

ReactOS

ReactOS is a free and open-source operating system for amd64/i686 personal computers intended to be binary-compatible with computer programs and device drivers made for Windows Server 2003 and later versions of Windows.^{[7][8]} ReactOS has been noted as a potential open-source drop-in replacement for Windows^{[9][10][11]} and for its information on undocumented Windows APIs.^[12]

ReactOS has been in development since 1996. As of April 2020 it is still considered feature-incomplete alpha software, and is therefore recommended by the developers only for evaluation and testing purposes.^{[13][14]} However, many Windows applications are currently working, such as Adobe Reader 6.0 and OpenOffice.^{[15][16]}

ReactOS is primarily written in C, with some elements, such as ReactOS File Explorer, written in C++. The project partially implements Windows API functionality and has been ported to the AMD64 processor architecture.^[17] ReactOS, as part of the FOSS ecosystem, re-uses and collaborates with many other FOSS projects,^{[18][19]} most notably the Wine project, which presents a Windows compatibility layer for Unix-like operating systems.

Contents

History

- Mission
- Early development
- Ekush OS fork
- Internal audit
- Google Summer of Code participation
- Lobbying for support in Russia
- Funding campaigns
- Thorium Core Cloud Desktop project
- ReactOS Community Edition
- ReactOS Hackfest

Release history

Features

ReactOS



ReactOS 0.4.7 Desktop

Developer	ReactOS Contributors
Written in	C, C++ ^[1]
OS family	Windows-like (aims to be a drop-in replacement of Windows in nearly all cases but is not Windows)
Working state	Alpha
Source model	Open source ^[2]
Initial release	1998
Latest preview	0.4.13 alpha ^{[3][4]} / April 9, 2020 ^[5]
Repository	github.com/reactos /reactos (https://github.com/reactos/reactos)
Marketing target	A free replacement for Microsoft Windows
Update method	CD-ROM ISO image, QEMU image,

<div> <div>Programs</div> <div>Commands</div> <div>Development</div> <div> <div>ReactOS core development</div> <div>Collaboration and reuse</div> <div>Hardware driver stack</div> <div>Networking</div> <div>Wine cooperation</div> <div>Other</div> </div> <div>Forks</div> <div>Reception</div> <div>Awards</div> <div>See also</div> <div>References</div> <div>External links</div> </div>	<div>VirtualBox image, VMware image, or source code^[6]</div> <div>Platforms</div> <div>amd64, i686, ARM</div> <div>Kernel type</div> <div>Hybrid (designed to be compatible with Windows NT family)</div> <div>Default user interface</div> <div>Graphical (ReactOS Explorer)</div> <div>License</div> <div>GPLv2+ with parts under LGPL and BSD licenses</div> <div>Official website</div> <div>www.reactos.org (https://www.reactos.org)</div>
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History

Mission

As formerly stated on the official Web site:

The main goal of the ReactOS project is to provide an operating system which is binary compatible with Windows ... such that people accustomed to the familiar user interface of Windows would find using ReactOS straightforward. The ultimate goal of ReactOS is to allow you to remove Windows and install ReactOS without the end user noticing the change.^[20]

Early development

Around 1996, a group of free and open-source software developers started a project called *FreeWin95* to implement a clone of Windows 95. The project stalled in discussions of the design of the system.

While FreeWin95 had started out with high expectations, there still had not been any builds released to the public by the end of 1997. As a result, the project members, led by coordinator Jason Filby, joined together to revive the project. The revived project sought to duplicate the functionality of Windows NT.^[21] In creating the new project, a new name, *ReactOS*, was chosen. The project began development in February 1998 by creating the basis for a new NT kernel and basic drivers.^[22] The name ReactOS was coined during an IRC chat. While the term "OS" stood for operating system, the term "react" referred to the group's dissatisfaction with — and reaction to — Microsoft's monopolistic position.^[10]



ReactOS 0.3 running the Firefox Web browser

In 2002 the ReactOS Foundation was established in Moscow with Maxim Osowski and Aleksey Bragin as executive officers and Vladimir Bragin, Saveliy Tretiakov and Alexey Ivanov on the board of directors.^[23] In 2015, the foundation was liquidated.^[24]

Ekush OS fork

In 2004, a copyright/license violation of ReactOS GPL code (and other FOSS code) was found when someone distributed a ReactOS fork under the name *Ekush OS*.^{[25][26]} The Web page later disappeared.^[27]

Internal audit

In order to avoid copyright prosecution, ReactOS had to be expressly completely distinct and non-derivative from Windows, a goal that needed very careful work.^[28] A claim was made on 17 January 2006, by now former developer Hartmut Birr on the ReactOS developers mailing list (ros-dev) that ReactOS contained code derived from disassembling Microsoft Windows.^[29] The code that Birr disputed involved the function BadStack in syscall.S,^[30] as well as other unspecified items.^[31] Comparing this function to disassembled binaries from Windows XP, Birr argued that the BadStack function was simply copy-pasted from Windows XP, given that they were identical. Alex Ionescu, the author of the code, asserted that while the Windows XP binary in question was indeed disassembled and studied, the code was not merely copy-pasted, but reimplemented; the reason why the functions were identical, Ionescu claimed, was because there was only one possible way to implement the function.^[32]

On 27 January 2006, the developers responsible for maintaining the ReactOS code repository disabled access after a meeting was held to discuss the allegations. When approached by NewsForge, Microsoft declined to comment on the incident. Since ReactOS is a free and open-source software development project, the claim triggered a negative reaction by the free software community; in particular, Wine barred several inactive developers from providing contributions and formal high level cooperation between the two projects remained difficult as of 2006.^[33] Contributions from several active ReactOS developers have been accepted post-audit, and low level cooperation for bug fixes has been still occurring.

In a statement on its Web site, ReactOS cited differing legal definitions of what constitutes clean-room reverse engineering as a cause for the conflict.^[34] Some countries, including the United States, require that a reimplementation based on disassembled code must be written by someone other than the person having disassembled and examined the original code,^{[35][36]} whereas other countries allow both tasks to be performed by the same individual. Consequently, ReactOS clarified that its Intellectual Property Policy Statement requirements on clean room reverse engineering conform to United States law. An internal source code audit was conducted to ensure that only clean room reverse engineering was used, and all developers were made to sign an agreement committing them to comply with the project's policies on reverse engineering.^[33] Contributors to its development were not affected by these events, and all access to the software development tools was restored shortly afterward. In September 2007, with the audit nearing completion, the audit status was removed from the ReactOS homepage. Though the audit was completed, specific details were not made public, as it was only an internal effort to ensure compliance with the project's own policies.^[37]

Much of the assembly code that was allegedly copied has also been replaced as a natural progression in ReactOS development, by the developers having reimplemented the functionality in C for portability reasons.

Also, the 2004 leaked Windows source code^[38] was not seen as legal risk for ReactOS, as the trade secret was considered indefensible in court due to broad spread.^[39]

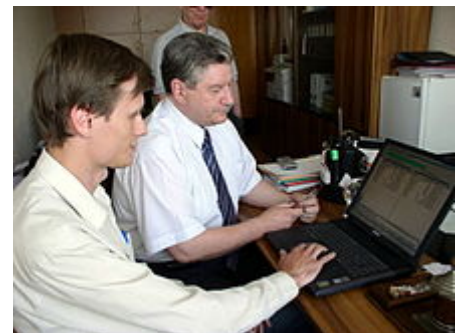
Google Summer of Code participation

Starting in 2006^[40] the ReactOS project participated in several Google Summers of Code. For example, in the GSoC 2011^[41] ReactOS mentored a student project which integrated lwIP into the network stack.^[42] ReactOS has to date participated six times in GSoC: 2006, 2011, 2016, 2017, 2018 and 2019.

Lobbying for support in Russia

Between 2007 and 2015, Russian ReactOS contributors representing the ReactOS Foundation made efforts at lobbying the Russian federal government. As of April 2019, these efforts have not yielded government support to ReactOS, and the Russia-based ReactOS Foundation has been dissolved since November 2015.^[24]

- In 2007, then State Duma member and nationalist hardliner Viktor Alksnis met with project coordinator Aleksey Bragin, who gave a presentation and demonstration of the project, showing ReactOS running with Total Commander and Mozilla Firefox.^[43]
- In 2011 a demonstration was given to then president Dmitry Medvedev during a visit to a high school in Verhnerusskoe, Stavropol, attended by one of the development team members.^[44]
- On 31 July 2012, Vladimir Putin was also given a demonstration during his visit as President of Russia to Seliger Youth Forum, attended by Marat Karatov, one of the development team members.^[45]
- On 1 April 2015, Bragin attended an expert meeting of the Russian Ministry of Communications on reducing Russia's dependency from proprietary software imports. Its minutes name the "creation of an open source operating system based on ReactOS for PCs, laptops and other mobile devices", as well as the "creation an open source operating system for servers based on ReactOS",^{[46][47][48][49]} placing it second among three named proposals.



