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For the macromolecular electrostatics modeling software package, see DelPhi. DelphiScreenshot of Delphi 10.4, with the visual form editor being used to create an applicationOriginal author(s)Borland, CodeGear, EmbarcaderoDeveloper(s)Embarcadero TechnologiesStable releaseRAD Studio 11 Alexandria[1] / 9 September 2021; 2 months ago (9 September 2021) Written inMostly Delphi (Object Pascal)Operating systemRuns on Windows 10[2] targets Windows 10, Linux, macOS, Android, & iOSTypeSoftware Development, Designer, IDE, Compiler, & RTLLicenseFreemiumWebsiteembarcadero.com/products/delphi Delphi is a software product that uses the Delphi dialect of the Object Pascal programming language and provides an integrated development environment (IDE) for rapid application development of desktop, mobile, web, and console software,[3] currently developed and maintained by Embarcadero Technologies. Delphi's compilers generate native code for Microsoft Windows, macOS, iOS, Android and Linux (x64).[4][5][6] Delphi includes a code editor, a visual designer, an integrated debugger, a source code control component, and support for third-party plugins. The code editor features Code Insight (code completion), Error Insight (real-time error-checking), and refactoring. The visual forms designer has the option of using either the Visual Component Library (VCL) for pure Windows development or the FireMonkey (FMX) framework for cross-platform development. Database support is a key feature and is provided by FireDAC (Database Access Components). Delphi is known for its fast compilation speed, native code, and developer productivity.[citation needed] Delphi was originally developed by Borland as a rapid application development tool for Windows as the successor of Turbo Pascal. Delphi added full object-oriented programming to the existing language, and the language has grown to support generics, anonymous methods, closures, and native Component Object Model (COM) support. Delphi and its C++ counterpart, C++Builder, are interoperable and jointly sold under the name RAD Studio. There are Professional, Enterprise, and Architect editions, with the higher editions having more features at a higher price. There is also a free-of-charge Community edition, with most of the features of Professional, but restricted to users and companies with low revenue.[7] Features Delphi supports rapid application development (RAD). Prominent features are a visual designer and two application frameworks, VCL for Windows and FireMonkey (FMX) for cross-platform development. Delphi uses the Pascal-based programming language Object Pascal created by Anders Hejlsberg for Borland (now IDERA) as the successor to Turbo Pascal. It supports native cross-compilation to many platforms including Windows, Linux, iOS and Android. To better support development for Microsoft Windows and interoperate with code developed with other software development tools, Delphi supports independent interfaces of Component Object Model (COM) with reference counted class implementations, and support for many third-party components. Interface implementations can be delegated to fields or properties of classes. Message handlers are implemented by tagging a method of a class with the integer constant of the message to handle.[citation needed] Database connectivity is extensively supported through VCL database-aware and database access components. Later versions have included upgraded and enhanced runtime library routines, some provided by the community group FastCode. Characteristics Delphi uses a strongly typed high-level programming language, intended to be easy to use and originally based on the earlier Object Pascal language. Pascal was originally developed as a general-purpose language "suitable for expressing the fundamental constructs known at the time in a concise and logical way", and "its implementation was to be efficient and competitive with existing FORTRAN compilers"[8] but without low-level programming facilities or access to hardware. Turbo Pascal and its descendants, including Delphi, support access to hardware and low-level programming, with the facility to incorporate code written in assembly language and other languages. Delphi's object orientation features only class- and interface-based polymorphism.[9] Metaclasses are first class objects. Objects are actually references to the objects (as in Java), which Delphi implicitly de-references, so there is usually no need to manually allocate memory for pointers to objects or use similar techniques that some other languages need. There are dedicated reference-counted string types, and also null-terminated strings. Strings can be concatenated by using the '+' operator, rather than using functions. For dedicated string types Delphi handles memory management without programmer intervention. Since Borland Developer Studio 2006 there are functions to locate memory leaks. Delphi includes an integrated IDE. The Delphi products all ship with a run-time library (RTL) and a Visual Component Library (VCL), including most of its source code. Third-party components (sometimes with full source code) and tools to enhance the IDE or for other Delphi related development tasks are available, some free of charge. The IDE includes a GUI for localization and translation of created programs that may be deployed to a translator; there are also third-party tools with more features for this purpose. The VCL framework maintains a high level of source compatibility between versions, which simplifies updating existing source code to a newer Delphi version. Third-party libraries typically need updates from the vendor but, if source code is supplied, recompilation with the newer version may be sufficient. The VCL was an early adopter of dependency injection or inversion of control; it uses a re-usable component model, extensible by the developer. With class helpers new functionality can be introduced to core RTL and VCL classes without changing the original source code of the RTL or VCL. The compiler is optimizing and is a single-pass compiler. It can optionally compile to a single executable which does not require DLLs. Delphi can also generate standard DLLs, ActiveX DLLs, COM automation servers and Windows services. The Delphi IDEs since Delphi 2005 increasingly support refactoring features such as method extraction and the possibility to create UML models from the source code or to modify the source through changes made in the model. Delphi has communities on the web, where also its employees actively participate. Backward compatibility Delphi is one of the languages where backward compatibility is close to 100%. Although each new release of Delphi attempts to keep as much backward compatibility as possible to allow existing code reuse, new features, new libraries, and improvements sometimes make newer releases less than 100% backwards compatible. Since 2016, there have been new releases of Delphi every six months, with new platforms being added approximately every second release.