Configuration Management

Outline

- Configuration management concept
- Configuration management activities
- Tools

Configuration Management

- Configuration management is the development and use of standards and procedures for managing an evolving （进化的） software system

- Configuration management is necessary for complex system

Evolving Software System

- Changes are usually made after
  - interview with clients
  - reviews (复审) of requirements documents, design documents, and source code
  - testing
  - new requirements are placed
  - normal revisions

Configuration Management

- Configuration management activities
  - Planning
  - Change management
  - Version control
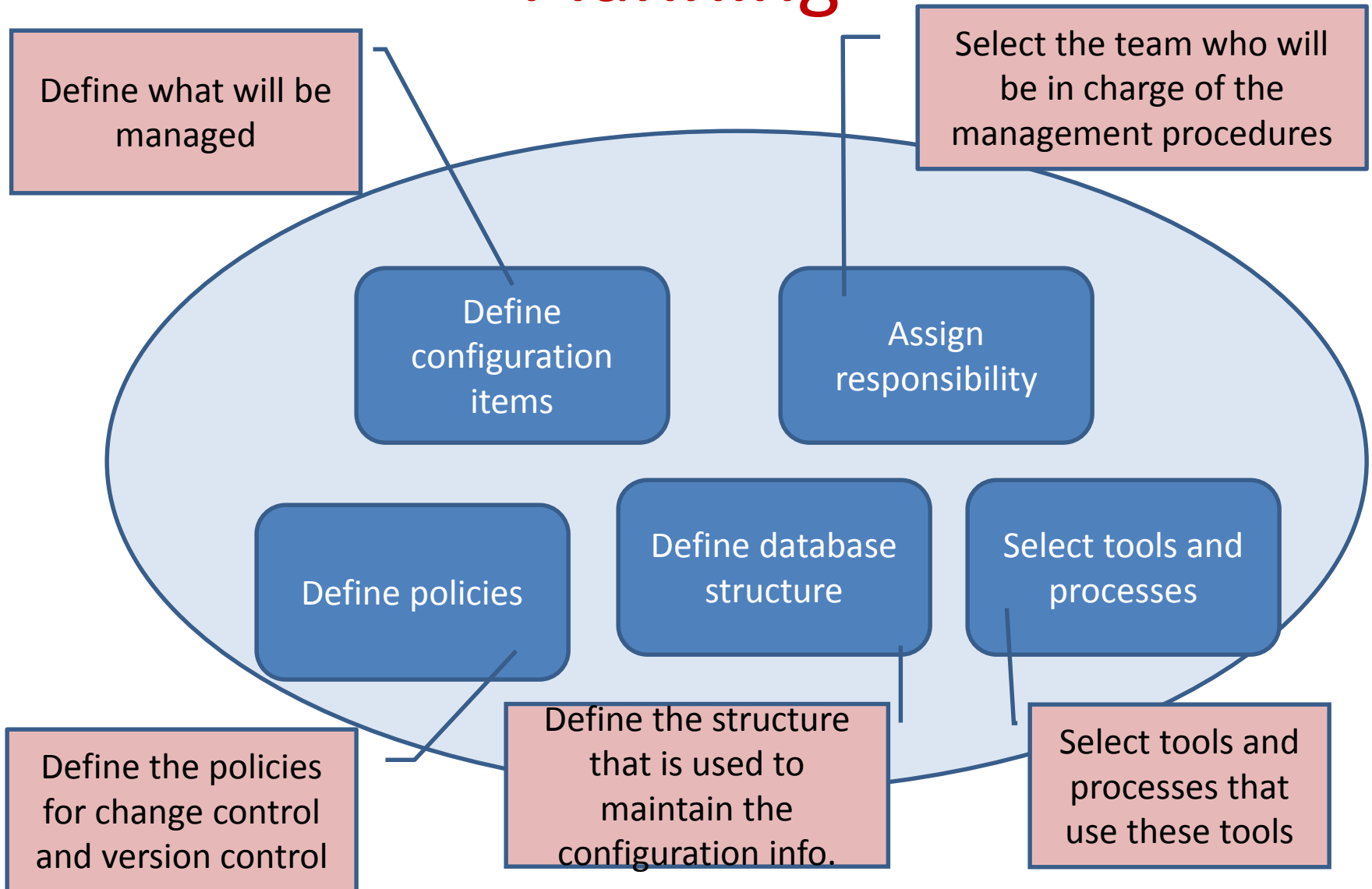 - System building

