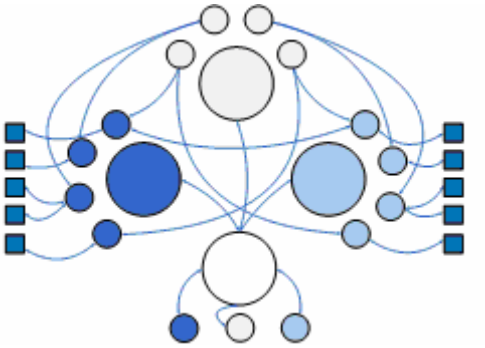


Framework Overview with UML Diagrams

Learn to Build Robust, Scalable and Maintainable Applications using PureMVC

Framework Overview

This document discusses the classes and interfaces of the PureMVC framework; illustrating their roles, responsibilities and collaborations with simple UML (Unified Modeling Language) diagrams.

The PureMVC framework has a very narrow goal. That is to help you separate your application's coding concerns into three discrete tiers; Model, View and Controller.

In this implementation of the classic MVC design *meta*-pattern, the application tiers are represented by three Singletons (a class where only one instance may be created).

A fourth Singleton, the *Façade*, simplifies development by providing a single interface for communications throughout the application.

The Model caches named references to ***Proxies***, which expose an API for manipulating the Data Model (including data retrieved from remote services).

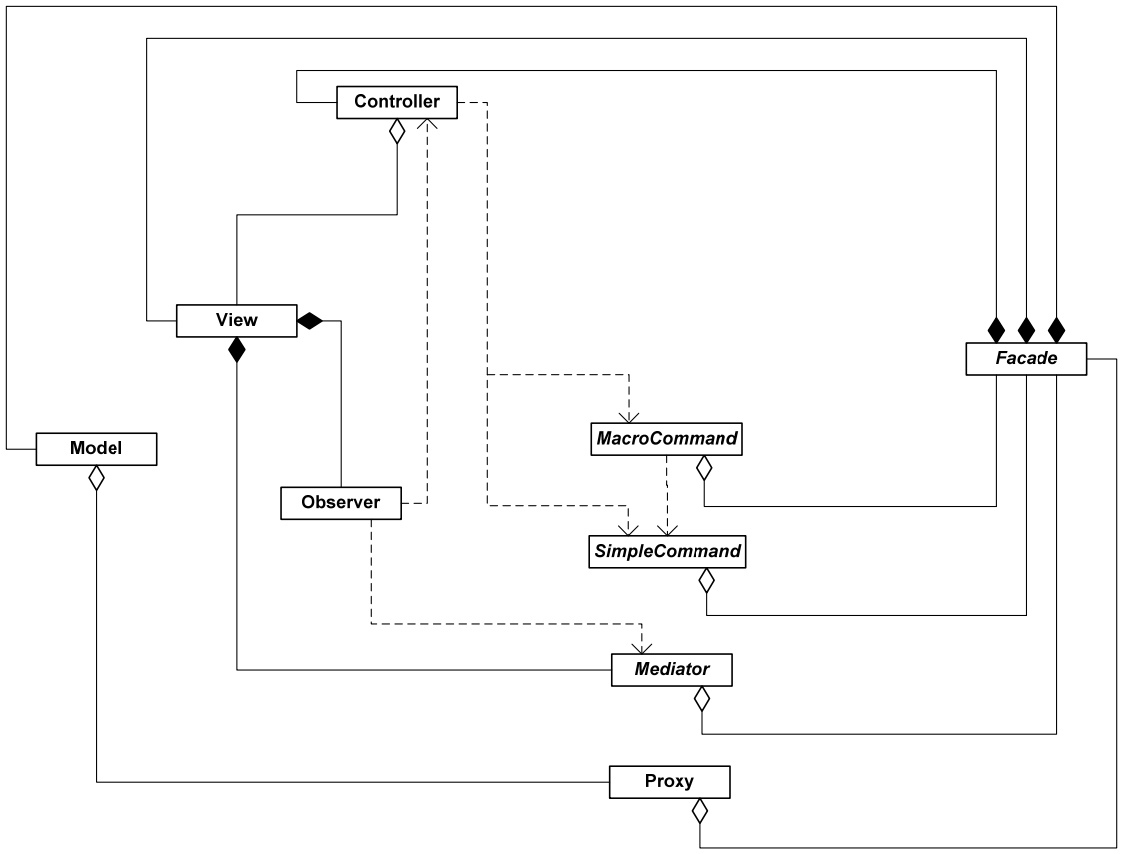
The View primarily caches named references to ***Mediators,*** which adapt and steward the View Components that make up the user interface.

