

# Asking for (and about) Permissions Used by Android Apps

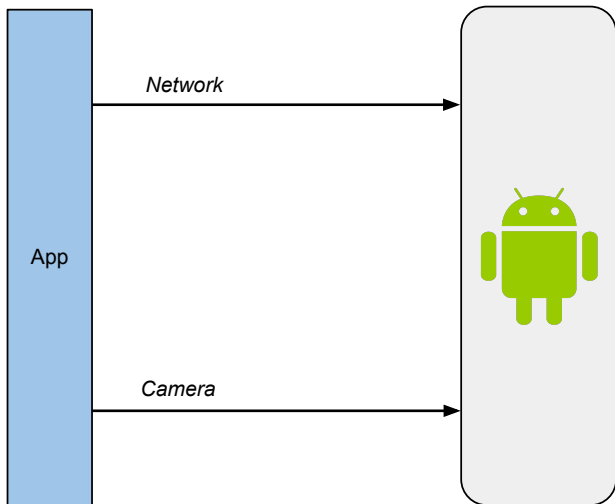
Ryan Stevens, Jonathan Ganz, Vladimir Filkov,  
Premkumar Devanbu, and Hao Chen

University of California, Davis

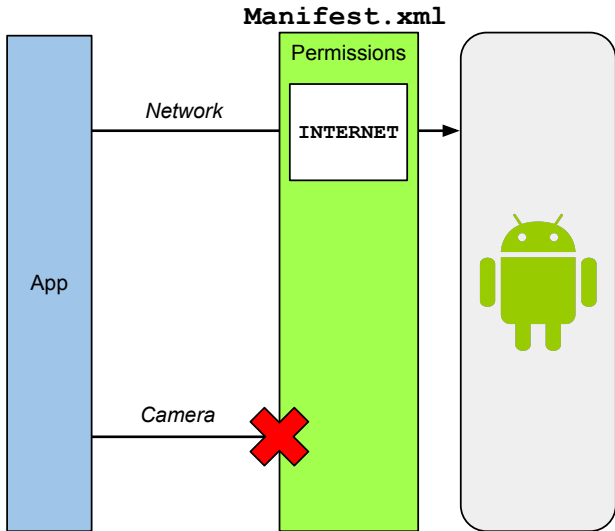
*This work was performed with the support of NSF and AFOSR.*

# Overprivileged Apps

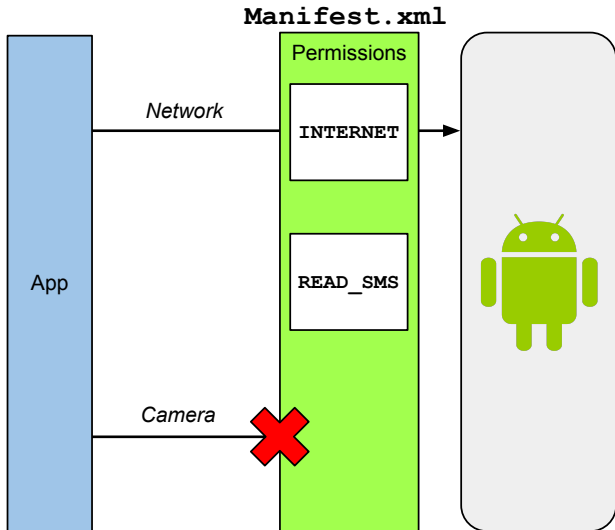
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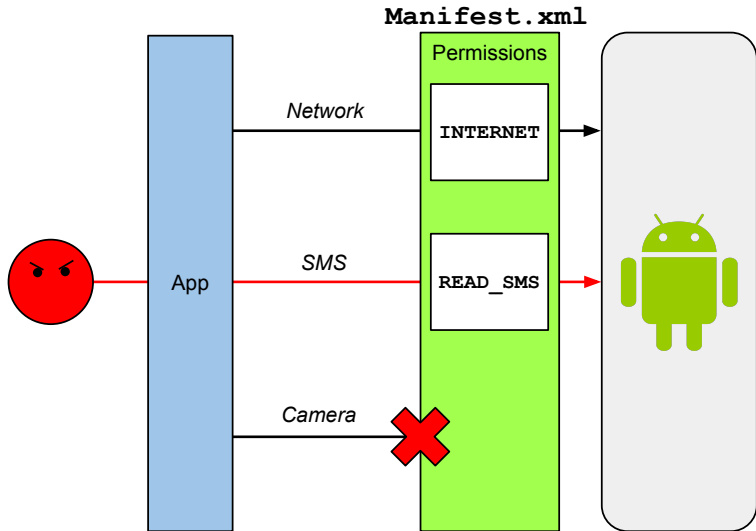
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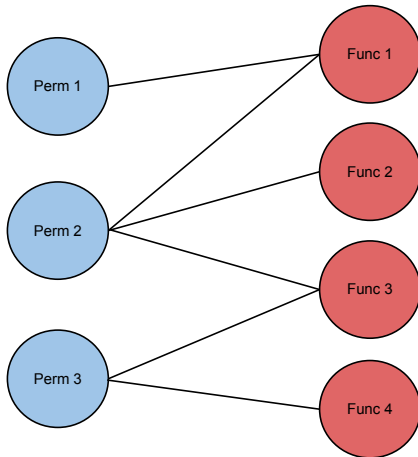


