Bug handling in Eclipse releases: Switching to a rapid relase cycle

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TU/e

Bug handling activity

Zeinab Abou Khalil   Eleni Constantinou   Tom Mens   Laurence Duchien   Clement Quinton
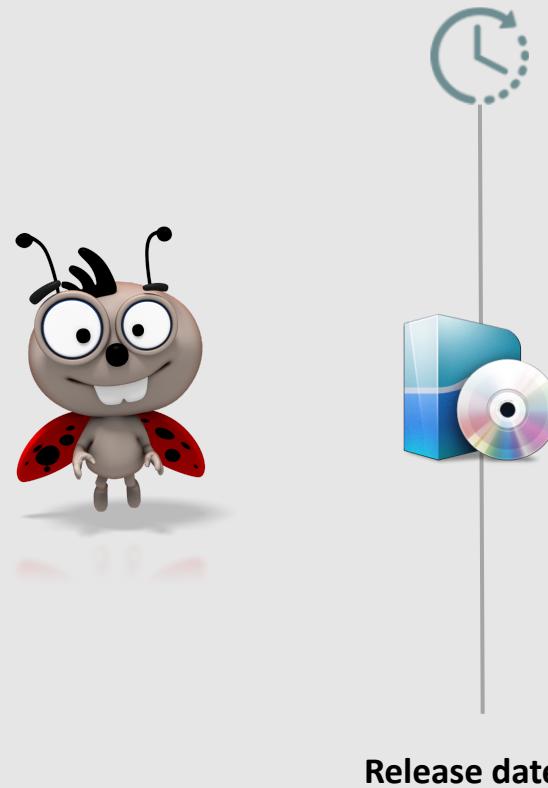
Z. A. Khalil, E. Constantinou, T. Mens, L. Duchien, C. Quinton:
A Longitudinal Analysis of Bug Handling Across Eclipse Releases.
ICSME 2019: 1-12

