

Real-Time Path-Sensitive Analysis in the Eclipse CDT

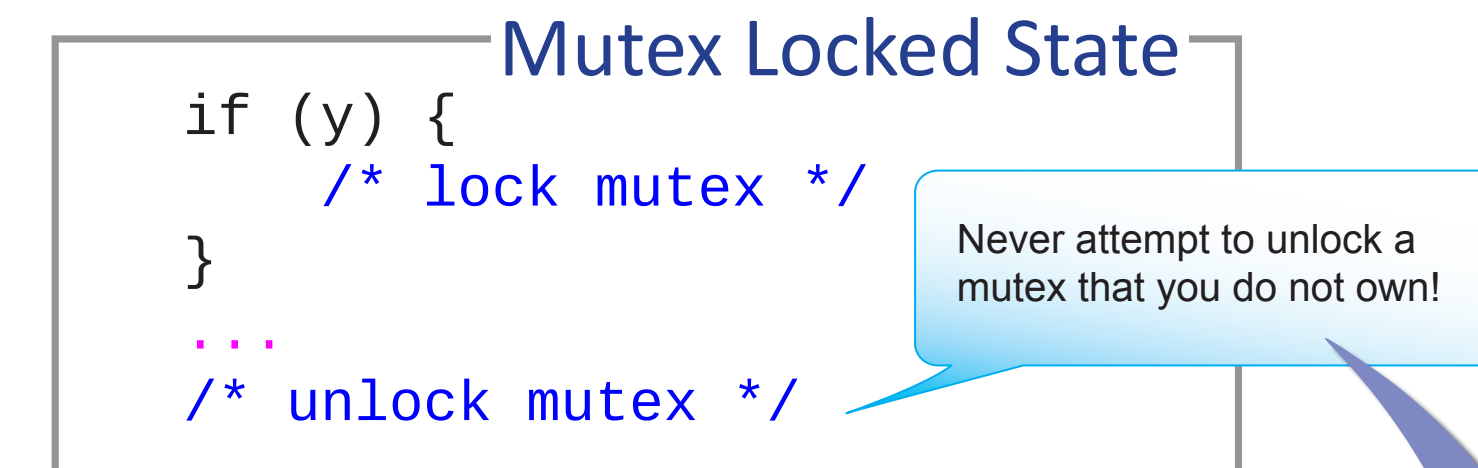
