The Dark Matter Data Framework

Building Modular GWT Applications

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PREFACE

This book provides an overview of the Dark Matter Data (DMD) Framework and adresses its use as the basis for the creation of modular data management applications that make use of the Google Web Toolkit.

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1. INTRODUCTION

This chapter provides an overview of the Dark Matter Data (DMD) Framework, including the basic philosophy behind it and how it relates to the creation of modular and extensible data management applications that are based on Google Web Toolkit (GWT) .

1.1 Overview

The current landscape of web application development is vast and confusing, with a wide variety of choices as to how to proceed with that development. I've chosen term “web application development” as being distinct from “web site development” which is, I believe, a very different undertaking. Many frameworks already exist that support the rapid development of web sites and maintenance of their content; Dark Matter does not directly relate to web site development.

Instead, the Dark Matter Data Framework addresses the development of data management applications that run within a web browser. These applications tend to support a different usage paradigm than standard websites and tend to behave more like desktop applications than a series of distinct web pages.

Although the concepts presented here can be used piecemeal to support traditional web page development that makes use of embedded GWT widgets, the real power of the framework derives from its ability to provide overall structure for more complex web applications.

1.2 A Note Regarding Sencha's ExtGWT (aka GXT)

Many of the initial examples in this book make use of the GXT Java library. The reasoning behind this is that, although GWT provides an amazing basis for developing AJAX applications, there is a huge amount of effort required to create a professional Look and Feel for such an application and I am certainly no expert in that regard. GXT provides an excellent Look and Feel and provides a framework that supports the creation of complex web applications. Although the framework is pretty light in the documentation department, most aspects can be understood by examining the sample code that Sencha provides.

The one area that is perhaps most important in the creation of a complex application is, likewise, one of the areas that is most shrouded in mystery, the Model View Controller (MVC) framework. This framework is featured in the “Mail App” sample, but beyond the example, there isn't much information. Dark Matter addresses this mystery by providing a descriptive mechanism for defining the various aspects of the MVC framework and generating much of the code required to drive your application.

1.3 Goals and Philosophy

The concepts on which Dark Matter is based arise from a telecommunications data management background and may seem unusual to designers from other backgrounds. However, in the field of data management, data is data, regardless of its source or usage. Keep an open mind.

1.3.1 Define Your Data

If you're managing data, you'd better be able to describe it clearly and concisely. For this reason, all aspects of the data associated with Dark Matter are defined via an extensible schema specification mechanism. This schema specification mechanism borrows concepts from some obscure sources: The Open Systems Interconnection (OSI) Guidelines for the Definition of Managed Objects (GDMO) and Lightweight Directory Access Protocol (LDAP) Directory Server concepts. However, don't let the obscure sources put you off, the mechanisms are straight forward can save you a great deal of time and coding effort.

Once the schema is defined, Dark Matter Objects (DMOs) can be generated and used in a variety of contexts throughout your application.

All aspects of schema definition are discussed in the Dark Matter Schema chapter.

1.3.2 Keep Your Behavior Separate

The behavior associated with data objects will depend on the usage context of the object. An object used within your Application Server will have different capabilities from the same object being used within the browser. Dark Matter allows for the augmentation of data objects with behavior that's appropriate to their usage context.

All aspects of adding behavioral wrappers to your data objects are discussed in the Wrapping up Behavior chapter.

1.3.3 Manipulate Your Data in a Rational Way

Many of the interfaces used between clients/servers are ad hoc and tend to grow and become complex as the application evolves. Dark Matter provides a well defined protocol based on yet another obscure technology, the Common Management Information Protocol (CMIP). Again, although CMIP was originally targeted at network management, it embodies generically useful data management concepts that can be used in any data management context.

All aspects of manipulating your data via GWT RPC are discussed in Dark Matter Protocol chapter.

1.3.4 Real-time Changes are Important

If you're managing data, you're often interested in when that data changes. Dark Matter embeds some functionality provided by Sven Strohschein from his GWT Event Service project at Google Code. By using this framework, Dark Matter provides event notifications that indicated when data objects have been created, deleted or modified.

1.3.5 Remain Repository Agnostic

So many frameworks claim to be repository agnostic, but that tends to be limited to being able to store your data in RDBMS X or RDBMS Y. Relational Database Management Systems are great for lots of things, but they aren't the only data repositories that exist and they can be complex to administer and maintain.

Dark Matter attempts to break out of the RDBMS trap by exposing you to some other options for storing your data, especially if that data tends to be hierarchic. That being said, there's nothing to stop you from storing Dark Matter Objects in an RDBMS.

See the Dark Matter Persistence chapter for further discussion.

1.3.6 Stay Pragmatic

The Dark Matter Data Framework is being used as the basis for a commercial network management product and, as such, is focused entirely on enabling the delivery of a solid, modular, maintainable product.

2. Getting Started with Dark Matter

3. The Dark Matter Schema

4. Context is Everything