Decker: Attack Surface Reduction via On-Demand Code Mapping

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Lightning talk

CREATING THE NEXT®

Reducing code surface as a defense

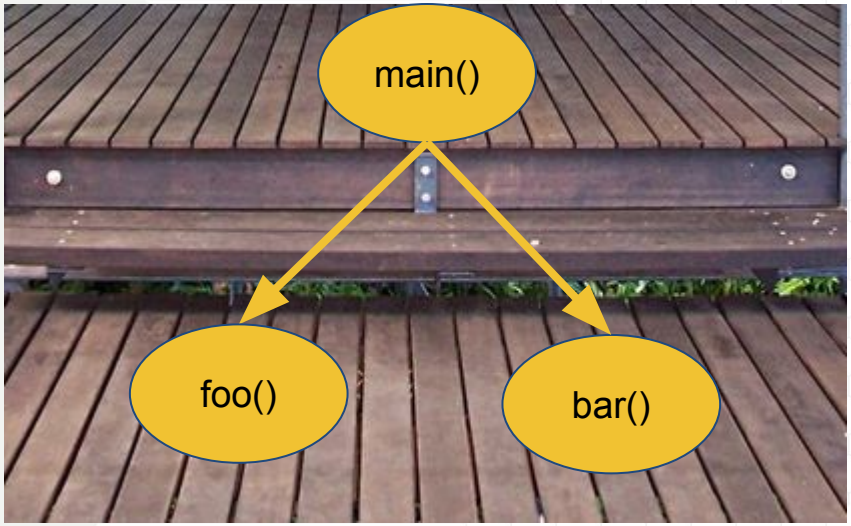
- Modern applications are bloated with unused functionality
- Novel code reuse attacks leverage this bloated code
- Recent code reduction techniques are typically
  - Sound but conservative (too much attack surface)
  - Aggressive but unsound (can lead to crashes)
- In this work, we build a prototype called Decker that takes a constructive approach to attack surface reduction

Example

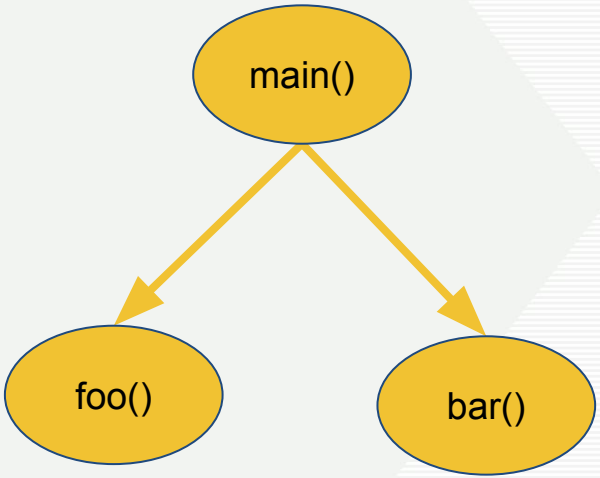
A deck

Image source: Wikipedia (deck)

Example



Example

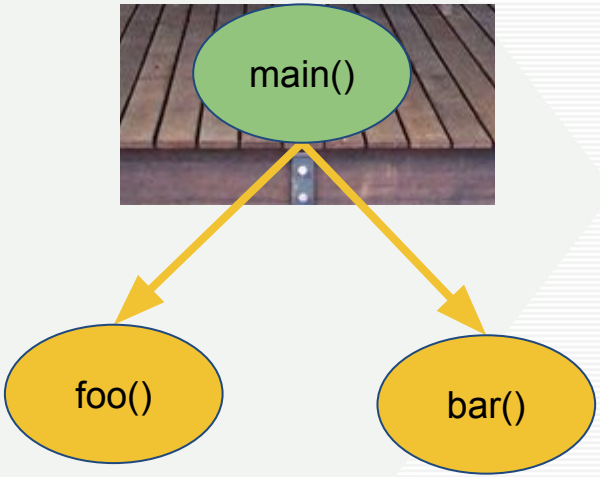



```
main()
   ...
   if(x)
      foo()
   bar()

foo()
   ...

bar()
   ...
```