Bug handling activity

Release date

Release date
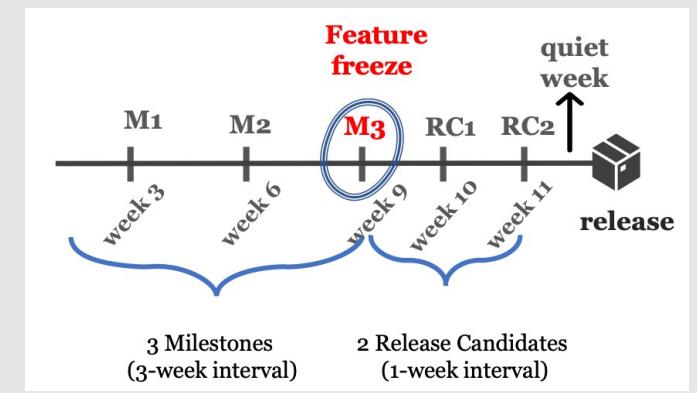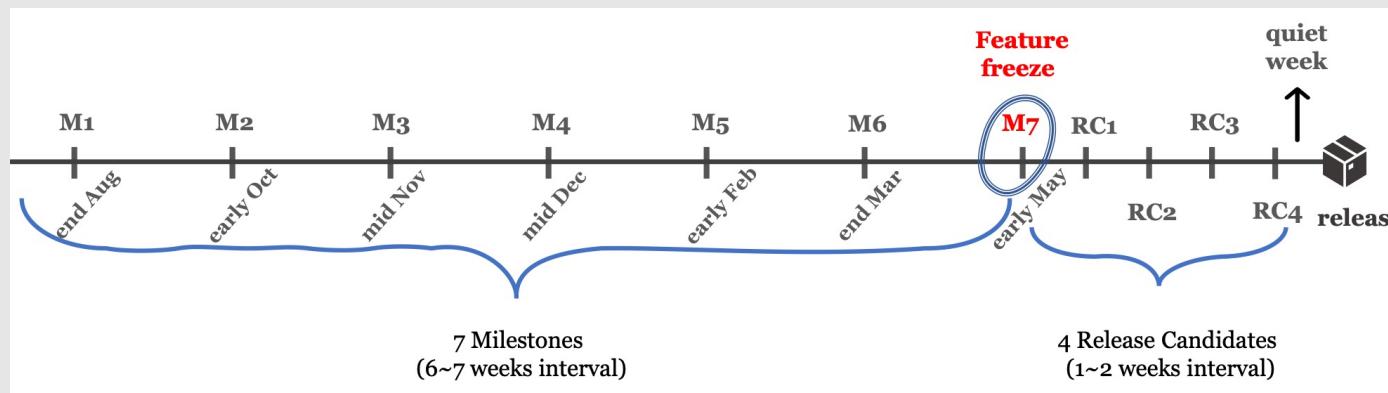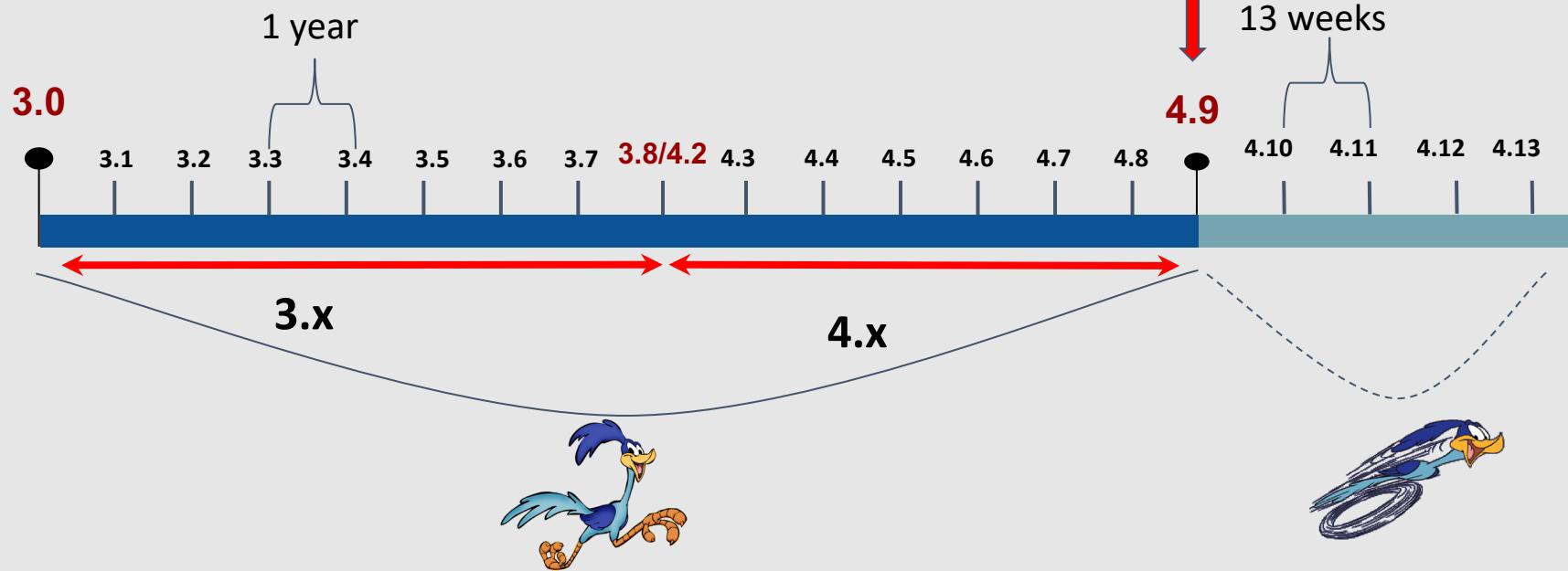
Study the impact of the release schedule on the bug handling process