The Controller maintains named mappings to ***Command*** classes, which are stateless, and only created when needed.

The Façade initializes and caches the Core actors (***Model, View*** *and* ***Controller***), and provides a single place to access all of their public methods.

AUTHOR: Cliff Hall <cliff@puremvc.org>
LAST MODIFIED: 3/05/2008

Façade and Core

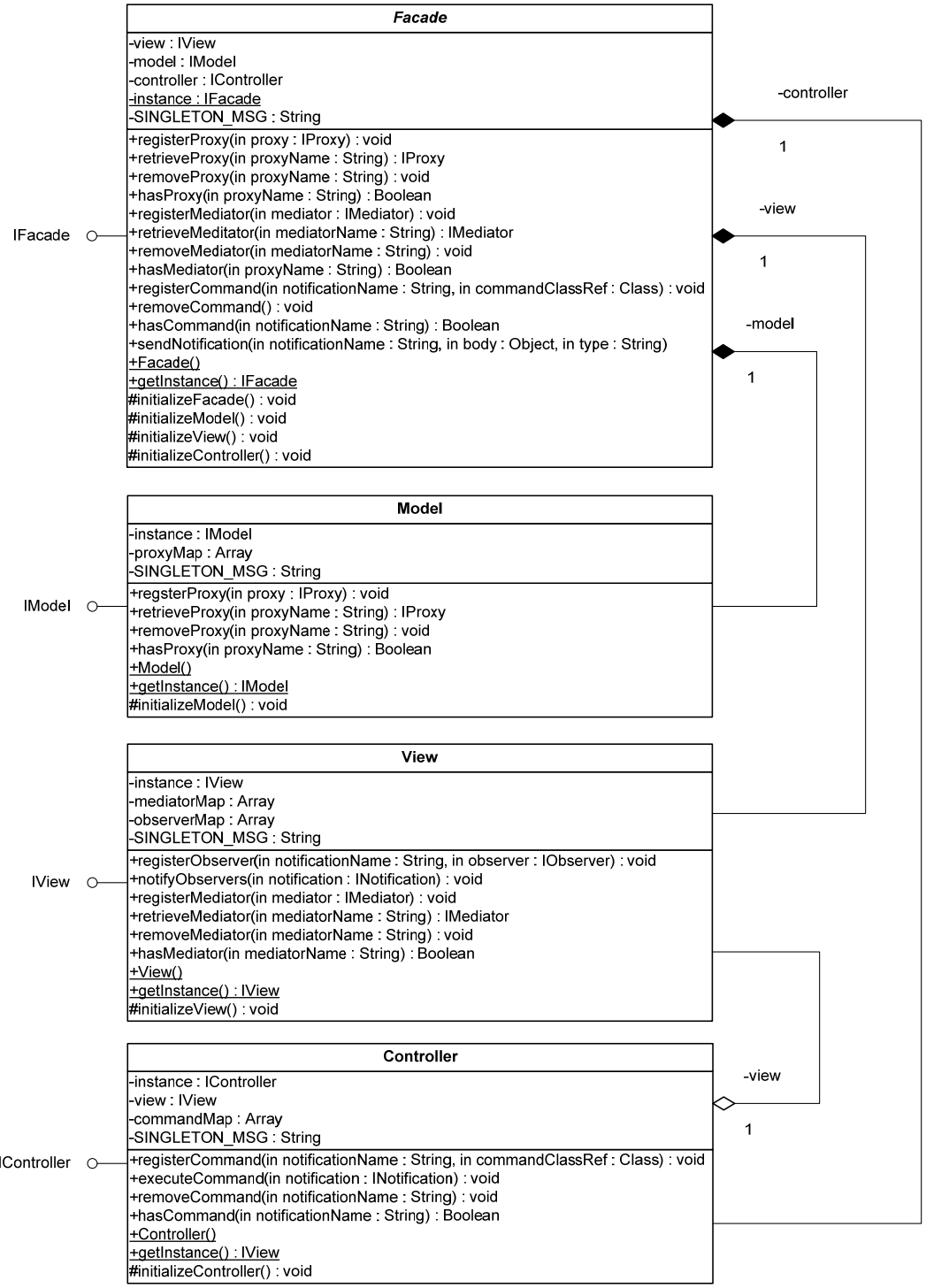


The **Façade** class makes it possible for the **Proxies**, **Mediators** and **Commands** that make up most of our final application to talk to each other in a loosely coupled way, without having to import or work directly with the Core framework actors.

