DEPARTMENT of COMPUTER ENGINEERING est. 1989
KASETSART UNIVERSITY

Software Testing

Lesson 9 – Incident Management

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Contents

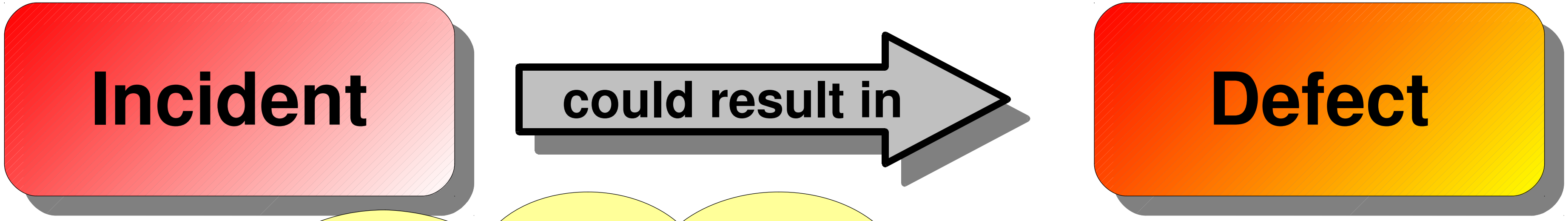
- Test Management – Incident Management
  - Terms
  - Defect reports
    - Rules
    - Attributes
  - Incident management
    - Bug life cycle
    - Tasks

Definitions of Terms

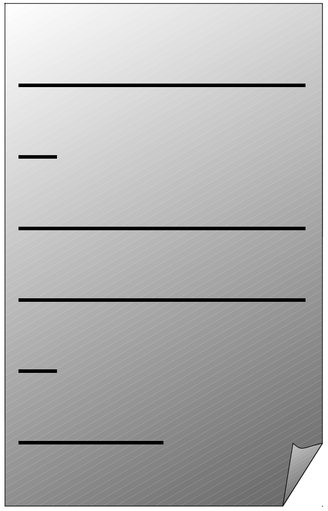
- Incident [ISTQB-GWP15 – after IEEE 1008]
  - Synonym: Deviation
  - Any event occurring that requires investigation

Definitions of Terms

- An incident must be investigated and may turn out to be a defect.



Hint:
In practice typically we talk about
“defects”, and
“defect management”.
ISTQB typically uses the terms
“incident”, and
“incident management”.



Defect Report

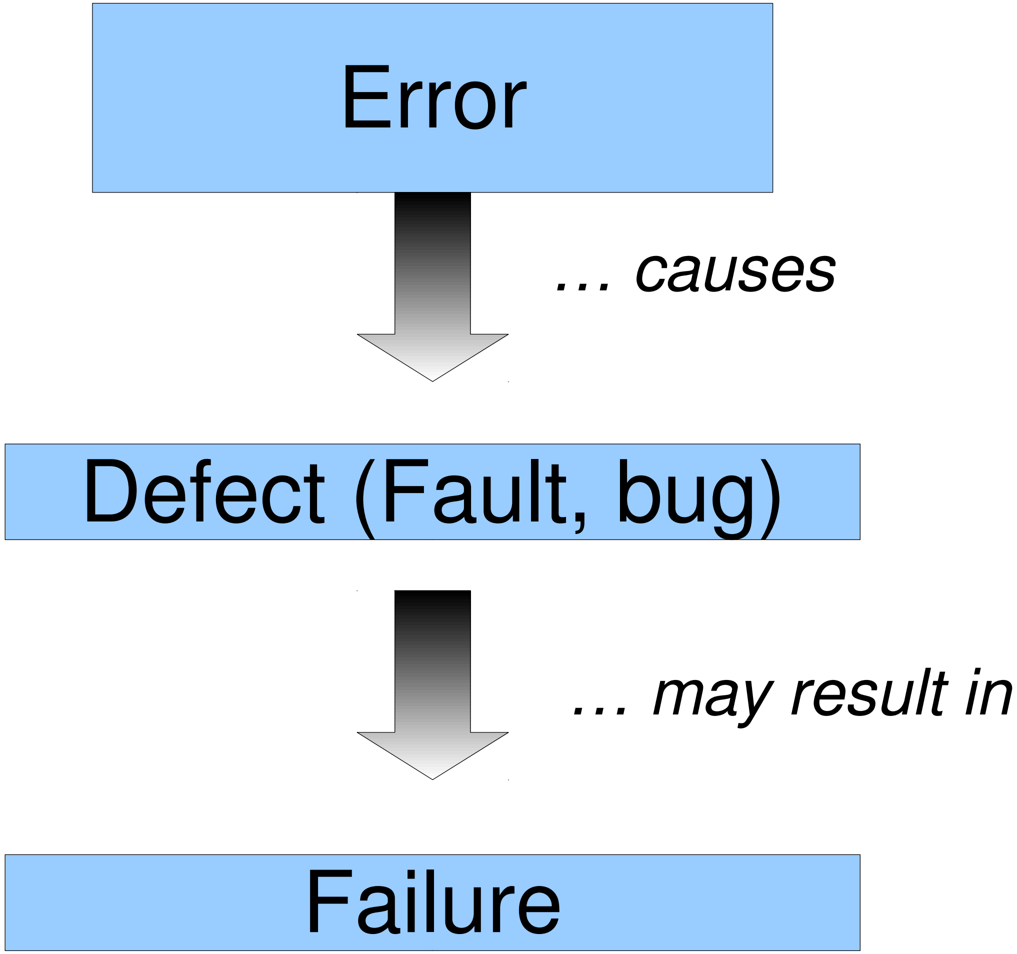
Definitions of Terms

- Defect [ISTQB-GWP15]
  - Synonyms: Bug, fault, problem
  - A flaw in a component or system that can cause the component or system to fail to perform its required function, e.g. an incorrect statement or data definition.
    A defect, if encountered during execution, may cause a failure of the component or system.

Definitions of Terms

- Defect – More definitions:
  - Something Is Definitely Wrong With The Product [KBP01].
  - An error in construction of a product or service that renders it unusable; an error that causes a product or service to not meet requirements [IQRC16]
  - In Wikipedia “*Defect*” refers to “*Software bug*”,
    “A failure of computer software to meet requirements.”
    A “*software bug*“ is an error, flaw, failure or fault in a computer program or system that causes it to produce an incorrect or unexpected result, or to behave in unintended ways [Wik16]

Definitions of Terms



Error

… causes

Defect (Fault, bug)

… may result in

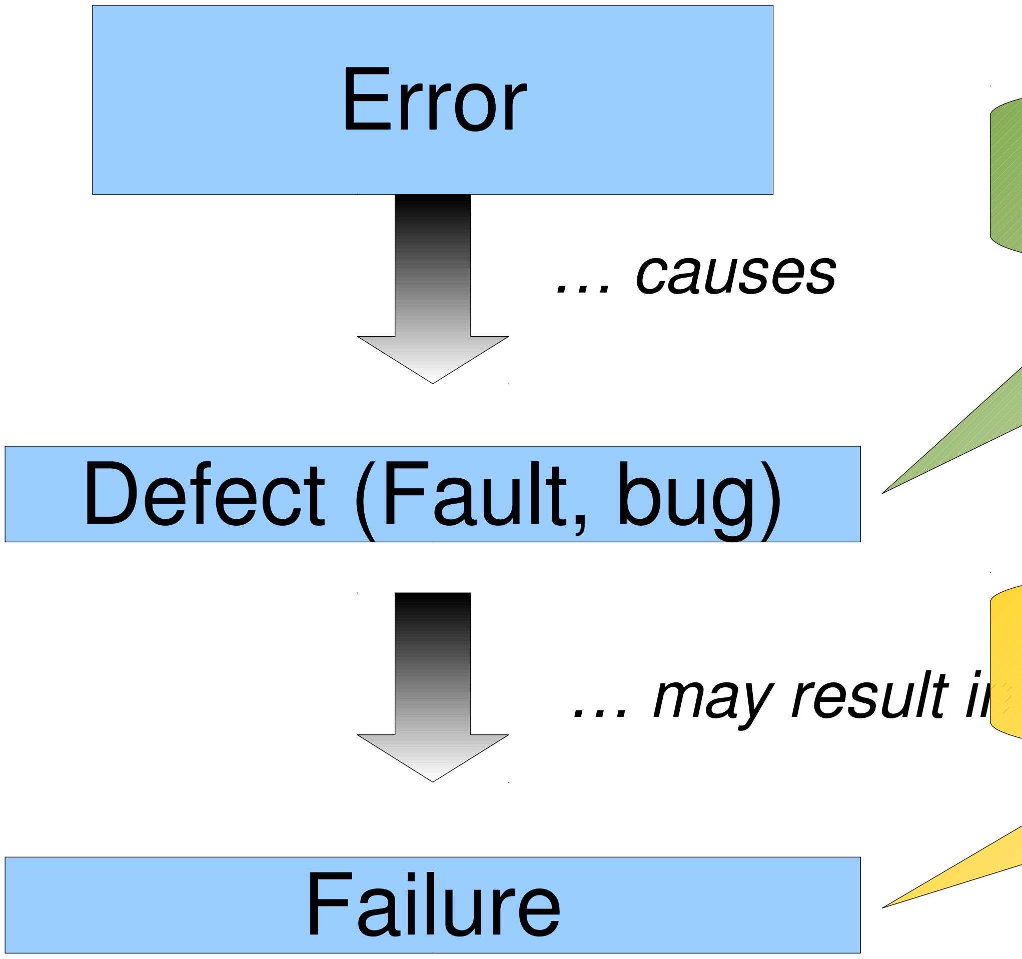
Failure

Error [ISTQB-GWP15, after IEEE 610]
A human action that produces an incorrect result

Defect [ISTQB-GWP15]
A flaw in a component or system that can cause the component or system to fail

Failure [ISTQB-GWP15]
Deviation of the component or system from its expected delivery, service or result

Definitions of Terms



Could be detected during static testing

Could be detected only through dynamic testing

Error [ISTQB-GWP15, after IEEE 610]

s an

Defect [ISTQB-GWP15]
A flaw in a component or system that can cause the component or

Failure [ISTQB-GWP15]
Deviation of the component or system from its expected delivery, service or result

Definitions of Terms

- Defect report [ISTQB-GWP15 after IEEE 829]
  - Synonym: Problem report, bug report
  - A document reporting on any flaw in a component or system that can cause the component or system to fail to perform its required function
- Incident report [ISTQB-GWP15 after IEEE 829]
  - Synonym: Deviation report
  - A document reporting on any event that occurred, e.g., during the testing, which requires investigation
  - The ‘Standard for Software Test Documentation’ [IEEE829] covers the structure of an incident report