Configuration Management

- Configuration management activities
  - Planning
  - Change management
  - Version control
  - System building

Planning

- A configuration management plan describes the standards and procedures that are used for configuration management
  - Define responsibilities
  - Define standards

Planning

Define what will be managed

Select the team who will be in charge of the management procedures

Define configuration items

Assign responsibility

Define policies

Define database structure

Select tools and processes

Define the policies for change control and version control

Define the structure that is used to maintain the configuration info.

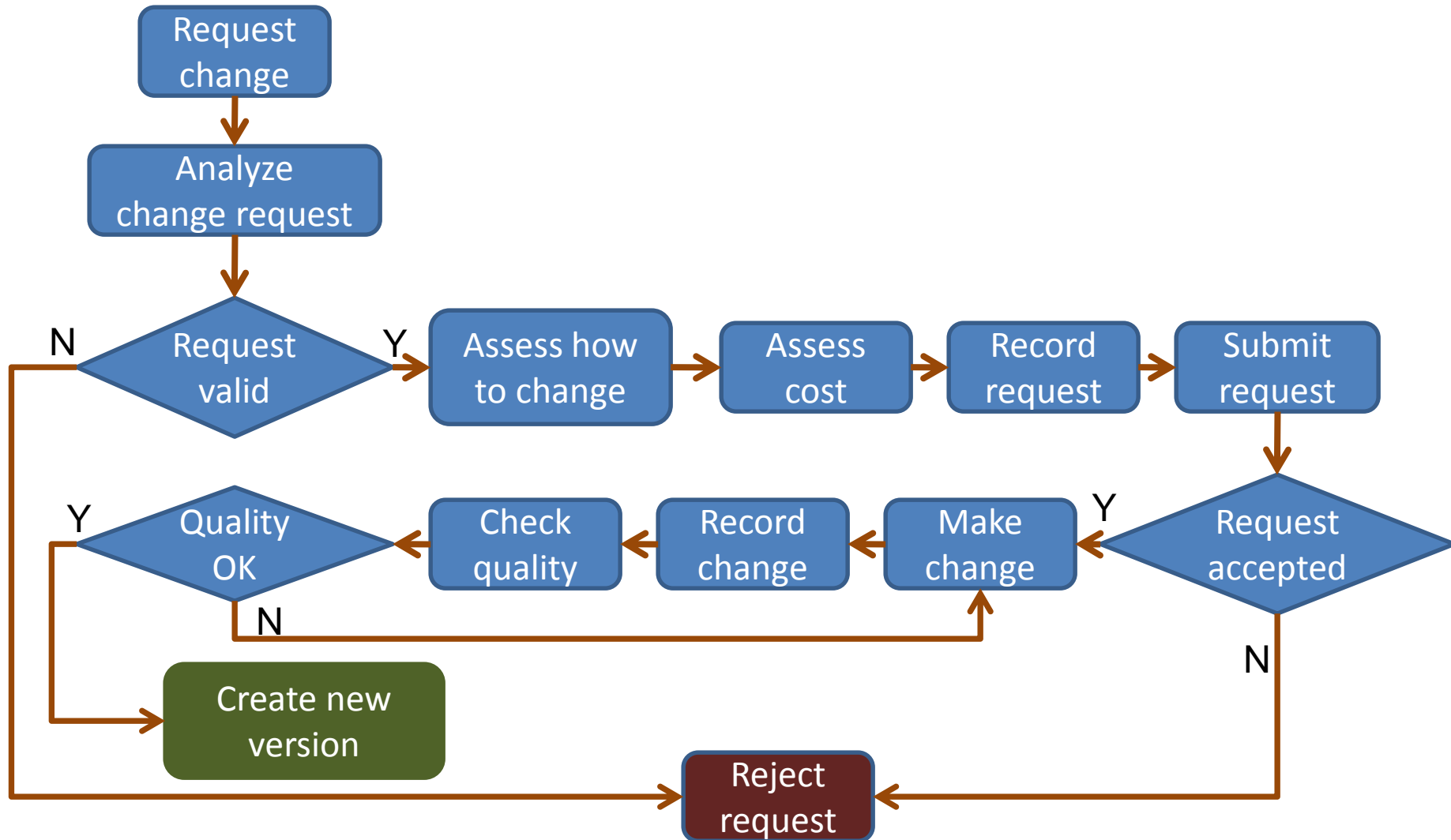Select tools and processes that use these tools