[10] Frameworks Delphi offers two frameworks for visual application development, VCL and FireMonkey (FMX): Visual Component Library (VCL) is the framework for developing pure Windows applications. VCL is a long-standing framework, included in the first release of Delphi and actively developed ever since then. FireMonkey (later abbreviated FMX), was released in 2011, as part of Delphi XE2, together with an additional set of built-in compilers for non-Windows platforms. FireMonkey is a cross-platform framework for Windows, macOS, iOS, Android and Linux (x64). The GUI parts of FireMonkey are largely based on Direct3D and OpenGL. FireMonkey is not compatible with VCL; they are two separate frameworks. FireMonkey applications do, however, allow easy sharing of non-visual code units with VCL applications, enabling a lot of code to be ported or shared easily between the platforms. Interoperability Delphi and its C++ counterpart, C++Builder, are interoperable. They share many core components, notably the IDE, the VCL and FMX frameworks, and much of the runtime library. In addition, they can be used jointly in a project. For example, C++Builder 6 and later can combine source code from Delphi and C++ in one project, while packages compiled with C++Builder can be used from within Delphi. In 2007, the products were released jointly as RAD Studio, a shared host for Delphi and C++Builder, which can be purchased with either or both. Starting with Rio, there is also interoperability with Python. History See History of Delphi (software) for details on the progression of language and IDE development from 1995 to the present. Roadmaps Embarcadero publishes "roadmaps" describing their future development plans. The most recent one was published in November 2020.[11] Version 10.5 referred to in the November 2020 roadmap was renamed 11.0. Related software Borland Enterprise Studio, a precursor to RAD Studio, is a software development suite that includes support for multiple languages. Borland Enterprise Studio for Windows supports Delphi.[12] Borland Kylix: Similar to Delphi, but for Linux, released in 2001. This was the first attempt to add Linux support in the Delphi product family.[13] Kylix used the new CLX cross-platform framework (based on QT), instead of Delphi's VCL. Kylix was discontinued after version 3. Today Linux support is integrated into the main Delphi product and uses the FireMonkey cross platform framework. InterBase is an embeddable SQL database that integrates natively to Delphi and C++Builder for client/server or embedded development. It's distinguishing features reduced administration requirements, commercial-grade data security, disaster recovery, and change synchronization. It is also accessible by all major languages and platforms in the market with database connection protocols like ODBC, ADO, ADO.NET and even with Java by JDBC/ODBC Bridge or Java type 4 connectors. JBuilder was a tool for Java development based on Eclipse since version JBuilder 2007. RadPHP (later replaced with HTML5 Builder) was an IDE for PHP that provided true RAD functionality. It has a form designer similar to that of Delphi or Visual Basic, and an integrated debugger based on the Apache web server. It also includes a VCL library ported to PHP. Unlike other IDEs it supports Web 2.0 features such as AJAX. Delphi for PHP was announced on March 20, 2007, renamed on October 2010 to RadPHP, and is based on Qadram Q studio. Embarcadero acquired Qadram in January 2011. Delphi Prism (later known as Embarcadero Prism) derived from the Oxygene programming language (previously known as Chrome) from RemObjects. It ran in the Microsoft Visual Studio IDE rather than RAD Studio. It was licensed and re-branded by Embarcadero to replace Delphi.NET when that product was discontinued. Free Pascal is an open-source Pascal cross-platform cross-compiler that supports most of Delphi's Object Pascal code. Free Pascal also has its own language extensions, multiple compiler [language syntax] modes, and supports 18+ operating systems and 9+ processor architectures.[14] Lazarus is a cross-platform RAD IDE that uses the Free Pascal compiler. Notable third-party libraries FastCode – Enhanced runtime libraries and memory manager. OpenWire (library) – Data flow, events, and state synchronization component library. Project Jedi (joint Endeavor of Delphi Innovators) – A collaborative open-source effort by the Delphi developer community to provide translations of Windows API interfaces, additional components and controls, and algorithms and data structures. Teechart – Charting library. References ^ "Announcing the Availability of RAD Studio 11 Alexandria". 10 September 2021. Retrieved 10 September 2021. ^ "Installation Notes - Operating System Requirements". Retrieved 2020-09-05. ^ William Buchanan (4 February 2003). Mastering Delphi Programming. Palgrave Macmillan. pp. 10–. ISBN 978-1-137-17356-0. ^ "Performance Comparison from Delphi 2010 to XE6 (Part 2)". Riversoft AVG. Retrieved 9 March 2016. ^ "The Delphi Geek: Built For Speed". Retrieved 9 March 2016. ^ "Discussion on Hacker News about Delphi being alive". Hacker News. Retrieved 9 March 2016. ^ "Delphi: App Development Product Editions". Embarcadero. 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