

System Calls in Operating System – Windows

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Abstract:

A system call is a way for a user program to interface with the operating system. The program requests several services, and the OS responds by invoking a series of system calls to satisfy the request. A system call can be written in assembly language or a high-level language like C or Pascal. System calls are predefined functions that the operating system may directly invoke if a high-level language is used.

What is a System Call?

A system call is a method for a computer program to request a service from the kernel of the operating system on which it is running. A system call is a method of interacting with the operating system via programs. A system call is a request from computer software to an operating system's kernel.

The Application Program Interface (API) connects the operating system's functions to user programs. It acts as a link between the operating system and a process, allowing user-level programs to request operating system services. The kernel system can only be accessed using system calls. System calls are required for any programs that use resources.

How are system calls made?

When a computer software needs to access the operating system's kernel, it makes a system call. The system call uses an API to expose the operating system's services to user programs. It is the only method to access the kernel system. All

programs or processes that require resources for execution must use system calls, as they serve as an interface between the operating system and user programs.

Below are some examples of how a system call varies from a user function.

1. A system call function may create and use kernel processes to execute the asynchronous processing.
2. A system call has greater authority than a standard subroutine. A system call with kernel-mode privilege executes in the kernel protection domain.
3. System calls are not permitted to use shared libraries or any symbols that are not present in the kernel protection domain.
4. The code and data for system calls are stored in global kernel memory.

Why do you need system calls in Operating System?

There are various situations where you must require system calls in the operating system. Following of the situations are as follows:

1. It is must require when a file system wants to create or delete a file.
2. Network connections require the system calls to sending and receiving data packets.
3. If you want to read or write a file, you need to system calls.
4. If you want to access hardware devices, including a printer, scanner, you need a system call.
5. System calls are used to create and manage new processes.

How System Calls Work

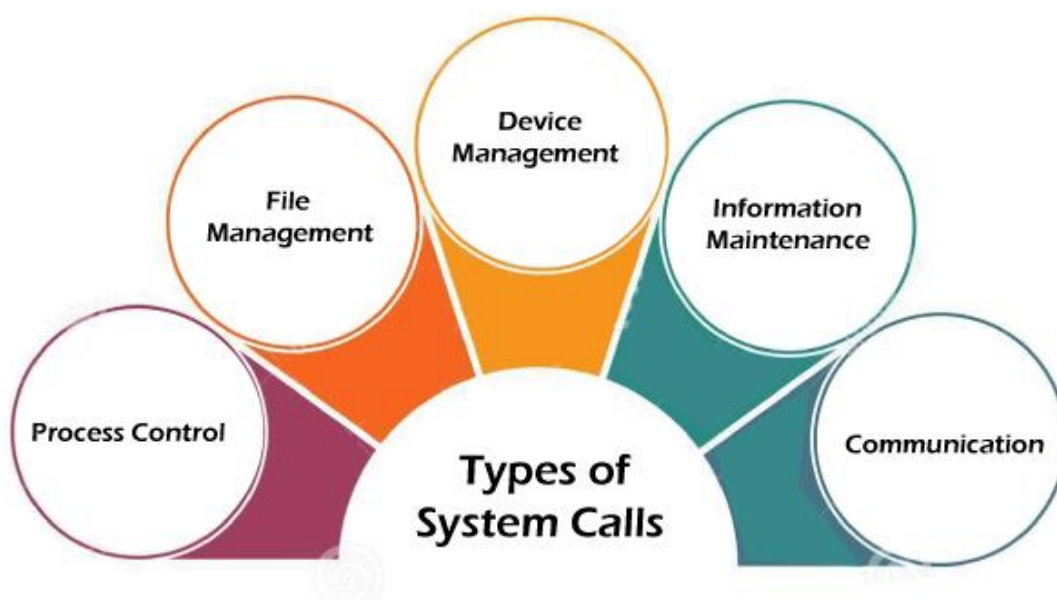
The Applications run in an area of memory known as user space. A system call connects to the operating system's kernel, which executes in kernel space. When an application creates a system call, it must first obtain permission from the kernel. It achieves this using an interrupt request, which pauses the current process and transfers control to the kernel.

If the request is permitted, the kernel performs the requested action, like creating or deleting a file. As input, the application receives the kernel's output. The application resumes the procedure after the input is received. When the operation is finished, the kernel returns the results to the application and then moves data from kernel space to user space in memory.

A simple system call may take few nanoseconds to provide the result, like retrieving the system date and time. A more complicated system call, such as connecting to a network device, may take a few seconds. Most operating systems launch a distinct kernel thread for each system call to avoid bottlenecks. Modern operating systems are multi-threaded, which means they can handle various system calls at the same time.

Types of System Calls

There are commonly five types of system calls. These are as follows:



1. **Process Control**
2. **File Management**
3. **Device Management**
4. **Information Maintenance**
5. **Communication**

Now, you will learn about all the different types of system calls one-by-one.

Process Control

Process control is the system call that is used to direct the processes. Some process control examples include creating, load, abort, end, execute, process, terminate the process, etc.

File Management

File management is a system call that is used to handle the files. Some file management examples include creating files, delete files, open, close, read, write, etc.

