



# TOUCHRAM

A MULTI-TOUCH ENABLED SOFTWARE DESIGN TOOL  
SUPPORTING CONCERN-ORIENTED REUSE

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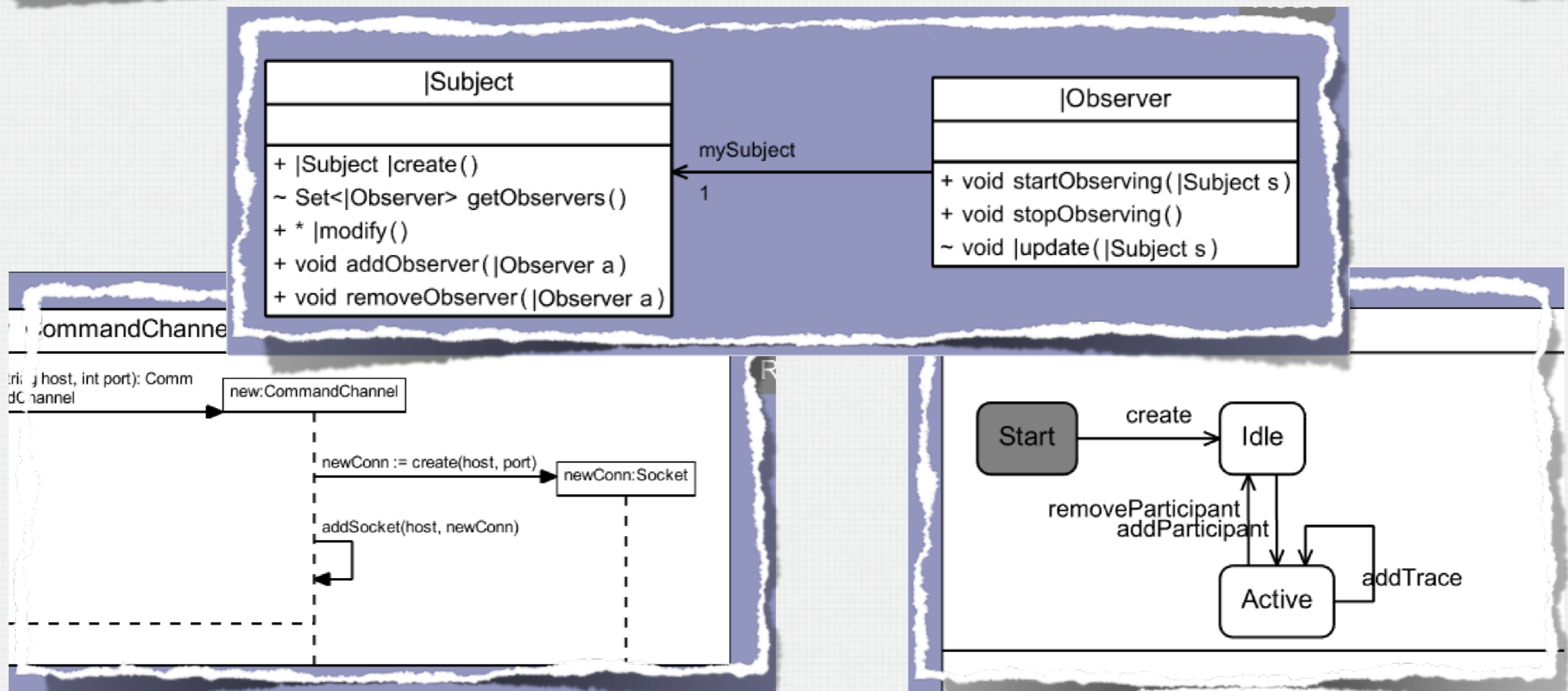
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# TOUCHRAM

- Tool of Agile **Software Design Modelling**
  - Support for Class Diagrams, Sequence Diagrams, State Diagrams
- Reusable Concern Model Library



# TOUCHRAM GUI

- **Multi-Touch**

- **Intuitive editing** using multi-touch gestures
- Significant **speedup for**
  - **Navigating** big models
  - **Moving** / rearranging classes
  - **Establishing mappings** between design concerns
- Simultaneous support for multi-touch (TUIO) as well as mouse / keyboard input

- **Multi-User**

- Every GUI Element can define its own gesture processors





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A **concern** groups software design models providing related functionality, and provides **three interfaces** to facilitate reuse