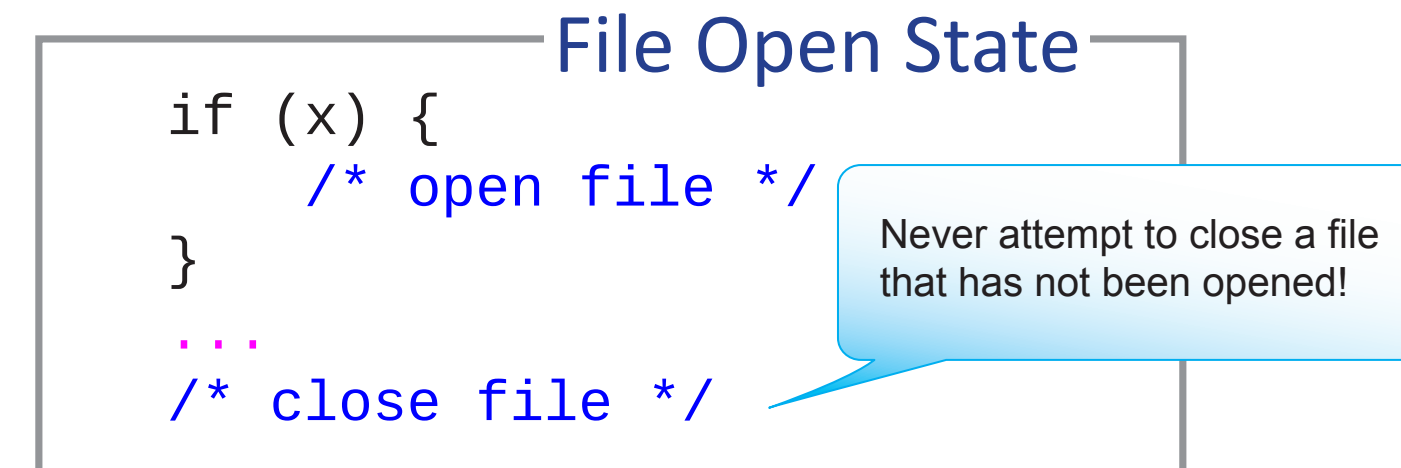
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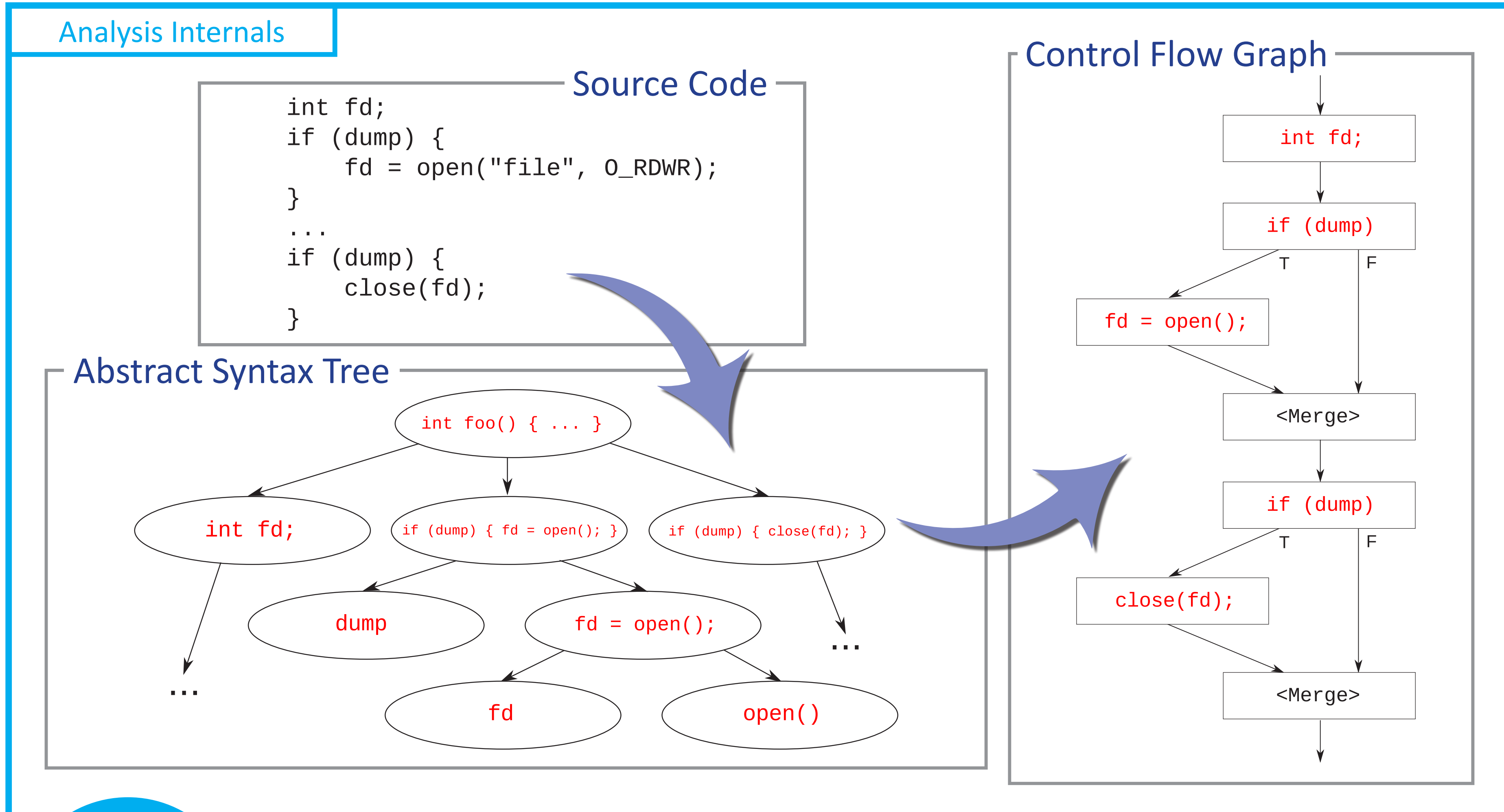