Device Management

Device management is a system call that is used to deal with devices. Some examples of device management include read, device, write, get device attributes, release device, etc.

Information Maintenance

Information maintenance is a system call that is used to maintain information. There are some examples of information maintenance, including getting system data, set time or date, get time or date, set system data, etc.

Communication

Communication is a system call that is used for communication. There are some examples of communication, including create, delete communication connections, send, receive messages, etc.

Examples of Windows and Unix system calls

There are various examples of Windows and Unix system calls. These are as listed below in the table:

Process	Windows	Unix
Process Control	CreateProcess() ExitProcess() WaitForSingleObject()	Fork() Exit() Wait()
File Manipulation	CreateFile() ReadFile() WriteFile() CloseHandle()	Open() Read() Write() Close()
Device Management	SetConsoleMode() ReadConsole() WriteConsole()	ioctl() Read() Write()
Information Maintenance	GetCurrentProcessID() SetTimer() Sleep()	Getpid() Alarm() Sleep()
Communication	CreatePipe() CreateFileMapping() MapViewOfFile()	Pipe() Shmget() Mmap()
Protection	SetFileSecurity() InitializeSecurityDescriptor() SetSecurityDescriptorGroup()	Chmod() Umask() Chown()

Here, you will learn about some methods briefly:

open()

The open() system call allows you to access a file on a file system. It allocates resources to the file and provides a handle that the process may refer to. Many processes can open a file at once or by a single process only. It's all based on the file system and structure.

read()

It is used to obtain data from a file on the file system. It accepts three arguments in general:

- A file descriptor.
- A buffer to store read data.
- The number of bytes to read from the file.

The file descriptor of the file to be read could be used to identify it and open it using `open()` before reading.

wait()

In some systems, a process may have to wait for another process to complete its execution before proceeding. When a parent process makes a child process, the parent process execution is suspended until the child process is finished. The `wait()` system call is used to suspend the parent process. Once the child process has completed its execution, control is returned to the parent process.

write()

It is used to write data from a user buffer to a device like a file. This system call is one way for a program to generate data. It takes three arguments in general:

- A file descriptor.
- A pointer to the buffer in which data is saved.
- The number of bytes to be written from the buffer.

fork()

Processes generate clones of themselves using the `fork()` system call. It is one of the most common ways to create processes in operating systems. When a parent process spawns a child process, execution of the parent process is interrupted until the child process completes. Once the child process has completed its execution, control is returned to the parent process.

close()

It is used to end file system access. When this system call is invoked, it signifies that the program no longer requires the file, and the buffers are flushed, the file information is altered, and the file resources are de-allocated as a result.

exec()

When an executable file replaces an earlier executable file in an already executing process, this system function is invoked. As a new process is not built, the old process identification stays, but the new process replaces data, stack, data, head, etc.

exit()

The exit() is a system call that is used to end program execution. This call indicates that the thread execution is complete, which is especially useful in multi-threaded environments. The operating system reclaims resources spent by the process following the use of the exit() system function.

Windows System Call Tables

System call
NtBindCompositionSurface
NtCloseCompositionInputSink
NtCompositionInputThread
NtCompositionSetDropTarget
NtCompositorNotifyExitWindows
NtCompositorNotifyForegroundChanged
NtCompositorUpdateLastInputTime
NtConfigureInputSpace
NtCreateCompositionInputSink
NtCreateCompositionSurfaceHandle
NtCreateImplicitCompositionInputSink
NtDCompositionAddCrossDeviceVisualChild
NtDCompositionAddVisualChild
NtDCompositionAttachMouseWheelToHwnd
NtDCompositionBeginFrame
NtDCompositionCapturePointer
NtDCompositionCommitChannel
NtDCompositionCommitSynchronizationObject
NtDCompositionConfirmFrame

NtDCompositionConnectPipe
NtDCompositionCreateAndBindSharedSection
NtDCompositionCreateChannel
NtDCompositionCreateConnection
NtDCompositionCreateConnectionContext
NtDCompositionCreateDwmChannel
NtDCompositionCreateResource
NtDCompositionCreateSharedResourceHandle
NtDCompositionCreateSharedVisualHandle
NtDCompositionCreateSynchronizationObject
NtDCompositionCurrentBatchId
NtDCompositionDestroyChannel
NtDCompositionDestroyConnection
NtDCompositionDestroyConnectionContext
NtDCompositionDiscardFrame
NtDCompositionDuplicateHandleToProcess
NtDCompositionDuplicateSwapchainHandleToDwm
NtDCompositionDwmSyncFlush
NtDCompositionEnableDDASupport
NtDCompositionEnableMMCSS
NtDCompositionGetAnimationTime
NtDCompositionGetBatchId
NtDCompositionGetChannels
NtDCompositionGetConnectionBatch
NtDCompositionGetConnectionContextBatch
NtDCompositionGetDeletedResources
NtDCompositionGetFrameLegacyTokens
NtDCompositionGetFrameStatistics
NtDCompositionGetFrameSurfaceUpdates
NtDCompositionGetMaterialProperty
NtDCompositionOpenSharedResource
NtDCompositionOpenSharedResourceHandle
NtDCompositionProcessChannelBatchBuffer
NtDCompositionReferenceSharedResourceOnDwmChannel
NtDCompositionRegisterThumbnailVisual
NtDCompositionRegisterVirtualDesktopVisual
NtDCompositionReleaseAllResources
NtDCompositionReleaseResource
NtDCompositionRemoveCrossDeviceVisualChild
NtDCompositionRemoveVisualChild
NtDCompositionReplaceVisualChildren