Former ReactOS project coordinator Aleksey Bragin (left) showing ReactOS to Viktor Alksnis



Prime Minister of Russia Dmitry Medvedev (left) being given a demonstration of ReactOS

Funding campaigns

On 1 May 2012, a €30,000 funding campaign was started to finance additional development projects.^{[50][51]} On the end of the year approximately 50% of the funding goal was achieved and it was decided to continue the funding campaign without deadlines.^[52] The money went to *ReactOS Deutschland e. V.* As the tax law in Germany for this form of a registered voluntary association (*Eingetragener Verein*) makes it problematic to pay developers directly,^[53] indirect possibilities like stipends were evaluated.

Thorium Core Cloud Desktop project

When ReactOS was awarded as Project of the Month on [SourceForge](#) on June 2013, a [crowdfunding](#) campaign on [Kickstarter](#) was announced in an interview with the project's coordinator, Aleksey Bragin.^[54] On 23 December 2013 the announced project was revealed as a Kickstarter campaign with the goal of US\$120,000 was started.^{[55][56]} The *Thorium Core Cloud Desktop* dubbed [cloud computing](#) service would use ReactOS as core and could allow the use of Windows compatible applications from [mobile devices](#) (like [smartphones](#), [tablets](#)), [workstations](#), or any other connected device. On 21 February 2014, fundraising ended short of the target amount, with \$48,965 of \$120,000 raised, resulting in no transferred money.^[57]

ReactOS Community Edition

In April 2014, the ReactOS project announced an [Indiegogo](#) campaign to launch ReactOS Community Edition, a version of ReactOS based on the 0.4 release. The flexible funding campaign had a goal of US\$50,000 with additional stretch goals beyond that.^[58] Development of ReactOS Community Edition would be community-centric, with ReactOS users voting and funding to decide which software and hardware drivers the project will aim to support.^{[59][60]} On 1 June 2014, the flexible crowdfunding campaign on Indiegogo ended, raising \$25,141 for the development of the community edition,^{[61][62]} and the voting process to support hardware and software was started shortly thereafter.^[63]

ReactOS Hackfest

The ReactOS project organized a [hackfest](#) from 7 to 12 August 2015, in the German city of [Aachen](#).^{[64][65][66]} The Hackfest resulted in many features being added to ReactOS.

The second hackfest was organized by the ReactOS project from 14 to 18 August 2017, in the German city of [Cologne](#).^[67]

The third hackfest was organized by the ReactOS project from 16 to 21 August 2018 in [Berlin](#).^[68]



Play media

First video of printing from ReactOS

Release history

System version	Release date	Release information
0.2.0	2004-01-25	First release with working <u>GUI</u>
0.2.1	2004-03-03	Bug fixes only
0.2.2	2004-04-27	Bug fixes only
0.2.3	2004-06-26	New LiveCD image, improved stability in the kernel and win32k, networking improvements and improved shell, command prompt and hardware drivers
0.2.4	2004-09-13	Code synced with Wine, compiler fixes and cleaned up file headers
0.2.5	2005-01-02	Imported Notepad from WINE, added Date/Time application
0.2.6	2005-04-09	NVIDIA OpenGL hardware acceleration works, NCITool created for generating system call database files
0.2.7	2005-08-21	New Command Prompt, My Computer and ReactOS logo icons, improved first-stage installer appearance
0.2.8	2005-10-29	VMware detection, <u>CSRSS</u> rewrite
0.2.9	2005-12-22	Bug fixes only
0.3.0	2006-08-27 ^[69]	First version to officially support networking
0.3.1	2007-03-10 ^[70]	Program manager included, start of kernel rewrite
0.3.2	<i>skipped</i>	Branch created but never released ^[71]
0.3.3	2007-09-12 ^[71]	Kernel and win32k improvements
0.3.4	2008-01-22 ^[72]	Registry support rewrite, remote desktop client and <u>Plug and Play</u>
0.3.5	2008-06-30 ^[73]	Bug fixes only
0.3.6	2008-08-06 ^[74]	RTL support
0.3.7	2008-11-04 ^[75]	Improved <u>x86-64</u> ; MSVC, new stacks
0.3.8	2009-02-04	Introduced PSEH and multi-partition HDD support in LiveCD
0.3.9	2009-04-26 ^[76]	24 MB minimum RAM, faster hyperspace mapping, initial sound support

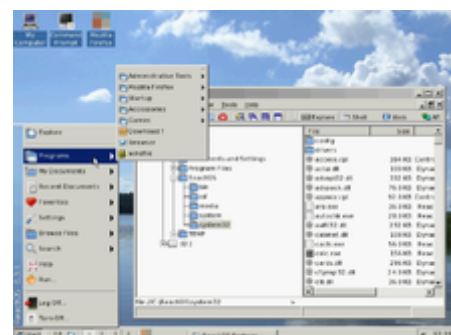
0.3.10	2009-07-05 ^[77]	Initial <u>SATA</u> support, <u>USB</u> keyboard/mouse support, <u>Paint</u> clone, initial <u>MSVC</u> . ^{[78][79]}
0.3.11	2009-12-16 ^[80]	Kdcom rewrite; Chinese/Korean fonts; compatibility updates; sound system improvements
0.3.12	2010-10-20 ^[81]	Trap handler rewrite; timer and message handling rewrite; <u>NMI</u> support; <u>SxS</u> support; partial <u>EMS</u> support ^[82]
0.3.13	2011-03-22 ^[83]	Heap manager rewrite, improved SATA support, fixed graphics issues ^[84]
0.3.14	2012-02-07 ^[85]	ACPI enabled by default, WiFi support (unencrypted and <u>WEP</u>), theme support, new TCP/IP driver (<u>LwIP</u>), <u>MSVC</u> compatibility, <u>Scatter/Gather</u> <u>DMA</u> operations supported, shell32 rewrite ^[86]
0.3.15	2013-05-30 ^[87]	USB support for mice, keyboard, and storage devices; rewritten session management; AHCI support with updated UniATA driver; alternate ReactOS Memory Management Module has taken over all memory management responsibilities except for sections; preliminary support for debugging ReactOS components using <u>WinDbg</u> ; improvements based on results from the <u>AutoHotkey</u> application functionality test suite; Bugfixes based on running Driver Verifier on several bundled drivers ^[88]
0.3.16 ^[89]	2014-02-06 ^[90]	CSRSS rewrite; theme support improved; network card driver for the <u>RTL8139</u> , allowing ReactOS to support newer versions of <u>QEMU</u> out of the box ^[91]
0.3.17 ^[92]	2014-11-05 ^[93]	Inclusion of an <u>NTVDM</u> ; font improvements; ^{[94][95]} bug fixes ^[96]
0.4.0 ^[97]	2016-02-16 ^[98]	Improved USB support, new file explorer shell and theming, improved <u>VirtualBox</u> and <u>Virtual PC</u> support, <u>ext2</u> read/write support, <u>NTFS</u> read support and improved networking support
0.4.1 ^[99]	2016-05-17 ^[100]	Improved Activation Context, <u>Btrfs</u> support, improved Shell, USB bug fixes, support for Virtual Machine Shared Folders
0.4.2	2016-08-16 ^[101]	Improved Btrfs and extended file system support, ReiserFS and <u>UFS/FFS</u> , introduced <u>.NET Framework</u> 2.0 and 4.0 support, Shell fixes and improvements
0.4.3	2016-11-16 ^[102]	New <u>Winsock</u> library, initial sections support, usual bug fixes
0.4.4	2017-02-16 ^[103]	Initial print stack support, minor font fixes, usual improvements and bug fixes
0.4.5	2017-05-18 ^[104]	Improved rendering of fonts and font metrics, major fixes in kernel and drivers, <u>Microsoft Office 2010</u> tested as functioning
0.4.6	2017-09-01 ^[105]	Several fixes for dual-boot issues, improved theming support, <u>NFS</u> driver added, several kernel and filesystem fixes
0.4.7	2017-12-06 ^[106]	Improved version of the applications manager RAPPS, implementation of the "Quick-Launch" toolbar in the explorer; various bug fixes in the filesystem drivers, improvements in the RDBSS/RXCE and NFS support.
0.4.8	2018-	Balloon notifications, notification tray, shell autocompletion, a new NTFS driver, crash dump

	04-14 ^[107]	reporting and experimental support for NT6+ software.
0.4.9	2018-07-23 ^[108]	ReactOS is (again) <u>self-hosting</u> .
0.4.10	2018-11-06 ^[109]	Supports BTRFS booting.
0.4.11	2019-03-04	Drivers for battery management (its icon is located in the taskbar, in the bottom right of the screen, next to the clock). Support for updating an existing ReactOS installation. Improved SATA support.
0.4.12	2019-09-23 ^[110]	Kernel improvements, window-snapping feature, font improvements, Intel e1000 NIC driver, user-mode DLLs, new themes.
0.4.13	2020-04-09 ^[111]	New USB stack, FAT driver from FreeLoader optimized, new software introduced: Accessibility Utility Manager.
Legend: ■ Old version ■ Latest version ■ Latest preview version ■ Future release		