Case study

Dataset

Bugzilla

- Platform
- PDE
- JDT
- E4
- Incubator
- Equinox

Enhancements

Unspecified versions

3.0 >Version > 4.13

versions that are not listed in the official releases
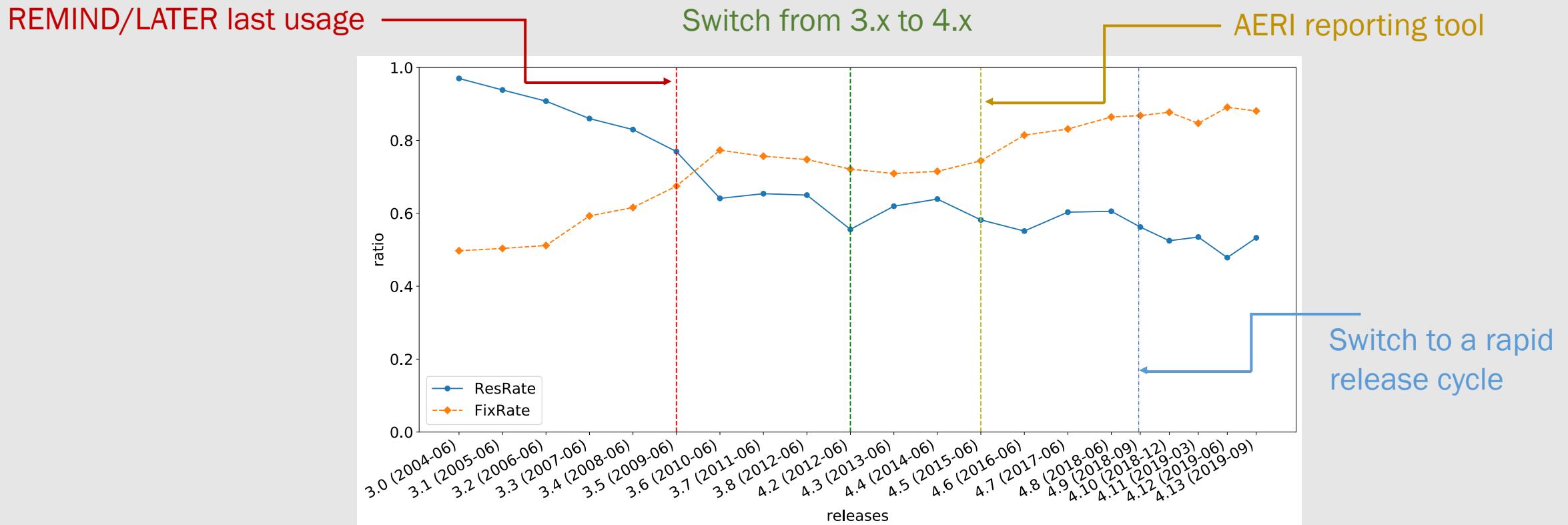
- Platform
- PDE
- JDT
- Equinox