NtDCompositionRetireFrame
NtDCompositionSetChannelCallbackId
NtDCompositionSetChannelCommitCompletionEvent
NtDCompositionSetChannelConnectionId
NtDCompositionSetChildRootVisual
NtDCompositionSetDebugCounter
NtDCompositionSetMaterialProperty
NtDCompositionSetResourceAnimationProperty
NtDCompositionSetResourceBufferProperty
NtDCompositionSetResourceCallbackId
NtDCompositionSetResourceDeletedNotificationTag
NtDCompositionSetResourceFloatProperty
NtDCompositionSetResourceHandleProperty
NtDCompositionSetResourceIntegerProperty
NtDCompositionSetResourceReferenceArrayProperty
NtDCompositionSetResourceReferenceProperty
NtDCompositionSetVisualInputSink
NtDCompositionSignalGpuFence
NtDCompositionSubmitDWMBatch
NtDCompositionSuspendAnimations
NtDCompositionSynchronize
NtDCompositionTelemetryAnimationScenarioBegin
NtDCompositionTelemetryAnimationScenarioReference
NtDCompositionTelemetryAnimationScenarioUnreference
NtDCompositionTelemetrySetApplicationId
NtDCompositionTelemetryTouchInteractionBegin
NtDCompositionTelemetryTouchInteractionEnd
NtDCompositionTelemetryTouchInteractionUpdate
NtDCompositionUpdatePointerCapture
NtDCompositionValidateAndReferenceSystemVisualForHwndTarget
NtDCompositionWaitForChannel
NtDWMBindCursorToOutputConfig
NtDWMCommitInputSystemOutputConfig
NtDWMSetCursorOrientation
NtDWMSetInputSystemOutputConfig
NtDesktopCaptureBits
NtDuplicateCompositionInputSink
NtDxgkCreateTrackedWorkload
NtDxgkDestroyTrackedWorkload
NtDxgkDispMgrOperation
NtDxgkDisplayPortOperation

NtDxgkDuplicateHandle
NtDxgkEndTrackedWorkload
NtDxgkEnumAdapters3
NtDxgkGetAvailableTrackedWorkloadIndex
NtDxgkGetProcessList
NtDxgkGetTrackedWorkloadStatistics
NtDxgkOutputDuplPresentToHwQueue
NtDxgkPinResources
NtDxgkRegisterVailProcess
NtDxgkResetTrackedWorkload
NtDxgkResetTrackedWorkloadStatistics
NtDxgkSubmitPresentBltToHwQueue
NtDxgkSubmitPresentToHwQueue
NtDxgkUnpinResources
NtDxgkUpdateTrackedWorkload
NtDxgkVailConnect
NtDxgkVailDisconnect
NtDxgkVailPromoteCompositionSurface
NtEnableOneCoreTransformMode
NtFlipObjectAddContent
NtFlipObjectAddPoolBuffer
NtFlipObjectConsumerAcquirePresent
NtFlipObjectConsumerAdjustUsageReference
NtFlipObjectConsumerBeginProcessPresent
NtFlipObjectConsumerEndProcessPresent
NtFlipObjectConsumerPostMessage
NtFlipObjectConsumerQueryBufferInfo
NtFlipObjectCreate
NtFlipObjectDisconnectEndpoint
NtFlipObjectEnablePresentStatisticsType
NtFlipObjectOpen
NtFlipObjectPresentCancel
NtFlipObjectQueryBufferAvailableEvent
NtFlipObjectQueryEndpointConnected
NtFlipObjectQueryNextMessageToProducer
NtFlipObjectReadNextMessageToProducer
NtFlipObjectRemoveContent
NtFlipObjectRemovePoolBuffer
NtFlipObjectSetContent
NtFlipObjectSetMaximumBackchannelQueueDepth
NtGdiAbortDoc