Definitions of Terms

Two important attributes of a defect in a defect report describe the failure severity, and the urgency to fix it:

- Severity [ISTQB-GWP15 – after IEEE 610]
  - The degree of impact that a defect has on the development or operation of a component or system
- Priority [ISTQB-GWP15]
  - The level of (business) importance assigned to an item, e.g., defect

Definitions of Terms

- Defect management [ISTQB-GWP15 – after IEEE 1044]
  - Synonym: Problem management
  - The process of recognizing, investigating, taking action and disposing of defects.
    It involves recording defects, classifying them and identifying the impact
- Incident management [ISTQB-GWP15 – after IEEE 1044]
  - The process of recognizing, investigating, taking action and disposing of incidents.
    It involves logging incidents, classifying them and identifying the impact

Definitions of Terms

- Defect management tool [ISTQB-GWP15]
  - Synonym: Bug tracking tool, defect tracking tool
  - A tool that facilitates the recording and status tracking of defects and changes.
    They often have workflow-oriented facilities to track and control the allocation, correction and re-testing of defects and provide reporting facilities
- Incident management tool [ISTQB-GWP15]
  - A tool that facilitates the recording and status tracking of incidents.
    They often have workflow-oriented facilities to track and control the allocation, correction and re-testing of incidents and provide reporting facilities

Defect report

- **Bad** bug reports [Tat99] are reports
  - that say nothing ("It doesn't work!")
  - that make no sense
  - that don't give enough information
  - that give wrong information
  - of problems that turn out to be
    - ➢ user error
    - ➢ the fault of somebody else's program
    - ➢ network failures
- **Good** bug reports:
  Wonderfully clear, helpful, *informative* bug reports

Defect report

- Defect reports have the following objectives:
  - Provide developers and other parties with feedback about the problem to enable identification, isolation and correction as necessary
  - Provide test leaders a means of tracking the quality of the system under test and the progress of the testing
  - Provide ideas for test process improvement

Defect report
Rules (1/3)

- Show a defect directly to the developer
- Describe a defect so it could be reproduced.
  Best: Step by step, use screenshots, videos
- Describe, what you expected and what you got
  What works and what went wrong?
- Notice contents of error messages, esp. numbers
- Report the symptoms
  - **Must:** What are actual facts
    "I was at the computer and this happened"
  - **Could:** What are speculations, your ideas as proposal
    "I think the problem might be this"

[Tat99]

Defect report Rules (2/3)

- Try to work around for intermittent faults and inform about version, operating system, etc.
  - Try other machines, web browsers, screen resolution
  - Does it depend on the size of files you use, other programs you use in parallel?
- Try to help that the defect could be fixed
  - Provide extra information on request like version numbers
  - Special activities, so that developer could locate the defect

[Tat99]

Defect report
Rules (3/3)

- Write clearly and as neutral as possible
  - *Be specific*. **Not:** "I selected Load"
    Better: "I clicked on Load", or "I pressed Alt-L"
  - *Be verbose*
    If you write one sentence only, developer must ask and ask
  - *Be careful of pronouns*
    Not: "I started FooApp. It put up a warning window.
    I tried to close it and it crashed."
    Better: "I started FooApp, which put up a warning window.
    I tried to close the warning window, and FooApp crashed."
  - *Read what you wrote*
    Try to reproduce a listed sequence of actions yourself
- Don't joke

[Tat99]

Defect report Attributes

- Details of the defect report may include:
  - Author, date of issue, issuing organization
  - Test item (configuration item)
  - Environment (Operating system, web browser, etc.)
  - Description of the defect to enable reproduction
    - Which test cases, which test steps, which test data?
    - Screenshots
    - Logs, dumps
    - Database, used files
  - Expected and actual results

Defect report Attributes

- Details of the defect report may include:
  - Severity and Priority
    In practice: Both parameter are often used similar, but originally difference meanings
  - Severity – of the impact on the system
    - 1 – very high: Data loss, not usable
    -
    - ...
    - n – very low: Disfigurement

Defect report Attributes

- Details of the defect report may include:
  - Severity – example for definitions
    - ➢ Severity 1: Critical
      Total system outage; system upgrade failed (e.g. system does not boot); restore not possible
    - ➢ Severity 2: Major
      Data migration too slow; excessive number of alarms; sporadic system re-starts; loss of synchronisation
    - ➢ Severity 3: Minor
      Incomplete list of commands; documentation issues
    - ➢ Severity 4: Non
      Cosmetic problems; not well structured printouts

Defect report Attributes

- Details of the defect report may include:
  - Priority – Urgency to fix
    - ➢ 1 – very high: Fastest fixing necessary
    - ➢ ...
    - ➢ n – very low: Place back handling:
Defect could be tolerated; possible solution: Listing in Release Notes as „open points / proposals“
    - ➢ Special status: Defect must not be fixed
  - Alternative: Control priority with “Planned fix date”

Defect report Attributes

- Details of the defect report may include:
  - Status of the defect
    Typical: New, open (in progress), fixed, re-test (ready for re-test), closed
  - Software or system life cycle process
    - in which the defect was observed
    - in which a fix is expected (planned fix date)
    - in which a fix is delivered (fix date)
  - Change history
    Sequence of actions taken by project team members with respect to the defect to isolate, repair, and confirm it as fixed

Defect report Attributes

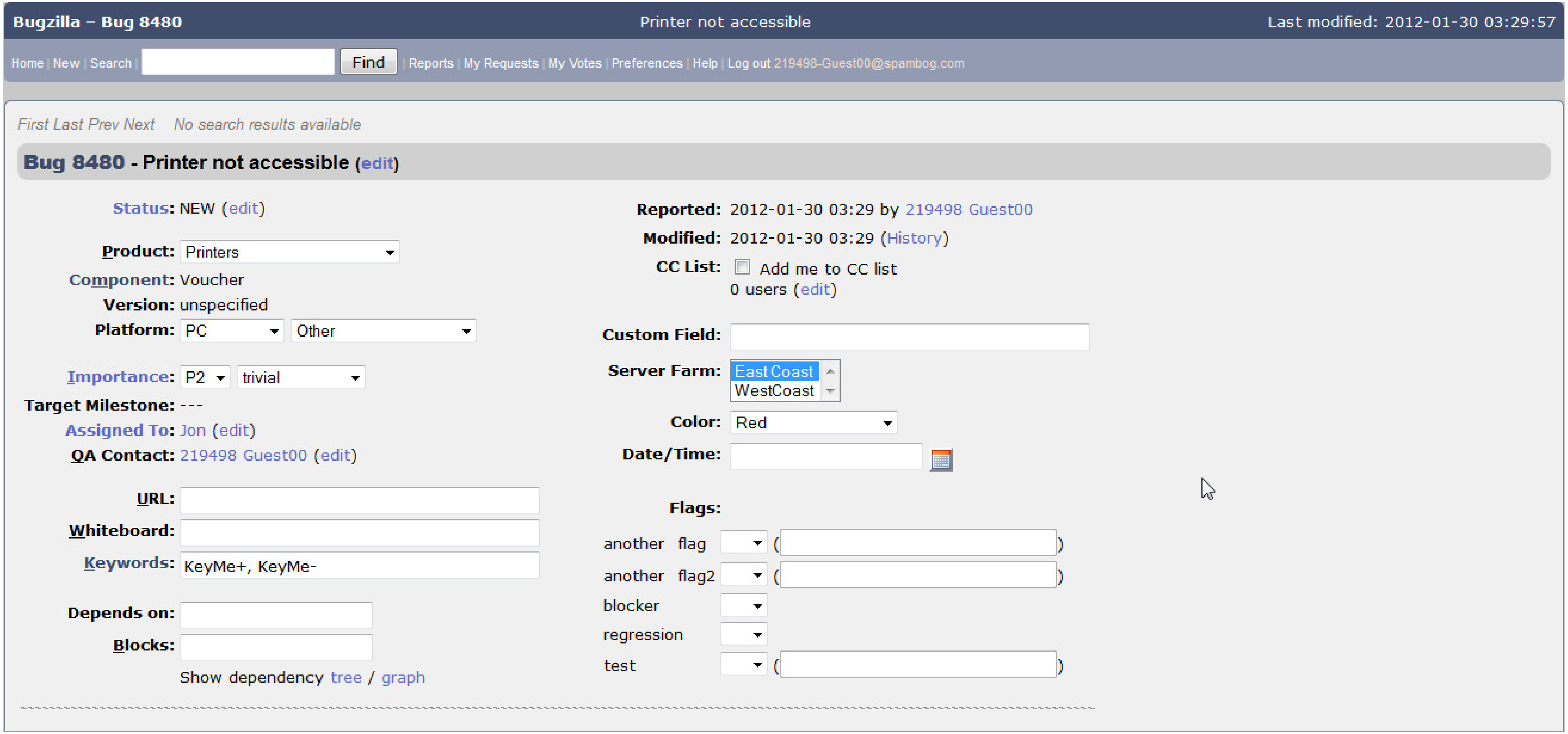
- Details of the defect report may include:
  - Conclusions, recommendations and approvals
  - References to
    - ➢ corresponding test case (If it does not exist, it should be created)
    - ➢ similar defects (duplicates should be closed)
  - Global issues E.g. other areas that may be affected by a change resulting from the defect
  - Scope or degree of impact on stakeholder(s) interests

Defect reports

- How to write reports? Example
  - Step 10: Enter zip code ✓
  - Step 20: Do not enter city name ✓
  - Step 30: Verify data base entry zip code ✓
  - Step 40: Verify data base entry city name ✘
    Nullpointer exception: Window with unreadable message appears, but could be closed.
    Proposal: A check for city name before sending the data to the server.
  - Step 50: Error message displayed

Important: Your task is to report the bug in the best way so it could be fixed – Ideas for reasons and solutions are **really only optionalS**

Defect reports Example (1/2)



Bugzilla – Bug 8480 | Printer not accessible | Last modified: 2012-01-30 03:29:57

Home | New | Search | Find | Reports | My Requests | My Votes | Preferences | Help | Log out 219498-Guest00@spambog.com

No search results available

Bug 8480 - Printer not accessible (edit)

Status: NEW (edit)

Product: Printers

Component: Voucher

Version: unspecified

Platform: PC | Other

Importance: P2 | trivial

Target Milestone: ---

Assigned To: Jon (edit)

QA Contact: 219498 Guest00 (edit)

URL:

Whiteboard:

Keywords: KeyMe+, KeyMe-

Depends on:

Blocks:

Show dependency tree / graph

Reported: 2012-01-30 03:29 by 219498 Guest00

Modified: 2012-01-30 03:29 (History)

CC List: □ Add me to CC list
0 users (edit)

Custom Field:

Server Farm: East Coast, WestCoast

Color: Red

Date/Time:

Flags:

another flag ( )

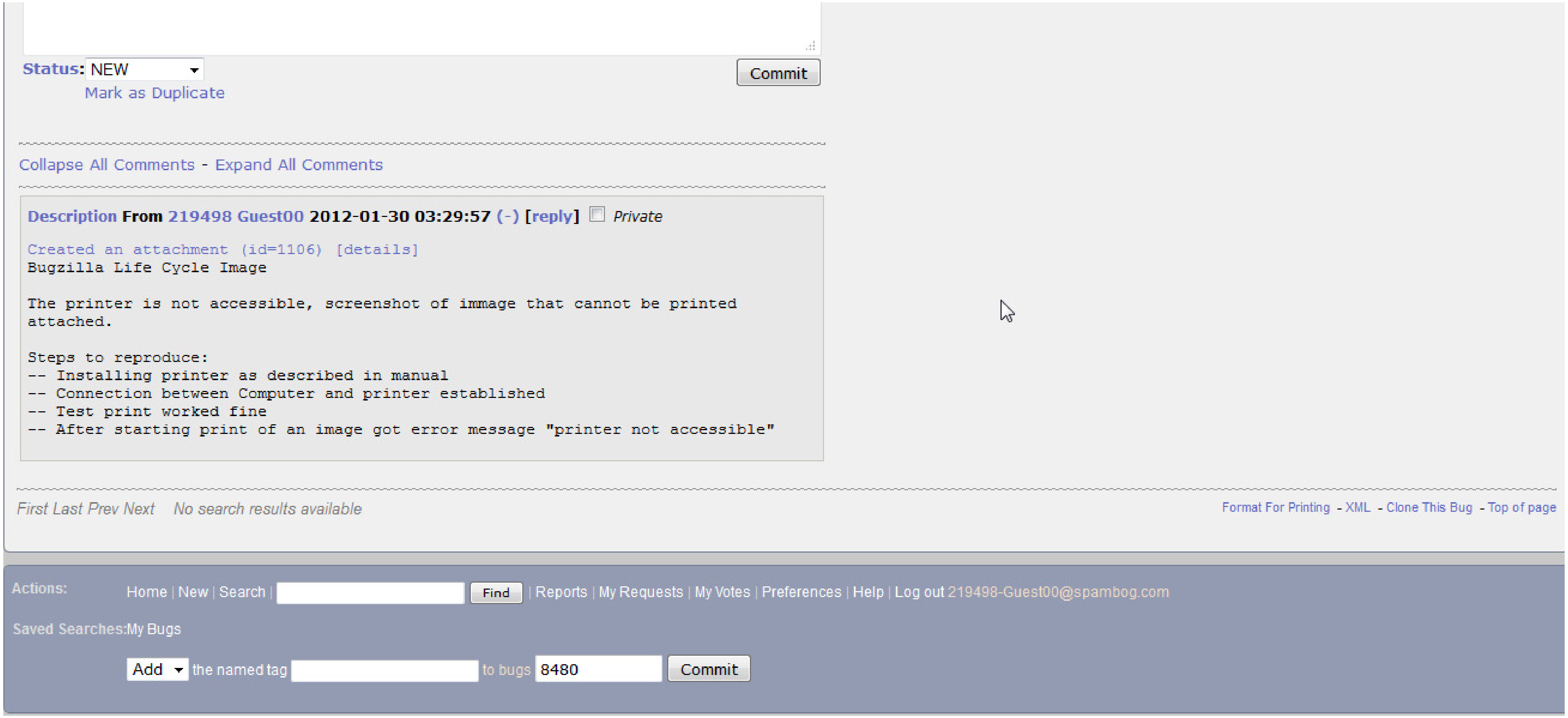
another flag2 ( )

blocker

regression

test ( )

Defect reports Example (2/2)



Description From 219498 Guest00 2012-01-30 03:29:57 (-) [reply] □ Private

```
Created an attachment (id=1106) [details]
Bugzilla Life Cycle Image

The printer is not accessible, screenshot of immage that cannot be printed
attached.

Steps to reproduce:
-- Installing printer as described in manual
-- Connection between Computer and printer established
-- Test print worked fine
-- After starting print of an image got error message "printer not accessible"
```

First Last Prev Next No search results available
Format For Printing - XML - Clone This Bug - Top of page
Actions: Home | New | Search | Find | Reports | My Requests | My Votes | Preferences | Help | Log out 219498-Guest00@spambog.com
Saved Searches:My Bugs
Add the named tag to bugs 8480 Commit

Incident Management

Motivation

- Objective of testing: Finding defects
- Discrepancies between actual and expected outcomes ⇨ Logging as incidents
  ⇨ May turn out to be a defect
- How to handle appropriate actions?
  ⇨ Incident management / Bug life cycle

Incident Management

- Incident management
  - Track incidents and defects
    Typical life cycle:
    1. Discovery and classification
    2. Correction
    3. Confirmation of the solution
  - Establish an incident management process
  - Define rules for classification

Incident Management

When?

- Incidents may be raised during
  - development
  - review
  - testing
  - use of a software product

Incident Management

Concerning what?

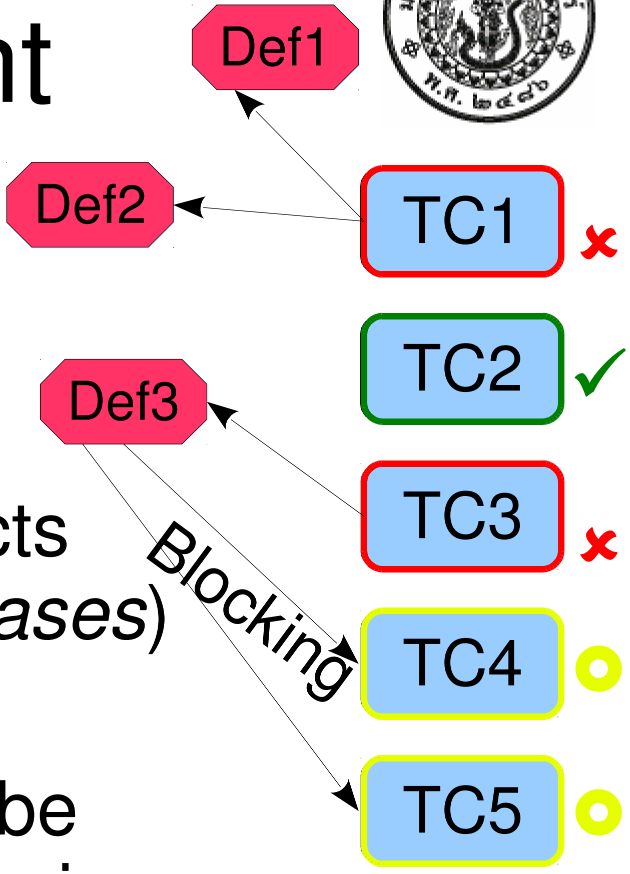
- Incidents may be raised for
  - issues in code or the working system
  - any type of documentation including
    - requirements
    - development documents
    - test documents
    - user information such as “Help”
    - installation guides

Incident Management

What are possible root causes?

- Distinguish
  - specification fault like wrong requirements
  - software defect
  - environment failure
  - interface defect
  - error in the test case or test scenario
  - error in test data