When we create a concrete **Façade** implementation for our application, we are able to use the Core actors 'out of the box', incidental to our interaction with the **Façade**, minimizing the amount of API knowledge the developer needs to have to be successful with the framework.

The Core actors **Model**, **View** and **Controller** implement **IModel**, **IView** and **IController** interfaces respectively. The **Façade** implements **IFacade**, which implements all the Core interfaces, by composition.

Façade and Core



View, Mediators and View Components

The **View** class is implemented as a Singleton that caches and provides access to concrete **IMediator** instances.

Mediators help us to create or reuse existing user interface components without the need to imbue them with knowledge about the PureMVC application they communicate with. Concrete **Mediators** must implement the **IMediator** interface, usually by sub-classing the framework **Mediator** class.

View Components display data or accept user gestures. In a Flash-based application, they typically communicate with their **Mediators** using **Events** and exposing some properties for the concrete **Mediator** to inspect or manage. A **Mediator** connects a View Component with its data and communicates with the rest of the system on its behalf.

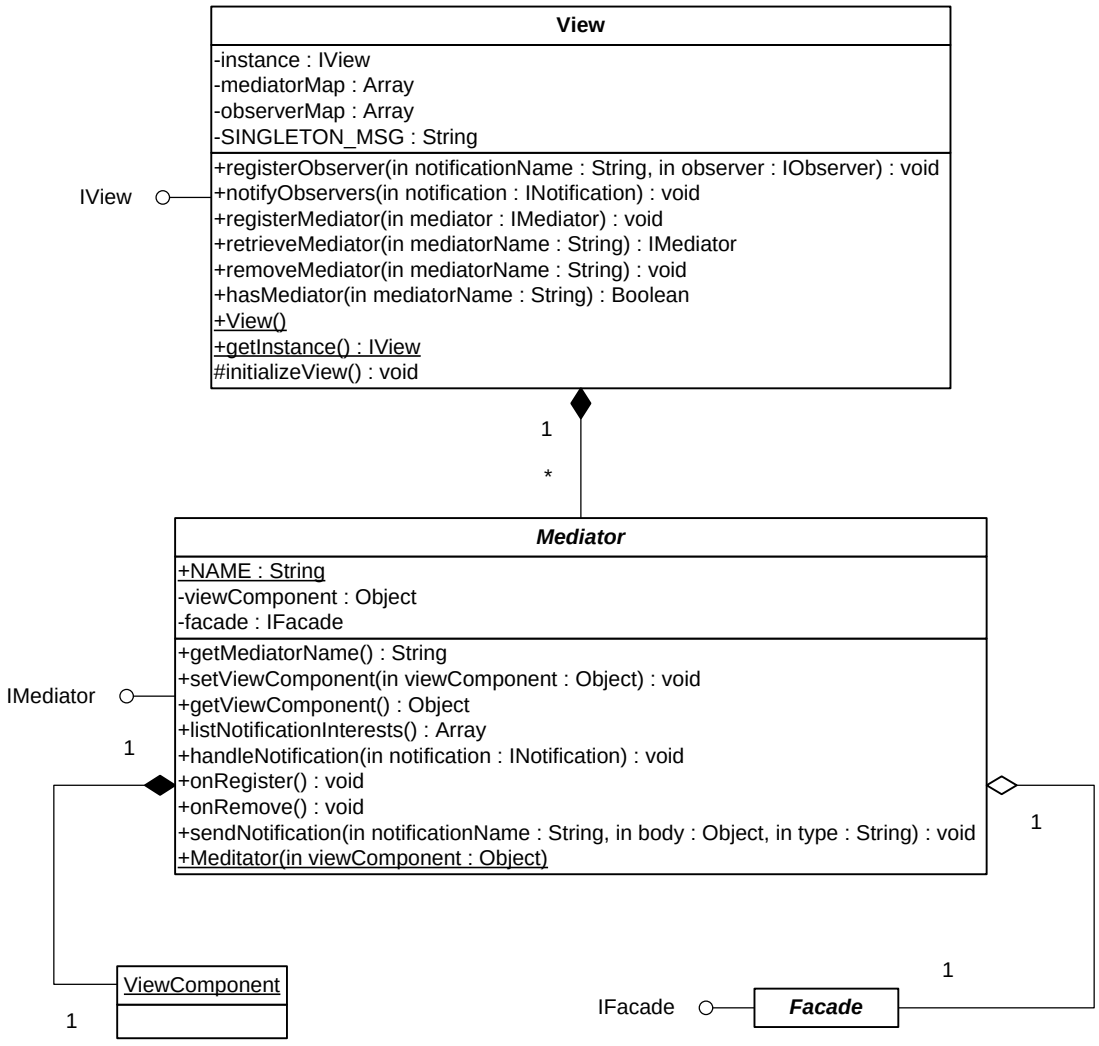
When a concrete **Mediator** is registered with the **View**, it is queried as to its **Notification** interests. It must return an **Array** of all the names of the **Notifications** it wishes to be informed of.