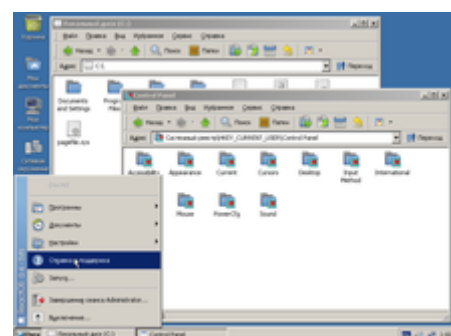
Features

Programs

- ReactOS Explorer (*File Explorer*)
- ReactOS Applications Manager
- Accessories
 - Calculator
 - Command Prompt
 - Notepad
 - Paint
 - WordPad
 - Magnifier
 - On-Screen Keyboard
 - Remote Desktop Connection
 - Multimedia Player (*Media Player*)
 - Sound Recorder
 - Volume Control
 - Character Map
 - Clipboard Viewer
 - FontSub
 - Keyboard Layout Switcher
 - ReactX Diagnostic (*DxDiag*)
 - Registry Editor
 - SnapShot
 - Task Manager



ReactOS 0.3.1 desktop: left Start Menu and right ReactOS's own File Explorer



New shell in ReactOS (v0.4.0 and newer)

- Administrative Tools
 - Device Manager
 - Event Viewer
 - Service Manager (*Windows service*)
 - System Configuration (*MSConfig*)
- Games
 - Solitaire (*Microsoft Solitaire*)
 - Spider Solitaire (*Microsoft Spider Solitaire*)
 - WineMine (*Microsoft Minesweeper*)

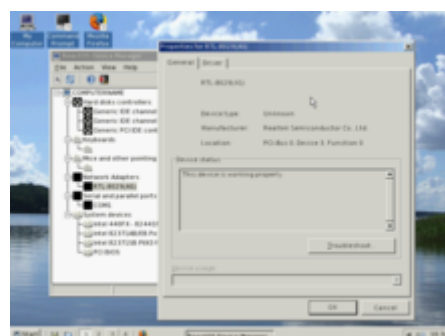


Command Prompt, Notepad, Registry Editor, Solitaire, WineMine and the Run command Dialog

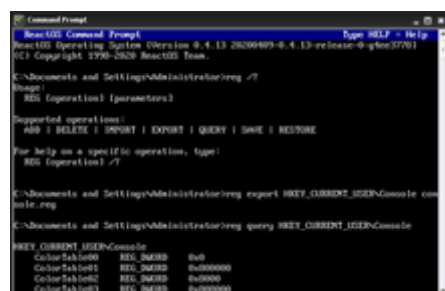
Commands

The following is a non-exhaustive list of commands that are supported by the ReactOS Command Prompt.^{[112][113]}

- | | | | |
|----------------------------------|----------------------|------------------|------------------------------------|
| ■ <u>?</u> | ■ <u>delete</u> | ■ <u>if</u> | ■ <u>sc</u> ^[115] |
| ■ <u>alias</u> | ■ <u>delay</u> | ■ <u>label</u> | ■ <u>schtasks</u> |
| ■ <u>assoc</u> | ■ <u>dir</u> | ■ <u>memory</u> | ■ <u>screen</u> |
| ■ <u>at</u> | ■ <u>dirs</u> | ■ <u>md</u> | ■ <u>set</u> |
| ■ <u>attrib</u> | ■ <u>doskey</u> | ■ <u>mkdir</u> | ■ <u>setlocal</u> |
| ■ <u>beep</u> | ■ <u>echo</u> | ■ <u>mklink</u> | ■ <u>shift</u> |
| ■ <u>cacsls</u> ^[114] | ■ <u>echos</u> | ■ <u>mode</u> | ■ <u>shutdown</u> ^[116] |
| ■ <u>call</u> | ■ <u>echoerr</u> | ■ <u>more</u> | ■ <u>sort</u> |
| ■ <u>cd</u> | ■ <u>echoserr</u> | ■ <u>move</u> | ■ <u>start</u> |
| ■ <u>chdir</u> | ■ <u>endlocal</u> | ■ <u>path</u> | ■ <u>taskkill</u> |
| ■ <u>chcp</u> | ■ <u>eventcreate</u> | ■ <u>pause</u> | ■ <u>time</u> |
| ■ <u>choice</u> | ■ <u>erase</u> | ■ <u>popd</u> | ■ <u>timeout</u> |
| ■ <u>clip</u> | ■ <u>exit</u> | ■ <u>prompt</u> | ■ <u>timer</u> |
| ■ <u>cls</u> | ■ <u>find</u> | ■ <u>pushd</u> | ■ <u>title</u> |
| ■ <u>color</u> | ■ <u>for</u> | ■ <u>rd</u> | ■ <u>tree</u> |
| ■ <u>comp</u> | ■ <u>free</u> | ■ <u>rmdir</u> | ■ <u>type</u> |
| ■ <u>copy</u> | ■ <u>fsutil</u> | ■ <u>reg</u> | ■ <u>ver</u> |
| ■ <u>ctty</u> | ■ <u>goto</u> | ■ <u>rem</u> | ■ <u>verify</u> |
| ■ <u>date</u> | ■ <u>help</u> | ■ <u>ren</u> | ■ <u>vol</u> |
| ■ <u>dbgprint</u> | ■ <u>history</u> | ■ <u>rename</u> | ■ <u>whoami</u> |
| ■ <u>del</u> | ■ <u>hostname</u> | ■ <u>replace</u> | ■ <u>xcopy</u> |



Device Manager in ReactOS 0.3.1



The ReactOS reg command

Development

ReactOS core development

ReactOS is primarily written in C, with some elements, such as ReactOS Explorer and the sound stack, written in C++. The project compiles using both MinGW and Microsoft Visual Studio, and contributes to the development of the build systems used through the submission of patches to its components.^[117]

The developers aim to make the kernel and usermode application programming interface (API) more compatible with Windows NT version 5.2 (Windows Server 2003) and to add support for more applications and hardware, with plans to target newer versions of Windows as development matures.^[118] DirectX support is undertaken through ReactX, an in-house implementation. 2D hardware-accelerated rendering is done natively, while other drawing functionality is redirected to OpenGL as a stopgap solution.^[17]

The development progress is influenced by the size of the development team and the level of experience among them. As an estimate of the effort required to implement Windows 7, Microsoft employed 1,000 or so developers, organized into 25 teams, with each team averaging 40 developers.^[119] As of 2 September 2011, in the ReactOS entry in Ohloh, the page followed through the "Very large, active development team" link lists 33 developers who have contributed over a 12-month period and a cumulative total of 104 present and former users who have contributed code to the project via Apache Subversion since its inception.^[120] In his presentation at Hackmeeting 2009 in Milan, ReactOS developer Michele C. noted that most of the developers learn about Windows architecture while working on ReactOS and have no prior knowledge.^[121]

While ReactOS targets currently mainly the x86/AMD64 PC platform,^[122] an effort to port to the ARM architecture was at one point "under way",^[17] while it did not produce much functionality and was abandoned.^[123] Support for the Xbox, a variant IA-32 architecture, was added through the use of an architecture-specific HAL,^[121] although this, along with a port to PowerPC, are no longer actively maintained^[13]. It is worth noting that improved 64-bit support for ReactOS is "being worked on", however, development seems to be going slowly.^[124]

Collaboration and reuse

While ReactOS has the aim to build a Windows-compatible kernel as open-source software, much of the surrounding required functionality to create a complete OS is already available in the greater open-source ecosystem. When available and possible, ReactOS therefore builds on and collaborates with already existing open-source projects.^[18] Conversely, projects like Wine,^[19] and formerly Captive NTFS^[125] and Longene re-use the open-source ReactOS code-base as well.^[126]

Hardware driver stack

On the hardware driver side, for instance the UniATA project provides Serial ATA drivers for ReactOS.^{[14][127]} The project has also experimented with using the FullFAT library in its rewrite of its FAT Installable File System.^[128] ReactOS makes use of the USB stack from Haiku both as a reference and as a foundation for its USB support.^{[129][130]} Mesa 3D provides OpenGL rendering.^{[14][117]}

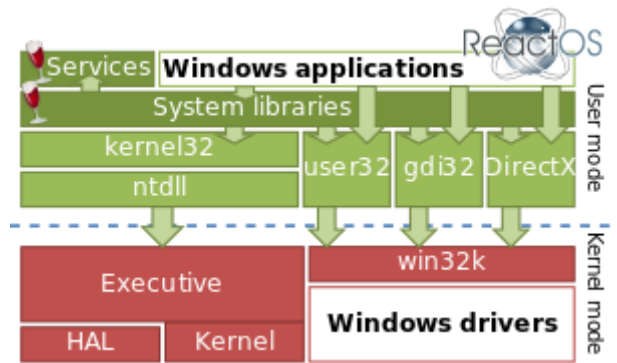
Networking

ReactOS's network stack is built on the TCP portion of OSKit's port of the network stack in FreeBSD, along with an internally developed implementation for packet-oriented protocols like IP.^[131] Later, lwIP was integrated into the ReactOS network stack.^[42] Windows network services like LSASS, SAM, NETLOGON, and print spooling are already available as open-source alternative by the Samba/Samba TNG project. A fork of rdesktop is used as an implementation of a client software for Microsoft's proprietary Remote Desktop Protocol.

