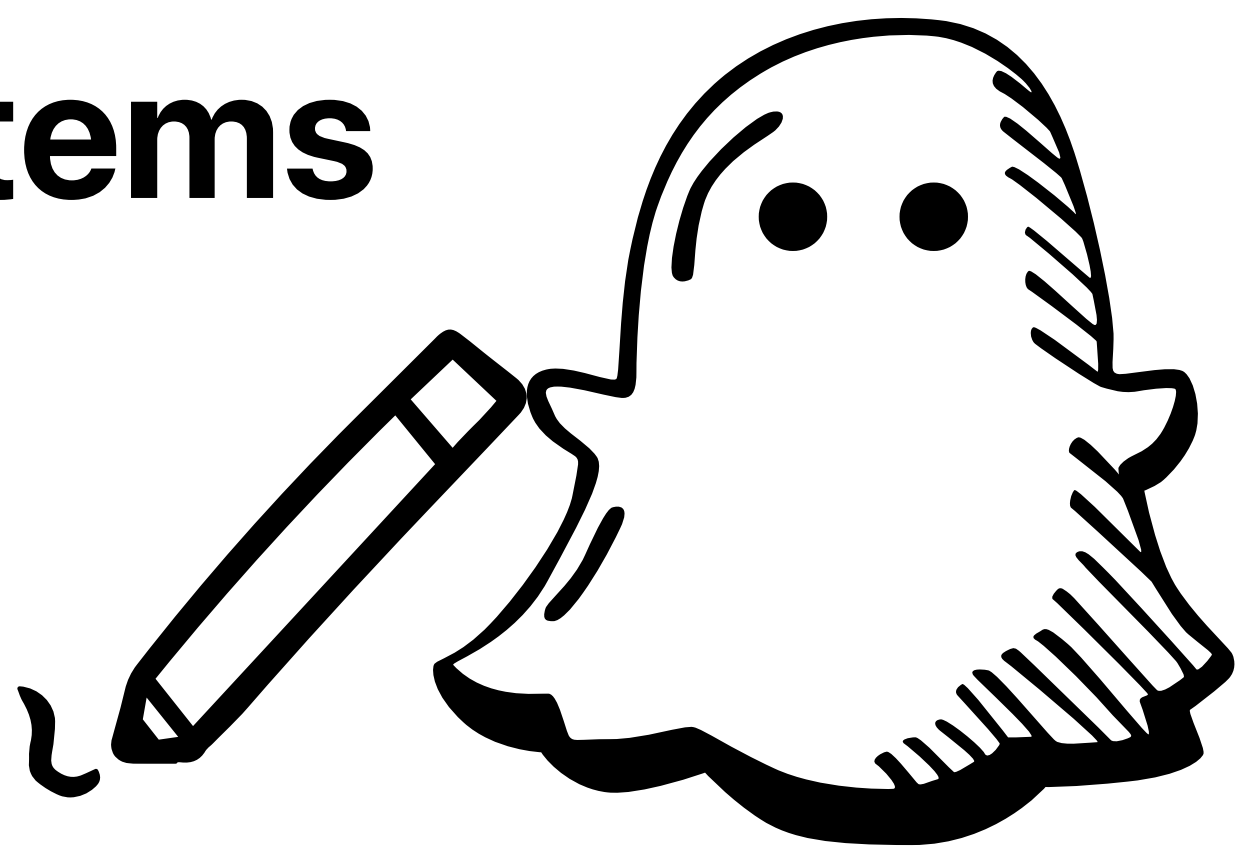


# Ghost Writer: Your sidekick to synthesizing device drivers for your operating systems

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## Device