



Professional

Microsoft®

# SQL Server® 2014 Integration Services

Brian Knight, Devin Knight, Jessica M. Moss, Mike Davis, Chris Rock



PROFESSIONAL

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Integration Services**



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*To my great team and work family at  
Pragmatic Works*

—BRIAN KNIGHT

*Proverbs 3:5-6*

—DEVIN KNIGHT

*For Rich: Thank you for your support.*

—JESSICA M. MOSS

*To my kids, Gabriel and Sydney — they are the light of  
my life.*

—MIKE DAVIS

*To the three girls in my life that mean more than  
anything to me, Tammy, Calista, and Callie*

—CHRIS ROCK





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—BRIAN KNIGHT

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—DEVIN KNIGHT

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—JESSICA M. MOSS

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—MIKE DAVIS

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—CHRIS ROCK

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# INTRODUCTION

**THE MOST IMPORTANT BUSINESS INTELLIGENCE TOOL** in the Microsoft Swiss Army knife of tools is SQL Server Integration Services (SSIS). This is because the other tools would be nothing without the cleansing and movement of data into a presentable format. The product can extract, transform, and load (ETL) data astonishingly fast. A 2010 benchmark showed movement of more than a terabyte an hour with SSIS! If you're new to SSIS, you've picked a fantastic field to become involved in. The one consistent skill needed in today's technical job market is ETL. If a company wants to establish a partnership with another company, it'll need to communicate data back and forth between the two companies. If your company wants to launch new products, it'll need a way to integrate those products into its website and catalog. All of these types of tasks are going to require the skill set you are developing and will learn in this book.

Companies that had never used SQL Server before are now allowing it in their environment because SSIS is such an easy-to-use and cost-effective way to move data. SSIS competes with the largest ETL tools on the market like Informatica, DataStage, and Ab Initio at a tiny fraction of the price. SQL Server 2014 now offers more components that you use to make your life even easier and the performance scales to a level never seen on the SQL Server platform.

The best thing about SSIS is its price tag: free with your SQL Server purchase. Many ETL vendors charge hundreds of thousands of dollars, if not millions, for what you will see in this book. SSIS is also a great platform for you to expand and integrate into, which many ETL vendors do not offer. Once you get past the initial learning curve, you'll be amazed with the power of the tool, and it can take weeks off your time to market. This author team has trained hundreds of people over the years, and you'll find that the learning curve of SSIS is shallow relative to competing platforms. In SQL Server 2012, the product matured to its third major envisioning. In that release the focus was on scalability, management, and more advanced data cleansing. In SQL Server 2014 an incremental change has happened so new content focuses on patterns in SSIS.

## WHO THIS BOOK IS FOR

Because we have used SSIS since the beta stages of SQL Server 2005 and through its evolution into its current form, the idea of writing this book was quite compelling. If you've never used SSIS before, we spend the first chapters focusing on lowering your learning curve on this product. If you've used SSIS in the past, we've added more patterns and best practices to this SQL Server 2014 version of the book to take your skills to the next level. If you're an SSIS 2005 or 2008 user, luckily the interface has not drastically changed, so you'll want to focus on advanced data cleansing and administration, which has gone through a drastic overhaul.

This book is intended for developers, DBAs, and casual users who hope to use SSIS for transforming data, creating a workflow, or maintaining their SQL Server. This book is a professional book, meaning that the authors assume that you know the basics of how to query a SQL Server and have

some rudimentary programming skills. Not many programming skills will be needed or assumed, but it will help with your advancement. No skills in the prior release of SSIS are required, but we do reference it throughout the book when we call attention to feature enhancements.

## WHAT THIS BOOK COVERS

Whether you're new to SSIS or an experienced SSIS developer, there's something for you in this book. This book takes you from the architecture and basics of SSIS all the way through to developing hard-core SSIS solutions to solve many of the industry's common business scenarios. The book is tutorial based, meaning that it teaches you through simple examples.

By the time you complete this book, you'll know how to load and synchronize database systems using SSIS by using some of the new SQL Server 2014 features. You'll also know how to load data warehouses, which is a very hot and specialized skill. Even in warehousing, you'll find features in the new 2014 release that you'll wonder how you lived without like the Data Quality Services integration and CDC integration!

## HOW THIS BOOK IS STRUCTURED

After discussing the architecture of SSIS, we'll start with the basics by introducing the fundamental concepts of SSIS: the Data Flow and Control Flow. We'll then build through the various other features, including the warehousing and scripting, and proceed to advanced topics like programming and extending the engine. SSIS is a very feature-rich product, and it took a lot to cover the product:

**Chapter 1, "Welcome to SQL Server Integration Services,"** introduces the concepts that we're going to discuss throughout the remainder of this book. We talk about the SSIS architecture and give a brief overview of what you can do with SSIS.

**Chapter 2, "The SSIS Tools,"** shows you how to quickly learn how to import and export data by using the Import and Export Wizard and then takes you on a tour of the SQL Server Data Tools (SSDT).

**Chapter 3, "SSIS Tasks,"** goes into each of the tasks that are available to you in SSIS. These tasks are the building blocks for your SSIS workflow and are much like LEGO block programming.

**Chapter 4, "The Data Flow,"** dives into the Data Flow components in SSIS. These components are where typical ETL developers will spend 75 percent of their time when loading a database.

**Chapter 5, "Using Variables, Parameters, and Expressions,"** instructs you how to use the obscure expression language in SSIS by showing you many example use cases and how to solve them through the language. We also cover in the chapter a new concept of parameters and parameterization of a package.