Wine cooperation

The ReactOS and the Wine projects share the goal to run binary Windows software natively and can therefore share many dependencies and development.^{[19][132]} ReactOS uses portions of the Wine project so that it can benefit from Wine's progress in implementing the Win32 API.^[132] While Wine's NTDLL, USER32, KERNEL32, GDI32, and ADVAPI32 components cannot be used directly by ReactOS due to architectural differences, code snippets of them and other parts can be shared between both projects. The kernel is developed by ReactOS separately as Wine relies here on existing Unix-like kernels.^{[117][121]}

Separately, the experimental *Arwinss* branch was created as an alternative means to improve USER32 and GDI32 support through an alternative implementation of the Win32 API. Whereas ReactOS's original Win32 subsystem was closely modeled after its equivalent in Windows, Arwinss combines the architecture of that subsystem with the corresponding implementation in Wine. To this end, Arwinss uses Wine's GDI32 and USER32 libraries with few changes to take fuller advantage of Wine's existing software compatibility. Arwinss also allows the user to optionally use a remote X server instead of a local display.^[133]



A simplified architecture diagram of ReactOS, with Wine dependencies indicated by the Wine logo. White boxes denote third-party binary software. Green boxes are "userland" components, red are kernel components.

Other

The Tango Desktop Project initiative provides open-source design guidelines and resources (as icons) for applications on desktop environments. FreeType is an open-source software development library, used to render text on to bitmaps and provides support for other font-related operations.^[14] The *KernelEx* project is a Windows-API extension and compatibility layer project, which provides open-source implementations of some Windows-APIs.^[134] Other contributing projects are MinGW, SYSLINUX, adns, ICU, GraphApp, Ext2, GNU FreeFont, DejaVu fonts, and Liberation fonts.^{[135][136][137]}

Forks

Forks based on ReactOS are occasionally created:

- Ekush OS (2004)^{[25][26][27]}
- ReactOS Server (2008-2013) ^{[138][139]}
- OpenROS (2013)^[140]
- FusionOS (2013)^[141]
- ReactOS NG (2015) – aiming for compatibility with Windows 8^[142]
- Greentea OS (2016-2019) – aiming for accelerated and simplified development^[143]

Reception

Various people have acknowledged ReactOS and the implications of having a viable open-source drop-in replacement for Windows.^[10] A 2004 article and interview of the German weekly magazine *Der Spiegel* describes ReactOS as directed at Windows users who want to renounce use of proprietary commercial

software without having to switch to Linux.^[10] DistroWatch, a Linux distribution's monitoring Web site, also lists ReactOS and describes it as "a free and open-source operating system based on the best design principles found in the Windows NT architecture."^[144]

In his column for Free Software Magazine, David Sugar noted in 2006 that ReactOS would allow the use of applications depending on older versions of Windows whose APIs have been deprecated. He also recognized its potential to expand the total deployed base of free software, and as a resource for developers wanting to know undocumented Windows APIs in the course of writing portable applications.^[12] PC Magazine columnist John C. Dvorak remarked in 2008 that the Windows NT architecture had remained largely unchanged, making it an ideal candidate for cloning, and believed that ReactOS could be "a bigger threat than Linux to Microsoft's dominance".^[11] In response to Dvorak's column, ZDNet technology journalist Dana Blankenhorn noted in 2008 that a lack of corporate sponsors and partners had rendered the project harmless to Microsoft.^{[145][146]} Echoing this, Thom Holwerda of OSNews in 2009 categorized ReactOS under a family of hobby operating systems maintained only by small groups of developers working in their spare time, lacking the financial support of more mainstream operating systems and the legacy of formerly mainstream ones such as RISC OS.^[147]

In October 2015, a Network World review of ReactOS v0.3.17 noted "It's just like running Windows 2000" and praised the application package manager, a feature the original Windows is missing.^[148]

Jesse Smith from DistroWatch Weekly reviewed ReactOS v0.4.9, and noted that ReactOS "ultimately had a similar problem: limited hardware support" and is not yet a stable operating system.^[149]

Awards

The ReactOS Project won on the annual Seliger Youth Forum "The Best Presentation" award with 100,000 Russian rubles (~US\$2700) in 2011, attended by Alexander Rechitskiy, one of the development team members.^[150]

ReactOS was a featured project on SourceForge for the weeks beginning on 27 February 2012, 25 April 2013,^[151] and several others. It was Project of the Month on SourceForge for June 2013.^[152]

See also

- Binary-code compatibility
- coLinux, a project allowing Microsoft Windows and the Linux kernel to run simultaneously in parallel on the same machine
- FreeDOS, a clone of MS-DOS
- Longene, a hybrid operating system kernel intended to be binary-compatible with both the Microsoft Windows and Linux ecosystems
- NDISwrapper, a re-creation of Windows NT kernel parts inside the Linux Kernel to allow the use of Windows drivers in Linux
- Wine, a compatibility layer that runs Microsoft Windows applications on Unix-like operating systems
- List of alternative shells for Windows
- Timelines of: Intel / Microsoft / Microsoft Windows / other operating systems (List)
- Comparison of operating systems

References

1. "ReactOS on Open Hub" (https://www.openhub.net/p/reactos/analyses/latest/languages_summary). *openhub.net*. Black Duck Open Hub. Retrieved 24 October 2014.
2. "ReactOS on GitHub" (<https://github.com/reactos/reactos>). Retrieved 27 April 2019.
3. <https://sourceforge.net/projects/reactos/files/ReactOS/>
4. https://reactos.org/wiki/Installing_ReactOS
5. "ReactOS 0.4.13 released" (<https://reactos.org/project-news/reactos-0413-released>). *ReactOS Project*. ReactOS Foundation. 9 April 2020. Retrieved 9 April 2020.
6. "Download | ReactOS Project" (<https://www.reactos.org/download>). *www.reactos.org*. Retrieved 28 July 2017.
7. Holwerda, Thom (5 March 2009). "ReactOS Targets Windows 2003, Vista" (<https://www.osnews.com/story/21087/reactos-targets-windows-2003-vista/>). *OSNews*. Retrieved 18 April 2019.
8. vicmarcal (14 April 2018). "ReactOS 0.4.8 released!!" (<https://www.reactos.org/project-news/reactos-048-released>). *ReactOS.org Project News* (Corporate blog). Archived (<https://archive.today/20180416011852/https://www.reactos.org/project-news/reactos-048-released>) from the original on 16 April 2018. Retrieved 8 July 2018. "With software specifically leaving NT5 behind, ReactOS is expanding its target to support NT6+ (Vista, Windows 8, Windows 10) software."
9. Stahl, Louis-F. (23 June 2015). "Russland erklärt ReactOS zu favorisierter Windows-Alternative" (<https://www.heise.de/newsticker/meldung/Russland-erklaert-ReactOS-zu-favorisierter-Windows-Alternative-2722495.html>). *heise online*. Retrieved 18 April 2019.
10. Sixtus, Von Mario (20 February 2004). "ReactOS: Das Nicht-Windows" (<http://www.spiegel.de/netzwelt/tech/0,1518,287199,00.html>) (in German). *Spiegel Online*. Retrieved 11 December 2009.
11. Dvorak, John C. (4 April 2008). "What A New OS Needs" (<https://www.pcmag.com/article2/0,2817,2290313,00.asp>). *PC Magazine*. Retrieved 11 December 2009.
12. Sugar, David (<http://www.freesoftwaremagazine.com/user/15>) (31 January 2006). "A reaction to ReactOS" (<https://web.archive.org/web/20070810113707/http://www.freesoftwaremagazine.com/node/1474>). *Free Software Magazine*. Archived from the original (<http://www.freesoftwaremagazine.com/node/1474>) on 10 August 2007. Retrieved 11 December 2009.
13. Kupfer, Matthias; Bragin, Aleksey (14 March 2010). *ReactOS — Das zu Windows binärkompatible Open-Source-Betriebssystem* (<http://chemnitzer.linux-tage.de/2010/vortraege/detail.html?idx=424>). *Chemnitzer Linux-Tage* (<http://chemnitzer.linux-tage.de/2010/info/>) (in German). Chemnitz, Germany. Retrieved 15 March 2010.
14. Royal, Simon (16 February 2014). "ReactOS: A Windows Compatible Alternative OS" (<http://lowendmac.com/2014/reactos-a-windows-compatible-alternative-os/>). *lowendmac.com*. Retrieved 10 January 2016. "While the main core of ReactOS is built from scratch, it has some dependencies on existing software and protocols. It uses parts of Wine, networking in the form of lwIP, USB from Haiku, as well as FreeType, Mesa3D, and UniATA."
15. Thom Holwerda (14 November 2007). "ReactOS Gets OpenOffice.org 2 Support; New Release Plans" (http://www.osnews.com/story/18921/ReactOS_Gets_OpenOffice_org_2_Support_New_Release_Plans). *OSNews*.
16. [Tests_for_0.4.4](https://www.reactos.org/wiki/Tests_for_0.4.4) (https://www.reactos.org/wiki/Tests_for_0.4.4) on reactos.org (February 2017)
17. Holwerda, Thom (17 January 2009). "ReactOS: Looking Back Upon 2008" (<https://www.osnews.com/story/20790/reactos-looking-back-upon-2008/>). *OSNews*. Retrieved 18 April 2019.
18. "ReactOS gets USB Stack, with Help from Us" (http://haiku-os.org/news/2012-02-20_reactos_gets_usb_stack_help_us). *Haiku*. 20 February 2012. Retrieved 2 January 2016. "The ReactOS and Haiku projects have had a friendly working relationship for several years now, with each group helping the other whenever possible."