Drivers are Critical and Error Prone in Operating Systems



### Key Insights

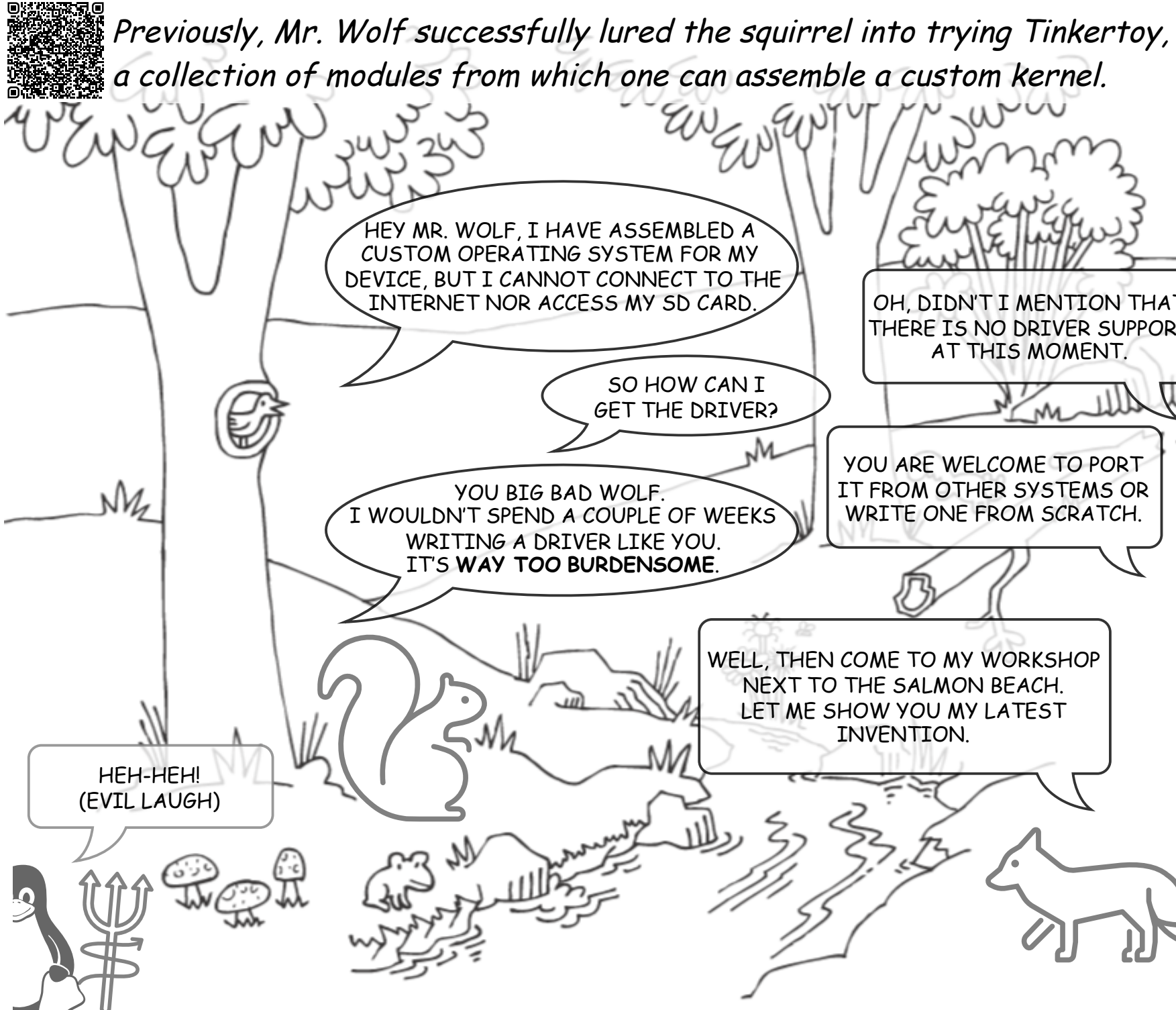
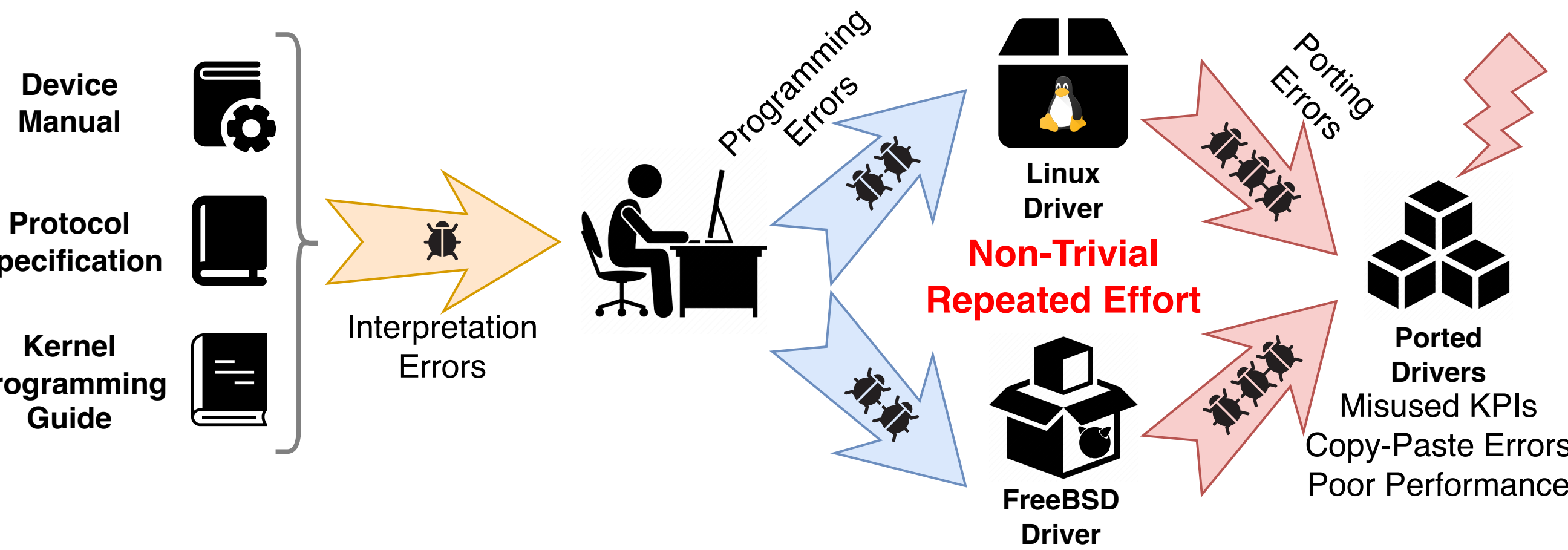