141K bugs

34K bugs 4.x series
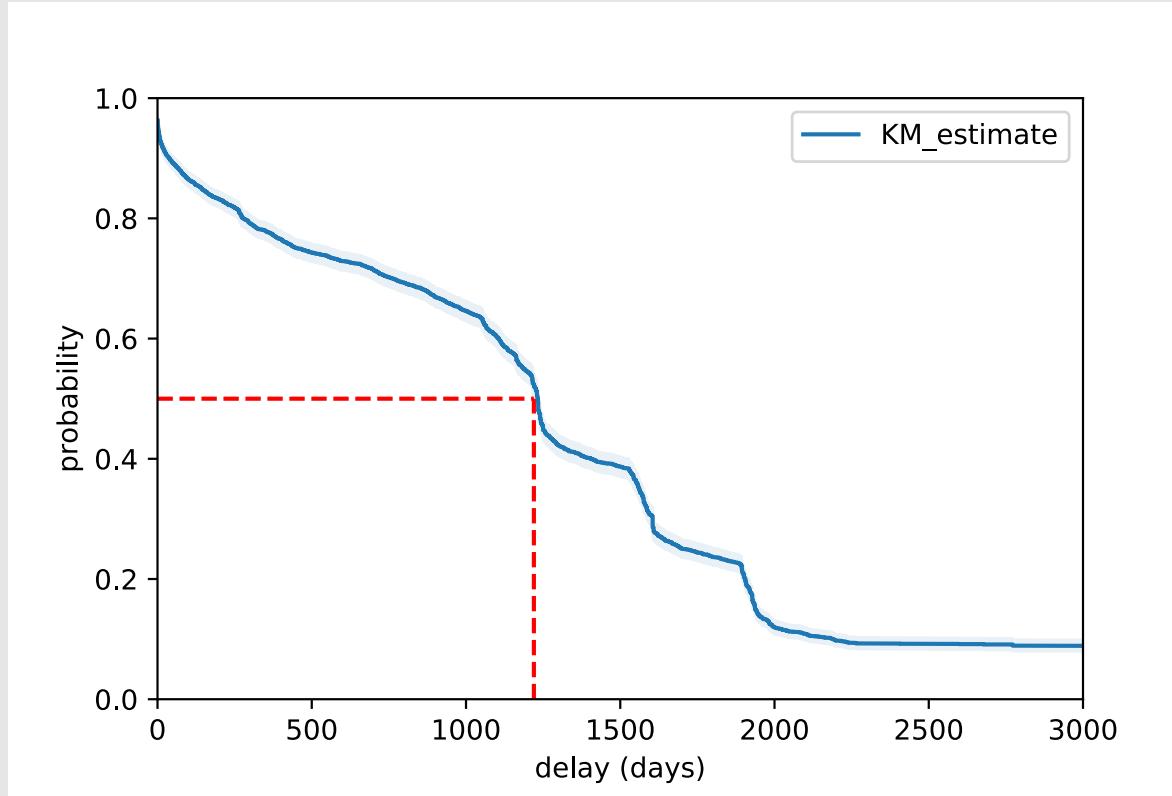
Bug handling rates & changes in the Eclipse bug handling process

$$ResRate(]d_1, d_2]) = \frac{\text{\# of bugs resolved}}{\text{\# of bugs reported}}$$

$$FixRate(]d_1, d_2]) = \frac{\text{\# of bugs fixed}}{\text{\# of bugs resolved}}$$