Example



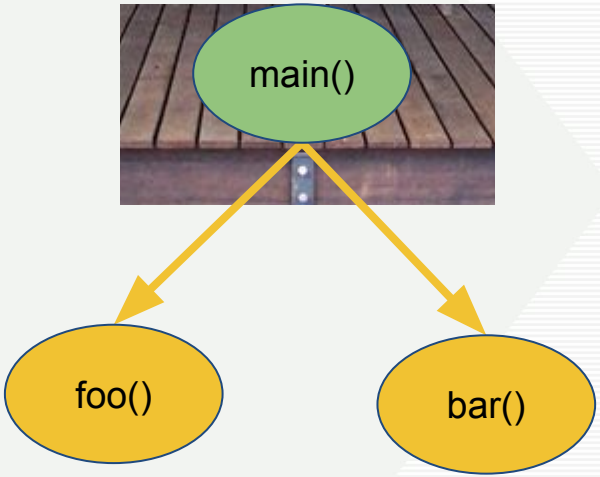
Program counter

```
main()
   ...
   if(x)
      foo()
   bar()

foo()
   ...

bar()
   ...
```

Example

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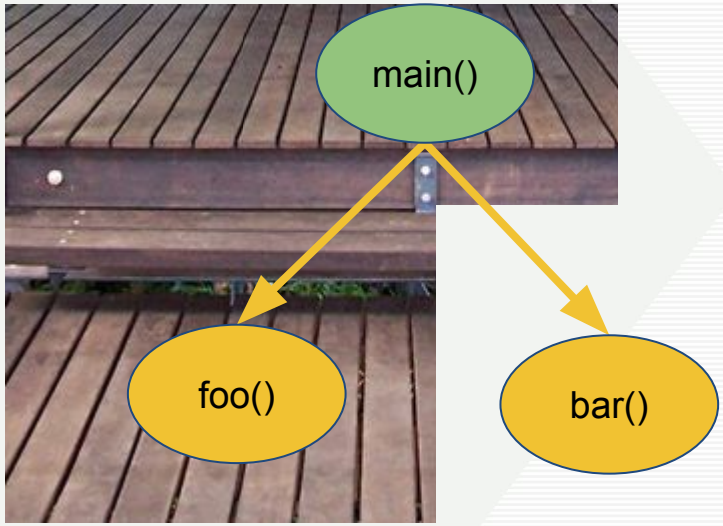
Example

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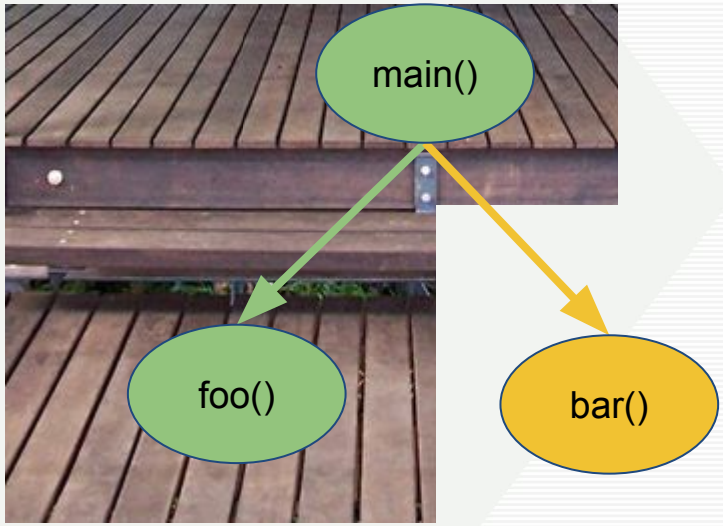