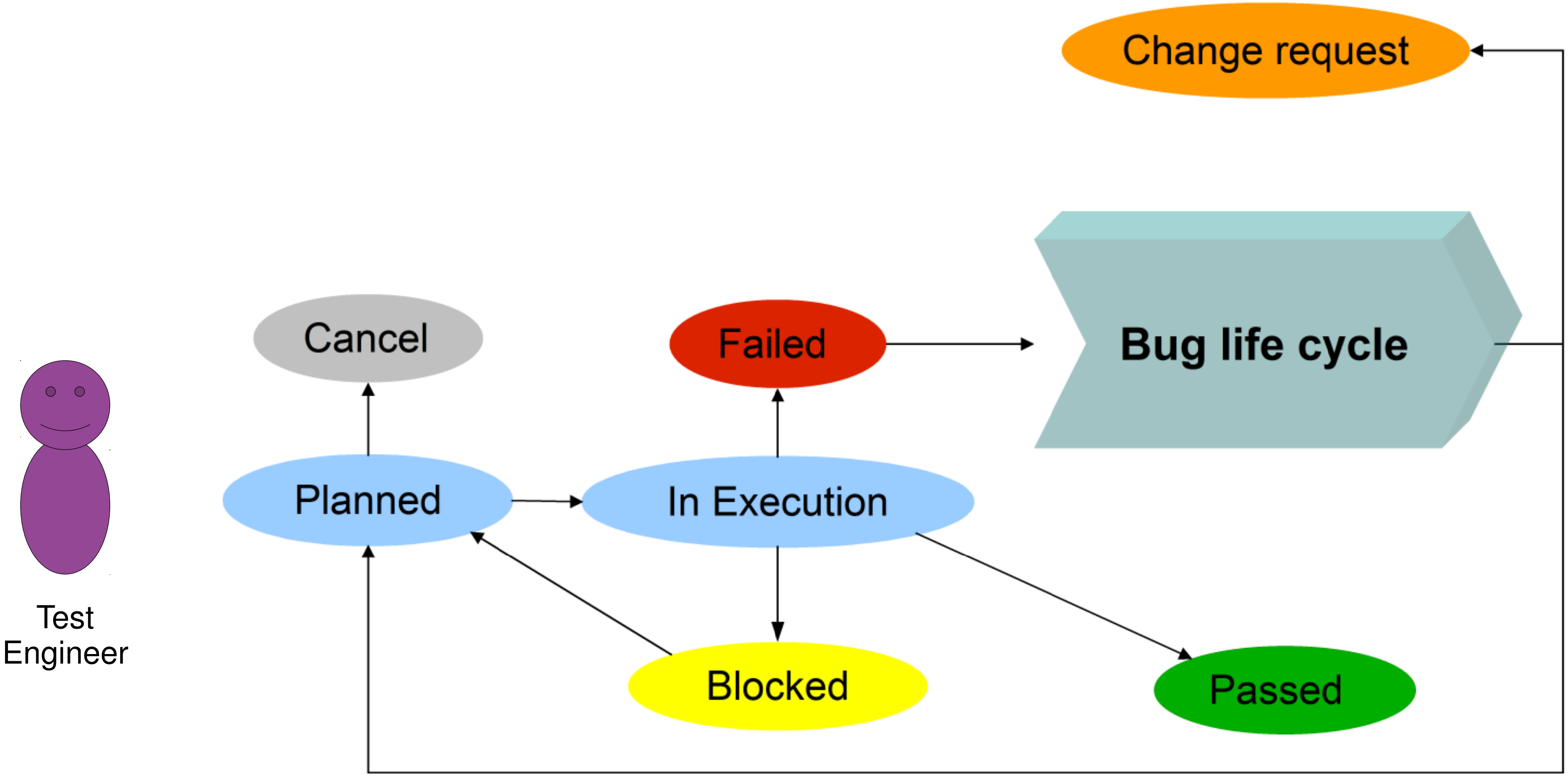
Incident Management



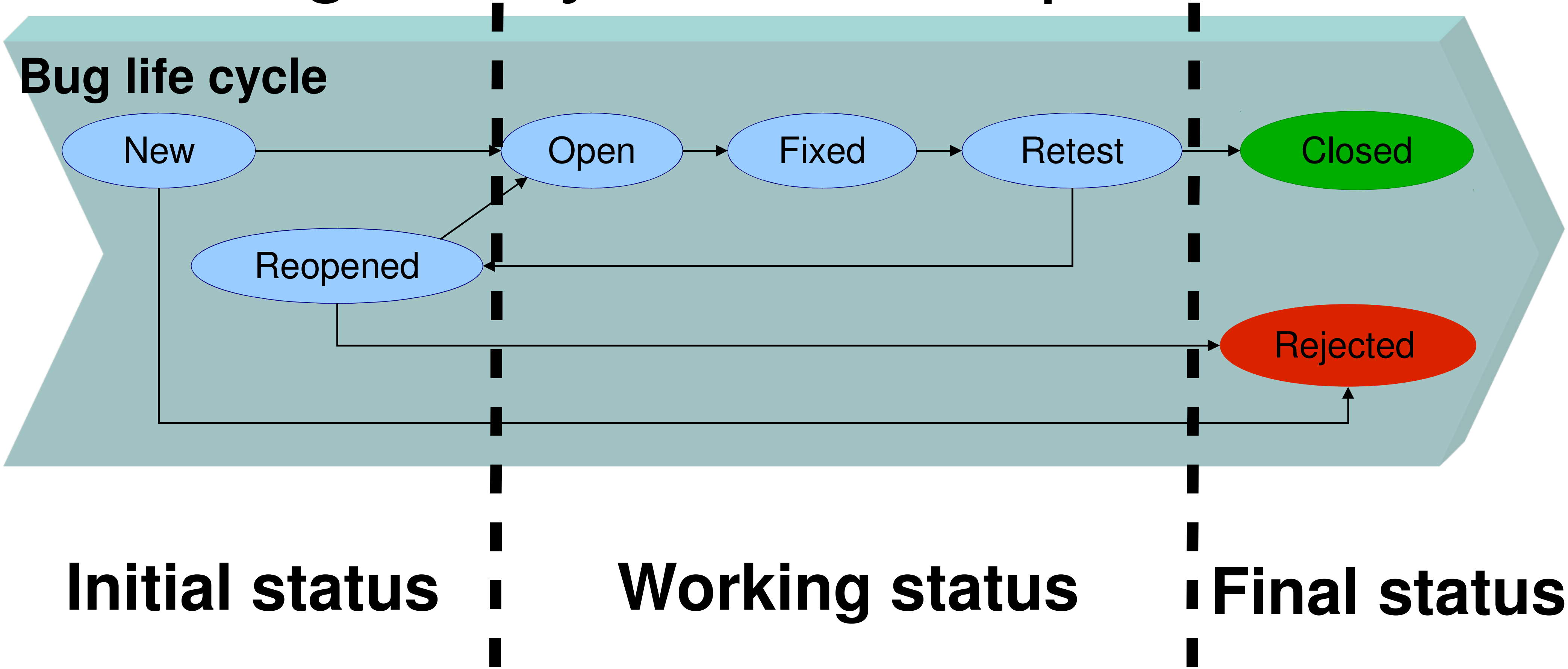
- Defects and test cases
  - Relation is `m:n`
  - A test case could have several defects (*Hint: That's why design small test cases*)
  - Hidden defects
    If an execution of a test case has to be stopped, possible defects in the following test steps could only be detected, after the defect is fixed and could be retested
  - A defect could block other test cases
    Example: Interface tests

Incident Management
Bug life cycle

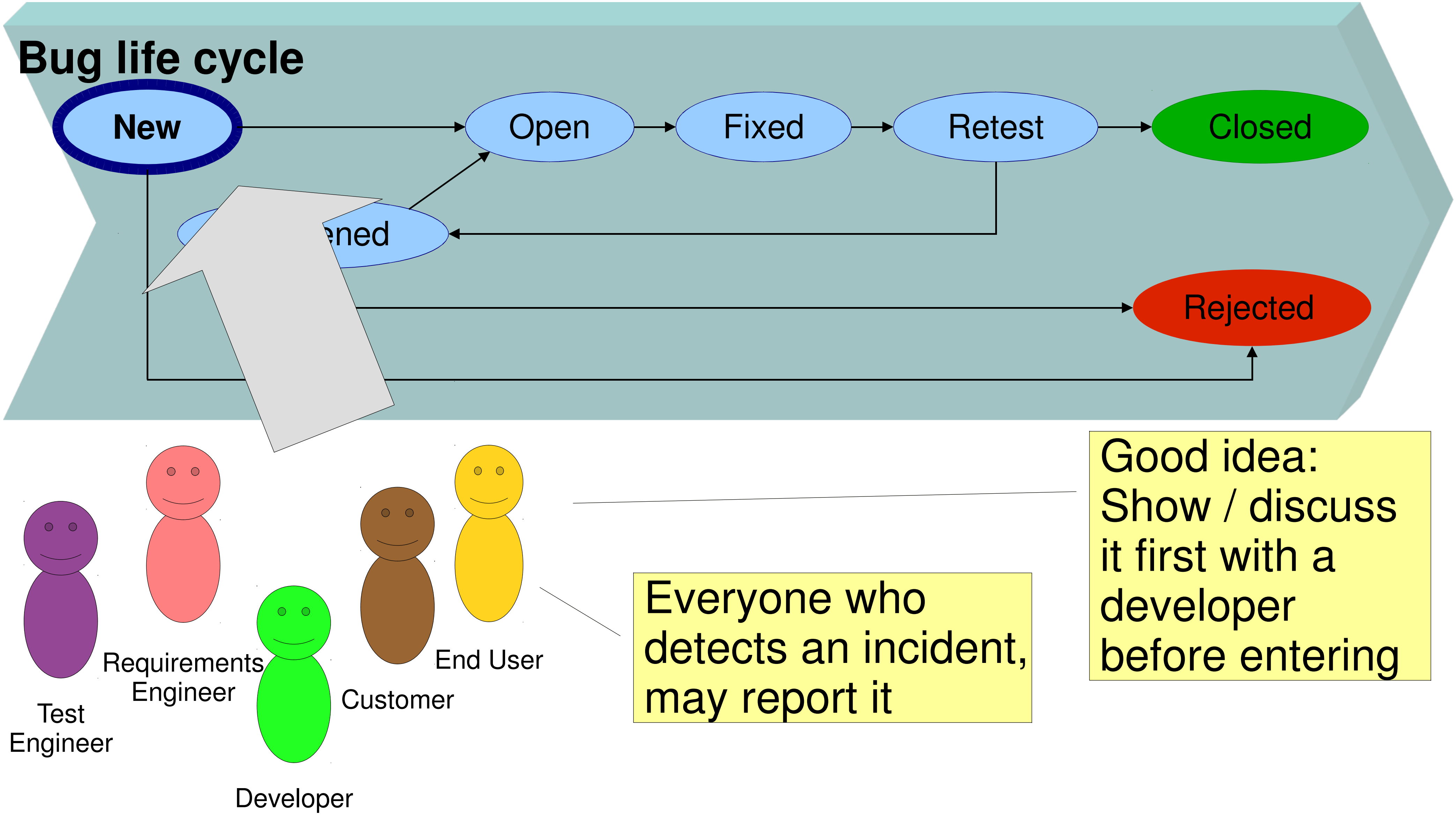
Execution of test cases and bug life cycle



Incident Management
Bug life cycle – Example 1



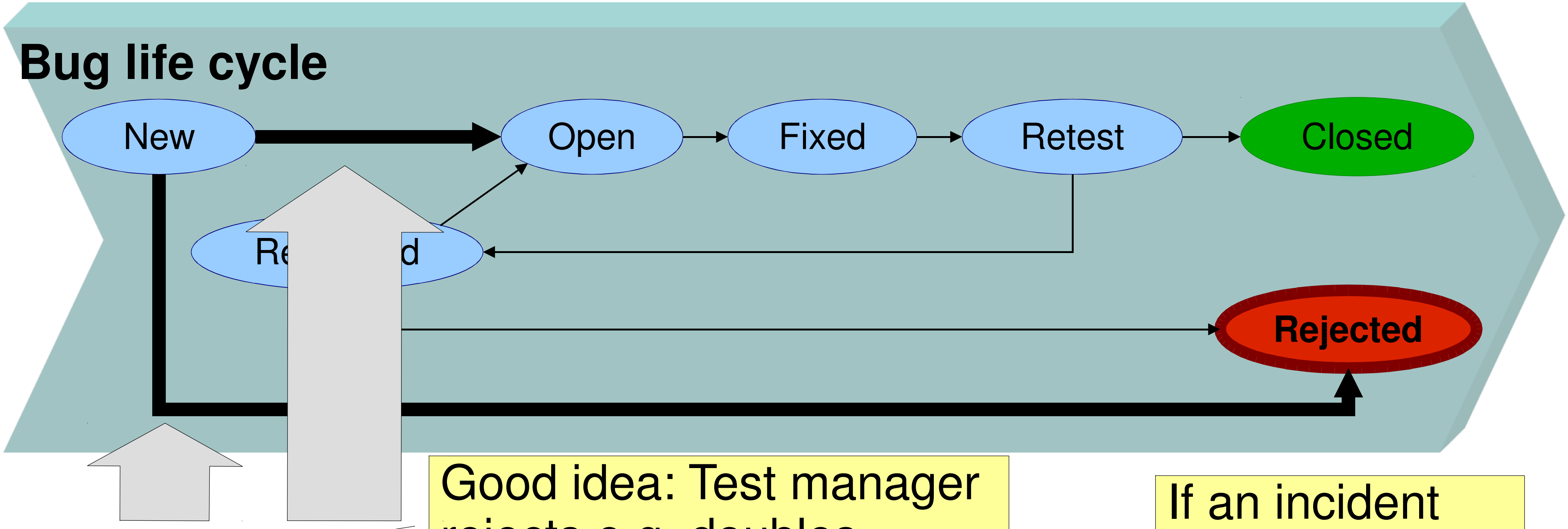
Incident Management
Bug life cycle – Example 1