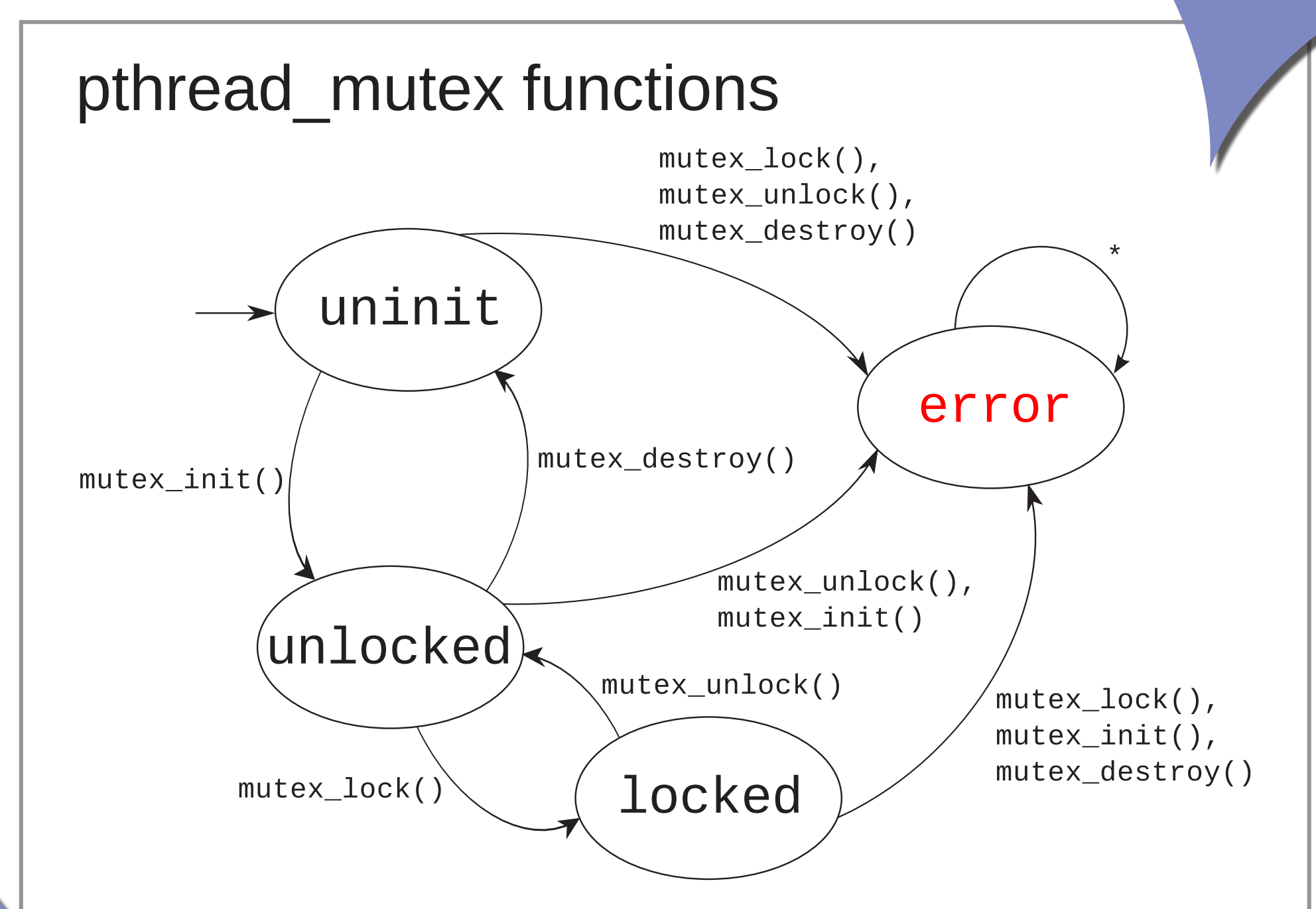
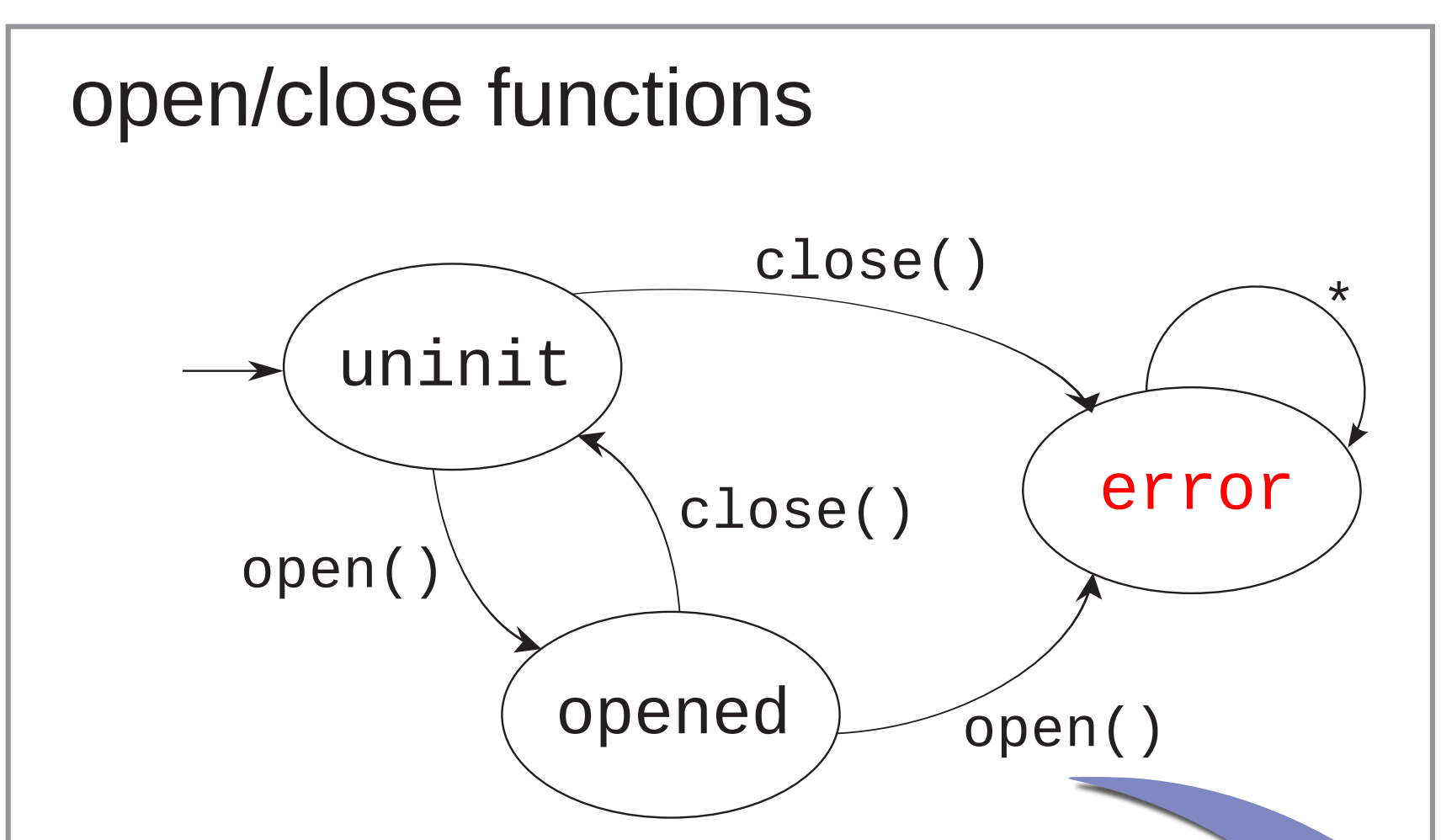
Motivation For Property Checking