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bar()
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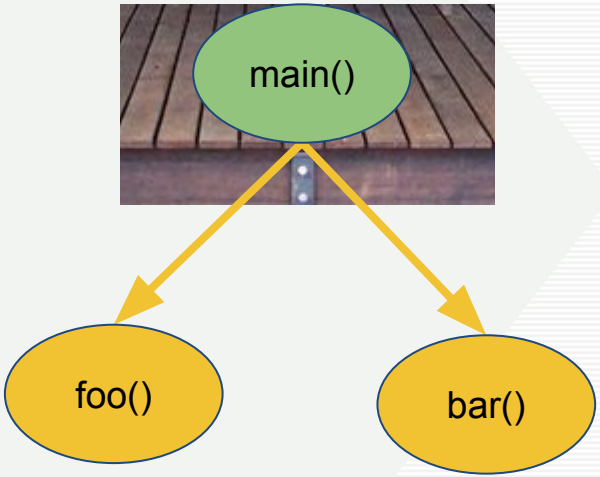
Example

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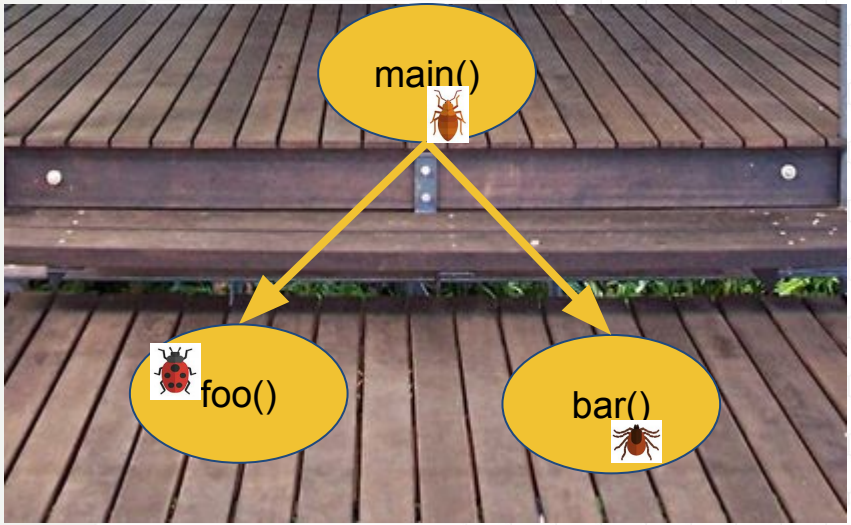
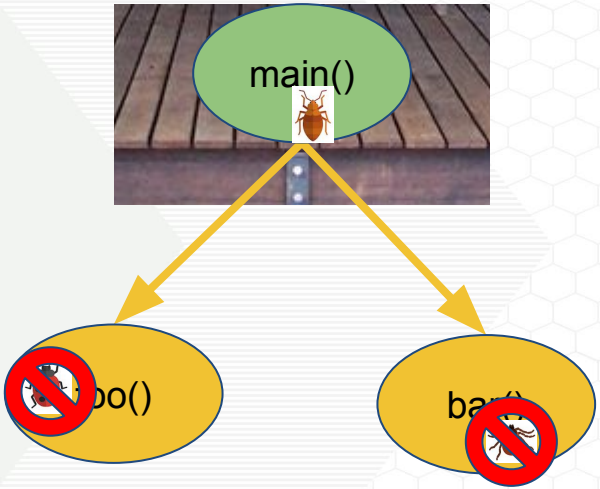
Example



Code reuse attack components: ✔

Example



Code reuse attack components:

Thank you!

- Please come to our talk for more details!
- Static compiler and dynamic runtime techniques
- Technique is **sound**
- nginx case study:
  - Windows and Linux support
  - Breaks real-world attacks
  - Large attack surface reduction (~80%)
  - Performant (~2% overhead)