Configuration Management

- Configuration management activities
  - Planning
  - Change management
  - Version control
  - System building

Change Management

- Change management concerns
  - analyzing the cost and the benefits of proposed changes,
  - approving those important changes and
  - tracking (追踪) those changes
- Change management ensures （确保）that all the changes are controlled.

The Change Management Process

Configuration Management

- Configuration management activities
  - Planning
  - Change management
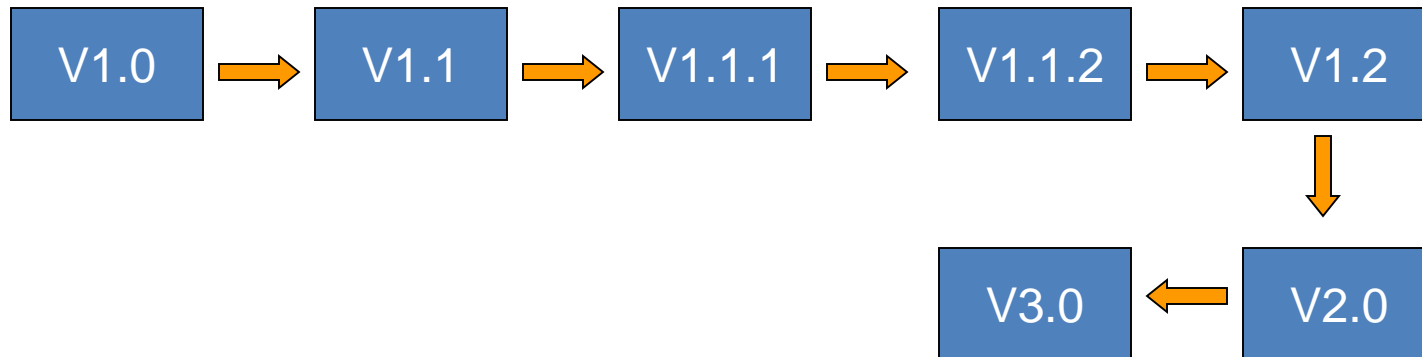 - Version control （版本）
  - System building

Version Control

- Version control identifies and keeps track of versions of a system

- Versions of a system can have different functionalities

- Versions are produced during the process before a system is delivered （发布）

  - A system version is an instance （实例）of system

  - A system release （发行版） is a version of a system that is delivered to customers.