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Variation Interface

Feature Model and Goal Model

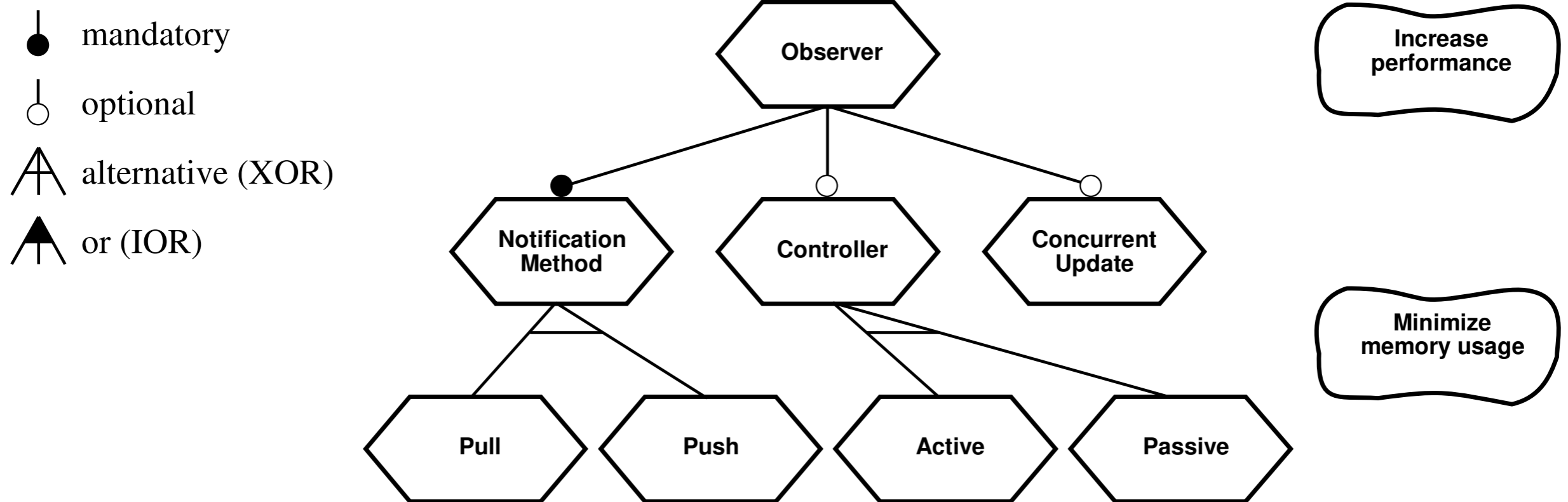
Customization Interface

Class Diagram

Usage Interface



# OBSERVER CONCERN

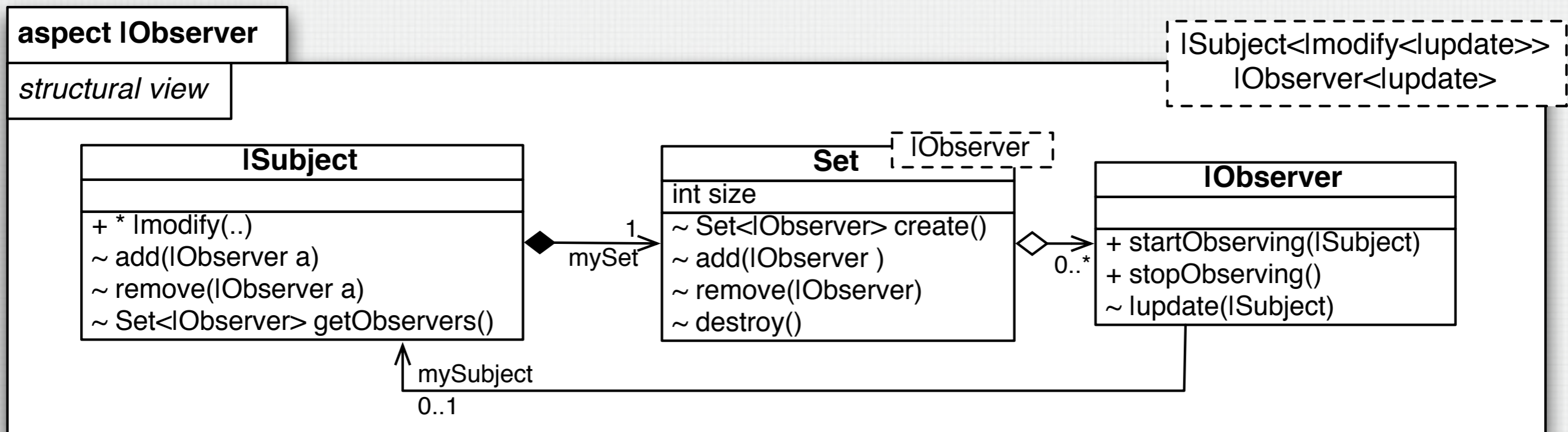


- **Variation Interface** of Observer
  - Exposes **possible design choices**
    - Optional, requires, excludes relationships also supported