"How can we statically enforce properties over the duration of the program?"



1

Temporal Properties As Finite State Machines



3

Enforce Properties As You Type

Class AbstractPropSimChecker

```
public abstract class AbstractPropSimChecker
extends AbstractIndexAstChecker

Abstract checker that uses intra-procedural Property Simulation for its analysis model. A control flow graph is constructed for each function in the project and each is analyzed using Property Simulation, an efficient path-sensitive static analysis technique.
```

Method Summary

```
protected abstract IPropertyFSM getPropertyFSM()
    Define a finite state machine that encapsulates the desired temporal property.
protected abstract void reportProblem(IASTNode node, ExecutionState condition)
    Callback to report violations of the temporal property to the user.
```

Method Detail

getPropertyFSM

```
protected abstract IPropertyFSM getPropertyFSM()
    Define a finite state machine that encapsulates the desired temporal property.
    Returns: said finite state machine
```

reportProblem

```
protected abstract void reportProblem(IASTNode node, ExecutionState condition)
    Callback to report violations of the temporal property to the user.
    Parameters: node - the node in the AST that triggered the error., condition - the ExecutionState that causes the error to occur.
```

Interface IPropertyFSM

```
public interface IPropertyFSM

A finite state machine that encodes a temporal property. It is a set of Property States with defined meanings and transitions.
```

Method Summary

```
PropertyState getErrorState()
Set<PropertyState> getPropertyStates()
    Returns all Property States in this finite state machine.
PropertyState getUninitState()
```

Method Detail

getErrorState

```
public PropertyState getErrorState()
    Returns: the error state indicating the temporal property was violated
```

getPropertyStates

```
public Set<PropertyState> getPropertyStates()
    Returns: all Property States in this finite state machine.
    Returns: a Set of all Property States
```

getUninitState

```
public PropertyState getUninitState()
    Returns: the initial state for this finite state machine
```

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Extension Point

All Extensions

Define extensions for this plug-in in the following section.

type filter text

- org.eclipse.cdt.codan.core.checkers
 - Improper use of open/close (checker) [Add...]
 - Improper use of open/close (problem) [Remove]
 - Improper use of fopen/fclose (checker) [Add...]
 - Improper use of fopen/fclose (problem) [Remove]

Extension Element Details

Set the properties of "checker". Required fields are denoted by "**".

id*: org.eclipse.cdt.codan.extension.checkers.CloseOpenedFile

class*: extension.checkers.CloseOpenedFilesChecker [Browse...]

name: Improper use of open/close

<http://ebaron.wordpress.com/category/eclipse/static-analysis/>