Version Identification

- Three techniques are used for version identification （标识）
  - Version numbering
    - Use explicit （清楚）, unique （独一） version number
  - Attribute-based identification （基于特征的标识）
    - The component name + attributes
  - Change-oriented identification
    - Similar to attribute-based identification
    - Component name + changes.
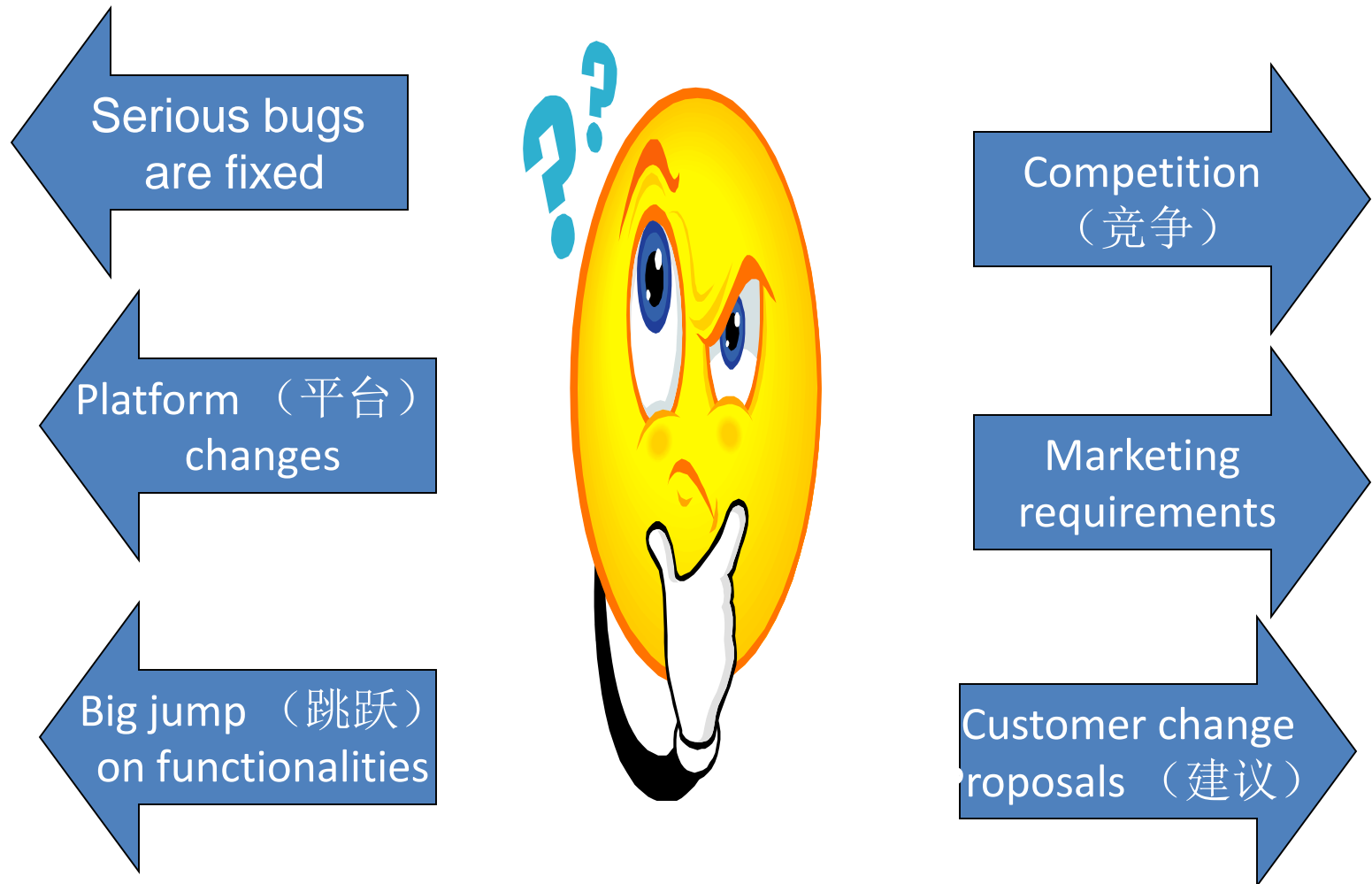
Version Numbering

Version Numbering

- Advantages
  - Simple
  - The updated version can be identified from the numbers

- Disadvantages
  - the differences between two versions cannot be told from the numbers
  - A lot of extra information must be maintained to keep track of changes

Release Management

- A system release is a version of a system that is delivered to customers.

