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Windows Research Kernel

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Download WRK

The Windows Research Kernel (WRK) is available via [MSDNAA Subscriber Downloads](#) (accessible to administrators of participating departments) or via the [Faculty Connection](#) portal (sign-in required) to eligible academic faculty or staff. The WRK may be redistributed to eligible users subject to the terms and conditions of the [Microsoft Windows Research Kernel Source Code License](#).

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Overview

The WRK packages core Windows XP x64 and Windows Server 2003 SP1 kernel source code with an environment for building and testing experimental versions of the Windows kernel for use in teaching and research.

The WRK includes the source for:

- Processes
- Threads
- LPC
- Virtual memory
- Scheduler
- Object manager
- I/O manager
- Synchronization
- Worker threads
- Kernel heap manager
- Other core Windows (NTOS) kernel functionality

The WRK is useful in design projects that allow your students to explore operating system (OS) principles using the Windows kernel sources. It facilitates the building of experiments and projects based on modifying the Windows kernel, enabling advanced teaching and research that promote better understanding of the Windows architecture and implementation.

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WRK Details

The Windows Research Kernel contains the sources for the core Windows (NTOS) kernel.

NTOS implements the basic OS functions for:

- Processes
- Threads
- Virtual memory and cache managers

- I/O management
- The registry
- Executive functions, such as the kernel heap and synchronization
- Object manager
- Local procedure call mechanism
- Security reference monitor
- Low-level CPU management (thread scheduling, Asynchronous and Deferred Procedure calls, interrupt/trap handling, exceptions)

The NT Hardware Abstraction Layer, file systems, network stacks, and device drivers are implemented separately from NTOS and loaded into kernel mode as dynamic libraries. Sources for these dynamic components are not included in the WRK. However, some are available in various development kits published by Microsoft, such as the Installable File System Kit and the Windows Driver Development Kit.

The WRK includes most of the NTOS kernel sources from the latest released version of Windows, which supports the x64 architecture on the desktop. The kernel sources excluded from the kit are primarily in the areas of Plug and Play, power management, the device verifier, kernel debugger interface, and virtual DOS machine. The primary modifications of the released kernel for the WRK are related to cleanup and removal of server support, such as code related to the Intel IA64.

WRK is primarily intended for faculty and instructors working in the area of operating systems who develop courses and write textbooks and want to include information about the Windows kernel based on the actual source code.

The WRK includes a build/test environment and binaries for the omitted source components, which can be used to build fully functional NTOS kernels that can be installed on Windows Server 2003 for x86/x64 and Windows XP x64.

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Use and Restrictions

Like all the components of the Windows Academic Program, the WRK is for academic, non-commercial use only.

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Eligibility Requirements

Use of the Windows Research Kernel requires academic affiliation with an accredited institution of higher education and direct involvement in teaching and/or research, such as:

- Academic faculty or staff members
- System or lab administrators or instructors
- Students enrolled in relevant undergraduate or graduate programs
- Academic researchers working on faculty-sponsored projects

Users must accept the terms and conditions of the [Microsoft Windows Research Kernel Source Code License](#).

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Customer Commitment

In exchange for obtaining access to the Windows Research Kernel, Microsoft requests that users respect our intellectual property and adhere to the license requirements.

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Your Questions

If you have questions about the Windows Academic Program, please send e-mail to compsci@microsoft.com.

You can also use the [Windows Academic Program discussion forum](#) to ask questions about the WRK and share helpful information with other members of the academic community.

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