Because it must implement the **IMediator** interface, the concrete Mediator will have a **handleNotification** method. When it is registered with the **View,** an **Observer** instance is created and registered for each **Notification** in the **Array** so that the **Mediator's handleNotification** method is invoked whenever a **Notification** of interest to the **Mediator** is sent.

The **Mediator** framework class implements **INotifier** and so has a **sendNotification** method, which takes the parameters for a new **Notification**, constructs the **Notification** and uses the Singleton **IFacade** instance to send it.

View, Mediators and View Components

The **Mediator's** protected **façade** property is initialized to the registered **IFacade** instance, and therefore the **Mediator** must be constructed *after* you have initialized your Application's concrete **Façade**.



Model, Proxies and Data Objects

The **Model** class is implemented as a Singleton that caches and provides access to concrete **IProxy** instances.

Proxies help us to expose data structures and entity classes (and the domain logic and services that support them) to our application in such a way that they may be easily reused elsewhere, or refactored with a minimum amount of impact to the rest of the application.

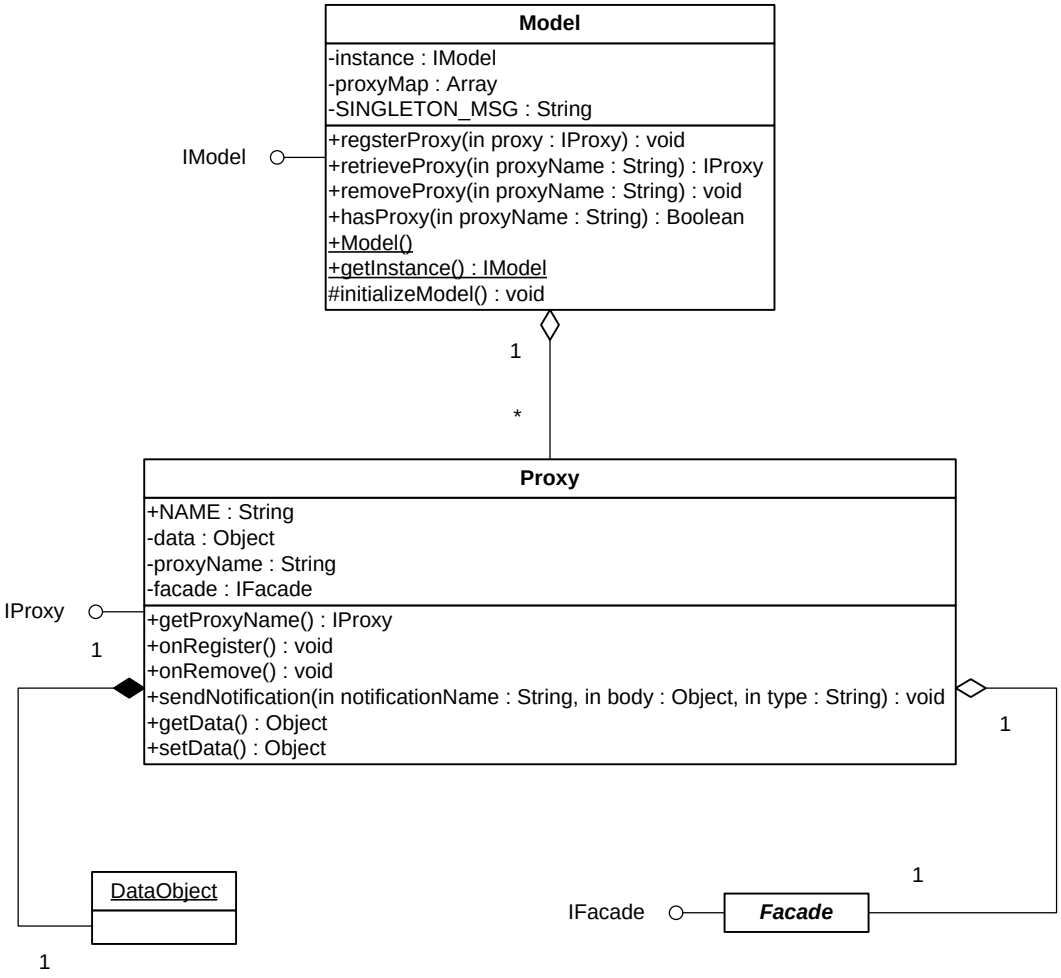
We might use a concrete **Proxy** to simply manage a reference to a local data object, in which case idioms for interacting with it might involve synchronous setting and getting of its data.