- Three main activities in releasing a system
  - Decide when to release the system
  - Manage the process to create the release
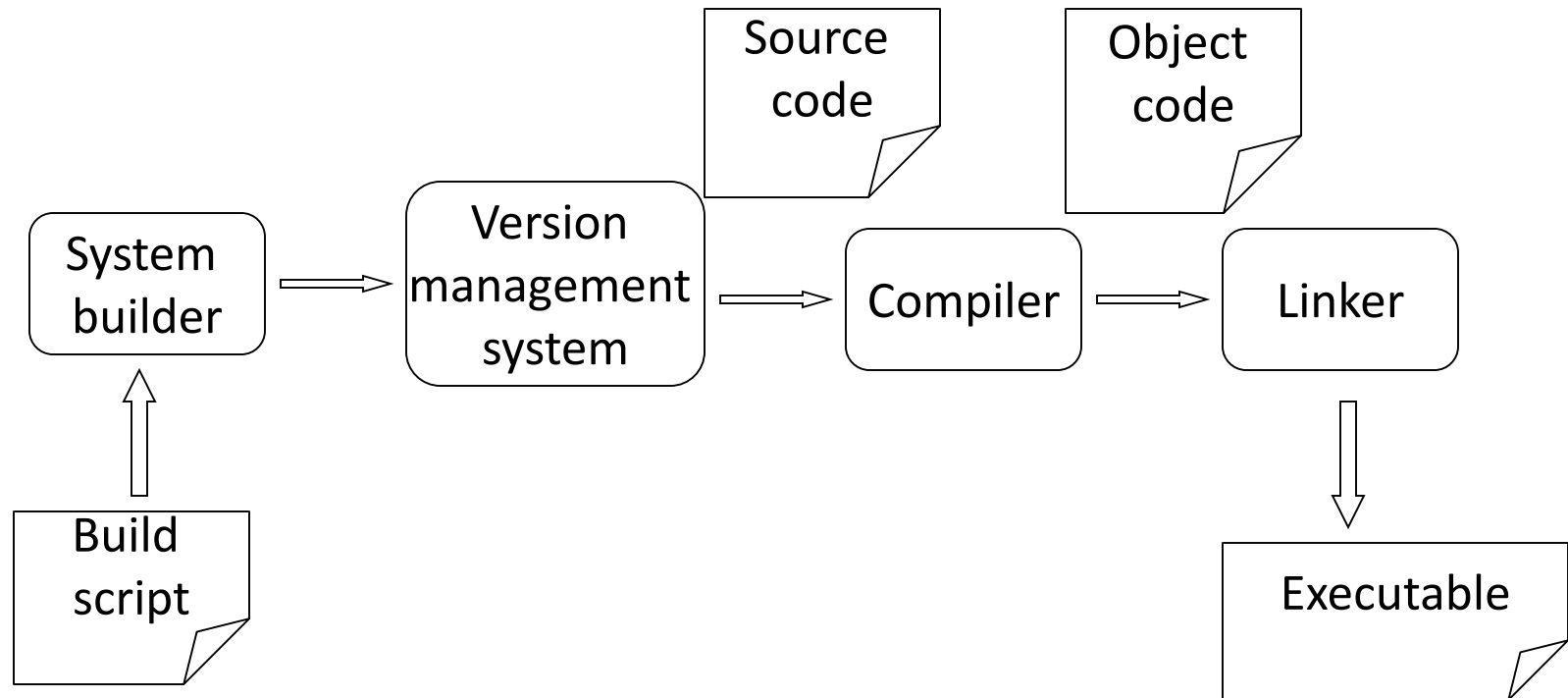 - Document the release