Devices are inherently independent of an OS, but their drivers are deeply coupled with an OS.



### New Frontier

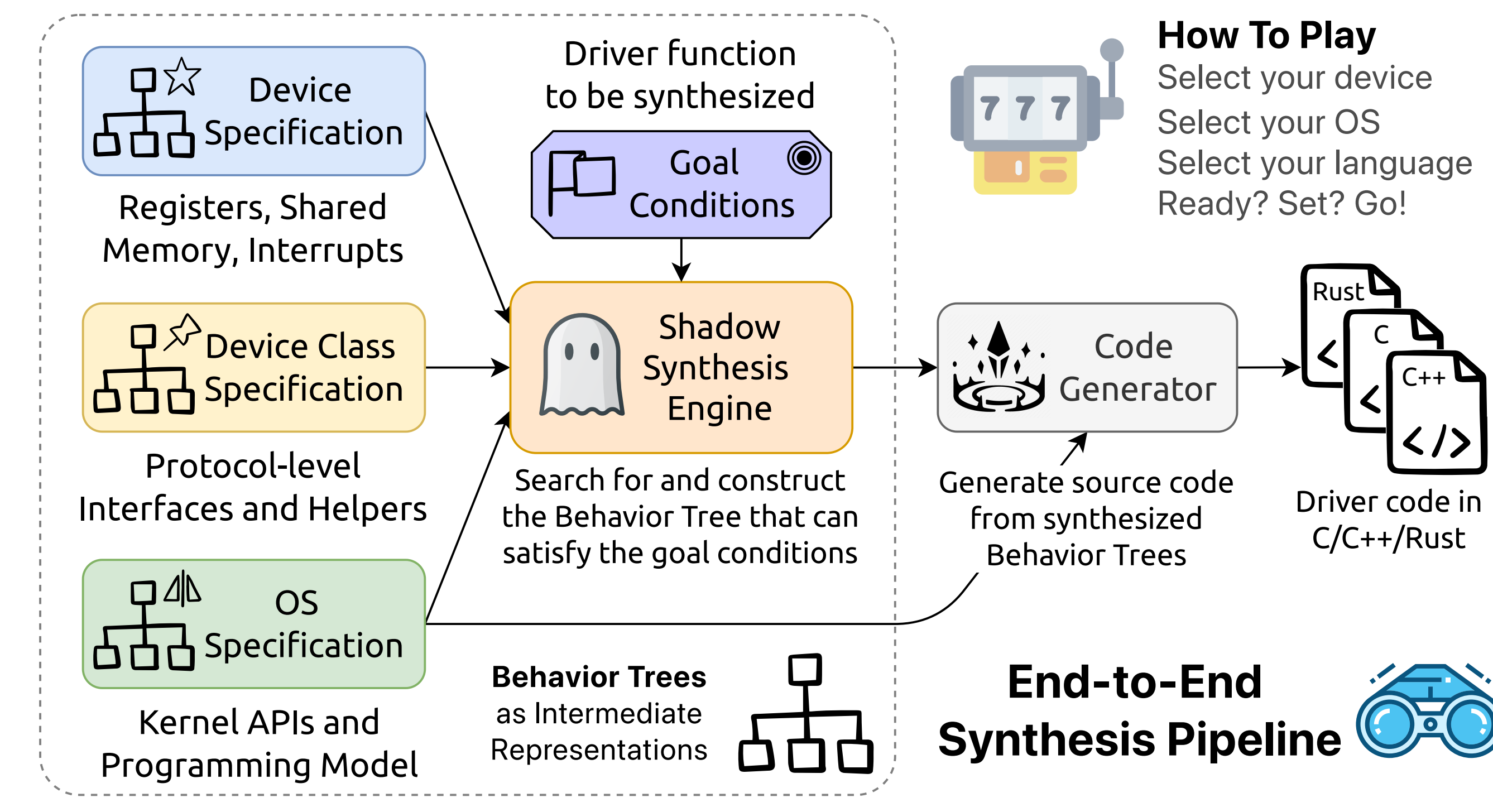