NtGdiAbortPath
NtGdiAddEmbFontToDC
NtGdiAddFontMemResourceEx
NtGdiAddFontResourceW
NtGdiAddInitialFonts
NtGdiAddRemoteFontToDC
NtGdiAddRemoteMMInstanceToDC
NtGdiAlphaBlend
NtGdiAngleArc
NtGdiAnyLinkedFonts
NtGdiArcInternal
NtGdiBRUSHOBJ_DeleteRbrush
NtGdiBRUSHOBJ_hGetColorTransform
NtGdiBRUSHOBJ_pvAllocRbrush
NtGdiBRUSHOBJ_pvGetRbrush
NtGdiBRUSHOBJ_ulGetBrushColor
NtGdiBeginGdiRendering
NtGdiBeginPath
NtGdiBitBlt
NtGdiCLIPOBJ_bEnum
NtGdiCLIPOBJ_cEnumStart
NtGdiCLIPOBJ_ppoGetPath
NtGdiCancelDC
NtGdiChangeGhostFont
NtGdiCheckBitmapBits
NtGdiClearBitmapAttributes
NtGdiClearBrushAttributes
NtGdiCloseFigure
NtGdiColorCorrectPalette
NtGdiCombineRgn
NtGdiCombineTransform
NtGdiComputeXformCoefficients
NtGdiConfigureOPMProtectedOutput
NtGdiConsoleTextOut
NtGdiConvertMetafileRect
NtGdiCreateBitmap
NtGdiCreateBitmapFromDxSurface
NtGdiCreateBitmapFromDxSurface2
NtGdiCreateClientObj
NtGdiCreateColorSpace
NtGdiCreateColorTransform

NtGdiCreateCompatibleBitmap
NtGdiCreateCompatibleDC
NtGdiCreateDIBBrush
NtGdiCreateDIBSection
NtGdiCreateDIBitmapInternal
NtGdiCreateEllipticRgn
NtGdiCreateHalftonePalette
NtGdiCreateHatchBrushInternal
NtGdiCreateMetafileDC
NtGdiCreateOPMProtectedOutput
NtGdiCreateOPMProtectedOutputs
NtGdiCreatePaletteInternal
NtGdiCreatePatternBrushInternal
NtGdiCreatePen
NtGdiCreateRectRgn
NtGdiCreateRoundRectRgn
NtGdiCreateServerMetaFile
NtGdiCreateSessionMappedDIBSection
NtGdiCreateSolidBrush
NtGdiD3dContextCreate
NtGdiD3dContextDestroy
NtGdiD3dContextDestroyAll
NtGdiD3dDrawPrimitives2
NtGdiD3dExecute
NtGdiD3dExecuteClipped
NtGdiD3dGetState
NtGdiD3dLightSet
NtGdiD3dMaterialCreate
NtGdiD3dMaterialDestroy
NtGdiD3dMaterialGetData
NtGdiD3dMaterialSetData
NtGdiD3dMatrixCreate
NtGdiD3dMatrixDestroy
NtGdiD3dMatrixGetData
NtGdiD3dMatrixSetData
NtGdiD3dRenderPrimitive
NtGdiD3dRenderState
NtGdiD3dSceneCapture
NtGdiD3dSetViewportData
NtGdiD3dTextureCreate
NtGdiD3dTextureDestroy

NtGdiD3dTextureGetSurf
NtGdiD3dTextureSwap
NtGdiD3dValidateTextureStageState
NtGdiDDCCIGetCapabilitiesString
NtGdiDDCCIGetCapabilitiesStringLength
NtGdiDDCCIGetTimingReport
NtGdiDDCCIGetVCPFeature
NtGdiDDCCISaveCurrentSettings
NtGdiDDCCISetVCPFeature
NtGdiDdAddAttachedSurface
NtGdiDdAlphaBlt
NtGdiDdAttachSurface
NtGdiDdBeginMoCompFrame
NtGdiDdBlt
NtGdiDdCanCreateD3DBuffer
NtGdiDdCanCreateSurface
NtGdiDdColorControl
NtGdiDdCreateD3DBuffer
NtGdiDdCreateDirectDrawObject
NtGdiDdCreateFullscreenSprite
NtGdiDdCreateMoComp
NtGdiDdCreateSurface
NtGdiDdCreateSurfaceEx
NtGdiDdCreateSurfaceObject
NtGdiDdDDIAbandonSwapChain
NtGdiDdDDIAcquireKeyedMutex
NtGdiDdDDIAcquireKeyedMutex2
NtGdiDdDDIAcquireSwapChain
NtGdiDdDDIAddSurfaceToSwapChain
NtGdiDdDDIAdjustFullscreenGamma
NtGdiDdDDICacheHybridQueryValue
NtGdiDdDDIChangeVideoMemoryReservation
NtGdiDdDDICheckExclusiveOwnership
NtGdiDdDDICheckMonitorPowerState
NtGdiDdDDICheckMultiPlaneOverlaySupport
NtGdiDdDDICheckMultiPlaneOverlaySupport2
NtGdiDdDDICheckMultiPlaneOverlaySupport3
NtGdiDdDDICheckOcclusion
NtGdiDdDDICheckSharedResourceAccess
NtGdiDdDDICheckVidPnExclusiveOwnership
NtGdiDdDDICloseAdapter

