

Delphi Developer Certification Exam Study Guide

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INTRODUCTION

This study guide walks you through the information and resources that will help you prepare to take the *Delphi Developer Certification* exam. The material in this document is organized in the following four sections:

- **Test Overview** – describes the structure of the exam, the organization of the questions included in the test and information about the certification.
- **Technical Resources** – recommends training courses, books, manuals, web sites and other information that can help you acquire the knowledge required to pass the test.
- **Test Sections** – lists topics covered in each section of the test.
- **Sample Questions** – provides sample test questions along with the correct answers.

TEST OVERVIEW

GENERAL DETAILS

- To take the test, go to <http://certification.embarcadero.com/exam>
- Each test consists of 60 questions taken from several pools of questions
- The allotted time for taking the test is 60 minutes
- The minimum score required to pass the test is 80% (48 or more correct answers)
- Each question is presented as a multiple choice question
- All test questions are weighted equally; they all count equally toward the final score
- If you pass the exam, the certification is valid for a period of 2 years from the date of the test

ORGANIZATION OF QUESTIONS

The pools of questions are grouped into the following sections of knowledge:

- Delphi Fundamentals
- Data Types, Variables, and Constants
- Procedures and Functions
- Classes and Objects
- Standards Routines and I/O
- Libraries and Packages
- Object Interfaces
- Memory Management
- Generics, Attributes and Anonymous Methods
- Exceptions and Assertions
- Database Concepts

A random number of questions will be chosen from each section, but there will be at least one question from each section. Embarcadero will not disclose the actual number of questions per section. The exam includes questions that require you to have knowledge of Delphi capabilities up to and including the latest Delphi XE product release.

Please note that some subject areas in the exam might be considered advanced topics, for example, the sections “Libraries and Packages” and “Generics, Attributes and Anonymous Methods”. The exam only covers the fundamental topics for these areas. Thus, an elementary understanding of these advanced topics is necessary to successfully pass the exam.

ABOUT THE CERTIFICATION

The *Delphi Developer Certification* exam tests your general knowledge of Delphi programming concepts. You will be tested on language syntax, programming techniques, using the IDE, and database development. The test will identify you as a special member of the global Delphi community. Developers who use this study guide and have at least 2 years of Delphi programming experience should be able to pass the *Delphi Developer Certification* exam.

This certification may be used as part of an ongoing skills improvement program within a company. Achieving certification may help a developer move forward inside an organization or move into a new job. This certification can be used by a potential employer as one part of a hiring process.

Embarcadero does not certify or represent that the individual has the necessary skills or qualities for a particular project or a particular employer. Since the *Delphi Developer Certification* exam is taken un-proctored and online by the individual, Embarcadero cannot ensure that the individual taking the *Delphi Developer Certification* exam is in fact the actual individual named in the test certification.

TECHNICAL RESOURCES

There are many sources of information that will help you prepare for the *Delphi Developer Certification* exam. These resources include training courses delivered by our training partners, Delphi on-line product documentation, the Embarcadero Developer Network, Delphi programming books, and information on other web sites. A few of these resources are listed below.

TRAINING PARTNERS

- Contact one of our Embarcadero Training Partners if you want to take a training course as part of your preparation for the certification exam - <http://www.embarcadero.com/partners/training>

ON-LINE DOCUMENTATION

To help you more effectively use the on-line documentation as a resource, we recommend you use the following topics as a launching point in your study.

- 1) Review the articles that help you understand the basics of the Delphi Language - http://docwiki.embarcadero.com/RADStudio/en/Delphi_Reference
- 2) Read through the "Steps to Developing a Project" - http://docwiki.embarcadero.com/RADStudio/en/Steps_in_Developing_a_Project
- 3) View the online references, "Designing Database Applications" and "Understanding DataSets" - http://docwiki.embarcadero.com/RADStudio/en/Designing_database_applications_Index and http://docwiki.embarcadero.com/RADStudio/en/Understanding_datasets_Index
- 4) Use the on-line product documentation main Wiki page to review other topics - http://docwiki.embarcadero.com/RADStudio/XE/en/Main_Page

Embarcadero Delphi XE documentation can be obtained from <http://docs.embarcadero.com/>.

The Delphi area of the Embarcadero Developer Network site contains a number of white papers you may find useful for preparing for this test -

<http://edn.embarcadero.com/delphi>.

BOOKS

- *Delphi XE Development Essentials* by Bob Swart - <http://www.lulu.com/product/pocketboek/delphi-xe-development-essentials/13211362>
- *Delphi 2010 Handbook* by Marco Cantu - <http://www.amazon.com/exec/obidos/ASIN/1450597262/marcocantusde-20>
- *Delphi 2009 Handbook* by Marco Cantu - <http://www.amazon.com/Delphi-2009-Handbook-Marco-Cantu/dp/1440480095/>
- *Delphi XE Starter Essentials* by Bob Swart - <http://www.lulu.com/product/paperback/delphi-xe-starter-essentials/14723094>
- *Essential Pascal* by Marco Cantu - <http://www.amazon.com/Essential-Pascal-Marco-Cantu/dp/1440480117/>

DELPHI PROGRAMMING WEB SITES

- Delphi Basics - <http://www.delphibasics.co.uk/>
- About Delphi Programming - <http://delphi.about.com/>
- CodeGear Guru – Delphi Tutorial Videos - <http://codegearguru.com/index.php>
- Delphi Knowledge Base: Language Basics - <http://www.prestwoodboards.com/ASPSuite/KB/browse.asp?tid=189&GroupID=22>
- Delphi Programming Wiki - http://delphi.wikia.com/wiki/Delphi_Wiki

TEST SECTIONS

The following information lists the subject areas that should be studied before taking the certification test. The bulleted lists contain review topics related to each section.