19. Vincent, Brian (15 May 2004). "Interview with Steven Edwards" (<https://www.winehq.org/interview/14>). winehq.com. Retrieved 6 January 2016. *"BV: Wine and ReactOS have had a mutually beneficial relationship. Is there anything Wine could do different that would help ReactOS development?[...] BV: You guys have certainly contributed a lot of your work back to Wine, including some of the utilities you've written. For instance, the task manager was recently ported from ReactOS. Do you guys have any plans in the works for developing more tools? Steven: I really want to see a solitaire clone make it in to Wine and ReactOS.[...] At some point we are going to have to develop replacement components for everything in Windows so if there is a program that Wine needs and ReactOS implements it then I will try to make sure it's released under a compatible license."*
20. "Frontpage" (<https://web.archive.org/web/20120920030447/http://www.reactos.org/en/index.html>). ReactOS Web-page. ReactOS Foundation. Archived from the original (<https://www.reactos.org/en/index.html>) on 20 September 2012. Retrieved 23 June 2013.
21. Loli, Eugenia (16 October 2001). "Interview with Jason Filby from the ReactOS Project" (<http://www.osnews.com/story/178/interview-with-jason-filby-from-the-reactos-project/>). OSNews. Retrieved 18 April 2019.
22. Loschwitz, Martin (March 2004), "Projects on the Move" (https://web.archive.org/web/20110519211406/https://www.linux-magazine.com/w3/issue/40/Free_Software_Projects.pdf) (PDF), *Linux Magazine*, p. 87, archived from the original (https://www.linux-magazine.com/w3/issue/40/Free_Software_Projects.pdf) (PDF) on 19 May 2011, retrieved 18 November 2009
23. "ReactOS Foundation — ReactOS Wiki" (https://www.reactos.org/wiki/ReactOS_Foundation). *www.reactos.org*. Retrieved 6 March 2019.
24. "ФОНД АКТИВИЗАЦИИ КИБЕРПРОСТРАНСТВА, ФАК, РЕАКТОС — ФОНД, ФОНД РЕАКТОС, г. Саранск: ИНН: 1328170012, ОГРН: 1021301112876" (<https://egrulinfo.com/8583363/>). *egrulinfo.com*. Retrieved 18 April 2019.
25. Ekush Emulator and Its License Pains (http://www.osnews.com/story/8830/Ekush_Emulator_And_its_License_Pains) on OSNews by Eugenia Loli (10 November 2004)
26. Ekush OS – stolen source code/copyright violation (<https://web.archive.org/web/20041114021115/http://blight.eu.org/reactos/ekush.html>) (archived 2004)
27. Ekush The Next Generation Operating System (<https://web.archive.org/web/20040918235716/http://www.akshor.com>) on akshor.com (archived 2004)
28. Hancock, Terry (29 August 2008). "What if copyright didn't apply to binary executables?" (http://www.freesoftwaremagazine.com/articles/what_if_copyright_didnt_apply_binary_executables). Free Software Magazine. Retrieved 25 January 2016. *"(...) ReactOS aims to run actual Windows binary executable programs. This means that ReactOS must implement the entire Windows environment. Functions must do exactly what their Windows counterparts would do. In other words, like our notional parallel stew recipes, ReactOS and Windows should be functionally identical. In order to avoid copyright prosecution, though, ReactOS must be expressly completely distinct and non-derivative from Windows. This is a careful tightrope walk! ReactOS is a free, clean room re-implemented drop-in replacement for Windows. So, consider this, especially regarding extremely simple library calls: is it legal for ReactOS to produce identical binary code to Windows?"*
29. Birr, Hartmut (18 January 2006). "Bye bye" (<http://marc.info/?l=ros-dev&m=118775346131642&w=2>). *ros-dev* (Mailing list). Retrieved 3 January 2009.
30. "BadStack in syscall.S" (<https://web.archive.org/web/20170904111000/https://svn.reactos.org/svn/reactos/trunk/reactos/ntoskrnl/ke/i386/syscall.S?revision=20935&view=markup&pathrev=20935#l43#l43>). ReactOS. 17 January 2006. Archived from the original (<https://svn.reactos.org/svn/reactos/trunk/reactos/ntoskrnl/ke/i386/syscall.S?revision=20935&view=markup&pathrev=20935#l43>) on 4 September 2017. Retrieved 4 August 2018.
31. Birr, Hartmut (18 January 2006). "Bye bye" (<http://marc.info/?l=ros-dev&m=118775346131646&w=2>). *ros-dev* (Mailing list). Retrieved 16 November 2009.

32. Ionescu, Alex (18 January 2006). "Bye bye" (<http://marc.info/?l=ros-dev&m=118775346131654&w=2>). *ros-dev* (Mailing list). Retrieved 16 November 2009.
33. Feller, Stephen (1 February 2006). "ReactOS suspends development for source code review" (<http://www.linux.com/archive/feature/51800>). *Linux.com*. Retrieved 10 December 2009.
34. Reset, Reboot, Restart, legal issues and the long road to 0.3 (<https://www.reactos.org/reset-reboot-restart-legal-issues-and-long-road-03>) on reactos.org by Steven Edwards (27 January 2006)
35. Schwartz, Mathew (12 November 2001). "Reverse-Engineering" (http://www.computerworld.com/s/article/65532/Reverse_Engineering?pageNumber=1). *Computerworld.com*. Retrieved 23 June 2013. *"To protect against charges of having simply (and illegally) copied IBM's BIOS, Phoenix reverse-engineered it using what's called a "clean room," or "Chinese wall", approach. First, a team of engineers studied the IBM BIOS — about 8KB of code — and described everything it did as completely as possible without using or referencing any actual code. Then Phoenix brought in a second team of programmers who had no prior knowledge of the IBM BIOS and had never seen its code. Working only from the first team's functional specifications, the second team wrote a new BIOS that operated as specified."*
36. Hogle, Sean (23 October 2008). "Clean Room Defeats Software Infringement Claim in US Federal Court" (<http://hoviblog.blogspot.de/2008/10/clean-room-defeats-software.html>). Retrieved 23 May 2013. *"[...] dirty room reverse engineering should be done in conjunction with clean room development by using two physically and electronically isolated teams where one team does dirty room reverse engineering and the other does clean room development. If a dirty room team exists, the clean room engineers can write a description of the portion of the specification that needs elaboration or clarification. The dirty room engineers then use that request to create additional functional specifications or tests."*
37. Bragin, Aleksey (18 September 2007). "Audit" (<http://marc.info/?l=ros-dev&m=119018479822866&w=2>). *ros-dev* (Mailing list). Retrieved 3 January 2009.
38. Windows Code May Be Stolen (<http://www.pcworld.com/article/114771/article.html>) on *PC World* by Joris Evers (February 2004)
39. Reset, Reboot, Restart, legal issues and the long road to 0.3 (<https://www.reactos.org/reset-reboot-restart-legal-issues-and-long-road-03>) *"Now as for the issue of leaked source code, I want to try to put all fears to rest. We don't know what the legal ramifications are for someone downloading and having leaked code, as the party that maintains copyright ownership of that code might still try to claim Trade Secrecy on information contained in the sources in a court of law. It is our point of view that the source code leaks of Windows have been spread to a broad enough audience that it would be impossible to claim the product is still under Trade Secrecy."* on reactos.org by Steven Edwards (27 January 2006)
40. "Google Summer of Code 2006" (<https://developers.google.com/open-source/soc/2006/#reactos>). "This is a page lists the students and organizations that participated in the Google Summer of Code 2006 program. [...] ReactOS"
41. "TCP/IP driver replacement for ReactOS, using lwIP" (https://web.archive.org/web/20120321144810/http://www.google-melange.com/gsoc/project/google/gsoc2011/claudiu_mihail/8001). Archived from the original (http://www.google-melange.com/gsoc/project/google/gsoc2011/claudiu_mihail/8001) on 21 March 2012. Retrieved 9 August 2011.
42. Gutman, Cameron (7 August 2011). "ReactOS is now using lwIP for TCP" (<http://lists.nongnu.org/archive/html/lwip-devel/2011-08/msg00010.html>). *lwip-devel* (Mailing list). Retrieved 9 August 2011.
43. Alksnis, Viktor (6 June 2007). "Виктор Имантович Алкснис – Знакомство с проектом ReactOS" (<http://v-alksnis2.livejournal.com/32900.html>) (in Russian). Retrieved 11 December 2009.
44. "Russian President Medvedev asked to fund Windows clone" (<https://www.bbc.co.uk/news/technology-14899507>). *BBC News*. 13 September 2011. Retrieved 15 September 2011.