Changes in the Eclipse bug handling process
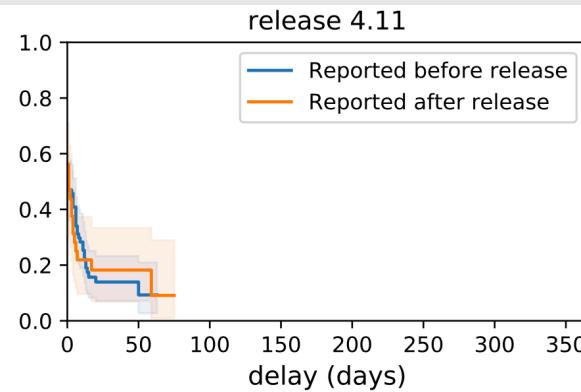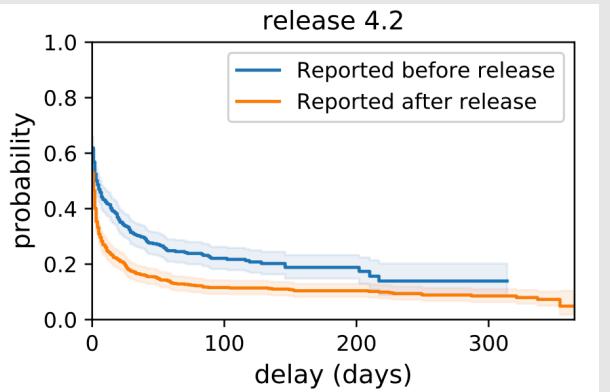
3,6K bugs
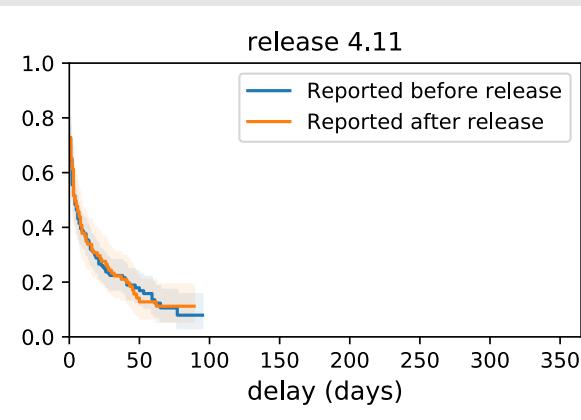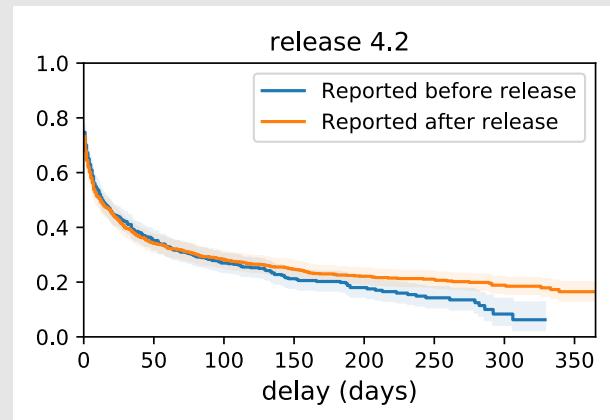
💡*It takes >1200 days for 50% of REMIND/LATER bugs to be resolved in another way*

How does the bug handling time differ before and after each release?

Triaging time

Fixing time
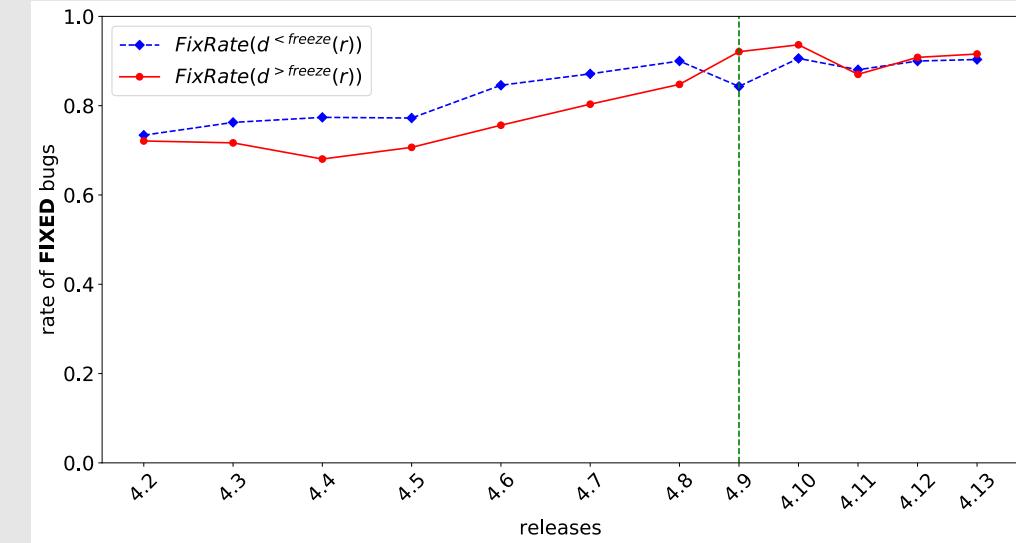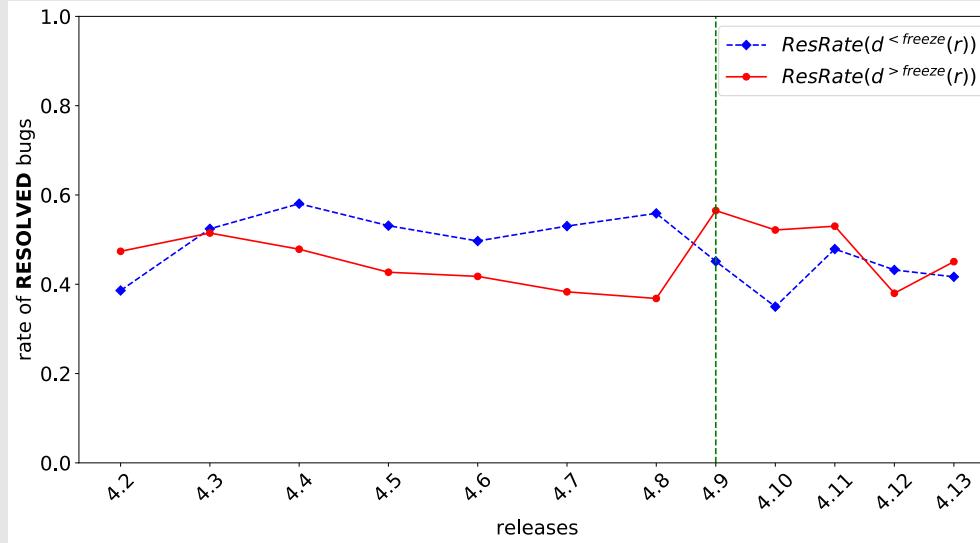
	Eclipse 4.x annual		Eclipse 4.x quarterly		
	Triaging	Fixing		Triaging	Fixing
4.2	R***	-	4.9	-	-
4.3	R*	-	4.10	-	-
4.4	R*	R***	4.11	-	-
4.5	R***	R***	4.12	-	-
4.6	R*	-	4.13	-	-
4.7	-	R*			
4.8	R*	-			