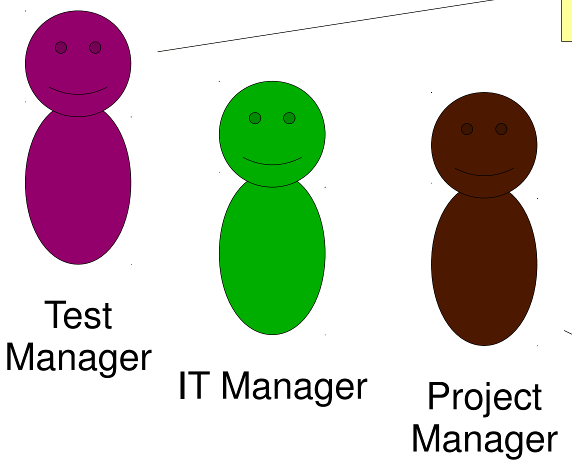


Everyone who detects an incident, may report it

Good idea: Show / discuss it first with a developer before entering

Incident Management
Bug life cycle – Example 1





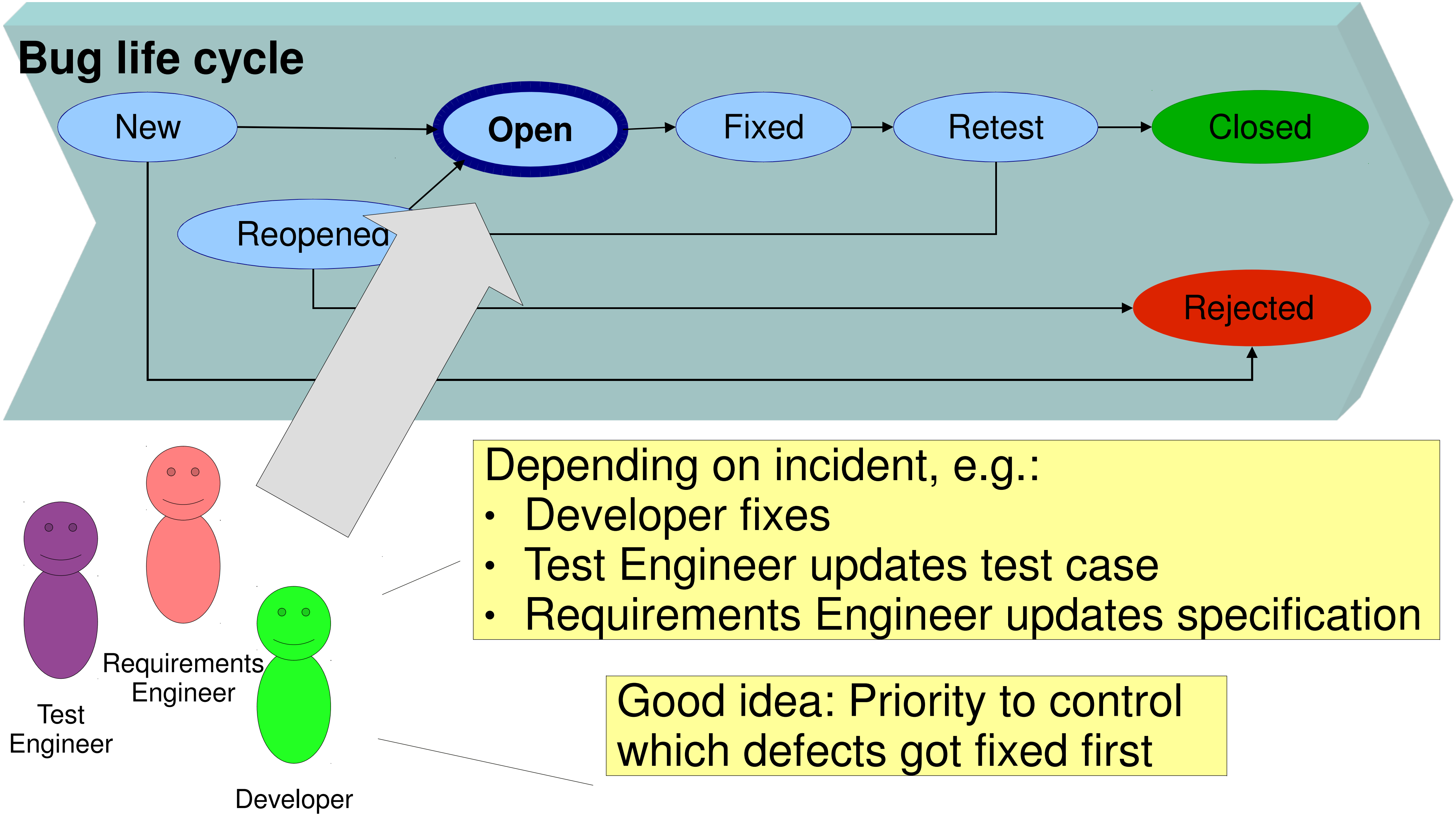
Good idea: Test manager rejects e.g. doubles

If an incident gets rejected, it is in a final state

Possible reason for “rejected”: Not reproducible

E.g. in a daily meeting it will be decided how to proceed

Incident Management
Bug life cycle – Example 1

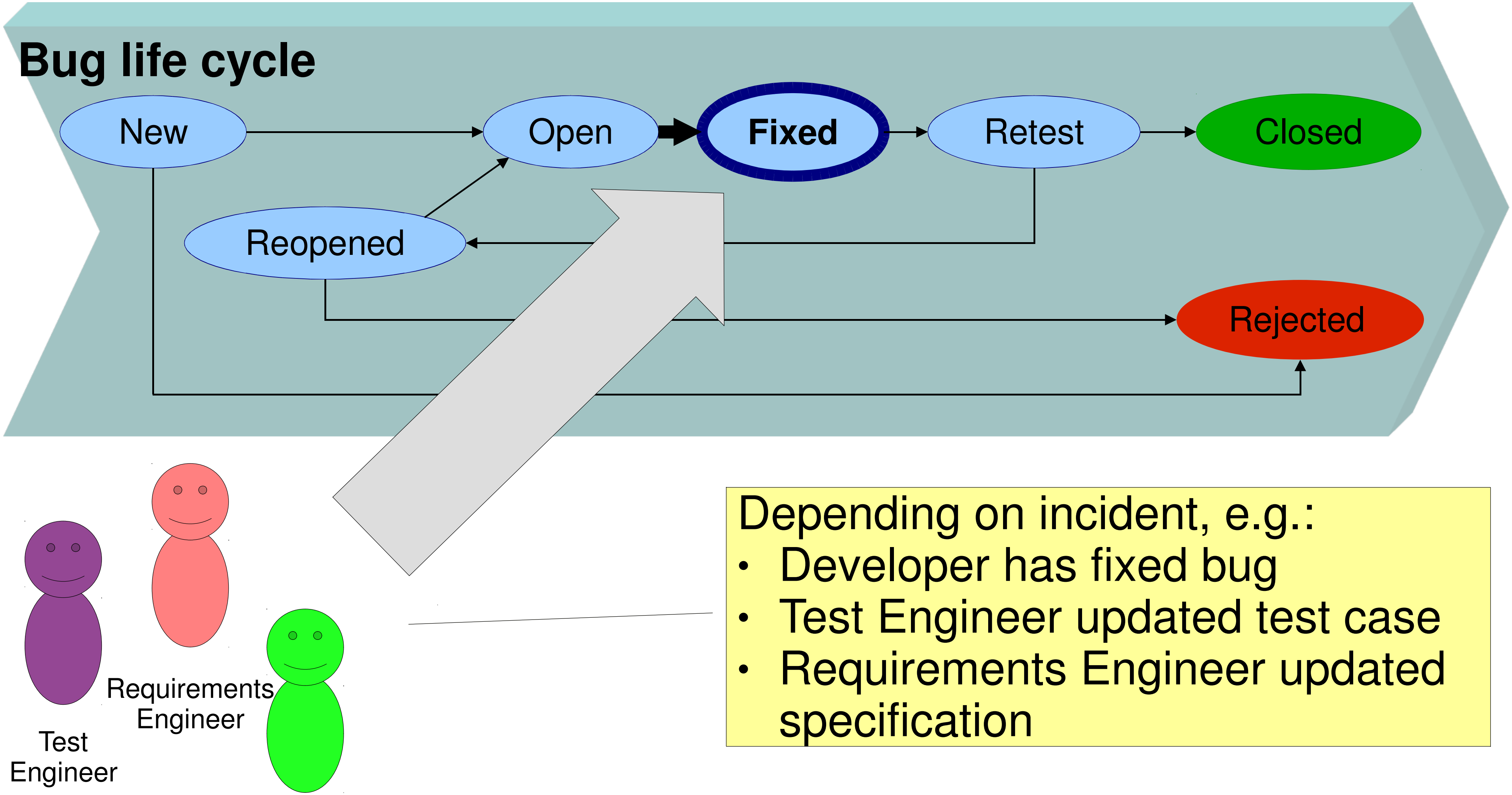


Depending on incident, e.g.:

- Developer fixes
- Test Engineer updates test case
- Requirements Engineer updates specification