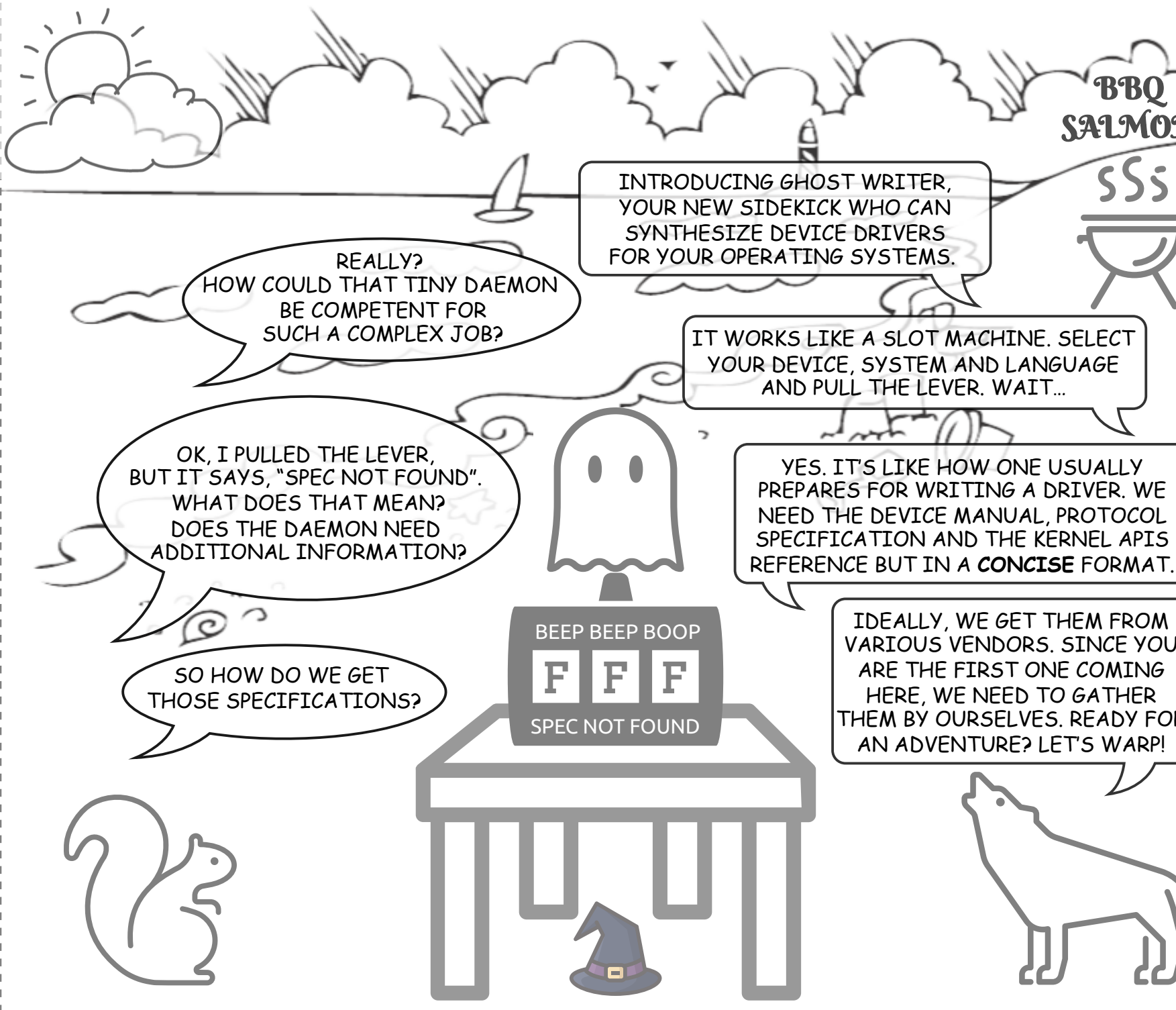
How do we develop device drivers for multiple OSes?  
Existing & New Devices  $\Leftrightarrow$  Existing & New OSes

