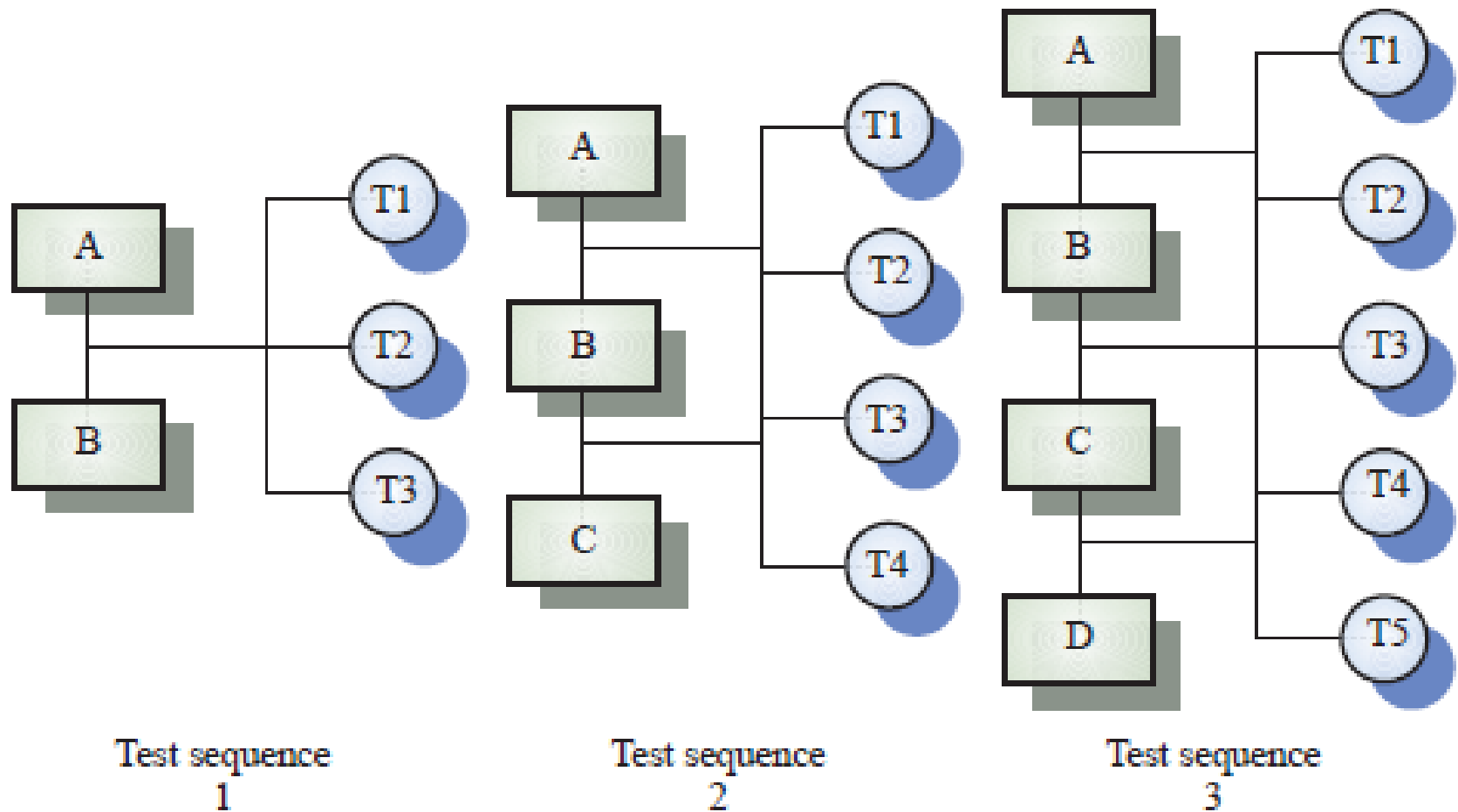# Integration testing

- Component들이 통합되어 구성된 전체 시스템 혹은 서브시스템들을 시험하는 것.
- 통합 테스팅은 테스트들이 명세서로부터 유도된 **black-box** 테스팅이어야 함
- 주요한 어려움은 에러들을 지역화(localization)하는 것임.
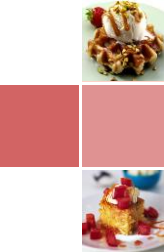- **점진적인 통합 테스팅이** 이 문제를 줄여줌.

