline Concept evolves and progresses from a high-level Baseline Concept to more detailed and specific baselines as the project moves forward.



APPLICATIONS

Applications of Software Configuration Items (SCIs) are:

1. Modular Development
2. Impact Analysis
3. Reusability
4. Version Control
5. Traceability and Accountability

Applications of Baselines are:

1. Release Management
2. Collaboration
3. Rollback and disaster recovery
4. Change Management
5. Auditing

ADVANTAGES

Some of the Advantages for SCIs and Baseline are:

- **Improved traceability and accountability:** SCIs and baselines enable clear identification of changes, who made them, and when they were made.
- **Enhanced collaboration and communication:** Shared understanding of the approved software components and their relationships.
- **Reduced risks and errors:** Baselines provide a known, stable foundation for further development, reducing the likelihood of introducing regressions or compatibility issues.
- **Faster troubleshooting and problem resolution:** Baselines allow for easy identification of the source of issues and rollback to a known good state.

INDUSTRY TRENDS

Industry Trends for Software Configuration Items (SCIs):

- **Microservices and Containerization:** Defining SCIs at the granular level of microservices and containerized components.
- **Agile and Continuous Delivery:** Aligning SCI management with Agile practices and Continuous Delivery workflows.
- **Artificial Intelligence and Machine Learning:** Leveraging AI/ML techniques to automate the identification, classification, and management of SCIs.

Industry Trends for Baselines:

- **Shift Left in Baseline Management:** Increased emphasis on defining and managing baselines earlier in the software development lifecycle.
- **Integration with CI/CD Pipelines:** Seamless integration of baselines with Continuous Integration/Continuous Deployment (CI/CD) workflows.
- **Baseline Security and Compliance.**

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