System Release Strategies

Serious bugs are fixed

Platform （平台） changes

Big jump （跳跃） on functionalities

Competition （竞争）

Marketing requirements

Customer change proposals （建议）

Release Management

- A release may include
  - configuration files (for installation(安装))
  - data file (for execution （运行）)
  - installation program (for installation)
  - documentation (for description of system)
  - packaging （打包）and associated publicity (宣传) (for release)
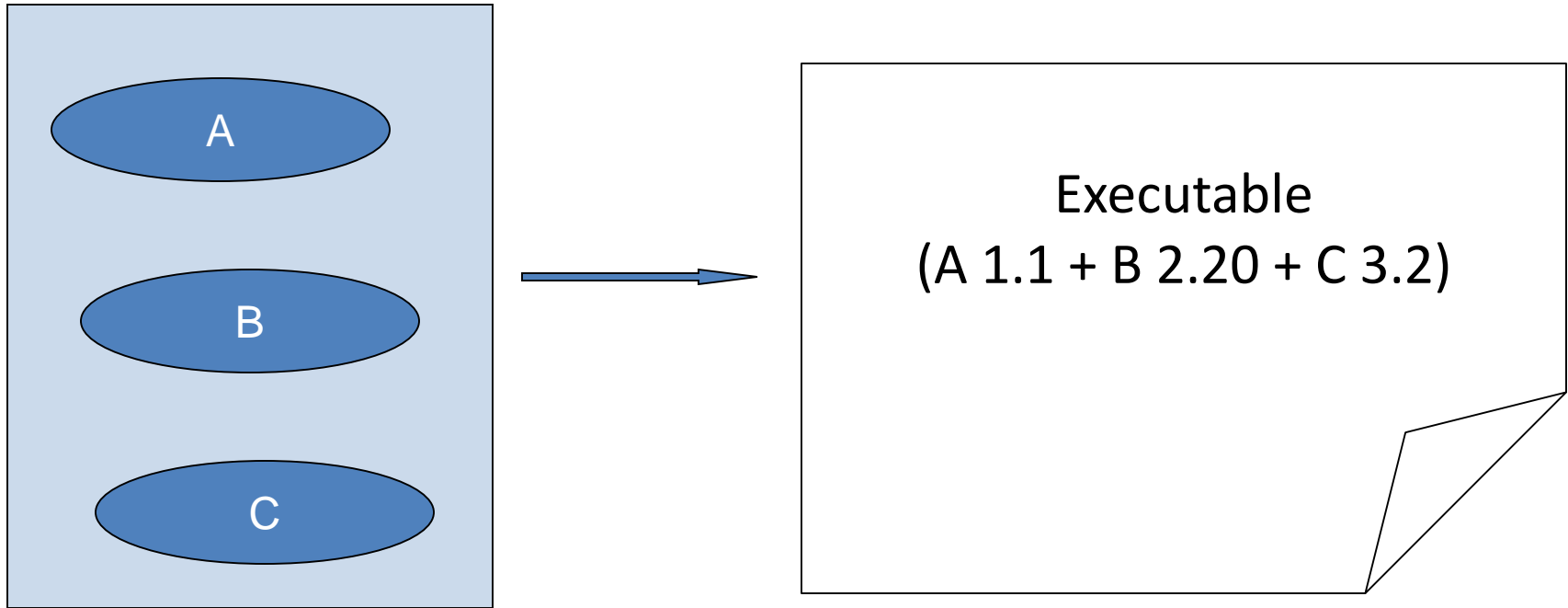
Configuration Management