Incremental integration testing

Test sequence
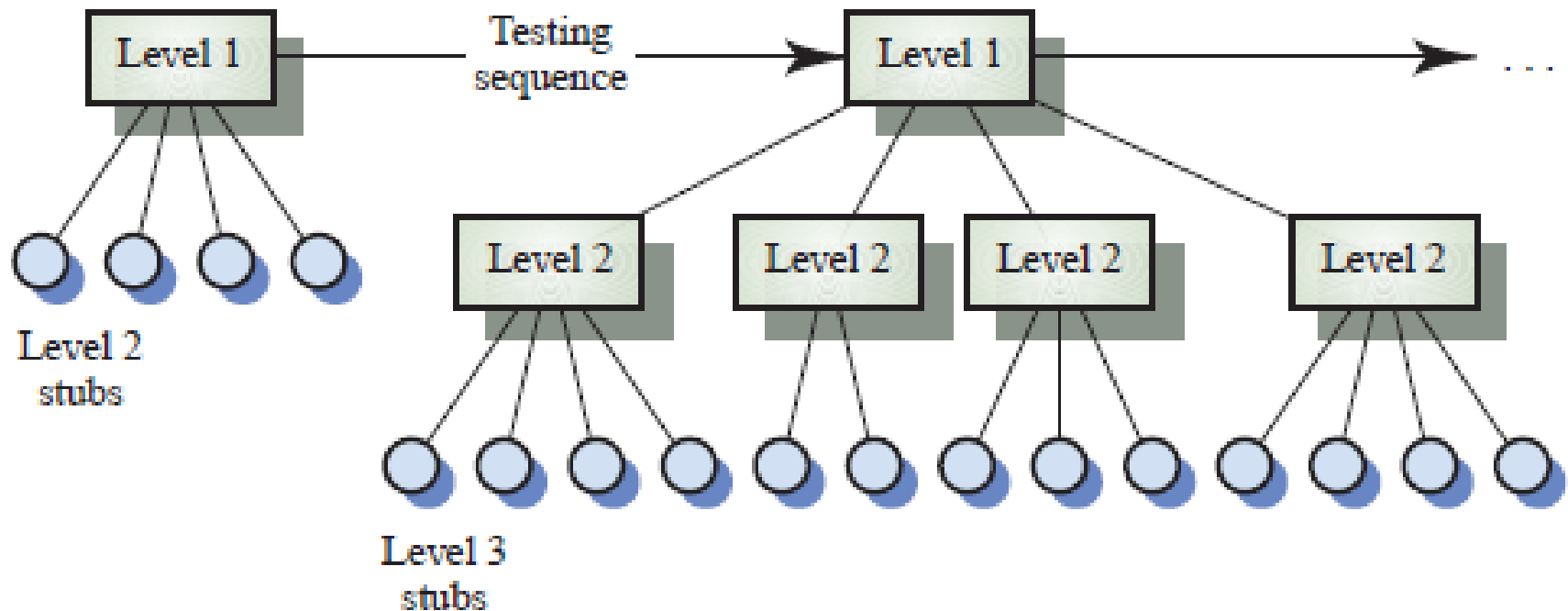1

Test sequence
2

Test sequence
3

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Approaches to integration testing

- ## Top-down testing
  - Start with high-level system and integrate from the top-down replacing individual components by **stubs** where appropriate

- ## Bottom-up testing
  - Integrate individual components in levels until the complete system is created

