Hermion - Exploiting Runtime Information in the IDE

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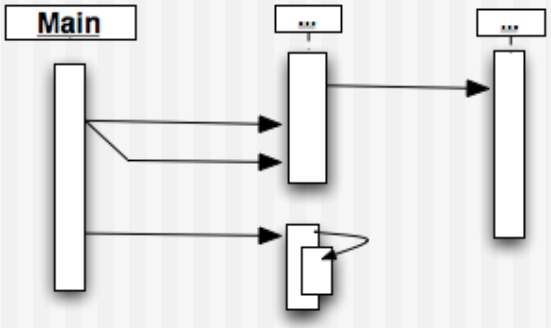
IDEs focus on static structure

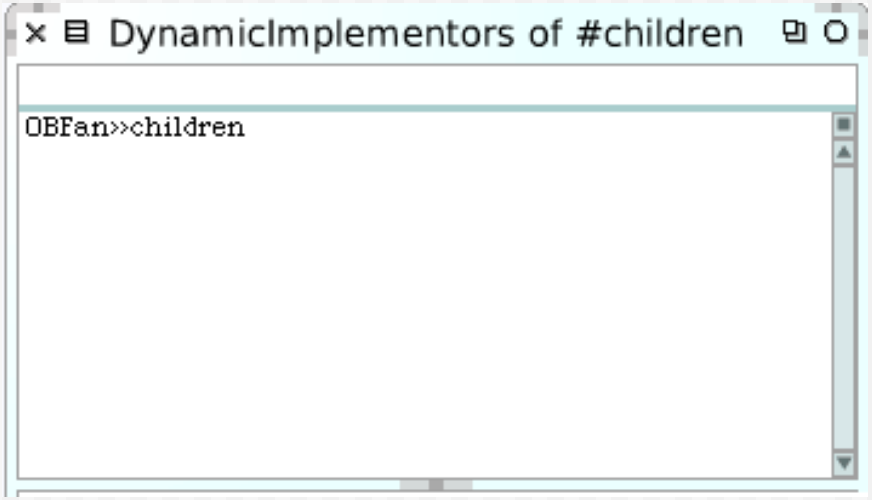


- Message sends?
- Variable accesses?
- Dynamic references?
- Polymorphism?
- Late binding?

Example: Implementors of a Method

```
OBColumn >> children
    ^fan children
```

Static implementors



Dynamic implementors

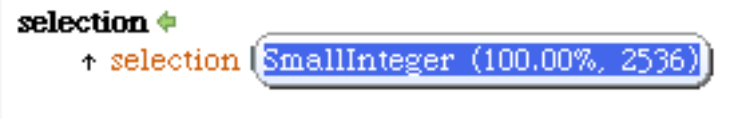
Dynamic Information I

- Precise knowledge about senders, implementors of methods
- Often just one single candidate

- But we can do even more!

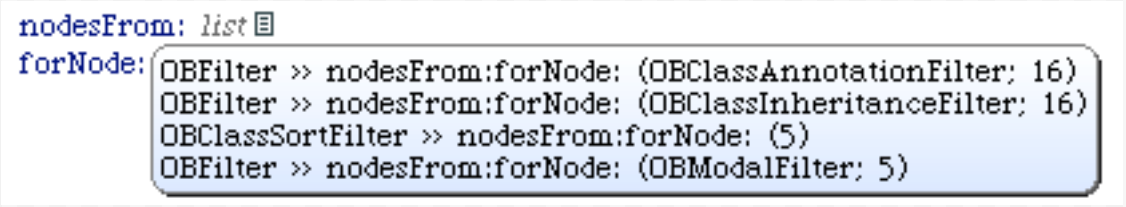
Dynamic Information II

- Precise type information for variables:



- Dynamic references:

- Polymorphism becomes visible:



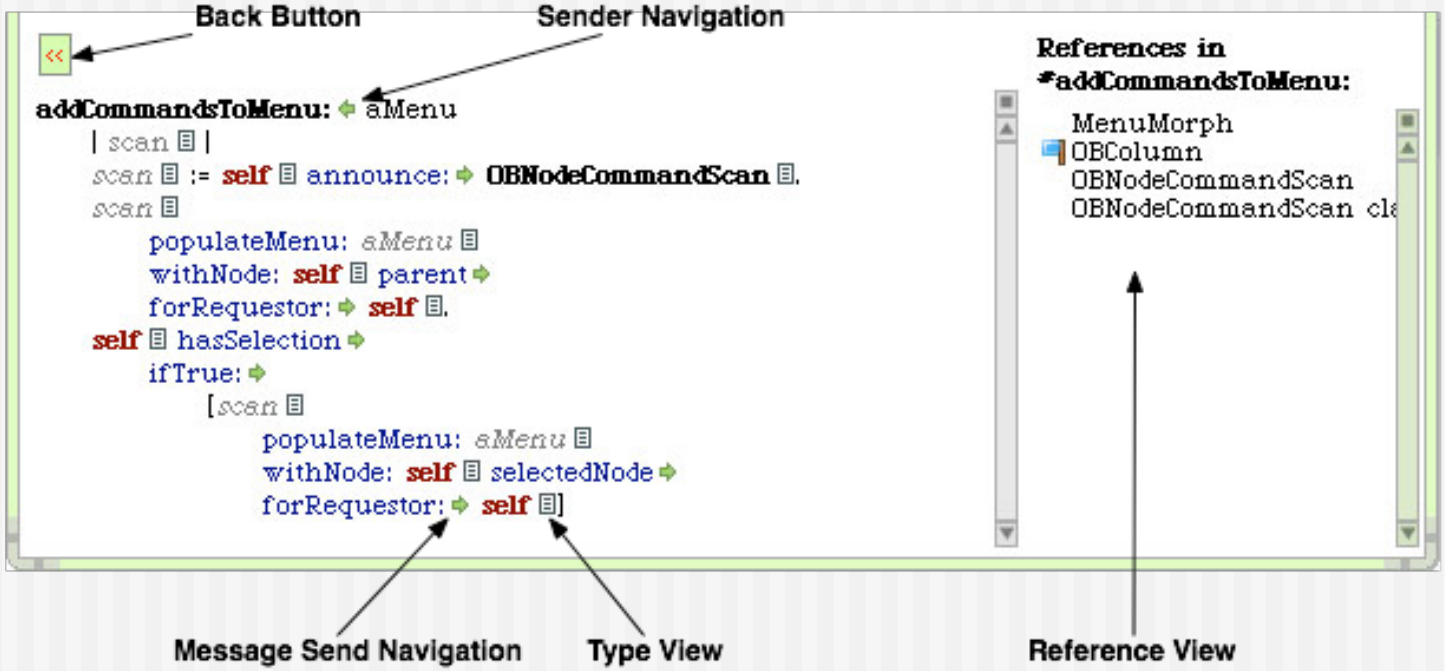
Integrating the Information I

- Directly embedded in source code:

```
nodeForDropEvent: evt inMorph: pluggableListMorph
    | index item label |
    index := pluggableListMorph rowAtLocation: evt position.
    index = 0 ifTrue: [↑ nil].
    item := pluggableListMorph listMorph item: index.
    label := item contents asString withBlanksTrimmed.
    ↑ self children
        detect: [:child | child displayString withBlanksTrimmed = label]
        ifNone: [nil]
```

Integrating the Information II

- Embed dynamic tools tightly in IDE:

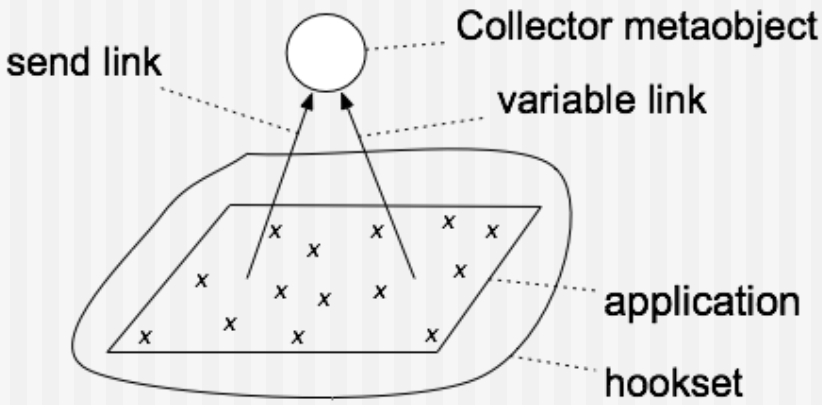


Demo

How to Gather the Information?