- Configuration management activities
  - Planning
  - Change management
  - Version control
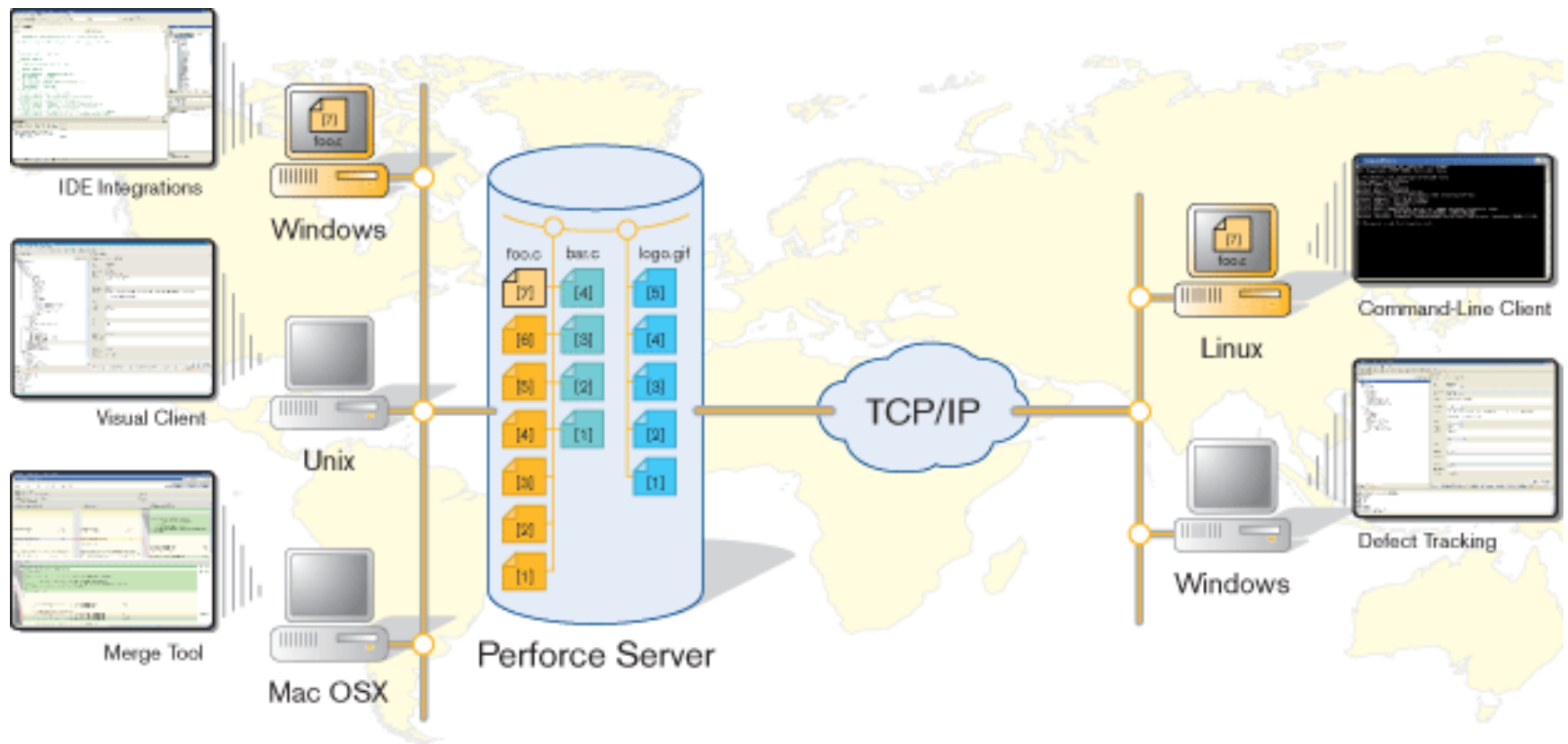 - System building（构造）

System Building

System Building

Executable
(A 1.1 + B 2.20 + C 3.2)

CASE Tools

- PVCS (http://www.serena.com/products/pvcs/)
  - Version management
  - Track management
  - Before 2008

CASE Tools

- Dimensions Express (http://www.serena.com/products/dimensions-express/index.html)

  - Projects in PVCS can migrate（移植）to Dimensions Express

  - copy-modify-merge model and atomic commit ensure that any conflicts（冲突） are resolved（解决）quickly and effortlessly（毫不费劲地）

  - for global software development （全球软件开发）

CASE Tools

- Perforce (http://www.perforce.com/perforce)

CASE Tools

- CVS (Concurrent Version Control System)
  - Free

  - open source software

  - released under the GNU General Public License

  - Client –Server architecture

  - By Dick Grune firstly (1986)

CASE Tools

- Git
  - Free
  - open source software
  - Git server software helps
    - add access control,
    - display the contents of a Git repository via the web, and
    - help managing multiple repositories.
    - E.g., GitHub

Summary

- Configuration management is very important in the software evolution and release
- Configuration should be well planned
- Changes to the system should be tracked
- Version control has several methods
- Software release consideration
- CASE tools can be used to support the management