45. Z98 (5 August 2012). "ReactOS Presented to President Putin" (<http://www.reactos.org/reactos-presented-president-putin>). *ReactOS News*. Retrieved 23 June 2013.
46. Minutes of the expert evaluation of projects on import substitution infrastructure software according to paragraph 4-8 of import substitution plan software, approved by order of the Ministry of Communications of Russia from 1 April 2015 №96 «On approval of import software" (<http://minsvyaz.ru/ru/documents/4662/>) Russian Ministry of Communications "Direction "client operating system / Server Operating Systems" 1st place — the project "Corporate platform on the basis of domestic operating systems" [...] 2nd place — the project "Creation of the operating system open source based on ReactOS for PCs, laptops and other mobile devices," "Creating the operating system open source-based server ReactOS" (Fund "Reaktos" MSTU. AN Bauman, LLC "Paral Plelz Research" and others.)." (2 June 2015, translated (https://translate.google.de/translate?sl=ru&tl=en&js=y&prev=_t&ie=UTF-8&u=http%3A%2F%2Fminsvyaz.ru%2Fru%2Fdocuments%2F4662%2F&edit-text=)))
47. "ReactOS as a second OS in Russian government's software freedom effort | ReactOS Project" (<https://www.reactos.org/project-news/reactos-second-os-russian-governments-software-freedom-effort/>). *www.reactos.org*. Retrieved 6 April 2019.
48. Russland-erklärt-ReactOS-zu-favorisierter-Windows-Alternative (<http://www.heise.de/newsticker/meldung/Russland-erklärt-ReactOS-zu-favorisierter-Windows-Alternative-2722495.html>) on *heise online* by Louis-F. Stahl (23 June 2015, in German)
49. Russland macht ReactOS zu bevorzugter Windows-Alternative (<http://derstandard.at/2000017947663/Russland-macht-ReactOS-zur-bevorzugten-Windows-Alternative>) on *Der Standard* (24 June 2015, in German)
50. Oliver Diedrich (3 May 2012). "ReactOS: Spenden gesucht" (<http://www.heise.de/open/meldung/ReactOS-Spenden-gesucht-1567379.html>). *heise.de* (in German).
51. A personal appeal from ReactOS Project Coordinator Aleksey Bragin (<http://www.reactos.org/archives/public/ros-general/2012-May/002810.html>), accessed on 15 April 2013
52. Spenderliste (http://old.reactos.org/de/foundation_donators.html) Archived (https://web.archive.org/web/20131230234231/http://old.reactos.org/de/foundation_donators.html) 30 December 2013 at the *Wayback Machine* 24 December 2012, accessed on 15 April 2013 (in German)
53. "January 2013 Meeting Minutes" (<https://web.archive.org/web/20130403104658/http://reactos.org/january-2013-meeting-minutes>). 7 February 2013. Archived from the original (<https://reactos.org/january-2013-meeting-minutes>) on 3 April 2013. Retrieved 19 June 2013. "Late last year the German foundation learned that the contracts it was issuing for developers might not be compliant with German regulations involving non-profits. Due to this, the German foundation needed to temporarily halt payment to developers and consult with tax attorneys to determine how to proceed in a compliant manner."
54. "Sourceforge POTM June 2013" (<http://sourceforge.net/blog/potm-201306/>). *Sourceforge.com*. 17 June 2013. Retrieved 17 June 2013. "Well I don't want to spread too many rumors, but I can say that we do have something in the works. If all goes well, it's going to be announced within a week. While I cannot go into too many details, I can say that it involves Kickstarter and what we believe to be a viable commercial product based off of ReactOS."
55. ReactOS Wants To Bring Open-Source Windows To The Cloud (https://www.phoronix.com/scan.php?page=news_item&px=MTU3OTY) on *Phoronix* by Michael Larabel (22 January 2014)
56. Oliver Diedrich (21 January 2014). "ReactOS: Freier Windows-Klon braucht Unterstützung]" (<http://www.heise.de/open/meldung/ReactOS-Freier-Windows-Klon-braucht-Unterstuetzung-2090408.html>). *heise.de* (in German).
57. Aleksey Bragin; Steven Edwards (23 December 2013). "Thorium Core Cloud Desktop" (<http://www.kickstarter.com/projects/thorium/thorium-core-cloud-desktop>). *Kickstarter.com*. Retrieved 8 April 2014.
58. Torsten Kleinz (8 April 2014). "XP ist tot, es lebe Windows" (<http://www.zeit.de/digital/internet/2014-04/reactos-alternative-windows-xp>) [XP is dead, long live Windows]. *Die Zeit* (in German).

59. [ReactOS Working On A Community Windows OS \(https://www.phoronix.com/scan.php?page=news_item&px=MTY2Nzk\)](https://www.phoronix.com/scan.php?page=news_item&px=MTY2Nzk) on [Phoronix](#) by [Michael Larabel](#) (19 April 2014)
60. [Silviu Stahie \(4 April 2014\). "ReactOS goes to Indiegogo, will run Windows apps natively" \(http://news.softpedia.com/news/ReactOS-Goes-to-IndieGogo-Will-Run-Windows-and-Linux-Apps-Natively-435797.shtml\)](http://news.softpedia.com/news/ReactOS-Goes-to-IndieGogo-Will-Run-Windows-and-Linux-Apps-Natively-435797.shtml). [softpedia.com](#). Retrieved 8 April 2014.
61. Hoffman, Chris (14 November 2014). ["Why prominent 'hobbyist' operating systems face an existential crisis" \(http://www.pcworld.com/article/2847723/why-prominent-hobbyist-operating-systems-face-an-existential-crisis.html\)](http://www.pcworld.com/article/2847723/why-prominent-hobbyist-operating-systems-face-an-existential-crisis.html). [PCWorld](#). Retrieved 29 December 2015. "ReactOS raised more than \$25,000 in an Indiegogo crowdfunding campaign earlier in 2014, for the development of a community edition of the operating system."
62. [reactos-community-edition \(https://www.indiegogo.com/projects/reactos-community-edition\)](https://www.indiegogo.com/projects/reactos-community-edition) on [Indiegogo](#) (1 June 2014)
63. [ReactOS: Große Fortschritte und Stipendien für Entwickler beim freien Windows-Nachbau \(http://www.heise.de/open/artikel/ReactOS-Grosse-Fortschritte-und-Stipendien-fuer-Entwickler-bei-m-freien-Windows-Nachbau-2410783.html\)](http://www.heise.de/open/artikel/ReactOS-Grosse-Fortschritte-und-Stipendien-fuer-Entwickler-bei-m-freien-Windows-Nachbau-2410783.html) on [heise.de](#) by Louis-F. Stahl (2 October 2014, in German)
64. [Russland-erklärt-ReactOS-zu-favorisierter-Windows-Alternative \(http://www.heise.de/newsticker/meldung/Russland-erklaert-ReactOS-zu-favorisierter-Windows-Alternative-2722495.html\)](http://www.heise.de/newsticker/meldung/Russland-erklaert-ReactOS-zu-favorisierter-Windows-Alternative-2722495.html) on [heise online](#) by Louis-F. Stahl "Einen weiteren Schub in der Entwicklung erhofft sich die ReactOS-Community vom ersten ReactOS Hackfest, das vom 7. bis zum 12. August 2015 in Aachen stattfindet." (23 June 2015, in German)
65. [Russland macht ReactOS zu bevorzugter Windows-Alternative \(http://derstandard.at/2000017947663/Russland-macht-ReactOS-zur-bevorzugten-Windows-Alternative\)](http://derstandard.at/2000017947663/Russland-macht-ReactOS-zur-bevorzugten-Windows-Alternative) on [Der Standard](#) "Von 7. bis 12. August lädt die Entwicklergemeinde in Deutschland zum ersten ReactOS-Hackfest, das in Aachen über die Bühne gehen wird." (24 June 2015, in German)
66. ["ReactOS Hackfest in Aachen" \(https://www.reactos.org/project-news/reactos-hackfest-aachen\)](https://www.reactos.org/project-news/reactos-hackfest-aachen). [ReactOS](#). 1 September 2015. Retrieved 18 April 2019.
67. ["ReactOS Hackfest 2017" \(https://reactos.org/wiki/ReactOS_Hackfest_2017\)](https://reactos.org/wiki/ReactOS_Hackfest_2017). [ReactOS Wiki](#). Retrieved 18 April 2019.
68. ["ReactOS Hackfest 2018" \(https://reactos.org/wiki/ReactOS_Hackfest_2018\)](https://reactos.org/wiki/ReactOS_Hackfest_2018). [ReactOS Wiki](#). Retrieved 18 April 2019.
69. ["ReactOS 0.3.0 Released!" \(https://reactos.org/project-news/reactos-030-released/\)](https://reactos.org/project-news/reactos-030-released/). [reactos.org](#). Retrieved 25 April 2020.
70. ["ReactOS 0.3.1 Released" \(https://reactos.org/project-news/reactos-031-released/\)](https://reactos.org/project-news/reactos-031-released/). [reactos.org](#). Retrieved 25 April 2020.
71. ["ReactOS 0.3.3 Released!" \(https://reactos.org/project-news/reactos-033-released/\)](https://reactos.org/project-news/reactos-033-released/). [reactos.org](#). Retrieved 25 April 2020.
72. ["ReactOS 0.3.4 Released" \(https://reactos.org/project-news/reactos-034-released/\)](https://reactos.org/project-news/reactos-034-released/). [reactos.org](#). Retrieved 25 April 2020.
73. ["ReactOS 0.3.5" \(https://reactos.org/project-news/reactos-035/\)](https://reactos.org/project-news/reactos-035/). [reactos.org](#). Retrieved 25 April 2020.
74. ["ReactOS 0.3.6" \(https://reactos.org/project-news/reactos-036/\)](https://reactos.org/project-news/reactos-036/). [reactos.org](#). Retrieved 25 April 2020.
75. ["ReactOS 0.3.7" \(https://reactos.org/project-news/reactos-037/\)](https://reactos.org/project-news/reactos-037/). [reactos.org](#). Retrieved 25 April 2020.
76. ["ReactOS 0.3.9 Released" \(https://reactos.org/project-news/reactos-039-released/\)](https://reactos.org/project-news/reactos-039-released/). [reactos.org](#). Retrieved 25 April 2020.
77. ["ReactOS 0.3.10 Released" \(https://reactos.org/project-news/reactos-0310-released/\)](https://reactos.org/project-news/reactos-0310-released/). [reactos.org](#). Retrieved 25 April 2020.