A **Proxy** might also encapsulate the application's interaction with a remote service to save or retrieve a piece of data, in which case, one might call a method or set data upon the **Proxy** and await a **Notification** sent when the **Proxy** has retrieved the data from the service.

The **Proxy** framework class implements **INotifier** and so has a **sendNotification** method, which takes the parameters for a new **Notification**, constructs the **Notification** and uses the **IFacade** Singleton instance to send it.

Its protected **façade** property is initialized to the registered **IFacade** instance, and therefore the **Proxy** must be constructed *after* you have initialized your Application's concrete **Facade**.

Model, Proxies and Data Objects



Controller and Commands

The **Controller** class is implemented as a Singleton that maintains a mapping between **Notification** names and **Command** class references.

A **Command** may retrieve and interact with **Proxies**, communicate with **Mediators**, or execute other **Commands**. **Commands** are often used to orchestrate complex or system-wide activities such as application startup and shutdown.

When it is initialized (typically by an **IFacade** implementation), the **Controller** creates and registers with the **View** an appropriate **Observer** instance for each **Notification** to **Command** mapping, such that when any of the registered **Notifications** are broadcast, the **Controller's executeCommand** method is called with the **Notification**.

When **Notifications** are broadcast by the **View**, the **Controller** instantiates the appropriate **Command** class and calls the **execute** method, passing in the **Notification**.