NtGdiDdDDIConfigureSharedResource
NtGdiDdDDICreateAllocation
NtGdiDdDDICreateBundleObject
NtGdiDdDDICreateContext
NtGdiDdDDICreateContextVirtual
NtGdiDdDDICreateDCFromMemory
NtGdiDdDDICreateDevice
NtGdiDdDDICreateHwContext
NtGdiDdDDICreateHwQueue
NtGdiDdDDICreateKeyedMutex
NtGdiDdDDICreateKeyedMutex2
NtGdiDdDDICreateOutputDupl
NtGdiDdDDICreateOverlay
NtGdiDdDDICreatePagingQueue
NtGdiDdDDICreateProtectedSession
NtGdiDdDDICreateSwapChain
NtGdiDdDDICreateSynchronizationObject
NtGdiDdDDIDisplayEnum
NtGdiDdDDIDestroyAllocation
NtGdiDdDDIDestroyAllocation2
NtGdiDdDDIDestroyContext
NtGdiDdDDIDestroyDCFromMemory
NtGdiDdDDIDestroyDevice
NtGdiDdDDIDestroyHwContext
NtGdiDdDDIDestroyHwQueue
NtGdiDdDDIDestroyKeyedMutex
NtGdiDdDDIDestroyOutputDupl
NtGdiDdDDIDestroyOverlay
NtGdiDdDDIDestroyPagingQueue
NtGdiDdDDIDestroyProtectedSession
NtGdiDdDDIDestroySynchronizationObject
NtGdiDdDDIDispMgrCreate
NtGdiDdDDIDispMgrSourceOperation
NtGdiDdDDIDispMgrTargetOperation
NtGdiDdDDIEnumAdapters
NtGdiDdDDIEnumAdapters2
NtGdiDdDDIEscape
NtGdiDdDDIEvict
NtGdiDdDDIExtractBundleObject
NtGdiDdDDIFlipOverlay
NtGdiDdDDIFlushHeapTransitions

NtGdiDdDDIFreeGpuVirtualAddress
NtGdiDdDDIGetAllocationPriority
NtGdiDdDDIGetCachedHybridQueryValue
NtGdiDdDDIGetContextInProcessSchedulingPriority
NtGdiDdDDIGetContextSchedulingPriority
NtGdiDdDDIGetDWMVerticalBlankEvent
NtGdiDdDDIGetDeviceState
NtGdiDdDDIGetDisplayModeList
NtGdiDdDDIGetMemoryBudgetTarget
NtGdiDdDDIGetMultiPlaneOverlayCaps
NtGdiDdDDIGetMultisampleMethodList
NtGdiDdDDIGetOverlayState
NtGdiDdDDIGetPostCompositionCaps
NtGdiDdDDIGetPresentHistory
NtGdiDdDDIGetPresentQueueEvent
NtGdiDdDDIGetProcessDeviceLostSupport
NtGdiDdDDIGetProcessDeviceRemovalSupport
NtGdiDdDDIGetProcessSchedulingPriorityBand
NtGdiDdDDIGetProcessSchedulingPriorityClass
NtGdiDdDDIGetResourcePresentPrivateDriverData
NtGdiDdDDIGetRuntimeData
NtGdiDdDDIGetScanLine
NtGdiDdDDIGetSetSwapChainMetadata
NtGdiDdDDIGetSharedPrimaryHandle
NtGdiDdDDIGetSharedResourceAdapterLuid
NtGdiDdDDIGetSharedResourceAdapterLuidFlipManager
NtGdiDdDDIGetYieldPercentage
NtGdiDdDDIInvalidateActiveVidPn
NtGdiDdDDIInvalidateCache
NtGdiDdDDILock
NtGdiDdDDILock2
NtGdiDdDDIMakeResident
NtGdiDdDDIMapGpuVirtualAddress
NtGdiDdDDIMarkDeviceAsError
NtGdiDdDDINetDispGetNextChunkInfo
NtGdiDdDDINetDispQueryMiracastDisplayDeviceStatus
NtGdiDdDDINetDispQueryMiracastDisplayDeviceSupport
NtGdiDdDDINetDispStartMiracastDisplayDevice
NtGdiDdDDINetDispStartMiracastDisplayDeviceEx
NtGdiDdDDINetDispStopMiracastDisplayDevice
NtGdiDdDDINetDispStopSessions

NtGdiDdDDIOfferAllocations
NtGdiDdDDIOpenAdapterFromDeviceName
NtGdiDdDDIOpenAdapterFromHdc
NtGdiDdDDIOpenAdapterFromLuid
NtGdiDdDDIOpenBundleObjectNtHandleFromName
NtGdiDdDDIOpenKeyedMutex
NtGdiDdDDIOpenKeyedMutex2
NtGdiDdDDIOpenKeyedMutexFromNtHandle
NtGdiDdDDIOpenNtHandleFromName
NtGdiDdDDIOpenProtectedSessionFromNtHandle
NtGdiDdDDIOpenResource
NtGdiDdDDIOpenResourceFromNtHandle
NtGdiDdDDIOpenSwapChain
NtGdiDdDDIOpenSyncObjectFromNtHandle
NtGdiDdDDIOpenSyncObjectFromNtHandle2
NtGdiDdDDIOpenSyncObjectNtHandleFromName
NtGdiDdDDIOpenSynchronizationObject
NtGdiDdDDIOutputDuplGetFrameInfo
NtGdiDdDDIOutputDuplGetMetaData
NtGdiDdDDIOutputDuplGetPointerShapeData
NtGdiDdDDIOutputDuplPresent
NtGdiDdDDIOutputDuplReleaseFrame
NtGdiDdDDIPinDirectFlipResources
NtGdiDdDDIPollDisplayChildren
NtGdiDdDDIPresent
NtGdiDdDDIPresentMultiPlaneOverlay
NtGdiDdDDIPresentMultiPlaneOverlay2
NtGdiDdDDIPresentMultiPlaneOverlay3
NtGdiDdDDIPresentRedirected
NtGdiDdDDIQueryAdapterInfo
NtGdiDdDDIQueryAllocationResidency
NtGdiDdDDIQueryClockCalibration
NtGdiDdDDIQueryFSEBlock
NtGdiDdDDIQueryProcessOfferInfo
NtGdiDdDDIQueryProtectedSessionInfoFromNtHandle
NtGdiDdDDIQueryProtectedSessionStatus
NtGdiDdDDIQueryRemoteVidPnSourceFromGdiDisplayName
NtGdiDdDDIQueryResourceInfo
NtGdiDdDDIQueryResourceInfoFromNtHandle
NtGdiDdDDIQueryStatistics
NtGdiDdDDIQueryVidPnExclusiveOwnership