Beneficial transition a quarterly release policy

How does the feature freeze period impact the bug handling time?
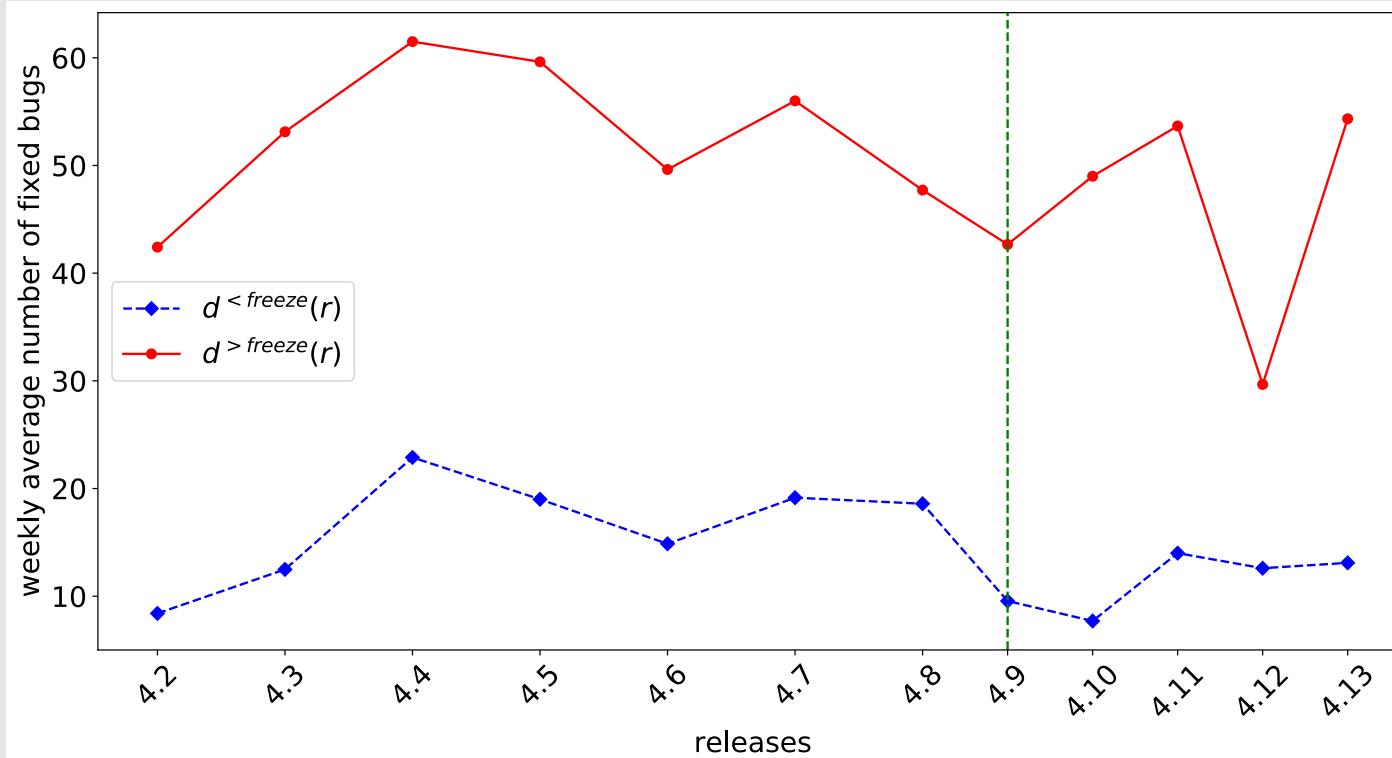
Resolution and fixing rates