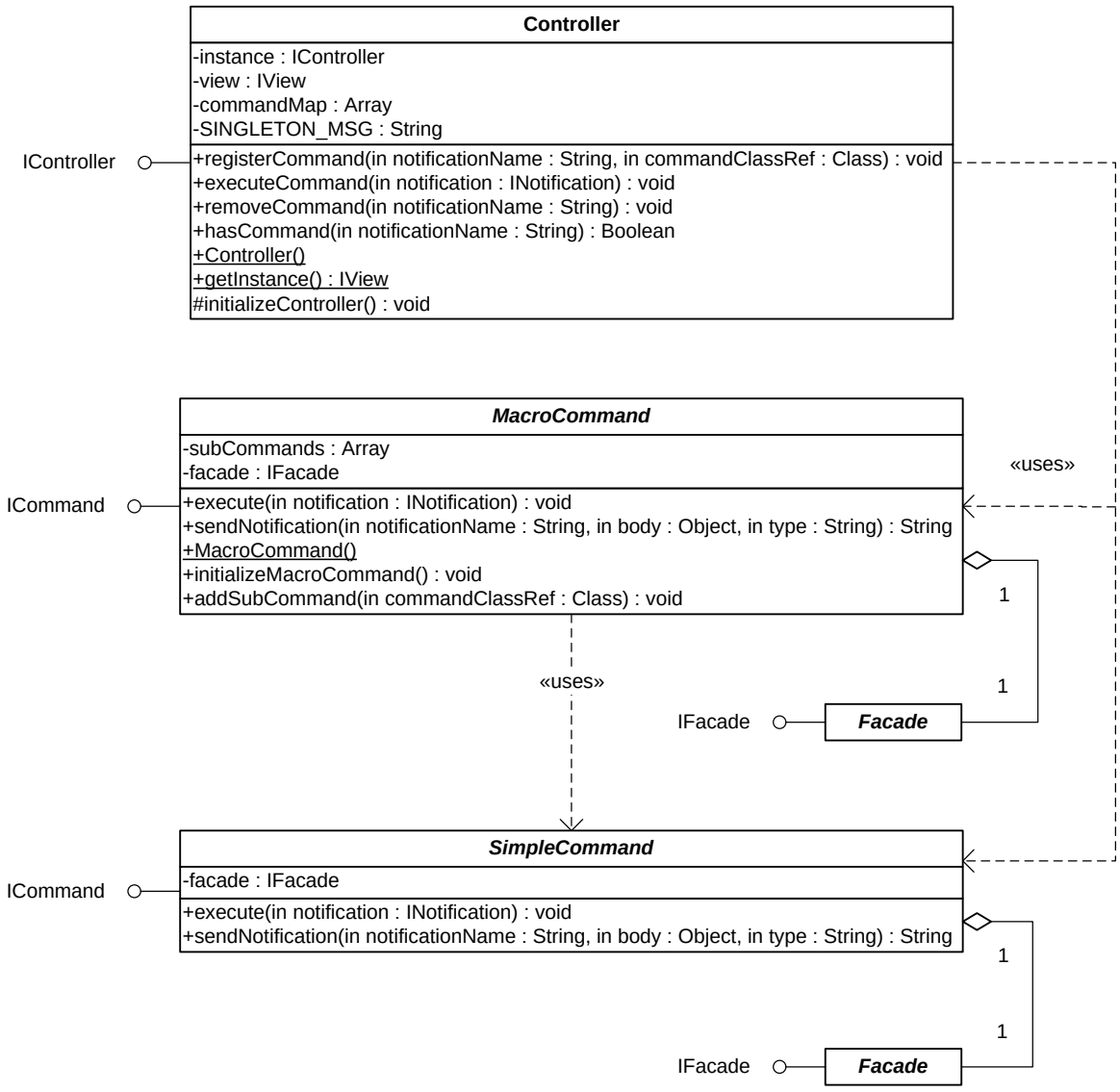
PureMVC includes two **ICommand** class implementations that you may easily extend. Both implement **INotifier,** and so have a **sendNotification** method and a protected **façade** property, initialized to the Singleton **IFaçade** instance.

The **SimpleCommand** class merely has an **execute** method which is called with the **Notification** object.

The **MacroCommand** class allows you to execute multiple 'subcommands' sequentially, each being created and passed the original **Notification** on its **execute** method.

Controller and Commands

MacroCommand calls its **initializeMacroCommand** method from within its constructor. You override this method in your sub classes to call the **addSubCommand** method once for each **Command** to be added. You may add **SimpleCommands** or other **MacroCommands**.



View, Observer and Notification

Proxies, **Mediators** and **Commands** communicate with each other in a loosely-coupled and platform-neutral way by broadcasting **Notifications**.