# Stowaway

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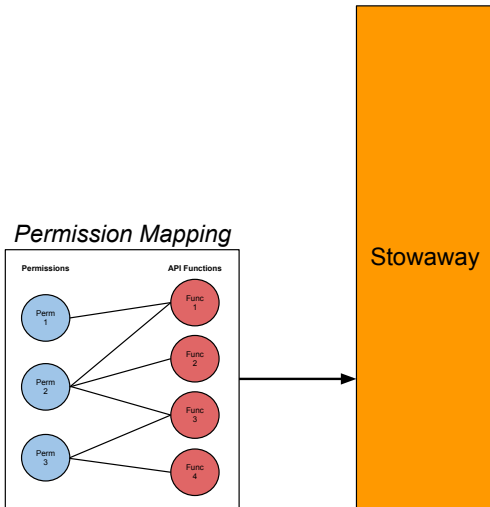
**Permissions**

**API Functions**

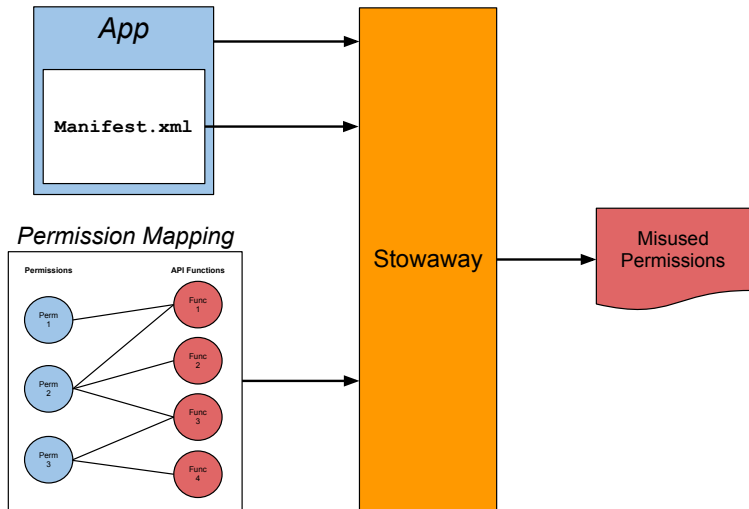




# Stowaway



# Stowaway



## Research Goals

**RQ1:** *What properties of permissions predict permission misuse?*

**RQ2:** *Why do developers misuse some permissions more than others?*

## Dataset

- Stowaway results for 10,300 free Android apps
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  - *popularity*
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| <b>Permission</b> | <i>popularity</i> | <i>misusage</i> | <i>influence</i> | <i>interference</i> | ... |
|-------------------|-------------------|-----------------|------------------|---------------------|-----|
| INTERNET          | 9,789             | 193             | 65               | 3                   |     |
| WAKE_LOCK         | 4,947             | 259             | 28               | 8                   |     |
| CAMERA            | 1,244             | 260             | 3                | 1                   |     |
| ...               |                   |                 |                  |                     |     |

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**RQ1:** *What properties of permissions predict permission misuse?*

**RQ2:** *Why do developers misuse some permissions more than others?*

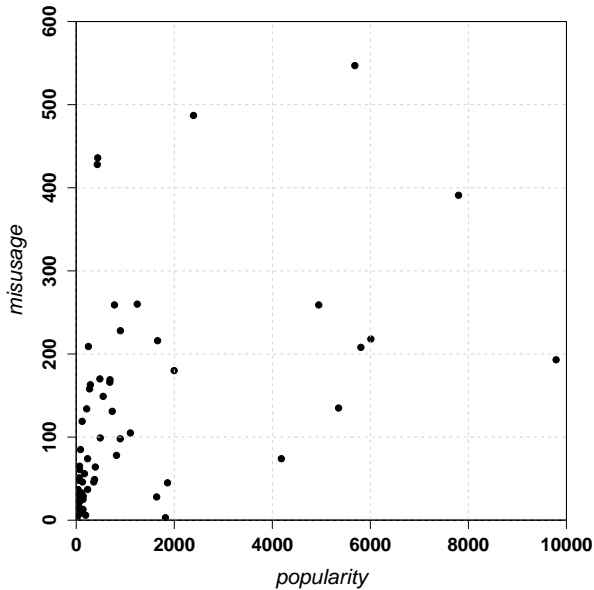
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**RQ1: What properties of permissions predict permission misuse?**