NtGdiDdDDIQueryVideoMemoryInfo
NtGdiDdDDIReclaimAllocations
NtGdiDdDDIReclaimAllocations2
NtGdiDdDDIReleaseKeyedMutex
NtGdiDdDDIReleaseKeyedMutex2
NtGdiDdDDIReleaseProcessVidPnSourceOwners
NtGdiDdDDIReleaseSwapChain
NtGdiDdDDIRemoveSurfaceFromSwapChain
NtGdiDdDDIRender
NtGdiDdDDIReserveGpuVirtualAddress
NtGdiDdDDISetAllocationPriority
NtGdiDdDDISetContextInProcessSchedulingPriority
NtGdiDdDDISetContextSchedulingPriority
NtGdiDdDDISetDeviceLostSupport
NtGdiDdDDISetDisplayMode
NtGdiDdDDISetDisplayPrivateDriverFormat
NtGdiDdDDISetDodIndirectSwapchain
NtGdiDdDDISetFSEBlock
NtGdiDdDDISetGammaRamp
NtGdiDdDDISetHwProtectionTeardownRecovery
NtGdiDdDDISetMemoryBudgetTarget
NtGdiDdDDISetMonitorColorSpaceTransform
NtGdiDdDDISetProcessDeviceRemovalSupport
NtGdiDdDDISetProcessSchedulingPriorityBand
NtGdiDdDDISetProcessSchedulingPriorityClass
NtGdiDdDDISetQueuedLimit
NtGdiDdDDISetStablePowerState
NtGdiDdDDISetStereoEnabled
NtGdiDdDDISetSyncRefreshCountWaitTarget
NtGdiDdDDISetVidPnSourceHwProtection
NtGdiDdDDISetVidPnSourceOwner
NtGdiDdDDISetVidPnSourceOwner1
NtGdiDdDDISetYieldPercentage
NtGdiDdDDIShareObjects
NtGdiDdDDISharedPrimaryLockNotification
NtGdiDdDDISharedPrimaryUnLockNotification
NtGdiDdDDISignalSynchronizationObject
NtGdiDdDDISignalSynchronizationObjectFromCpu
NtGdiDdDDISignalSynchronizationObjectFromGpu
NtGdiDdDDISignalSynchronizationObjectFromGpu2
NtGdiDdDDISubmitCommand

NtGdiDdDDISubmitCommandToHwQueue
NtGdiDdDDISubmitSignalSyncObjectsToHwQueue
NtGdiDdDDISubmitWaitForSyncObjectsToHwQueue
NtGdiDdDDITrimProcessCommitment
NtGdiDdDDIUnOrderedPresentSwapChain
NtGdiDdDDIUnlock
NtGdiDdDDIUnlock2
NtGdiDdDDIUnpinDirectFlipResources
NtGdiDdDDIUpdateAllocationProperty
NtGdiDdDDIUpdateGpuVirtualAddress
NtGdiDdDDIUpdateOverlay
NtGdiDdDDIWaitForIdle
NtGdiDdDDIWaitForSynchronizationObject
NtGdiDdDDIWaitForSynchronizationObjectFromCpu
NtGdiDdDDIWaitForSynchronizationObjectFromGpu
NtGdiDdDDIWaitForVerticalBlankEvent
NtGdiDdDDIWaitForVerticalBlankEvent2
NtGdiDdDeleteDirectDrawObject
NtGdiDdDeleteSurfaceObject
NtGdiDdDestroyD3DBuffer
NtGdiDdDestroyFullscreenSprite
NtGdiDdDestroyMoComp
NtGdiDdDestroySurface
NtGdiDdEndMoCompFrame
NtGdiDdFlip
NtGdiDdFlipToGDISurface
NtGdiDdGetAvailDriverMemory
NtGdiDdGetBltStatus
NtGdiDdGetDC
NtGdiDdGetDriverInfo
NtGdiDdGetDriverState
NtGdiDdGetDxHandle
NtGdiDdGetFlipStatus
NtGdiDdGetInternalMoCompInfo
NtGdiDdGetMoCompBuffInfo
NtGdiDdGetMoCompFormats
NtGdiDdGetMoCompGuids
NtGdiDdGetScanLine
NtGdiDdLock
NtGdiDdLockD3D
NtGdiDdNotifyFullscreenSpriteUpdate