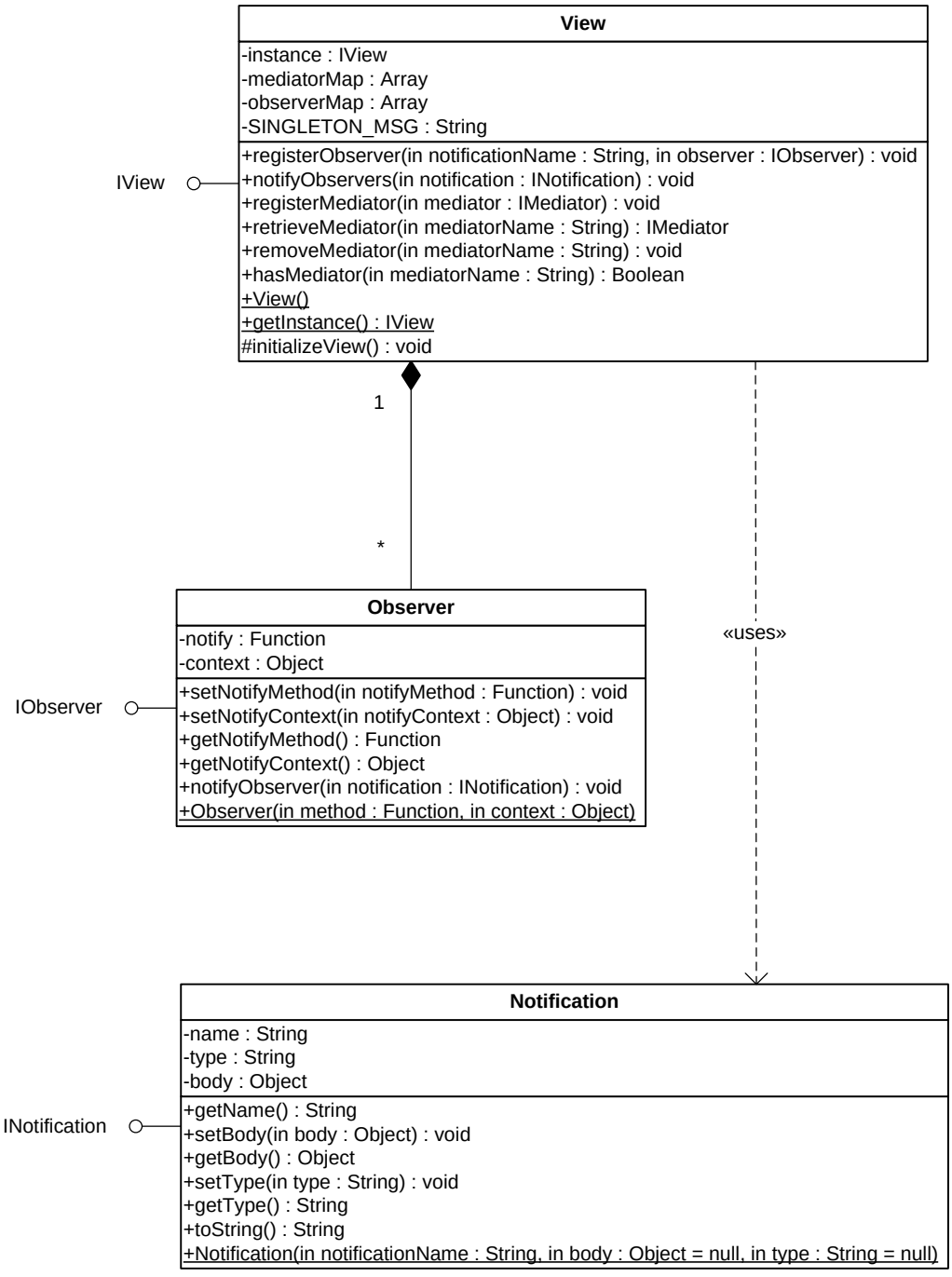
- Proxies may broadcast, but do not listen for Notifications.
- Mediators listen for and may broadcast Notifications.
- Commands are triggered by and may broadcast Notifications.

Since PureMVC applications may also run in a pure ActionScript environment without the underlying **flash.events.Event** and **EventDispatcher** classes, the framework implements an Observer notification scheme for communication between the Core actors and other parts of the system.

PureMVC employs the Observer pattern for this purpose. An **IObserver** instance carries a reference to an object which wishes to be notified (the *'Notify Context'*), and a method on that object to call when an **INotification** is broadcast (the *'Notify Method'*).

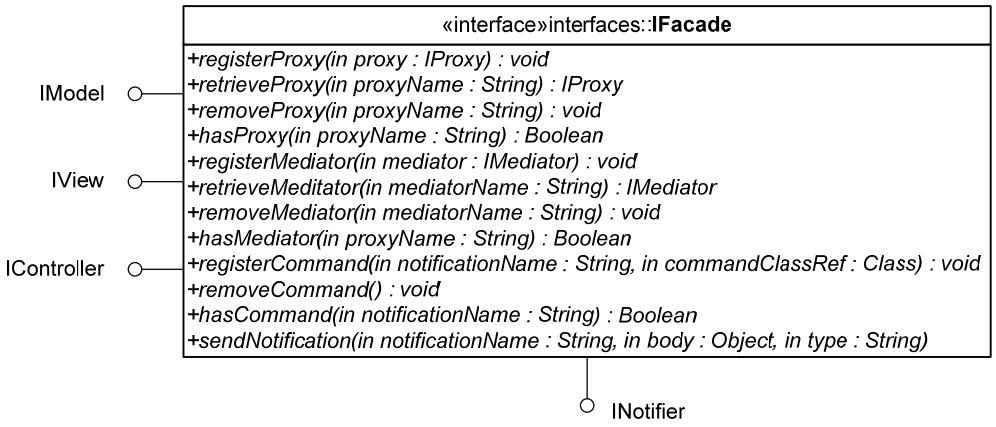
The **View** is responsible for managing the map of **Notification** names to **Observer** lists and for notifying all **Observers** when a **Notification** is sent.