78. "ReactOS 0.3.10" (<https://web.archive.org/web/20091212140506/http://osrevolution.com/os-release/reactos-0-3-10>). OS Revolution. Archived from the original (<http://osrevolution.com/os-release/reactos-0-3-10>) on 12 December 2009. Retrieved 9 December 2009.
79. Holwerda, Thom (6 July 2009). "ReactOS 0.3.10 Released" (http://www.osnews.com/story/21778/ReactOS_0_3_10_Released). OSNews. Retrieved 9 December 2009.
80. "ReactOS 0.3.11 Released" (<https://reactos.org/project-news/reactos-0311-released/>). *reactos.org*. Retrieved 25 April 2020.
81. "ReactOS 0.3.12 Released" (<https://reactos.org/project-news/reactos-0312-released/>). *reactos.org*. Retrieved 25 April 2020.
82. Holwerda, Thom (20 October 2010). "ReactOS 0.3.12 Released" (http://www.osnews.com/story/23919/ReactOS_0_3_12_Released). OSNews. Retrieved 8 November 2010.
83. "ReactOS 0.3.13 Released" (<https://reactos.org/project-news/reactos-0313-released/>). *reactos.org*. Retrieved 25 April 2020.
84. *0.3.13 — ReactOS* (<https://www.reactos.org/wiki/0.3.13>), ReactOS Foundation, retrieved 10 February 2014
85. "ReactOS 0.3.14 Released" (<https://reactos.org/project-news/reactos-0314-released/>). *reactos.org*. Retrieved 25 April 2020.
86. *0.3.14 — ReactOS* (<https://www.reactos.org/wiki/0.3.14>), ReactOS Foundation, retrieved 10 February 2014
87. "ReactOS 0.3.15 Released" (<https://reactos.org/project-news/reactos-0315-released/>). *reactos.org*. Retrieved 25 April 2020.
88. *0.3.15 — ReactOS* (<https://www.reactos.org/node/663>), ReactOS Foundation, retrieved 10 February 2014
89. ReactOS review | LinuxBSDos.com (<http://www.linuxbsdos.com/2014/02/06/reactos-0-3-16-review/>)
90. "ReactOS 0.3.16 Released" (<https://reactos.org/project-news/reactos-0316-released/>). *reactos.org*. Retrieved 25 April 2020.
91. *ReactOS 0.3.16 Released* (<https://www.reactos.org/node/772>), ReactOS Foundation, retrieved 10 February 2014
92. DistroWatch Weekly, Issue 593, 19 January 2015 (<https://distrowatch.com/weekly.php?issue=20150119#reactos>)
93. "ReactOS 0.3.17 Released" (<https://reactos.org/project-news/reactos-0317-released/>). *reactos.org*. Retrieved 25 April 2020.
94. *Gimp/GTK+ drawing problems* (<https://jira.reactos.org/browse/CORE-4657>), ReactOS Foundation, retrieved 5 October 2014
95. *JRE installer and Winrar shows Marlett font instead the proper one* (<https://jira.reactos.org/browse/CORE-8525>), ReactOS Foundation, retrieved 5 November 2014
96. *ReactOS 0.3.17 Released* (<https://www.reactos.org/it/node/911>), ReactOS Foundation, retrieved 5 November 2014
97. DistroWatch Weekly, Issue 652, 14 March 2016 (<https://distrowatch.com/weekly.php?issue=20160314#reactos>)
98. *ReactOS 0.4.0 Released* (<https://www.reactos.org/project-news/reactos-040-released>), ReactOS Foundation, retrieved 16 February 2016
99. ReactOS 0.4.1 review — Cold fusion (<http://www.dedoimedo.com/computers/reactos-0-4.html>), **Dedoimedo**
00. *ReactOS 0.4.1 Released* (<https://www.reactos.org/project-news/reactos-041-released>), ReactOS Foundation, retrieved 17 May 2016
01. *ReactOS 0.4.2 Released* (<https://reactos.org/project-news/reactos-042-released>), ReactOS Foundation, retrieved 16 August 2016

02. *ReactOS 0.4.3 Released* (<https://reactos.org/project-news/reactos-043-released>), ReactOS Foundation, retrieved 16 November 2016
03. *ReactOS 0.4.4 Released* (<https://reactos.org/project-news/reactos-044-released>), ReactOS Foundation, retrieved 16 February 2017
04. *ReactOS 0.4.5 Released* (<https://www.reactos.org/project-news/reactos-045-released>), ReactOS Foundation, retrieved 19 May 2017
05. *ReactOS 0.4.6 released* (<https://www.reactos.org/project-news/reactos-046-released>), ReactOS Foundation, retrieved 1 September 2017
06. *ReactOS 0.4.7 released!* (<https://www.reactos.org/project-news/reactos-047-released>), ReactOS Foundation, retrieved 6 December 2017
07. *ReactOS 0.4.8 released!!* (<https://www.reactos.org/project-news/reactos-048-released>), ReactOS Foundation, retrieved 14 April 2018
08. *ReactOS 0.4.9 released* (<https://www.reactos.org/project-news/reactos-049-released>), ReactOS Foundation, retrieved 23 July 2018
09. *ReactOS 0.4.10 released* (<https://www.reactos.org/project-news/reactos-0410-released>), ReactOS Foundation, retrieved 6 November 2018
10. "ReactOS 0.4.12 released | ReactOS Project" (<https://reactos.org/project-news/reactos-0412-released>). *reactos.org*. Retrieved 23 September 2019.
11. "ReactOS 0.4.13 released | ReactOS Project" (<https://reactos.org/project-news/reactos-0413-released>). *reactos.org*. Retrieved 10 April 2020.
12. `reactos/base/shell/cmd` at master · reactos/reactos · GitHub (<https://github.com/reactos/reactos/tree/master/base/shell/cmd>)
13. `reactos/base/applications/cmdutils` at master · reactos/reactos · GitHub (<https://github.com/reactos/reactos/tree/master/base/applications/cmdutils>)
14. `reactos/base/applications/cacsl` at master · reactos/reactos · GitHub (<https://github.com/reactos/reactos/tree/master/base/applications/cacsl>)
15. `reactos/base/applications/sc` at master · reactos/reactos · GitHub (<https://github.com/reactos/reactos/tree/master/base/applications/sc>)
16. `reactos/base/applications/shutdown` at master · reactos/reactos · GitHub (<https://github.com/reactos/reactos/tree/master/base/applications/shutdown>)
17. Ionescu, Alex (<http://www.alex-ionescu.com>) (26 February 2006). *The ReactOS Project – An Open Source OS Platform for Learning* (<http://mirror.csclub.uwaterloo.ca/csclub/alex-ionescu.pdf>) (PDF) (Speech). University of Waterloo, Canada (<http://csclub.uwaterloo.ca/media/ReactOS%20-%20An%20Open%20Source%20OS%20Platform%20for%20Learning.html>). Retrieved 10 December 2009.
18. "ReactOS versioning" (<https://www.reactos.org/pipermail/ros-dev/2015-March/017216.html>). ReactOS. Retrieved 7 March 2015.
19. Sinovsky, Steven (18 August 2008). "The Windows 7 Team" (http://blogs.msdn.com/e7/archive/2008/08/18/windows_5F00_7_5F00_team.aspx). Engineering Windows 7, MSDN. Retrieved 9 December 2009.
20. "ReactOS" (<http://www.ohloh.net/p/reactos/>). Ohloh. Retrieved 2 September 2011.
21. C., Michele (19 June 2009). *ReactOS is (not) Windows* (<http://it.hackmeeting.org>). Hackmeeting 2009 (<http://it.hackmeeting.org>). Milan. Retrieved 9 December 2009.
22. "Installing" (http://www.reactos.org/wiki/Installing_ReactOS). ReactOS. 20 January 2014. Retrieved 10 February 2014.
23. https://www.reactos.org/wiki/ReactOS_ports
24. "ReactOS GitHub (Label: x64)" (<https://github.com/reactos/reactos/labels/x64>). Retrieved 11 August 2019.