NtGdiDdQueryDirectDrawObject
NtGdiDdQueryMoCompStatus
NtGdiDdQueryVisRgnUniqueness
NtGdiDdReenableDirectDrawObject
NtGdiDdReleaseDC
NtGdiDdRenderMoComp
NtGdiDdResetVisrgn
NtGdiDdSetColorKey
NtGdiDdSetExclusiveMode
NtGdiDdSetGammaRamp
NtGdiDdSetOverlayPosition
NtGdiDdUnattachSurface
NtGdiDdUnlock
NtGdiDdUnlockD3D
NtGdiDdUpdateOverlay
NtGdiDdWaitForVerticalBlank
NtGdiDeleteClientObj
NtGdiDeleteColorSpace
NtGdiDeleteColorTransform
NtGdiDeleteObjectApp
NtGdiDescribePixelFormat
NtGdiDestroyOPMProtectedOutput
NtGdiDestroyPhysicalMonitor
NtGdiDoBanding
NtGdiDoPalette
NtGdiDrawEscape
NtGdiDrawStream
NtGdiDvpAcquireNotification
NtGdiDvpCanCreateVideoPort
NtGdiDvpColorControl
NtGdiDvpCreateVideoPort
NtGdiDvpDestroyVideoPort
NtGdiDvpFlipVideoPort
NtGdiDvpGetVideoPortBandwidth
NtGdiDvpGetVideoPortConnectInfo
NtGdiDvpGetVideoPortField
NtGdiDvpGetVideoPortFlipStatus
NtGdiDvpGetVideoPortInputFormats
NtGdiDvpGetVideoPortLine
NtGdiDvpGetVideoPortOutputFormats
NtGdiDvpGetVideoSignalStatus

NtGdiDvpReleaseNotification
NtGdiDvpUpdateVideoPort
NtGdiDvpWaitForVideoPortSync
NtGdiDwmCreatedBitmapRemotingOutput
NtGdiDwmGetDirtyRgn
NtGdiDwmGetSurfaceData
NtGdiDxgGenericThunk
NtGdiEllipse
NtGdiEnableEudc
NtGdiEndDoc
NtGdiEndGdiRendering
NtGdiEndPage
NtGdiEndPath
NtGdiEngAlphaBlend
NtGdiEngAssociateSurface
NtGdiEngBitBlt
NtGdiEngCheckAbort
NtGdiEngComputeGlyphSet
NtGdiEngCopyBits
NtGdiEngCreateBitmap
NtGdiEngCreateClip
NtGdiEngCreateDeviceBitmap
NtGdiEngCreateDeviceSurface
NtGdiEngCreatePalette
NtGdiEngDeleteClip
NtGdiEngDeletePalette
NtGdiEngDeletePath
NtGdiEngDeleteSurface
NtGdiEngEraseSurface
NtGdiEngFillPath
NtGdiEngGradientFill
NtGdiEngLineTo
NtGdiEngLockSurface
NtGdiEngMarkBandingSurface
NtGdiEngPaint
NtGdiEngPlgBlt
NtGdiEngStretchBlt
NtGdiEngStretchBltROP
NtGdiEngStrokeAndFillPath
NtGdiEngStrokePath
NtGdiEngTextOut

NtGdiEngTransparentBlt
NtGdiEngUnlockSurface
NtGdiEnsureDpiDepDefaultGuiFontForPlateau
NtGdiEnumFontChunk
NtGdiEnumFontClose
NtGdiEnumFontOpen
NtGdiEnumFonts
NtGdiEnumObjects
NtGdiEqualRgn
NtGdiEudcEnumFaceNameLinkW
NtGdiEudcLoadUnloadLink
NtGdiExcludeClipRect
NtGdiExtCreatePen
NtGdiExtCreateRegion
NtGdiExtEscape
NtGdiExtFloodFill
NtGdiExtGetObjectW
NtGdiExtSelectClipRgn
NtGdiExtTextOutW
NtGdiFONTOBJ_cGetAllGlyphHandles
NtGdiFONTOBJ_cGetGlyphs
NtGdiFONTOBJ_pQueryGlyphAttrs
NtGdiFONTOBJ_pfdg
NtGdiFONTOBJ_pifi
NtGdiFONTOBJ_pvTrueTypeFontFile
NtGdiFONTOBJ_pxoGetXform
NtGdiFONTOBJ_vGetInfo
NtGdiFillPath
NtGdiFillRgn
NtGdiFixUpHandle
NtGdiFlattenPath
NtGdiFlush
NtGdiFlushUserBatch
NtGdiFontIsLinked
NtGdiForceUFIMapping
NtGdiFrameRgn
NtGdiFullscreenControl
NtGdiGetAndSetDCDword
NtGdiGetAppClipBox
NtGdiGetAppliedDeviceGammaRamp
NtGdiGetBitmapBits

