

# Formalizing Interrupt Systems

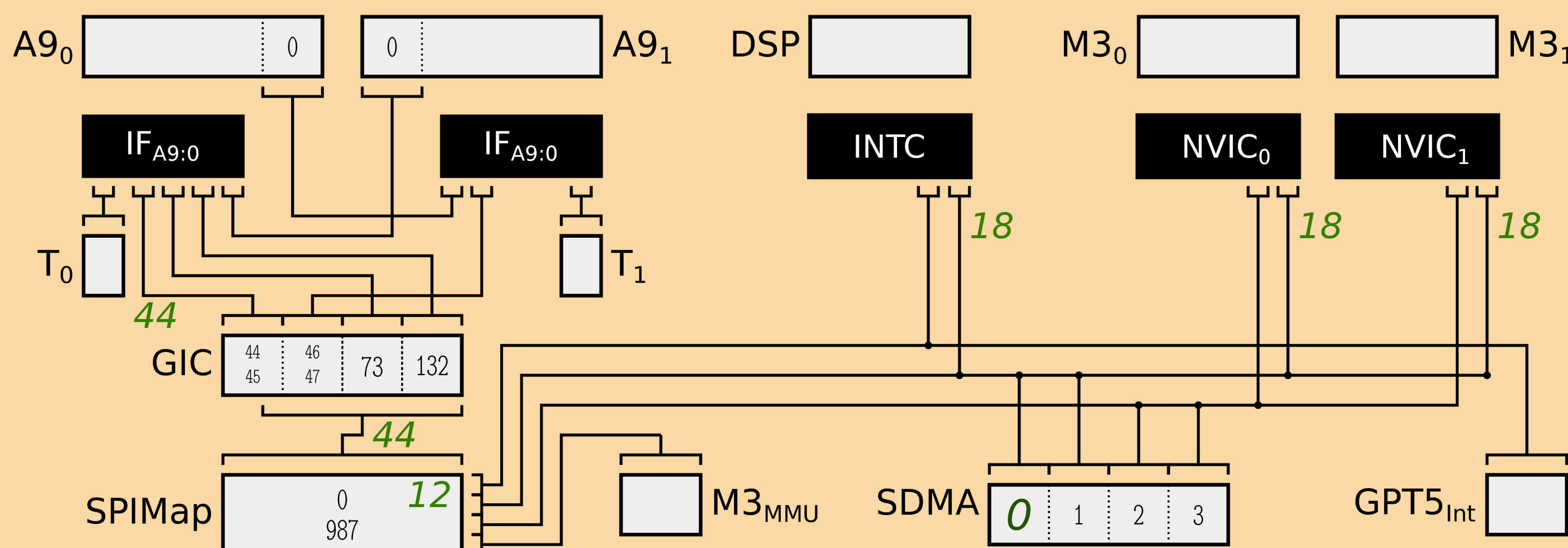
A formal framework for expressing interrupt delivery systems



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Problem

Current OS  
abstractions are  
oversimplified



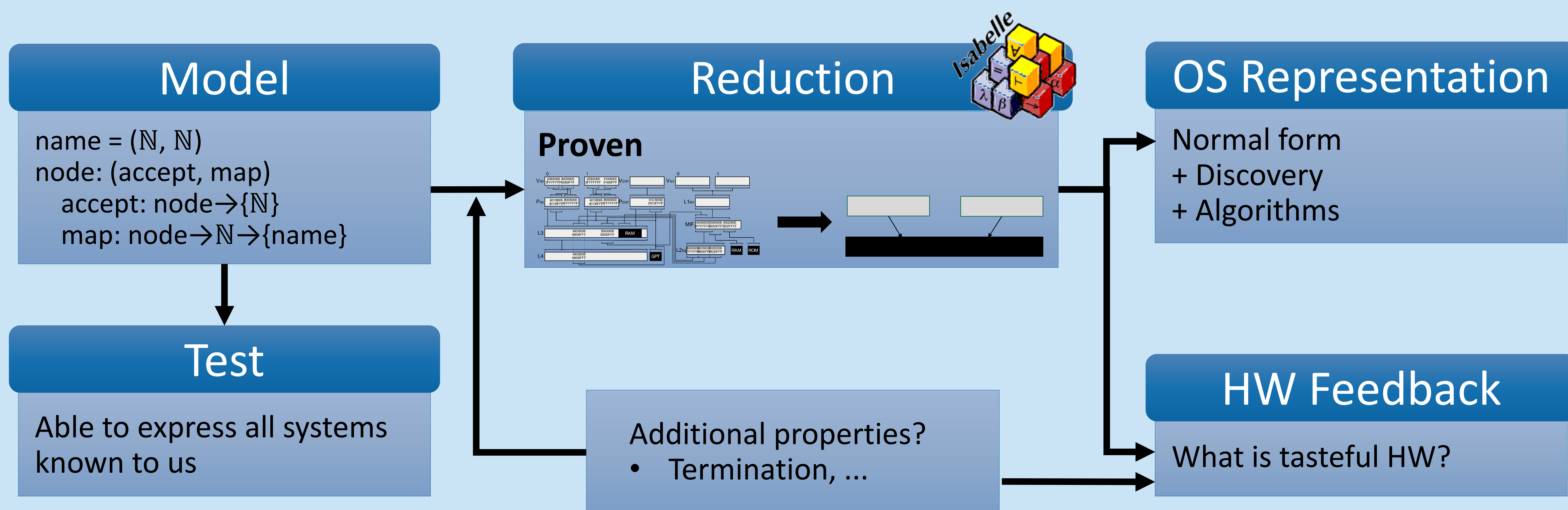
- **Asymmetry**
- **Reachability, Broadcast**
- **Diversity:** Accelerators, SoCs, Virtualization, Rackscale, ...
- **Complex configuration**
- Abstractions too simple

Hard to support → new hardware  
→ new use cases

Idea

Formalize Interrupt System

Approach



Future Work

## Configuration

- Controller constraints
- Synthesize configuration
- Optimize for cost function

## Configuration Transition

Hotplug /  
Driver move / VCPU starts

$$CFG_t \rightarrow CFG_{t+1}$$

Ensure correct delivery  
during update

## Authorization Model

Derive capability system  
for changing interrupt  
routing configuration