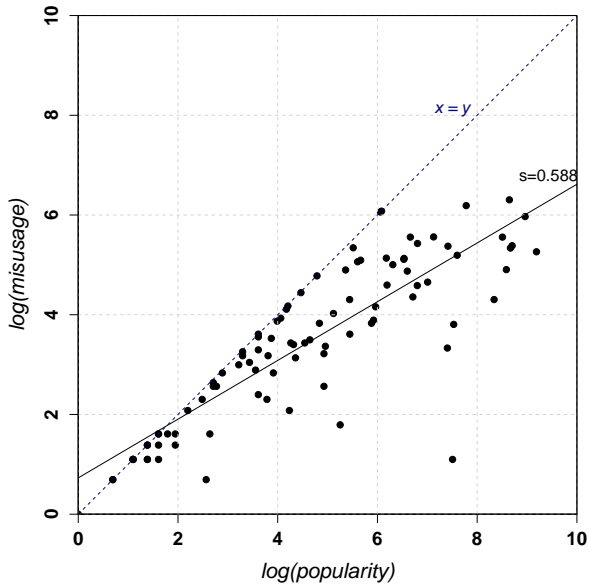
**RQ2: *Why do developers misuse some permissions more than others?***



## RQ1: Permission Misuse



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**RQ1: What properties of permissions predict permission misuse?**

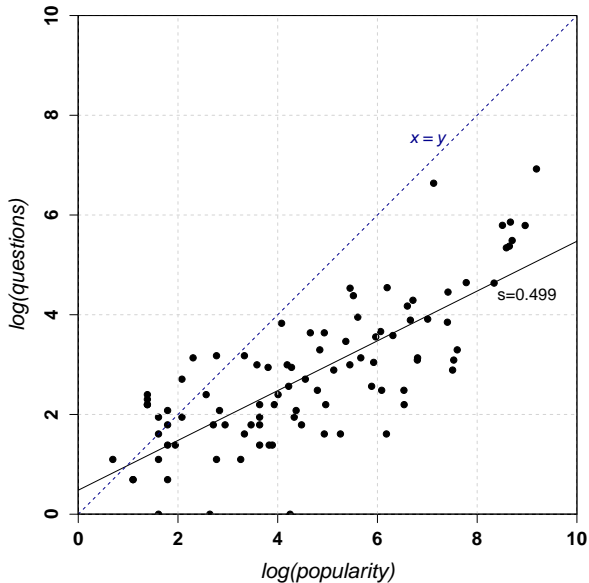
**RQ2:** *Why do developers misuse some permissions more than others?*

## Research Goals

**RQ1:** *What properties of permissions predict permission misuse?*

**RQ2:** **Why do developers misuse some permissions more than others?**

## RQ2: Demand for Documentation



## Conclusions

- Influence and interference are not strong indicators of permission misuse
- Significant sub-linear relationship between a permission's popularity and its frequency of misuse
- Community forums - specifically StackOverflow - provide developers with adequate documentation
- More results in paper!

# Questions/Comments?

Presenter:

Ryan Stevens

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## Permission Misuse

| <b>DV</b>      | <b>IV</b>           | <b>Pearson</b> | <b>p-value</b> |
|----------------|---------------------|----------------|----------------|
|                | <i>popularity</i>   | 0.56           | < 0.01         |
| <i>misused</i> | <i>influence</i>    | 0.17           | 0.68           |
|                | <i>interference</i> | -0.04          | 0.82           |



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|                     | <i>interference</i>    | -0.04          | 0.82           |
| <i>log(misused)</i> | <i>log(popularity)</i> | 0.73           | < 0.01         |
|                     | <i>influence</i>       | 0.29           | 0.50           |
|                     | <i>interference</i>    | -0.05          | 0.62           |

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*Our data does not support the hypothesis that our measures of interference and influence affect the degree of misuse*

## Demand for Documentation

| <b>DV</b>             | <b>IV</b>              | <b>Pearson</b> | <b>p-value</b> |
|-----------------------|------------------------|----------------|----------------|
|                       | <i>log(popularity)</i> | 0.77           | < 0.01         |
| <i>log(questions)</i> | <i>influence</i>       | 0.44           | < 0.01         |
|                       | <i>interference</i>    | -0.18          | < 0.01         |

## Demand for Documentation