  - Exposes impact on NFRs / qualities



# OBSERVER CONCERN

- **Customization Interface** of Observer
  - Exposes **general design classes and operations** that need to be mapped to application-specific classes and operations





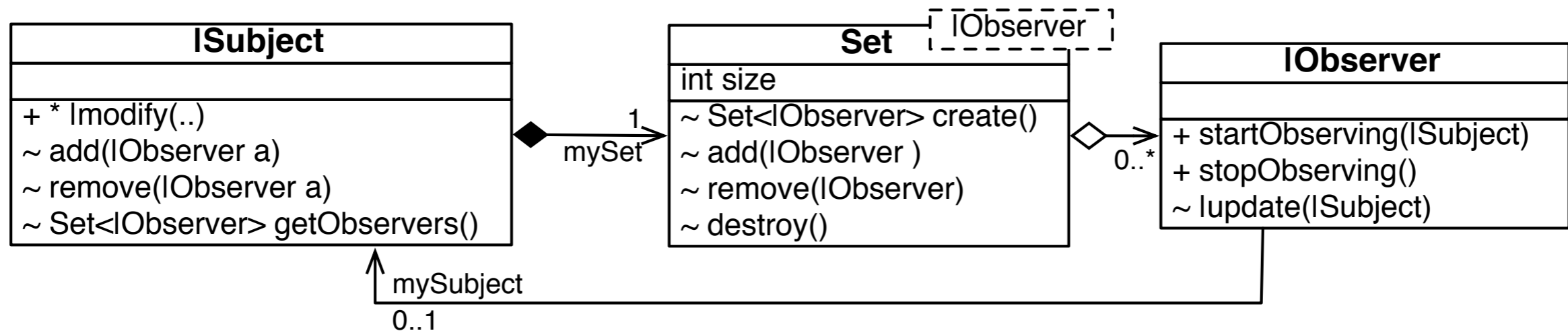
# OBSERVER CONCERN

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Mandatory Instantiation Parameters