### An Example Workflow of Writing Bugs



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## Synthesize Implementation from Specifications with Ghost Writer



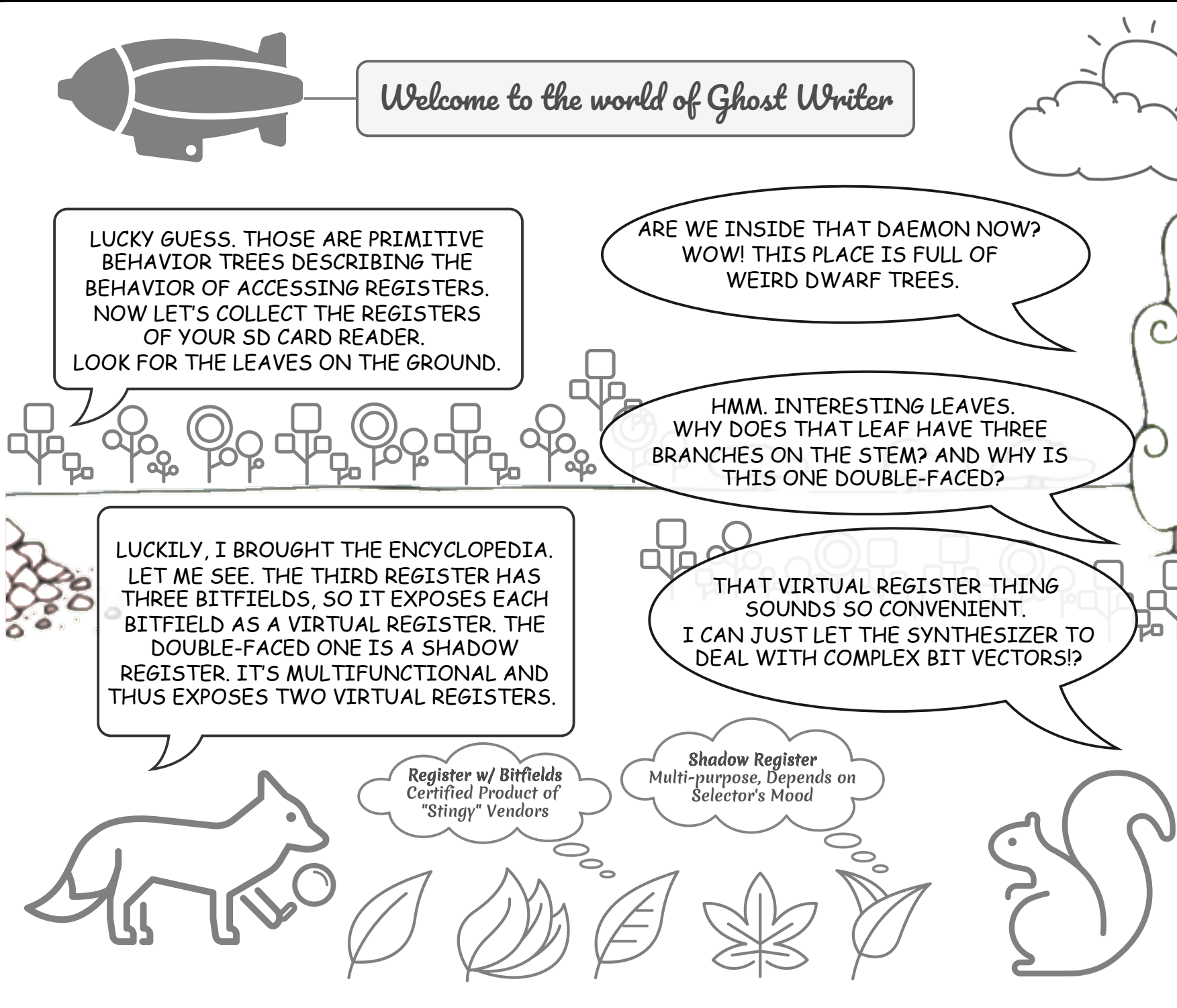
