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Testing Cloud Native Applications

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Objectives

After completing this lesson, you should be able to;

- Describe different Testing Methodologies
- Describe various ways to test Cloud Native Applications

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Testing Cloud-Native Applications

Testing

- Can't survive with manual tests
- Reliable, repeatable and automated tests are essential
- Use test doubles (mocks, fakes and stubs) for dependencies

MOCK

Object use to test the calls it receives

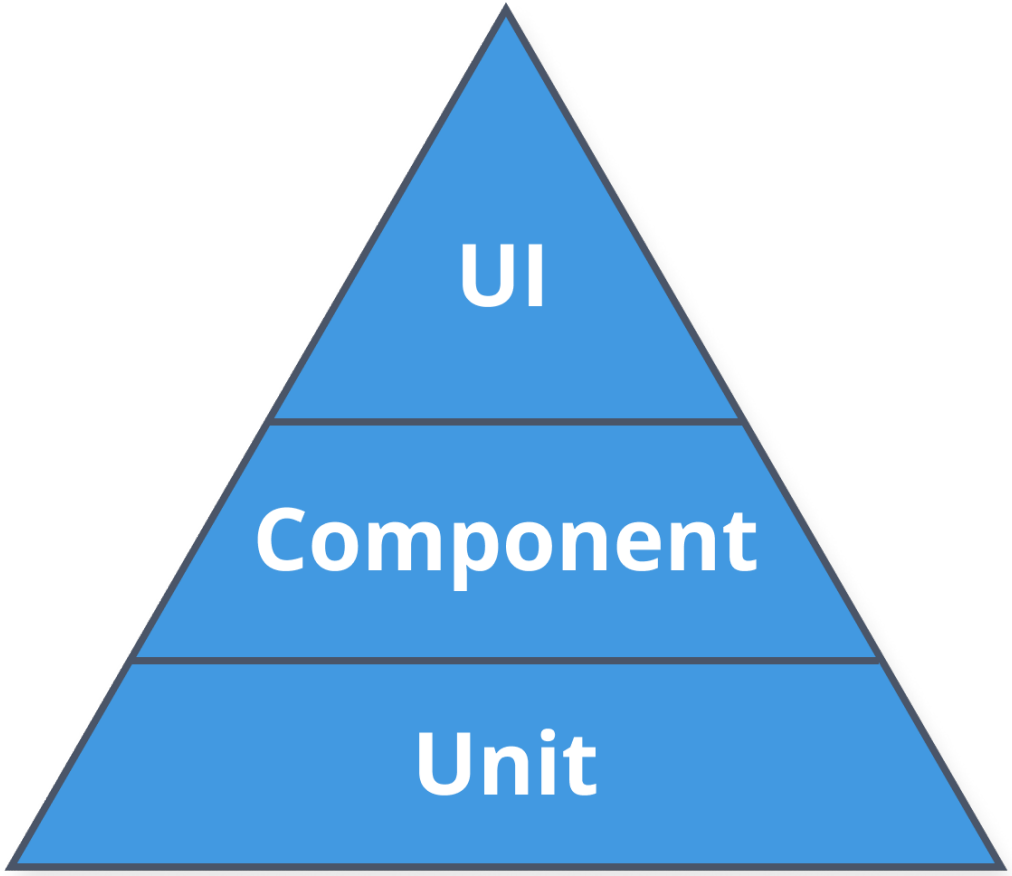
FAKE

Object with working implementation (di"erent from a real implementation)

STUB

Object that returns prepopulated data

Test Automation Pyramid



Building blocks of Testing

Unit tests 

- Fast to execute First line of defense

Service Tests / Component-level tests 

- Test interactions between services/components

User interface tests 

- End-to-end tests
- (Relatively) slow to execute and costly to write/maintain Crucial for usability/accessibility

Different type of Testing

- Acceptance tests
- Smoke tests
- Integration tests
- Security
  - Penetration tests
  - Fuzz tests
- Performance tests
  - Load tests
- Usability tests
- Chaos tests
- Canary tests
- A/B tests

Right time of Testing

When and how often to execute tests?

Unit: during development, before every merge/check-in
Service/Component: before/after every merge/check-in
Integration: before deployments
Canary: run continuously *
Security: automated, part of integration/canary tests if possible

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UI: on UI changes, consider automating if UI heavy
Performance: get baselines manually, consider automating for repeatable numbers A/B: as needed, make sure you have clear goals and metrics defined
Chaos: as needed, for operational readiness, to catch potential prod issues

* **can be costly to maintain**

Testing Environments

Dev → Test → Staging → Production

- Mimic production environment (as closely as possible)
- How to keep environments in sync?
- What's the cost for all this?
- Are you running staging in all regions, just like production

Additional Information

- For additional information on Testing Cloud Native Applications, please refer to:

https://www.oreilly.com/library/view/cloud-native-infrastructure/9781491984291/ch06.html

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Oracle Cloud always free tier:
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Thank you