aspect IObserver

structural view

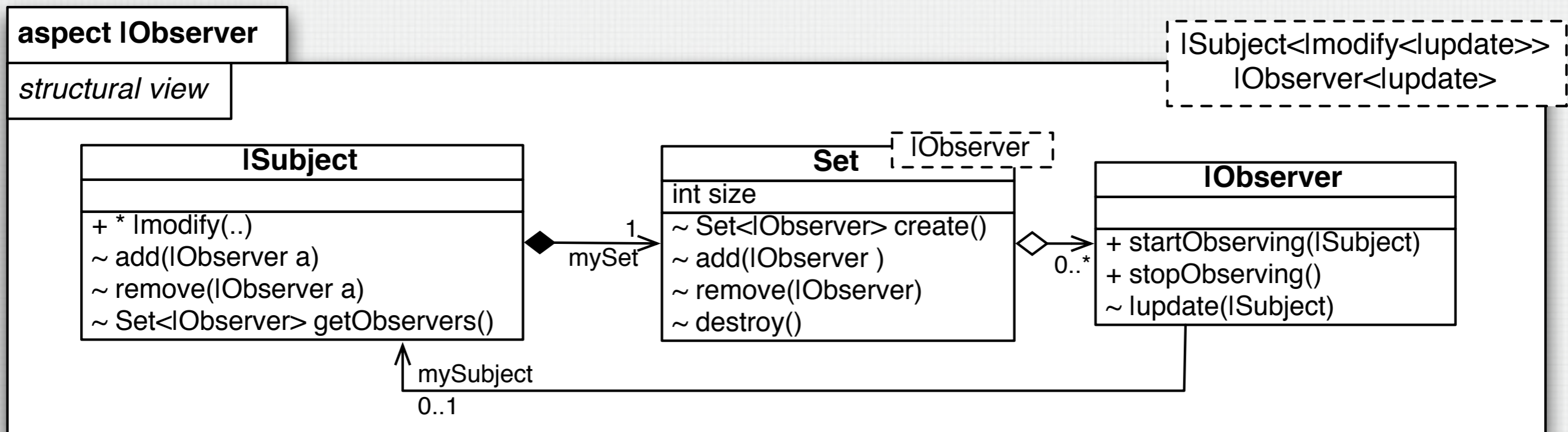


ISubject<Imodify<lupdate>>  
IObserver<lupdate>



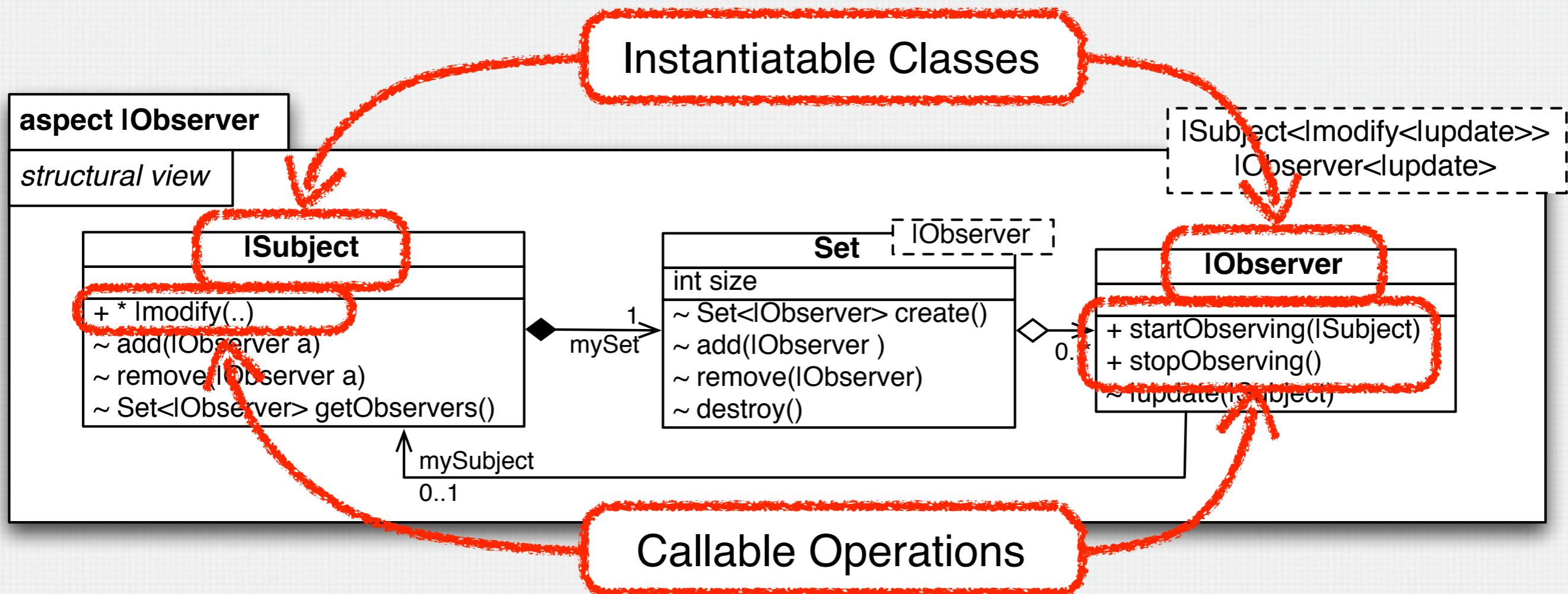
# OBSERVER CONCERN

- **Usage Interface** of Observer
  - Specifies **classes that can be instantiated** and **operations that can be called**



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# CONCERN REUSE PROCESS

1. **Use the variation interface** of the concern to select the most appropriate feature(s)
  - That provides the desired functionality
  - That maximizes positive impact on relevant non-functional application properties

➔ **TouchRAM generates the detailed generic design for the selected feature(s) of the concern**
2. **Use the customization interface** of the generated design to adapt the generic design elements to the application-specific context
  - ➔ **TouchRAM generates the application-specific design for the selected feature(s) of the concern**
3. **Use the selected concern feature** within the application design **according to the usage interface**