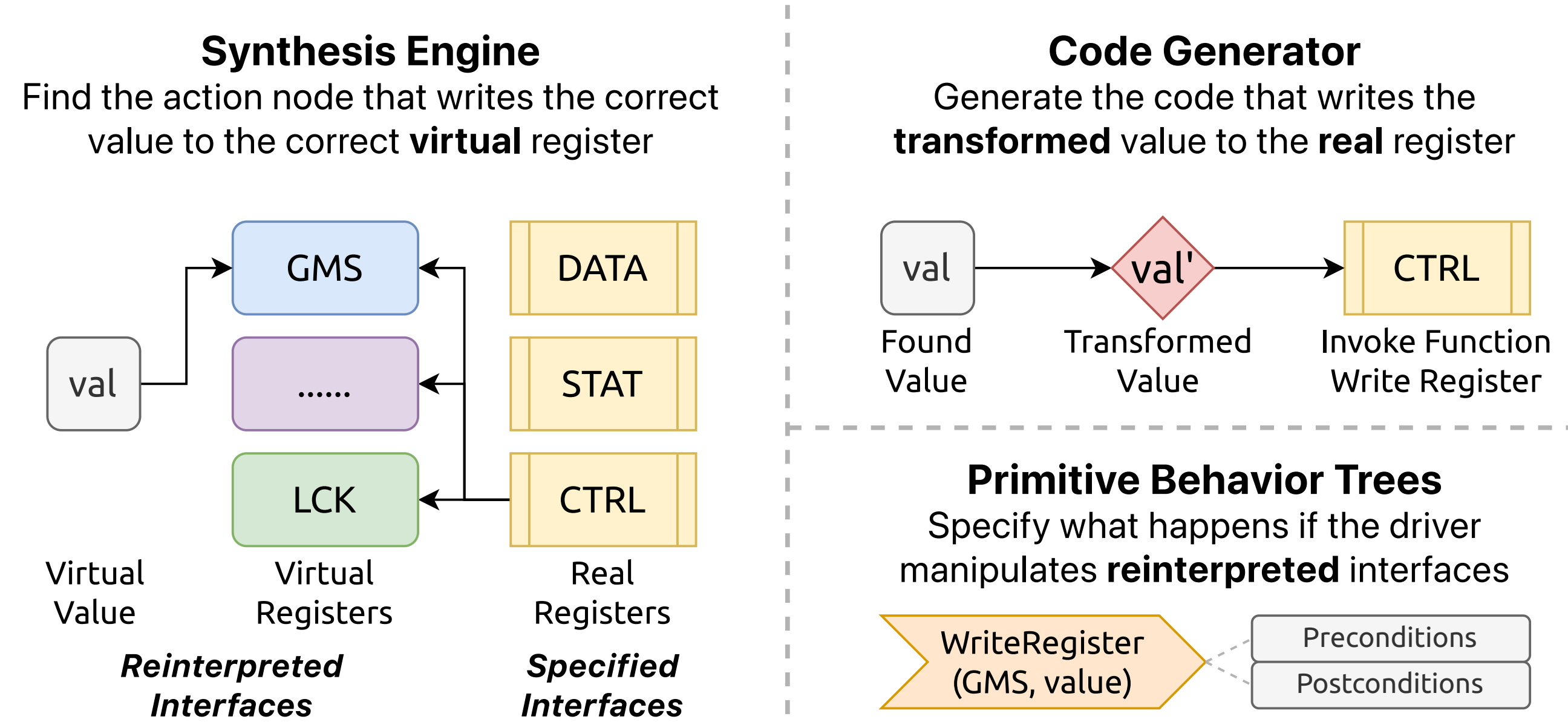
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## Use of Key Abstractions: Virtual Registers and Behavior Trees