Good idea: Priority to control which defects got fixed first

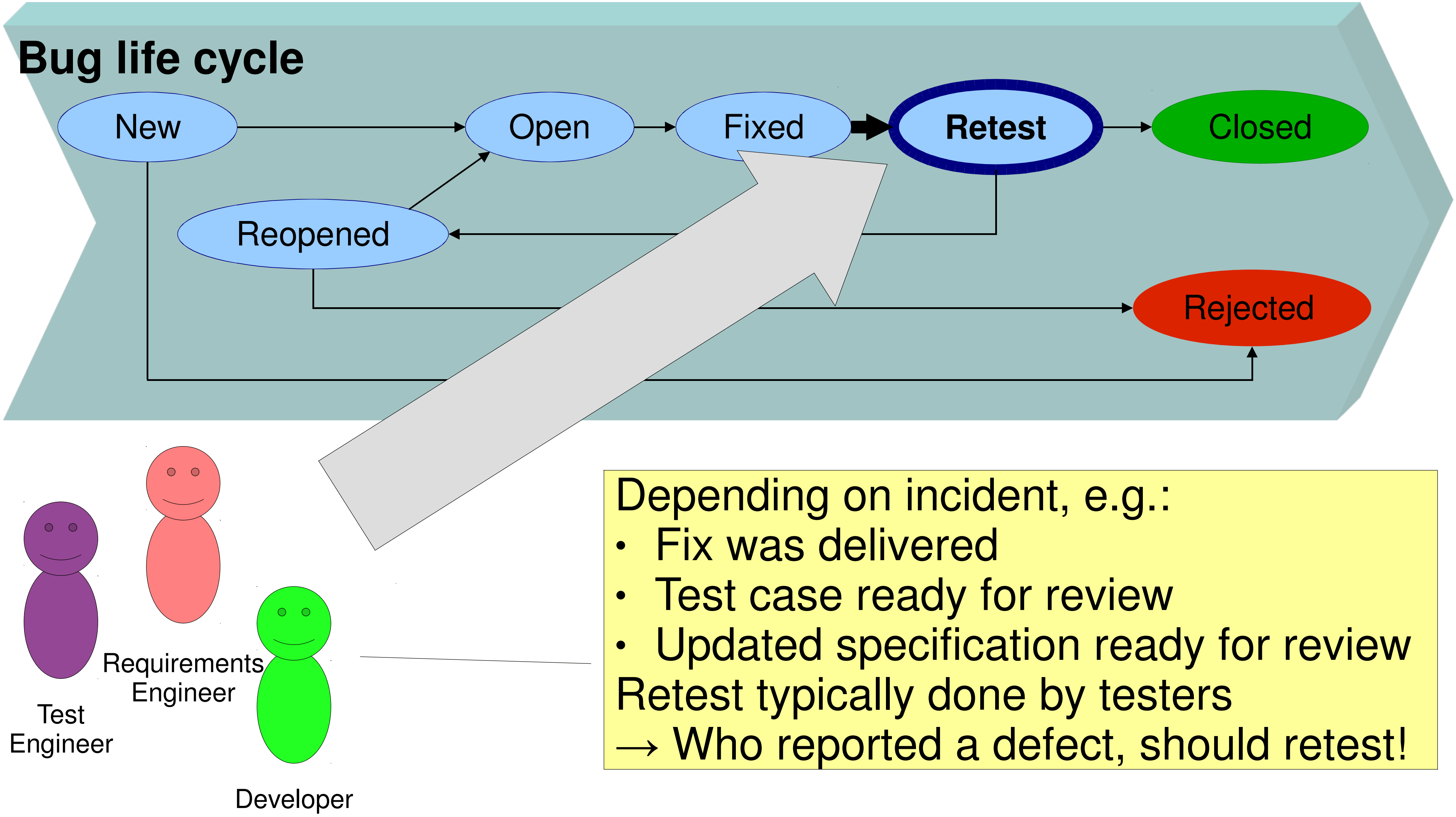
Incident Management
Bug life cycle – Example 1



Depending on incident, e.g.:

- Developer has fixed bug
- Test Engineer updated test case
- Requirements Engineer updated specification

Incident Management
Bug life cycle – Example 1

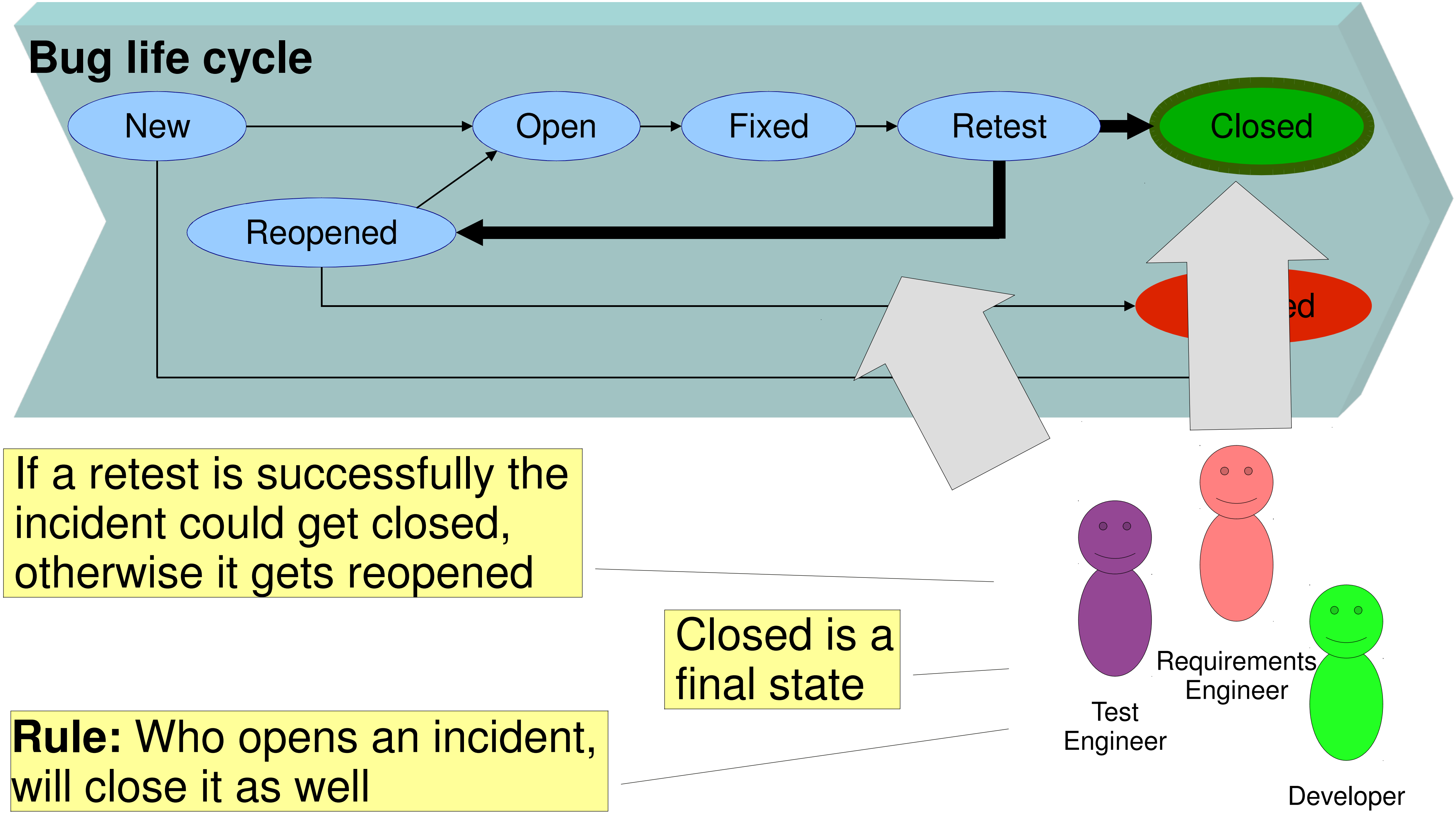


Depending on incident, e.g.:
- Fix was delivered
- Test case ready for review
- Updated specification ready for review

Retest typically done by testers

→ Who reported a defect, should retest!

Incident Management
Bug life cycle – Example 1

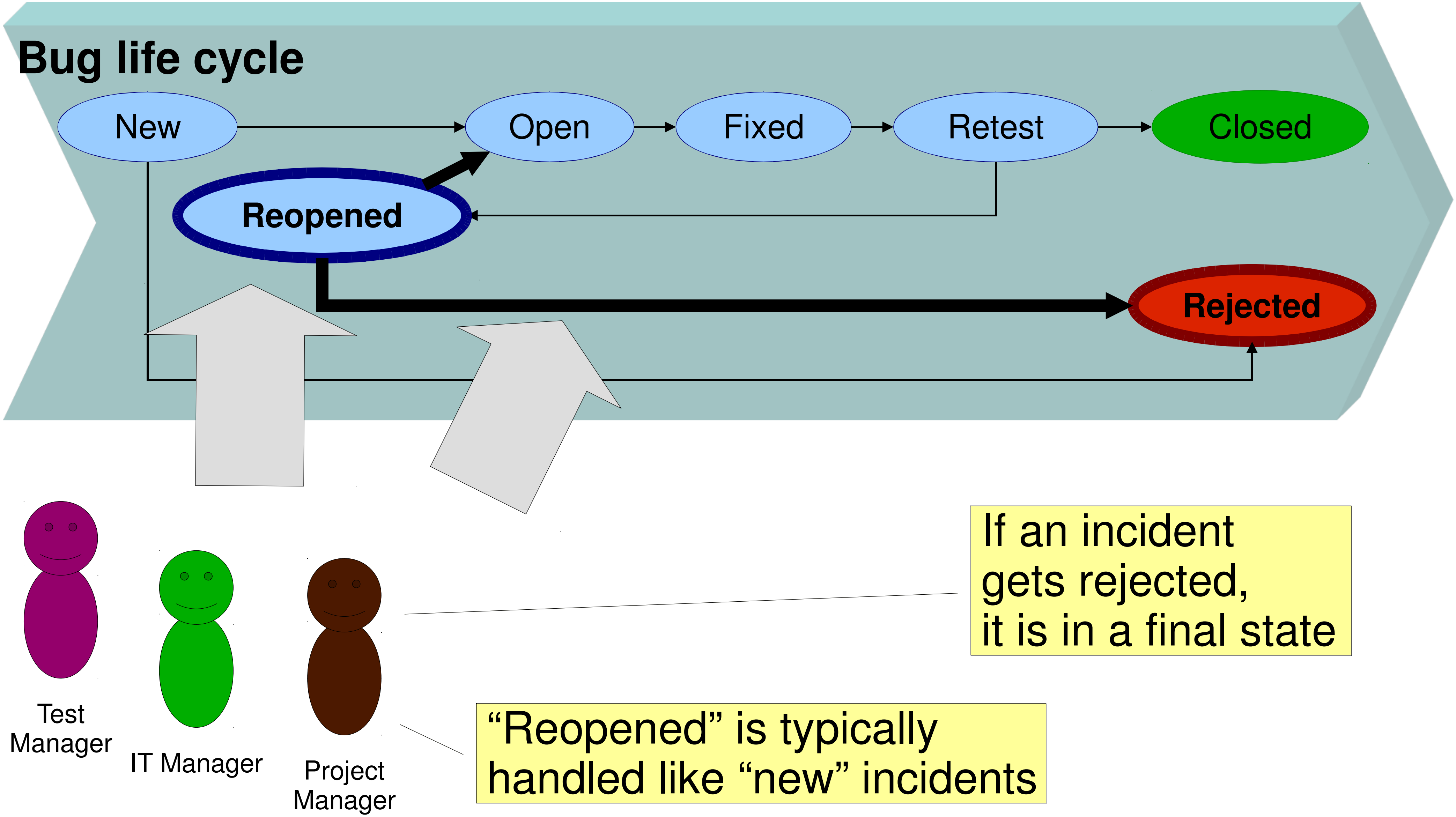


If a retest is successfully the incident could get closed, otherwise it gets reopened