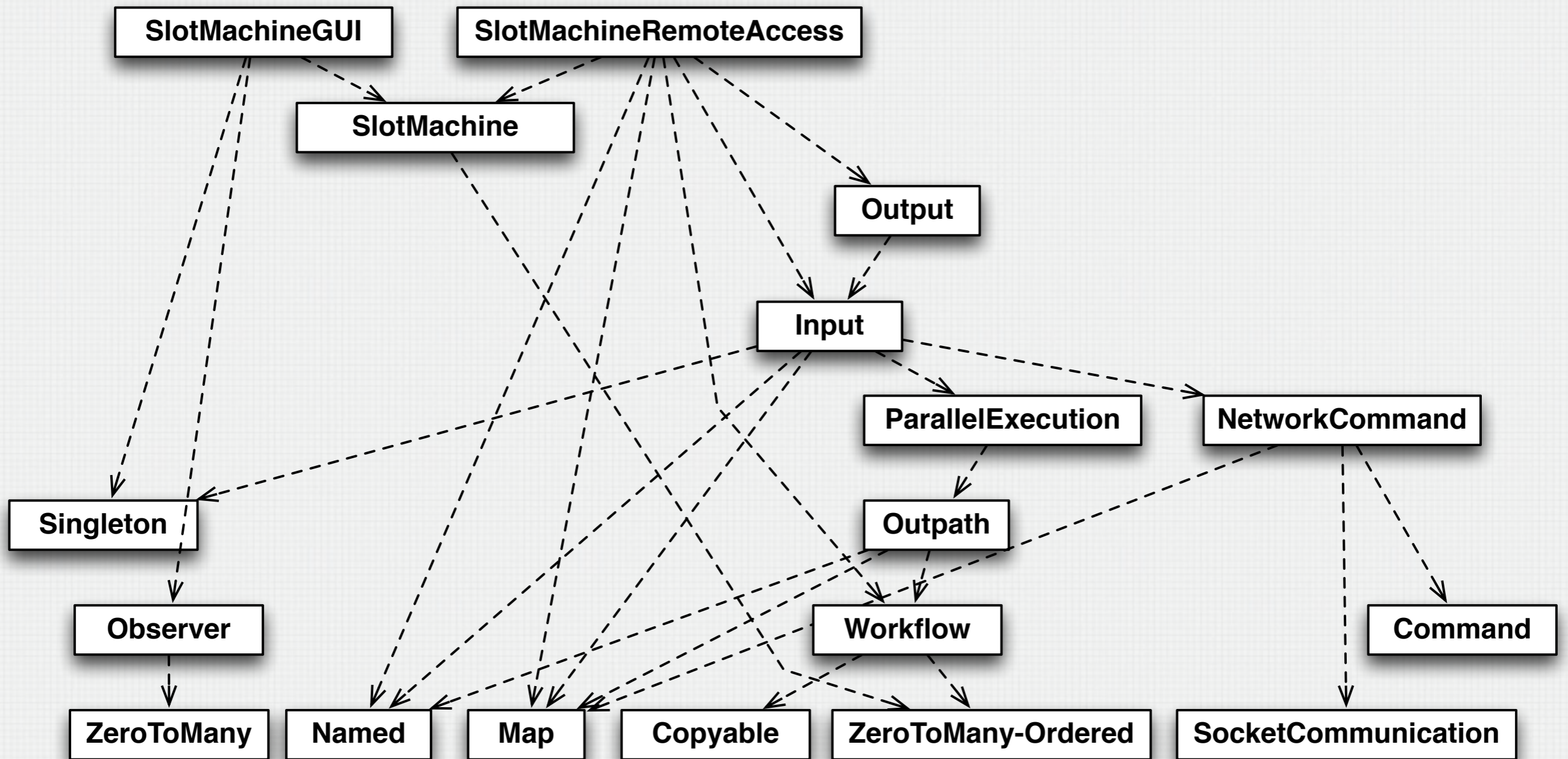
# TOUCHRAM: DEMO

- **Simple Video Slot Machine**
  - SlotMachine has Reels with Symbols
  - Has a local GUI
  - Provides remote access