- Reason about message sends, variable accesses
- Ie. sub-method elements
- But: Too much data!
  (up to millions of events)
- Precise selection of desired information crucial
- **Reflectivity**

Reflectivity



- Precisely select where reifications should occur, eg. only in specific classes
- Selection done in IDE

Defining Reifications

Links for sends and variables:

```
sendLink:=GPLink new metaObject: self;
            selector: #message:receiver:args:;
            control: #before
            arguments: #(node receiver arguments).

varLink := GPLink new metaObject: self;
            selector: #variable:value:;
            control: #before;
            arguments: #(node value).
```

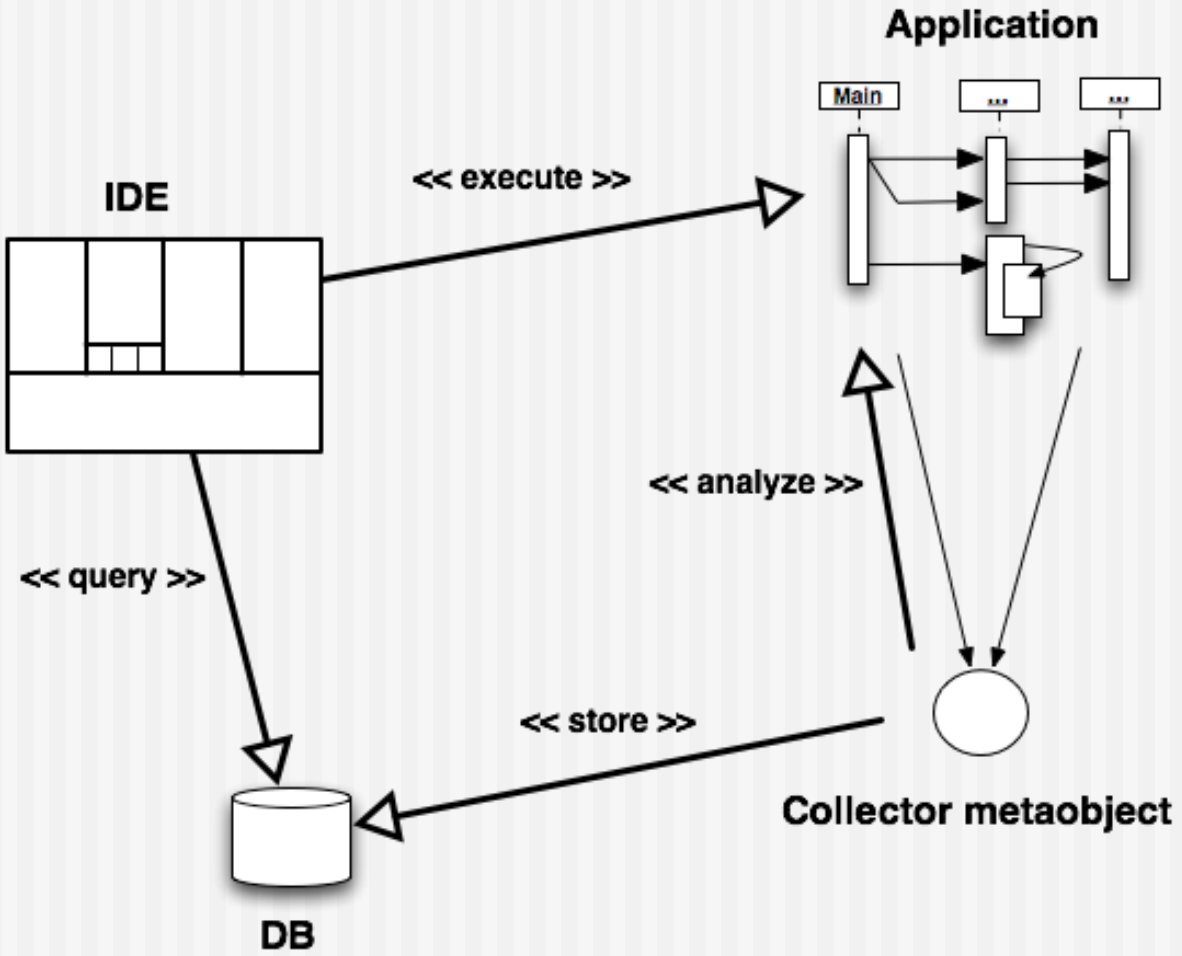
self refers to the collector metaobject

Installing the Links

```
aMethod sends do: [:send |
        send link: sendLink].
aMethod variableReads do: [:var |
        var link: varLink].
```

- At runtime the information is collected in a database
- The IDE queries this database to display the dynamic information

Hermion - Schema



Hermion - Features

- Analysis of runtime behavior
- Immediate presentation of gathered information
- Embedded in traditional IDE tools, enhancing and enriching them
- No gap between runtime analysis and IDE

Summary

- Dynamic information integrated in the IDE
- Eases navigation and understanding of software systems
- Bridges the gap between analysis and development tools