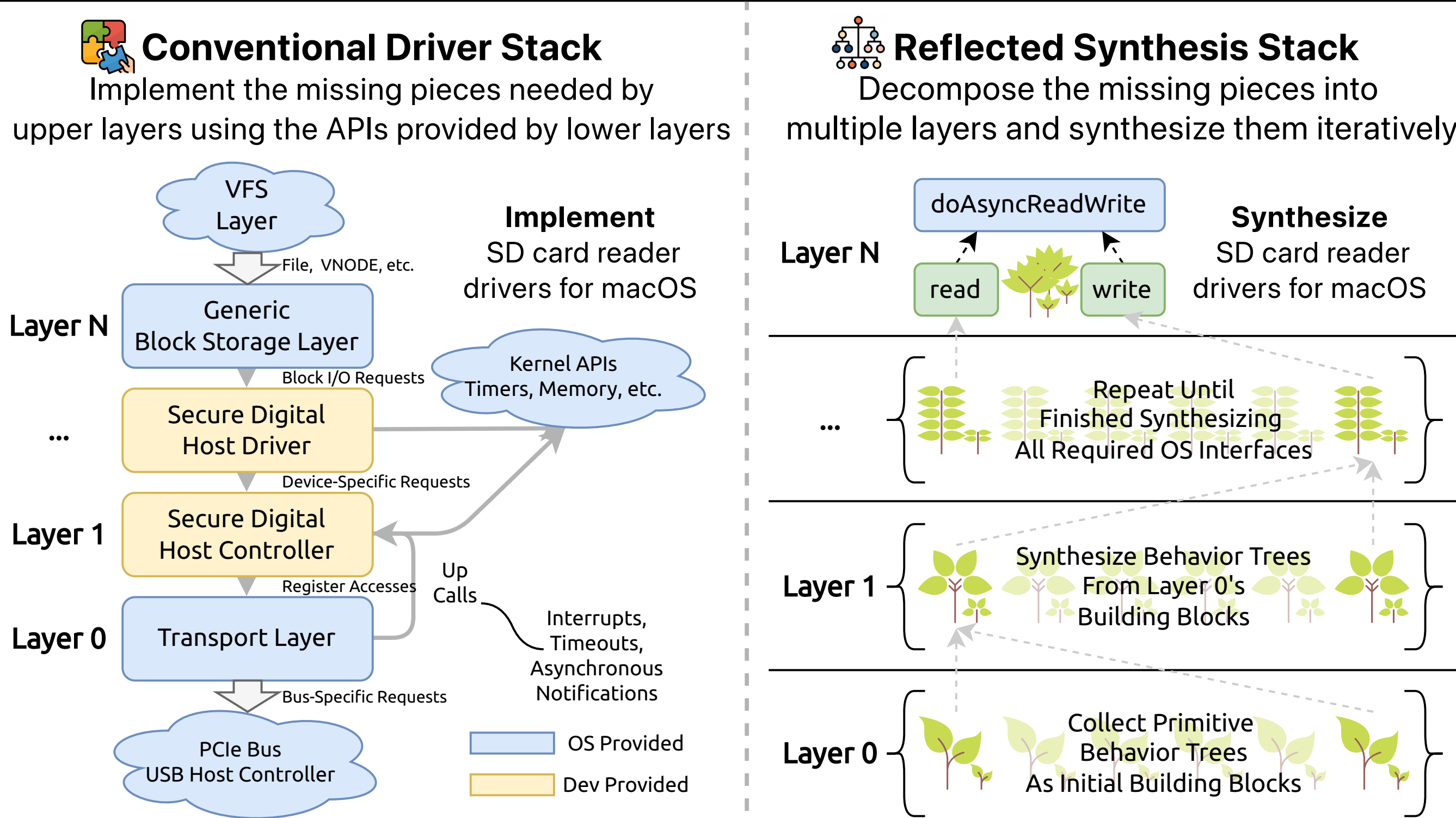
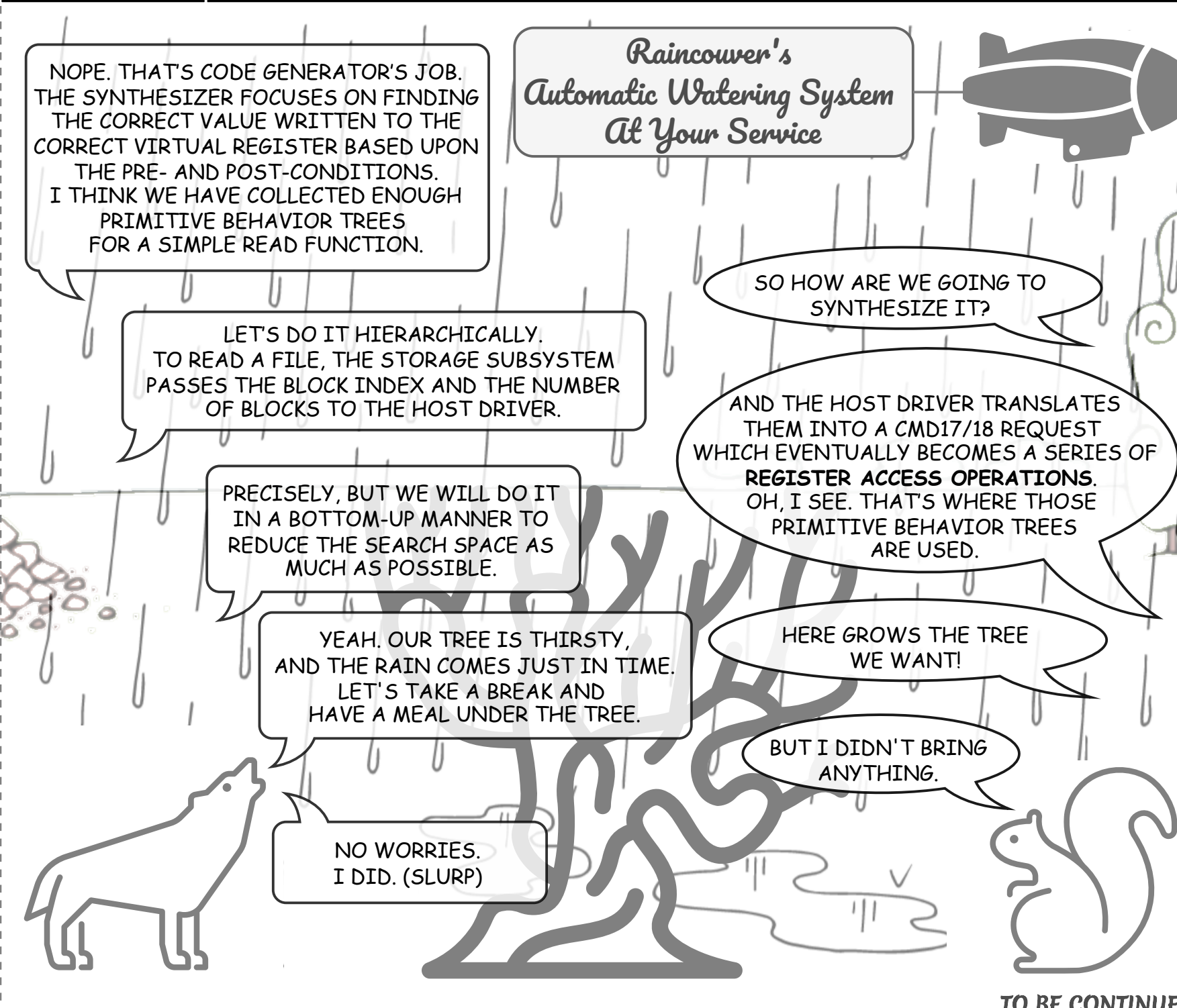
### Core Design Principles

Separated Responsibility & Minimized Individual Problem



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## Synthesize Device Drivers Hierarchically: A Bottom-Up Approach



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