Annual/quarterly releases:
No difference between development and feature freeze period in the rate of resolved/fixed bugs

How does the feature freeze period impact the bug handling time?
Bug handling effort
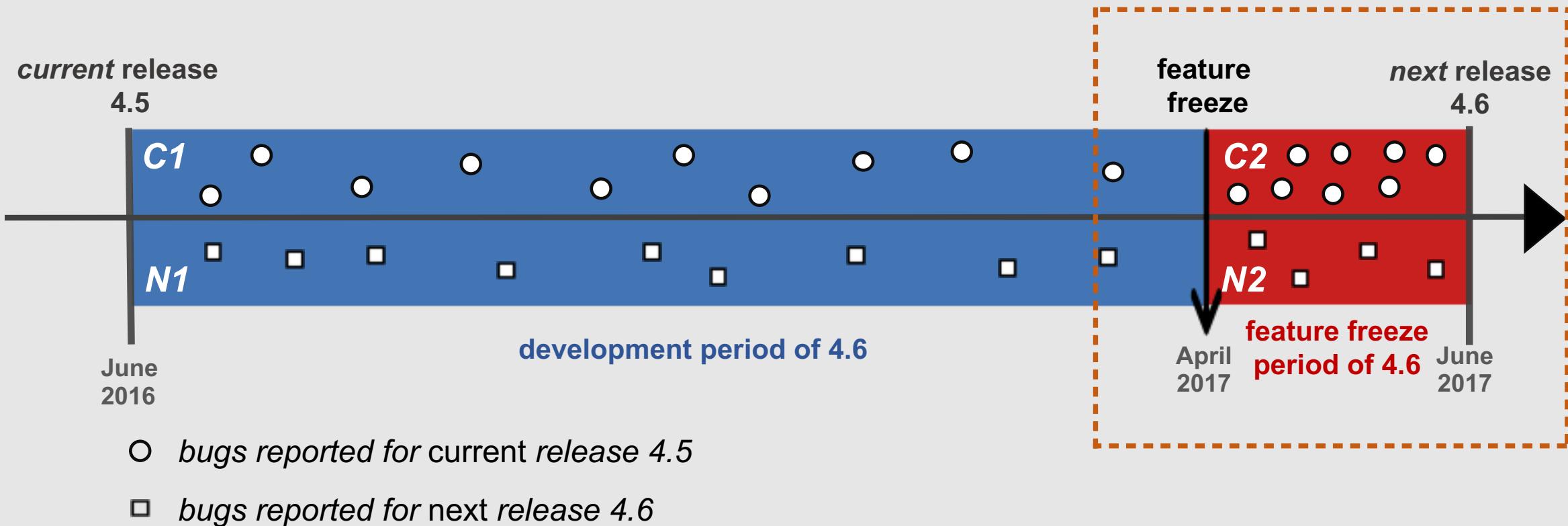
More intense fixing activity during the feature freeze period