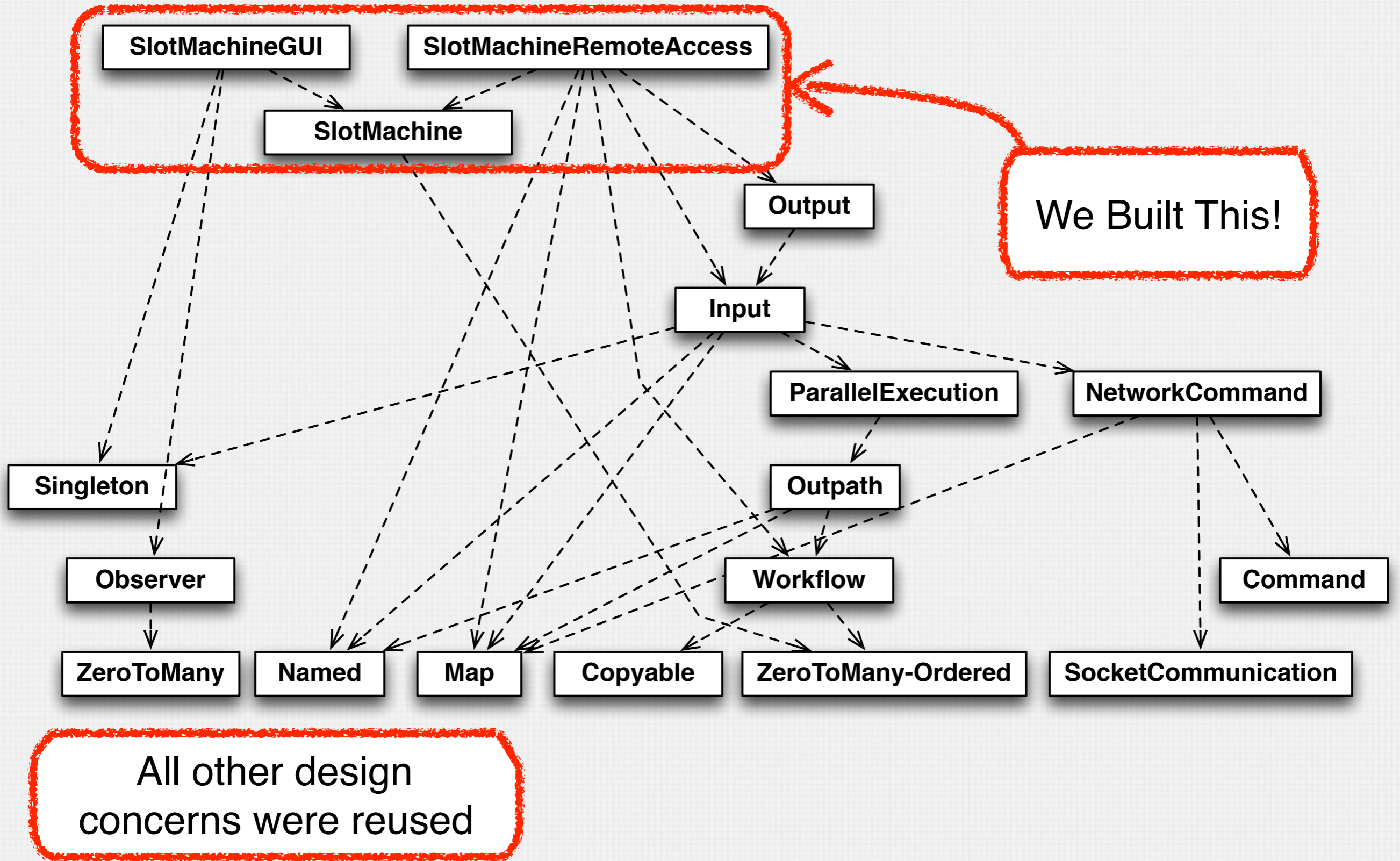




# TOUCHRAM DEMO CONCERNS



# TOUCHRAM DEMO CONCERNS





# TOUCHRAM



Download TouchRAM:

<http://www.cs.mcgill.ca/~joerg/SEL/TouchRAM.html>



# TOUCHRAM

## Current features:

Multi-User, Multi-Touch

Concern-Orientation

Structural view (display, edit, weave)

Message view (display, edit, weave)

State view (display, basic edit, weave)

Feature view (simple display)

Simple consistency checks

Basic code generation



## Planned features:

Feature view (display, edit, weave)

Impact model support

Elaborate consistency checks

UML import / export

Advanced code generation

## Download TouchRAM:

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