Closed is a final state

Rule: Who opens an incident, will close it as well

Incident Management
Bug life cycle – Example 1



If an incident gets rejected, it is in a final state

“Reopened” is typically handled like “new” incidents

Incident Management
Bug life cycle – Example 2

- Example 2 Bug life cycle of Bugzilla [Wik16a]

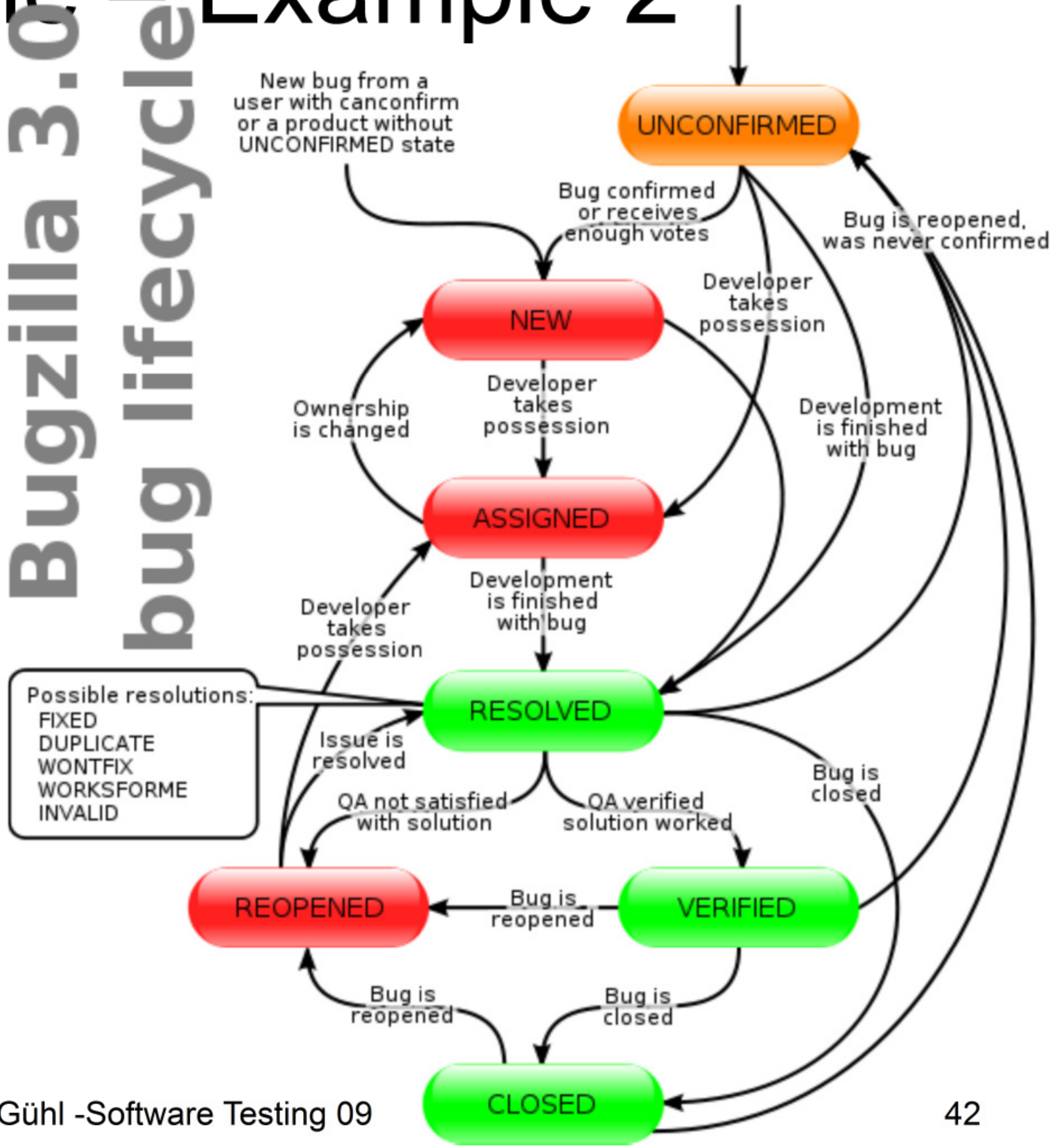
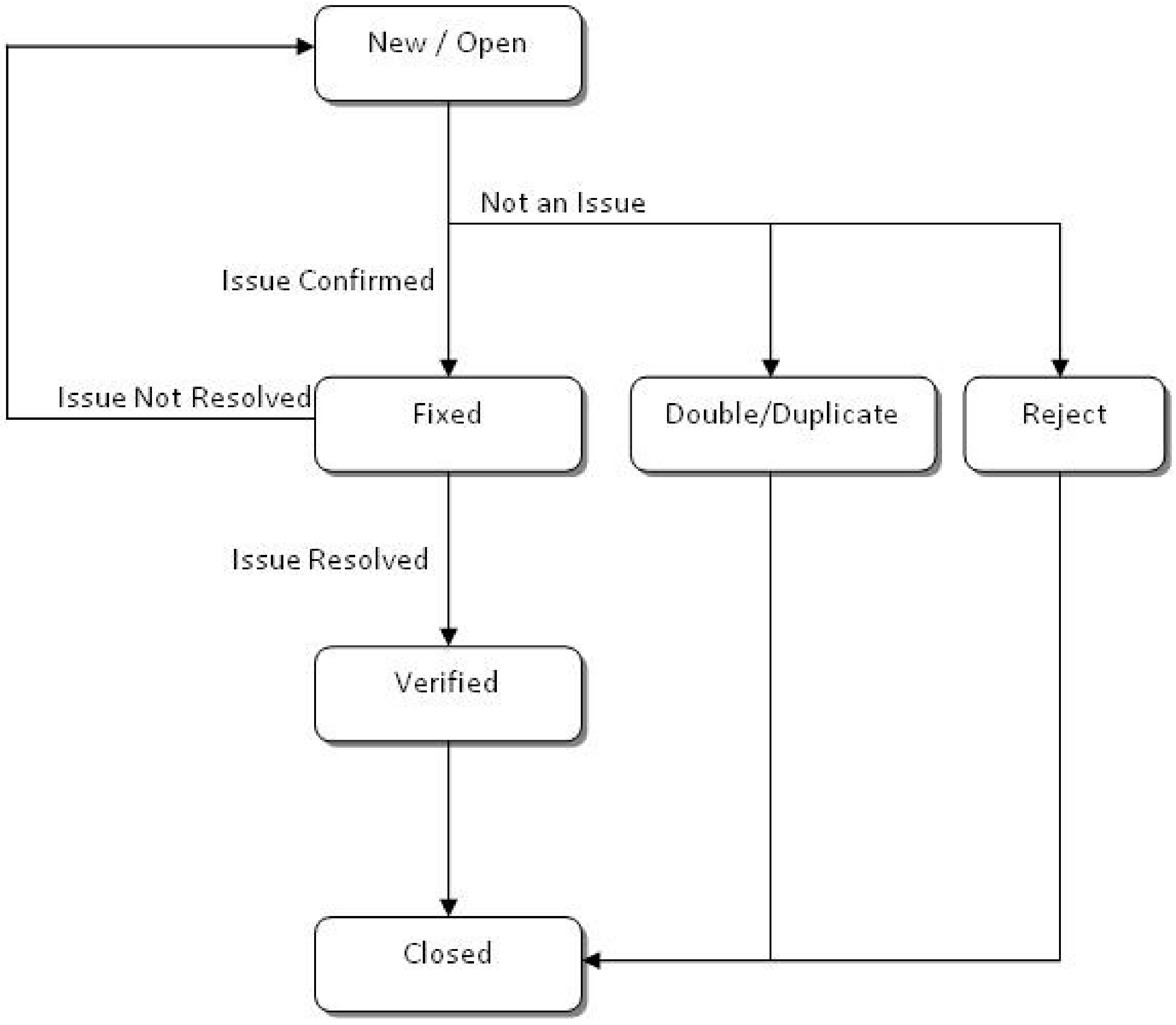

Bugzilla 3.0
bug lifecycle
New bug from a user with canconfirm or a product without UNCONFIRMED state
UNCONFIRMED
Bug confirmed or receives enough votes
Bug is reopened, was never confirmed
NEW
Developer takes possession
Ownership is changed
Developer takes possession
Development is finished with bug
ASSIGNED
Development is finished with bug
Developer takes possession
Possible resolutions:
FIXED
DUPLICATE
WONTFIX
WORKSFORME
INVALID
RESOLVED
Issue is resolved
QA not satisfied with solution
QA verified solution worked
Bug is closed
REOPENED
Bug is reopened
VERIFIED
Bug is reopened
Bug is closed
CLOSED

Image source: https://en.wikipedia.org/wiki/File:Bugzilla_Lifecycle_color-aqua.svg

Incident Management
Bug life cycle – Example 3

- Example 3: Bug Life Cycle [QAT16]



Bug Life Cycle

Image source:
http://www.qatutorial.com/pics/BugLifeCycle.JPG

Incident Management Tasks (1/2)

- Daily communication
  - Discussion of new defects
  - Proceeding concerning special defects
    - Defects with high severity
    - Defects with no activities for certain time
- Coordination with tester, customers, and software vendor (developers)
  - Collection and administration of defects
  - Assigning of severity and priority levels
  - Clarification of responsibilities