x3.8 more fixed bugs

How does the feature freeze period impact the bug handling time?

Bugs of current vs next release

*current* release 4.5

next release 4.6

feature freeze

C1

C2

N1

N2

development period of 4.6

feature freeze period of 4.6

June 2016

April 2017

June 2017

○ *bugs reported for* current *release 4.5*

□ *bugs reported for* next *release 4.6*
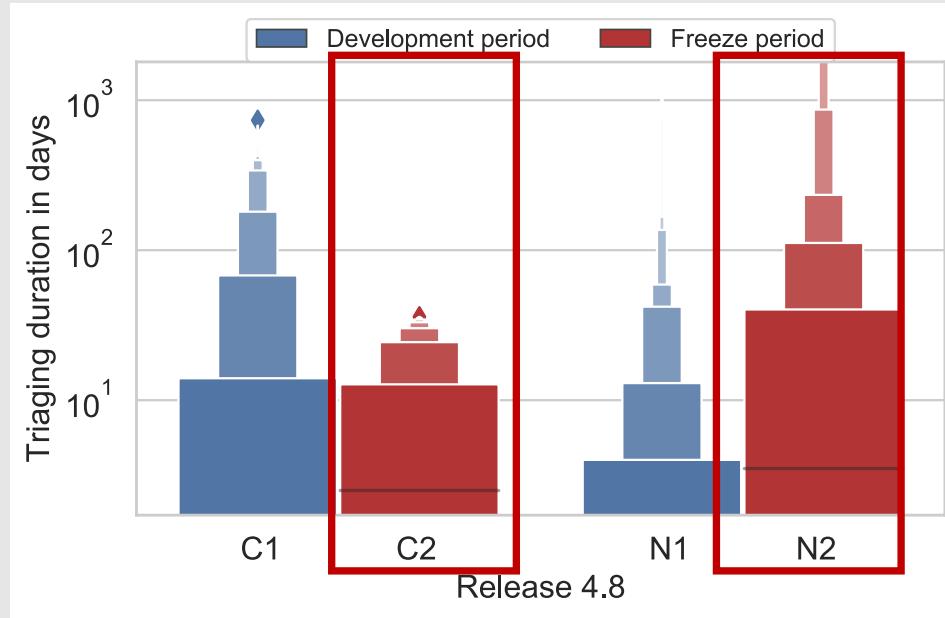
How does the feature freeze period impact the bug handling time?

Bugs of current vs next release in the feature freeze period

R*: p<0.05
R**: p<0.01
R***: p<0.001

Eclipse 4.x annual			Eclipse 4.x quarterly		
	Triaging	Fixing		Triaging	Fixing
4.3	S*	M***	4.9	-	L***
4.4	-	L***	4.10	-	L***
4.5	L***	M***	4.11	-	S**
4.6	M***	L***	4.12	-	-
4.7	S*	L***			
4.8	-	L***			

Within the feature freeze period:
Bugs of the upcoming release are fixed faster – no difference in triaging time

Conclusion: Switching to a faster release cycle

Beneficial w.r.t the time it takes for bug fixes and new features to reach users.

When properly planned, a faster release cycle can be beneficial, as long as maintainers are aware of the pitfalls

Which is the optimal duration of a fast release cycle for different communities?

What is the effect of a faster release cycle to plugin development?

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