



Developing Applications with MongoDB and .NET

Course ISI-1463 3 Days Instructor-led, Hands on

Course Description

This three day instructor led course provides students with a complete guide to MongoDB and how to develop applications in C# and .NET with it. MongoDB is the most popular of the "Big Data" NoSQL database technologies, and it's still growing. Imagine a world where using a database is so simple that you soon forget you're even using it. Imagine a world where speed and scalability just work, and there's no need for complicated configuration or set up. Imagine being able to focus only on the task at hand.

MongoDB is an open-source document database that provides high performance, high availability, and automatic scaling. A record in MongoDB is a document, which is a data structure composed of field and value pairs. MongoDB documents are similar to JSON objects. MongoDB stores documents in collections. Collections are analogous to tables in relational databases. Unlike a table, however, a collection does not require its documents to have the same schema.

This class will introduce, clarify, and deepen your MongoDB knowledge both through using it in the shell as well as developing .NET applications with it. The class includes many hands-on labs that will lead to building a complete .NET MVC application using Visual Studio 2015 and C#.

Course Objectives

- Learn what is MongoDB
- Learn how to install MongoDB
- Learn the structure of data in MongoDB
- Learn how to work with data
- Learn how to use GridFS
- Learn how to use the MongoDB .net driver
- Learn how to perform advanced CRUD operations in C#
- Learn how to structure advanced MongoDB queries
- Learn how to administer a MongoDB database
- Learn how to optimize the performance of MongoDB
- Learn how to create and use replica sets
- Learn all about MongoDB sharding

Prerequisites

To get the most out of this course, you'll need knowledge of programming in C# and ASP .NET with Visual Studio

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>



Course Outline

Chapter 1: Introduction to MongoDB

- Reviewing the MongoDB Philosophy
- Fitting Everything Together
- Reviewing the Feature List
- Getting Help

Chapter 2: Installing MongoDB

- Choosing Your Version
- Running MongoDB
- Installing Additional Drivers

Chapter 3: The Data Model

- Designing the Database
- Building Indexes
- Implementing Geospatial Indexing
- Pluggable Storage Engines
- Using MongoDB in the Real World

Chapter 4: Working with Data

- Navigating Your Databases
- Inserting Data into Collections
- Querying for Data
- Updating Data
- Processing Data in Bulk
- Renaming a Collection
- Deleting Data
- Referencing a Database
- Implementing Index-Related Functions

Chapter 5: GridFS

- Filling in Some Background
- Working with GridFS
- Getting Started with the Command-Line Tools
- Looking Under MongoDB's Hood
- Exploiting the Power of .NET
- Putting Files into MongoDB
- Retrieving Files from GridFS
- Deleting Files

Chapter 6: The .NET MongoDB Driver

- Comparing Documents in MongoDB and C#
- MongoDB Classes
- Listing Your Data
- Using Query Operators
- Modifying Data with C#
- Processing Data in Bulk
- Deleting Data
- DBRef

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>



- GridFS and the .NET Driver

Chapter 7: Advanced MongoDB CRUD Operations with .NET

- Working with Documents in C#
- Using Modules
- Connecting and Disconnecting
- Inserting Data
- Finding Your Data
- Modifying the Data
- Deleting Data
- Creating a Link Between Two Documents

Chapter 8: Advanced Queries

1. Text Search
2. The Aggregation Framework
3. MapReduce
4. How MapReduce Works

Chapter 9: Database Administration

- Using Administrative Tools
- Backing Up the MongoDB Server
- Digging Deeper into Backups
- Restoring Individual Databases or Collections
- Automating Backups
- Backing Up Large Databases
- Importing Data into MongoDB
- Exporting Data from MongoDB
- Securing Your Data by Restricting Access to a MongoDB Server
- Protecting Your Server with Authentication
- Managing Servers
- Upgrading MongoDB
- Monitoring MongoDB
- Using MongoDB Cloud Manager

Chapter 10: Optimization

- Optimizing Your Server Hardware for Performance
- Understanding MongoDB's Storage Engines
- Understanding MongoDB Memory Use Under MMAPv1
- Understanding MongoDB Memory Use Under WiredTiger
- Evaluating Query Performance
- Managing Indexes
- Three-Step Compound Indexes
- Specifying Index Options
- Using hint() to Force Using a Specific Index
- Using Index Filters
- Optimizing the Storage of Small Objects

Chapter 11: Replication

- Spelling Out MongoDB's Replication Goals
- Replication Fundamentals
- Drilling Down on the Oplog

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>



- Implementing a Replica Set
- Read Concern

Chapter 12: Sharding

- Exploring the Need for Sharding
- Partitioning Horizontal and Vertical Data
- Analyzing a Simple Sharding Scenario
- Implementing Sharding with MongoDB
- The Balancer
- Hashed Shard Keys
- Tag Sharding
- Adding More Config Servers