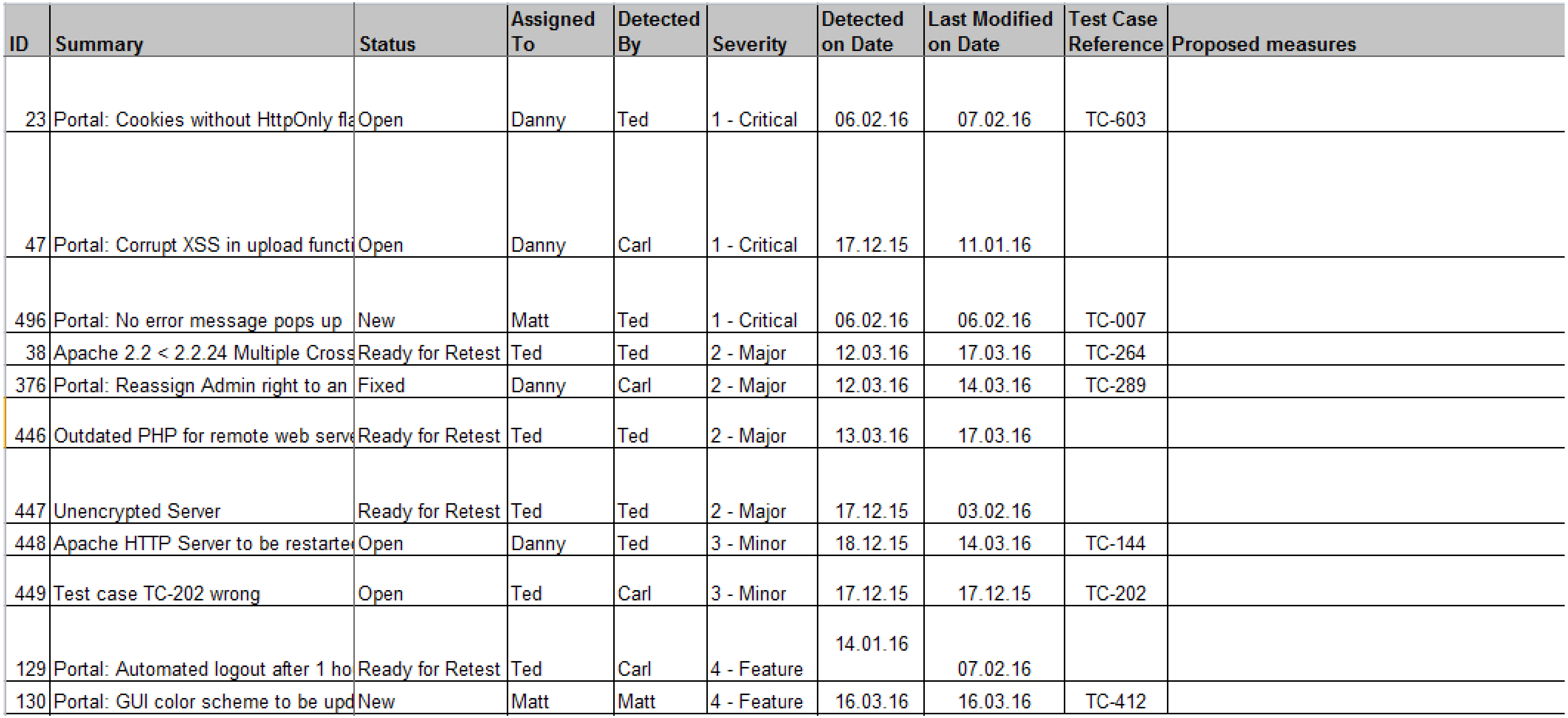
Incident Management Tasks (2/2)

- Monitoring of defect fixing
  - Monitoring releases:
    Which defects were fixed and delivered?
  - Organize re-testing
- Proposal: Usage of an attribute “Estimated fix date”
  Based on this date regular monitoring is possible.

Incident Management Example

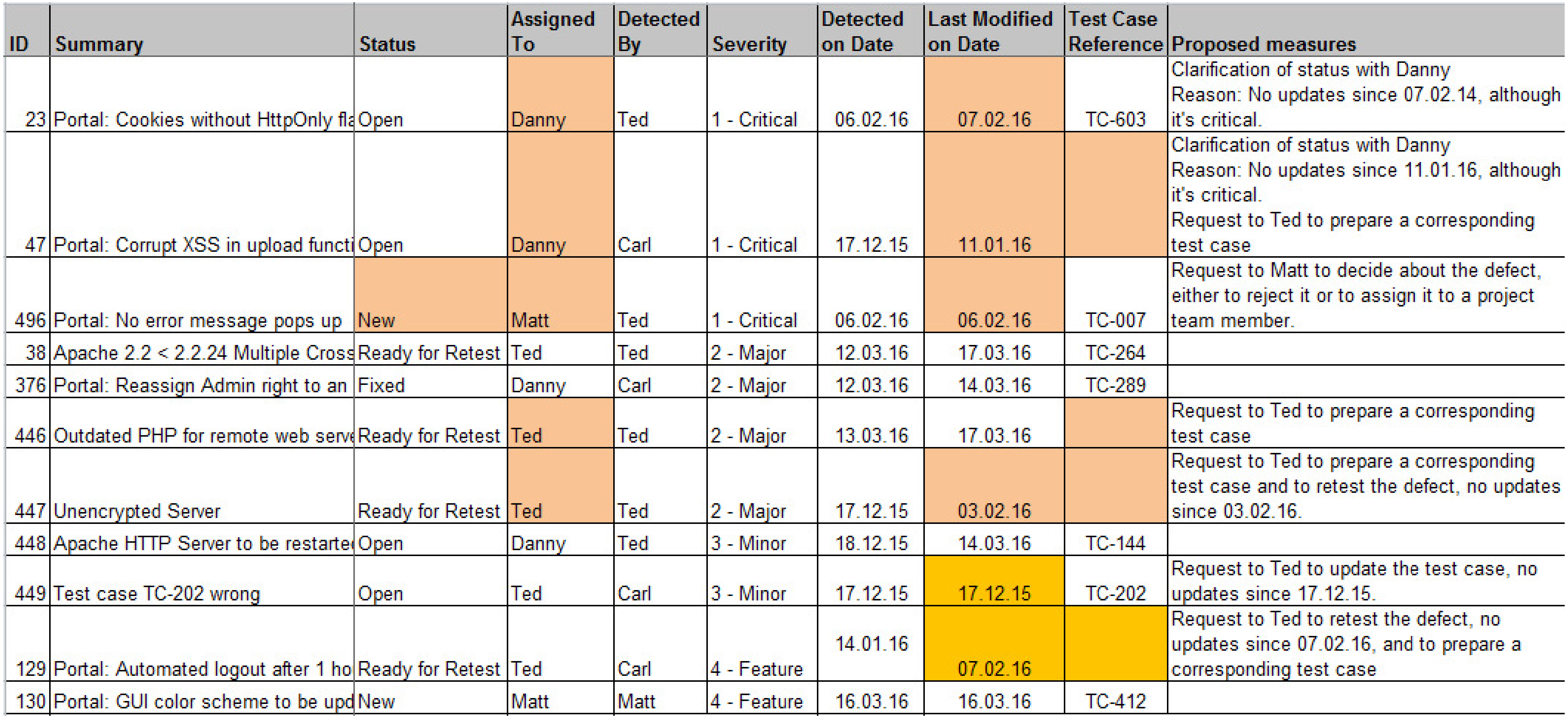
- Today is the 18th of March 2016.
- You are a defect manager in a software development team with
  - Test manager Matt
  - Test engineer Ted
  - Developer Danny
  - Customer Carl
- Given following open defect overview from today. What are measures to do?

Incident Management Example



ID	Summary	Status	Assigned To	Detected By	Severity	Detected on Date	Last Modified on Date	Test Case Reference	Proposed measures
23	Portal: Cookies without HttpOnly fla	Open	Danny	Ted	1 - Critical	06.02.16	07.02.16	TC-603	
47	Portal: Corrupt XSS in upload functi	Open	Danny	Carl	1 - Critical	17.12.15	11.01.16		
496	Portal: No error message pops up	New	Matt	Ted	1 - Critical	06.02.16	06.02.16	TC-007	
38	Apache 2.2 < 2.2.24 Multiple Cross	Ready for Retest	Ted	Ted	2 - Major	12.03.16	17.03.16	TC-264	
376	Portal: Reassign Admin right to an	Fixed	Danny	Carl	2 - Major	12.03.16	14.03.16	TC-289	
446	Outdated PHP for remote web serve	Ready for Retest	Ted	Ted	2 - Major	13.03.16	17.03.16		
447	Unencrypted Server	Ready for Retest	Ted	Ted	2 - Major	17.12.15	03.02.16		
448	Apache HTTP Server to be restarte	Open	Danny	Ted	3 - Minor	18.12.15	14.03.16	TC-144	
449	Test case TC-202 wrong	Open	Ted	Carl	3 - Minor	17.12.15	17.12.15	TC-202	
129	Portal: Automated logout after 1 ho	Ready for Retest	Ted	Carl	4 - Feature	14.01.16	07.02.16		
130	Portal: GUI color scheme to be upd	New	Matt	Matt	4 - Feature	16.03.16	16.03.16	TC-412	

Incident Management Example



ID	Summary	Status	Assigned To	Detected By	Severity	Detected on Date	Last Modified on Date	Test Case Reference	Proposed measures
23	Portal: Cookies without HttpOnly fla	Open	Danny	Ted	1 - Critical	06.02.16	07.02.16	TC-603	Clarification of status with Danny Reason: No updates since 07.02.14, although it's critical.
47	Portal: Corrupt XSS in upload functi	Open	Danny	Carl	1 - Critical	17.12.15	11.01.16		Clarification of status with Danny Reason: No updates since 11.01.16, although it's critical. Request to Ted to prepare a corresponding test case
496	Portal: No error message pops up	New	Matt	Ted	1 - Critical	06.02.16	06.02.16	TC-007	Request to Matt to decide about the defect, either to reject it or to assign it to a project team member.
38	Apache 2.2 < 2.2.24 Multiple Cross	Ready for Retest	Ted	Ted	2 - Major	12.03.16	17.03.16	TC-264	
376	Portal: Reassign Admin right to an	Fixed	Danny	Carl	2 - Major	12.03.16	14.03.16	TC-289	
446	Outdated PHP for remote web serv	Ready for Retest	Ted	Ted	2 - Major	13.03.16	17.03.16		Request to Ted to prepare a corresponding test case
447	Unencrypted Server	Ready for Retest	Ted	Ted	2 - Major	17.12.15	03.02.16		Request to Ted to prepare a corresponding test case and to retest the defect, no updates since 03.02.16.
448	Apache HTTP Server to be restarte	Open	Danny	Ted	3 - Minor	18.12.15	14.03.16	TC-144	
449	Test case TC-202 wrong	Open	Ted	Carl	3 - Minor	17.12.15	17.12.15	TC-202	Request to Ted to update the test case, no updates since 17.12.15.
129	Portal: Automated logout after 1 ho	Ready for Retest	Ted	Carl	4 - Feature	14.01.16	07.02.16		Request to Ted to retest the defect, no updates since 07.02.16, and to prepare a corresponding test case
130	Portal: GUI color scheme to be upd	New	Matt	Matt	4 - Feature	16.03.16	16.03.16	TC-412	

Sources (1/2)

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