DELPHI FUNDAMENTALS

This section tests your knowledge on the fundamentals of the Delphi Language. To successfully answer questions in this section you will be expected to know the following:

- Delphi XE product capabilities
- Delphi language syntax and reserved words
- The general hierarchy of Delphi programs
- The files types used in a Delphi project
- Procedure, function and variable declarations

DATA TYPES, VARIABLES, AND CONSTANTS

This section tests your knowledge of Delphi's data types, variables and constants. You will be expected to know the following:

- Differences between types, variables and constants
- Declaration syntax
- Delphi data types including pointers
- Records and enumerations
- Arrays and dynamic arrays
- Character and string types – Char/String, AnsiChar / AnsiString, WideChar / WideString, UnicodeString
- Handling sets of characters using RTL functions

PROCEDURES AND FUNCTIONS

This section tests your knowledge of Procedures and Functions. You will be expected to know the following:

- Declaration syntax for procedures and functions
- Procedure and function calling conventions

- Forward, interface and external declarations
- Function and method overloading
- Local and global declarations
- Nested functions and procedures
- Parameters and return values
- Directives

CLASSES AND OBJECTS

This section tests your knowledge of Classes and Objects. You will be expected to know the following:

- Declaration syntax for classes and objects
- Inheritance and scope
- Polymorphism
- Constructors and destructors
- Visibility of class and object members: Public, Private, Protected, Published, Strict Private, Strict Protected, Sealed, Final, Virtual, Static
- Forward declarations and mutually dependent classes

STANDARD ROUTINES AND I/O

This section tests your knowledge of Delphi's standard Run Time Library (RTL) routines and input / output functions. You will be expected to know the following:

- RTL functions including memory allocation and string handling
- Standard input / output Routines (Read, ReadLn, Write, WriteLn)
- File I/O
- Directory manipulation
- I/O error handling

LIBRARIES AND PACKAGES

This section tests your understanding libraries and packages. You will be expected to know the following:

- Creating and using functions in Windows Dynamic Link Libraries (DLLs)
- Package fundamentals such as package structure, naming conventions and using run-time packages
- Understand the contains and requires clauses in a package declaration
- How to avoid circular references
- Localizing your applications using the Integrated Translation Environment (ITE)

OBJECT INTERFACES

This section tests your knowledge of object interfaces. You will be expected to know the following:

- Declaration syntax for interfaces
- The differences between an interface and inheritance
- How to implement interfaces
- How to implement classes based on interfaces

MEMORY MANAGEMENT

This section tests your knowledge of Delphi's memory management support . You will be expected to know the following:

- Using Delphi's memory management functions
- How to configure the memory manager
- Automatic and manual memory management
- Memory allocation for data types, objects/classes, arrays and strings
- Areas of memory – stack and heap
- How to handle memory leaks

GENERIC, ATTRIBUTES AND ANONYMOUS METHODS

This section tests your basic understanding of Generics, Attributes and Anonymous Methods. You will be expected to know the following:

- Declaring generics, attributes and anonymous methods
- The different types of collection classes and when and where to use them

- Using generics and generic constraints
- Using attributes and the extended RTTI (Run Time Type Information)
- Use of Anonymous Methods

EXCEPTIONS AND ASSERTIONS

This section tests your knowledge of exception handling and assertions. You will be expected to know the following:

- Exception and assertion syntax
- Creating an exception handler
- Exception classes
- Raising and re-raising exceptions
- Nested exception handling
- How and when to use silent exceptions: the abort procedure
- Enabling and disabling assertions

DATABASE CONCEPTS

This section tests your general knowledge of Delphi's Database Development concepts. You will be expected to know the following:

- General knowledge of the TDataSet and TFields
- Database drivers and connections
- How the data access components in Delphi work together
- General requirements and usage of the data-aware components
- Methods of the data access components and a general knowledge of the sequence of these methods
- Database "before", "on" and "after" events
- Navigating, creating, inserting, editing, updating and deleting data

SAMPLE QUESTIONS WITH ANSWERS

QUESTIONS

1. In the Delphi language, which symbols or words define the start and end of a code block?
 - a) { }
 - b) []
 - c) start end
 - d) begin end
2. What is the underlying type of the TDateTime type?
 - a) Double
 - b) TObject
 - c) String
 - d) Integer
3. Which of the following is not a valid calling convention for 32-bit Delphi routines?
 - a) register
 - b) dynamic
 - c) stdcall
 - d) cdecl
4. Delphi Package can contain components, non-visual classes, but not forms.
 - a) True
 - b) False

5. In the Delphi language, which symbols or words define the declaration of an attribute?
- a) { }
 - b) < >
 - c) []
 - d) & &
 - e) None of the above
6. In which memory area are local variables and procedure parameters stored?
- a) Stack
 - b) Heap
 - c) Random access area
7. Which generics classes will destroy an object when they are removed from the list, assuming the list owns the object? (Choose all that apply)
- a) TList
 - b) TObjectList
 - c) TDictionary
 - d) TObjectDictionary
8. When working with a large number of records in the dataset, what DataSet method should the application call to prevent data-aware controls from updating every time the active record changes?
- a) BlockUpdate
 - b) DisableControls
 - c) Disable
 - d) None of the above

ANSWERS

1. Correct answer: d. begin end
2. Correct answer: a. Double
3. Correct answer: b. dynamic
4. Correct answer: b. False
5. Correct answer: c. []
6. Correct answer: a. Stack
7. Correct answers: b and d. TObjectList and TObjectDictionary
8. Correct answer: b. DisableControls



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