View, Observer and Notification

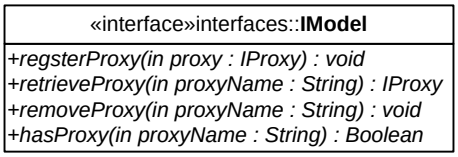


Interfaces

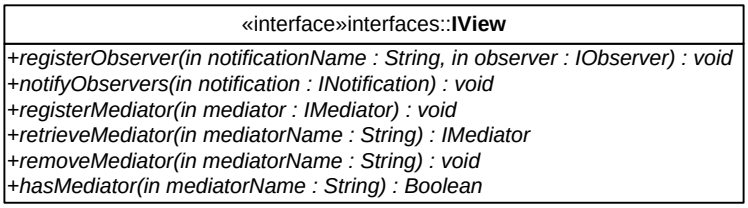
IFacade



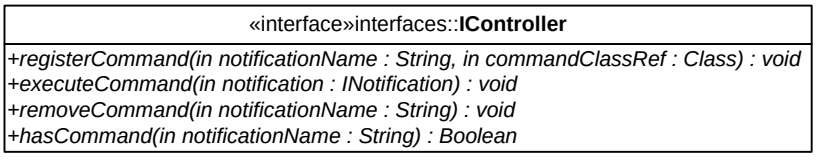
IModel



IView

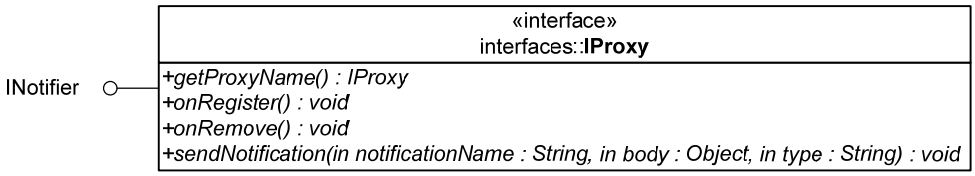


IController

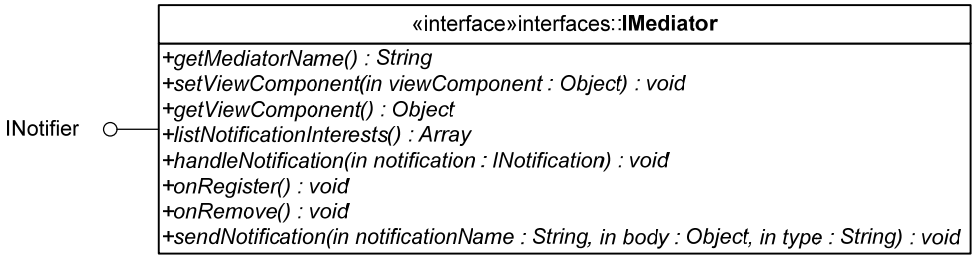


Interfaces

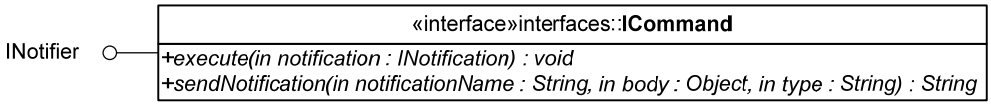
IProxy



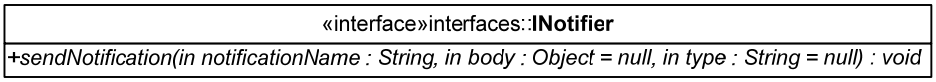
IMediator



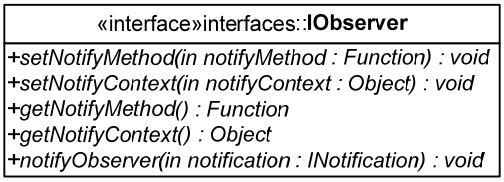
ICommand



INotifier



IObserver



Interfaces

INotification