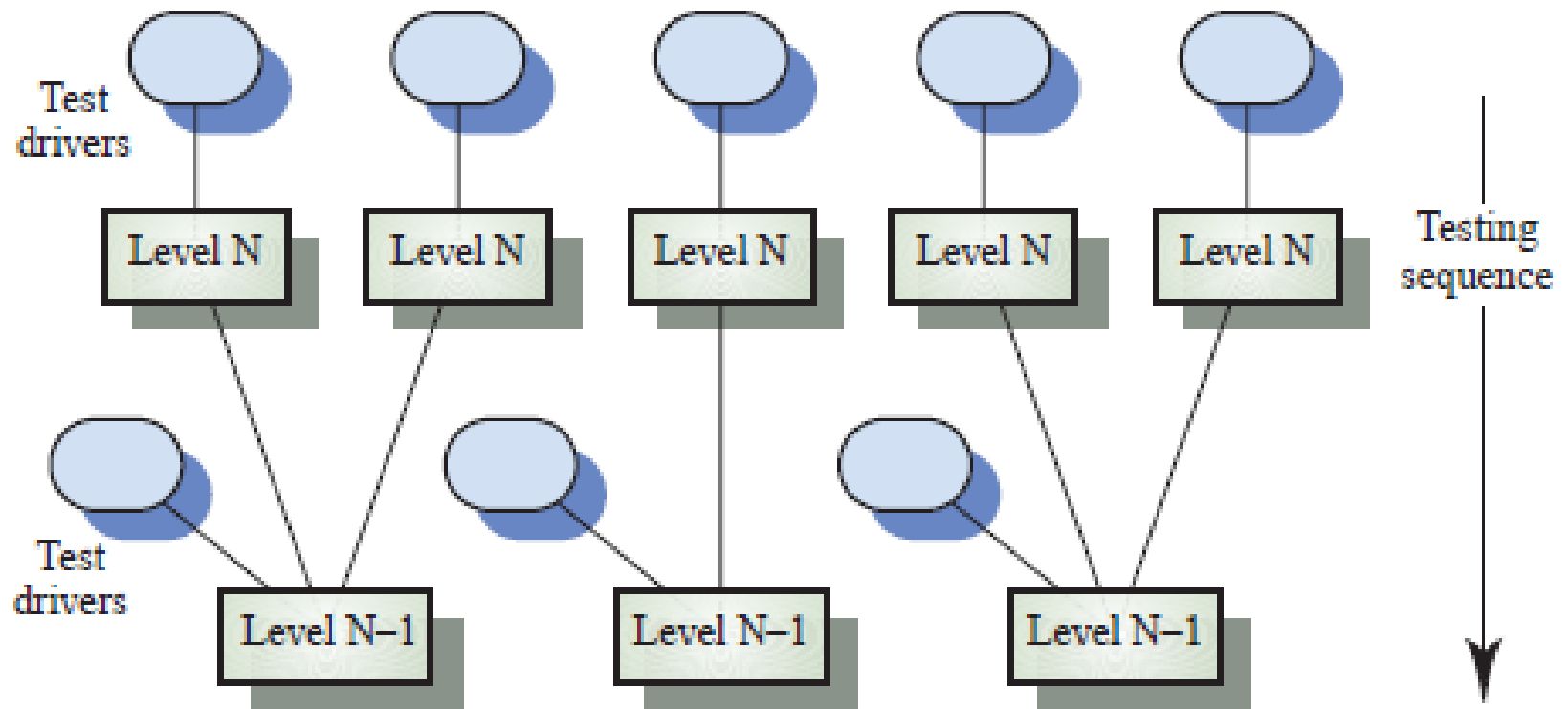- ## In practice, most integration involves a combination of these strategies

Top-down testing

Bottom-up testing

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Testing approaches

- 구조 확인(Architectural validation)

  Top-down integration testing is better at discovering errors in the system architecture

- 시스템 증명(System demonstration)

  - Top-down integration testing allows a limited demonstration at an early stage in the development

- 테스트 구현(Test implementation)

  - Often easier with bottom-up integration testing

- 테스트 관측(Test observation)

  - Problems with both approaches. Extra code may be required to observe tests