25. Captive: NTFS Read/Write Filesystem Addon for Linux (http://www.osnews.com/story/5299/Captive_NTFS_Read_Write_Filesystem_Addon_for_Linux) on OSNews by Eugenia Loli "*They are using WINE and ReactOS code to emulate parts of Windows environment needed to make the driver work.*" (4 December 2003)
26. Linux unified kernel 0.2.4.1 (<https://lwn.net/Articles/349988/>) "The LUK project does not develop the Windows and the Linux userland libraries. Those libraries are offered by the Wine (or Microsoft Windows/ReactOS) project and the Linux project."
27. "Universal ATA/SATA/AHCI driver for Windows NT3.51/NT4/2000/XP/2003/7" (http://alter.org.ua/soft/win/uni_ata/). Alter.org.ua. Retrieved 10 February 2014.
28. Walmsley, James (2009). "Features — Portability" (<https://web.archive.org/web/20100423042752/http://www.fullfat-fs.co.uk/Features/Portability>). Archived from the original (<http://www.fullfat-fs.co.uk/Features/Portability>) on 23 April 2010. Retrieved 19 February 2010.
29. ReactOS gets USB stack with Haiku's help (http://www.osnews.com/story/25632/ReactOS_gets_USB_stack_with_Haiku_s_help/) on OSNews by Thom Holwerda
30. "ReactOS gets USB Stack, with Help from Us" (http://haiku-os.org/news/2012-02-20_reactos_gets_usb_stack_help_us). Haiku. 20 February 2012. Retrieved 2 March 2012.
31. "An interview with Art Yerkes, Network Developer for the ReactOS Project" (http://www.networkperformancedaily.com/2007/03/an_interview_with_art_yerkes_n_1.html). Network Performance Daily. 28 March 2007. Retrieved 22 February 2010.
32. "Acknowledgements" (<http://wiki.winehq.org/Acknowledgements>). Wine. Retrieved 15 November 2009.
33. Holwerda, Thom (18 January 2010). "ReactOS Proposes Radical New Win32 Subsystem" (http://www.osnews.com/story/22750/ReactOS_Proposes_Radical_New_Win32_Subsystem). OSNews. Retrieved 18 January 2010.
34. kernelex (<http://sourceforge.net/projects/kernelex/>) on sourceforge.net
35. "Third party libraries — ReactOS" (https://www.reactos.org/wiki/Third_party_libraries). www.reactos.org. Retrieved 8 January 2015.
36. "FishEye: Annotated — reactos/trunk/reactos/media/doc/3rd Party Files.txt" (<https://web.archive.org/web/20160803013323/http://code.reactos.org/browse/reactos/trunk/reactos/media/doc/3rd%20Party%20Files.txt?hb=true>). code.reactos.org. Archived from the original (<https://code.reactos.org/browse/reactos/trunk/reactos/media/doc/3rd%20Party%20Files.txt?hb=true>) on 3 August 2016. Retrieved 8 January 2015.
37. "[reactos] Contents of /trunk/reactos/dll/win32/syssetup/syssetup.rc" (<https://web.archive.org/web/20170904111913/https://svn.reactos.org/svn/reactos/trunk/reactos/dll/win32/syssetup/syssetup.rc?view=markup>). svn.reactos.org. Archived from the original (<https://svn.reactos.org/svn/reactos/trunk/reactos/dll/win32/syssetup/syssetup.rc?view=markup>) on 4 September 2017. Retrieved 8 January 2015.
38. ReactOS Server (<http://sourceforge.net/projects/reactos-server/>) – Sourceforge
39. ReactOS Server Edition (<http://reactos-server.sourceforge.net/>)
40. OpenROS – Sourceforge (<http://sourceforge.net/projects/openros/>)
41. Fusion Operating System (<http://sourceforge.net/projects/fos/>) – Sourceforge
42. ReactOS NG (<https://github.com/wjk/rosng>) Archived (<https://web.archive.org/web/20170904111946/https://github.com/wjk/rosng>) 4 September 2017 at the Wayback Machine – GitHub
43. (inactive) Greentea Operating System (<https://greenteaos.github.io/>) – GitHub
44. reactos (<http://distrowatch.com/table.php?distribution=reactos>) on distrowatch.com *ReactOS is a free and open-source operating system based on the best design principles found in the Windows NT architecture.* (accessed January 2016)
45. Blankenhorn, Dana (<http://blogs.zdnet.com/bio.php#blankenhorn>) (13 May 2008). "ReactOS no threat to Windows" (<http://blogs.zdnet.com/open-source/?p=2425>). ZDNet. Retrieved 22 December 2009.

46. Blankenhorn, Dana (<http://blogs.zdnet.com/bio.php#blankenhorn>) (13 May 2008). "ReactOS needs a channel" (<http://talkback.zdnet.com/5208-10535-0.html?forumID=1&threadID=47591&messageID=886507>). ZDNet. Retrieved 22 December 2009.
47. Holwerda, Thom (20 December 2009). "My OS Is Less Hobby Than Yours" (http://www.osnews.com/story/22638/My_OS_Is_Less_Hobby_than_Yours). OSNews. Retrieved 22 December 2009.
48. Lunduke, Bryan (28 October 2015). "Linux cousins Part 2: Reviewing ReactOS, the Open Source version of Windows" (<http://www.networkworld.com/article/2998265/opensource-subnet/linux-cousins-part-2-reviewing-reactos-the-open-source-version-of-windows.html>). Network World. Retrieved 4 January 2016. *"In short: It's just like running Windows 2000. Except Free and Open Source. Which makes it feel both awesome. And dirty. And profound... also infuriating. If I'm honest, I really don't know how ReactOS makes me feel. But it's damned impressive that it exists and works so well. Beyond simply being Open Source, ReactOS has one cool features that Windows never really provided properly: An application manager that is laid out and structured like a Linux package manager. From within it you can even install a large number of FOSS software staples, such as Firefox, LibreOffice, and GIMP."*
49. Jesse Smith. "Guix System Distribution 0.15.0 and ReactOS 0.4.9" (<https://distrowatch.com/weekly.php?issue=20180827#guixsd>). DistroWatch Weekly (778). Retrieved 27 August 2018.
50. "Russian president asked to Fund Windows Open Source Clone" (<https://web.archive.org/web/20140201224904/http://jordanopensource.org/freeplanet/article/russian-president-asked-fund-windows-open-source-clone>). Jordan Open Source Association. 12 September 2011. Archived from the original (<http://jordanopensource.org/freeplanet/article/russian-president-asked-fund-windows-open-source-clone>) on 1 February 2014. Retrieved 18 June 2013. *"At the forum, ReactOS won "The Best Presentation" award and a grant of 100,000 rubles (approximately 2,400 JDs). In addition, around twenty large investors became interested in the project."*
51. "Featured projects, February 27, 2012" (<http://sourceforge.net/blog/featured-projects-20120227/>). SourceForge.com. 27 December 2012. Retrieved 20 December 2012.
52. "Sourceforge POTM June 2013" (<http://sourceforge.net/blog/potm-201306/>). Sourceforge.com. 17 June 2013. Retrieved 17 June 2013.

External links

- [Official website \(https://reactos.org\)](https://reactos.org) 
 - [reactos \(https://github.com/reactos\)](https://github.com/reactos) on [GitHub](#)
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