NtGdiGetBitmapDimension
NtGdiGetBitmapDpiScaleValue
NtGdiGetBoundsRect
NtGdiGetCOPPCompatibleOPMInformation
NtGdiGetCertificate
NtGdiGetCertificateByHandle
NtGdiGetCertificateSize
NtGdiGetCertificateSizeByHandle
NtGdiGetCharABCWidthsW
NtGdiGetCharSet
NtGdiGetCharWidthInfo
NtGdiGetCharWidthW
NtGdiGetCharacterPlacementW
NtGdiGetColorAdjustment
NtGdiGetColorSpaceforBitmap
NtGdiGetCurrentDpiInfo
NtGdiGetDCDpiScaleValue
NtGdiGetDCDword
NtGdiGetDCObject
NtGdiGetDCPoint
NtGdiGetDCforBitmap
NtGdiGetDIBitsInternal
NtGdiGetDeviceCaps
NtGdiGetDeviceCapsAll
NtGdiGetDeviceGammaRamp
NtGdiGetDeviceWidth
NtGdiGetDhpdev
NtGdiGetETM
NtGdiGetEmbUFI
NtGdiGetEmbedFonts
NtGdiGetEntry
NtGdiGetEudcTimeStampEx
NtGdiGetFontData
NtGdiGetFontFileData
NtGdiGetFontFileInfo
NtGdiGetFontResourceInfoInternalW
NtGdiGetFontUnicodeRanges
NtGdiGetGammaRampCapability
NtGdiGetGlyphIndicesW
NtGdiGetGlyphIndicesWInternal
NtGdiGetGlyphOutline

NtGdiGetKerningPairs
NtGdiGetLinkedUFIs
NtGdiGetMiterLimit
NtGdiGetMonitorID
NtGdiGetNearestColor
NtGdiGetNearestPaletteIndex
NtGdiGetNumberOfPhysicalMonitors
NtGdiGetOPMInformation
NtGdiGetOPMRandomNumber
NtGdiGetObjectBitmapHandle
NtGdiGetOutlineTextMetricsInternalW
NtGdiGetPath
NtGdiGetPerBandInfo
NtGdiGetPhysicalMonitorDescription
NtGdiGetPhysicalMonitors
NtGdiGetPixel
NtGdiGetProcessSessionFonts
NtGdiGetPublicFontTableChangeCookie
NtGdiGetRandomRgn
NtGdiGetRasterizerCaps
NtGdiGetRealizationInfo
NtGdiGetRegionData
NtGdiGetRgnBox
NtGdiGetServerMetaFileBits
NtGdiGetSpoolMessage
NtGdiGetStats
NtGdiGetStockObject
NtGdiGetStringBitmapW
NtGdiGetSuggestedOPMProtectedOutputArraySize
NtGdiGetSystemPaletteUse
NtGdiGetTextCharsetInfo
NtGdiGetTextExtent
NtGdiGetTextExtentExW
NtGdiGetTextFaceW
NtGdiGetTextMetricsW
NtGdiGetTransform
NtGdiGetUFI
NtGdiGetUFIBits
NtGdiGetUFIPathname
NtGdiGetWidthTable
NtGdiGradientFill

NtGdiHLSurfGetInformation
NtGdiHLSurfSetInformation
NtGdiHT_Get8BPPFormatPalette
NtGdiHT_Get8BPPMaskPalette
NtGdiHfontCreate
NtGdiIcmBrushInfo
NtGdiInit
NtGdiInitSpool
NtGdiIntersectClipRect
NtGdiInvertRgn
NtGdiLineTo
NtGdiMakeFontDir
NtGdiMakeInfoDC
NtGdiMakeObjectUnXferable
NtGdiMakeObjectXferable
NtGdiMaskBlt
NtGdiMirrorWindowOrg
NtGdiModifyWorldTransform
NtGdiMonoBitmap
NtGdiMoveTo
NtGdiOffsetClipRgn
NtGdiOffsetRgn
NtGdiOpenDCW
NtGdiPATHOBJ_bEnum
NtGdiPATHOBJ_bEnumClipLines
NtGdiPATHOBJ_vEnumStart
NtGdiPATHOBJ_vEnumStartClipLines
NtGdiPATHOBJ_vGetBounds
NtGdiPatBlt
NtGdiPathToRegion
NtGdiPerf
NtGdiPlgBlt
NtGdiPolyDraw
NtGdiPolyPatBlt
NtGdiPolyPolyDraw
NtGdiPolyTextOutW
NtGdiPtInRegion
NtGdiPtVisible
NtGdiQueryFontAssocInfo
NtGdiQueryFonts
NtGdiRectInRegion

NtGdiRectVisible
NtGdiRectangle
NtGdiRemoveFontMemResourceEx
NtGdiRemoveFontResourceW
NtGdiRemoveMergeFont
NtGdiResetDC
NtGdiResizePalette
NtGdiRestoreDC
NtGdiRoundRect
NtGdiSTROBJ_bEnum
NtGdiSTROBJ_bEnumPositionsOnly
NtGdiSTROBJ_bGetAdvanceWidths
NtGdiSTROBJ_dwGetCodePage
NtGdiSTROBJ_vEnumStart
NtGdiSaveDC
NtGdiScaleRgn
NtGdiScaleValues
NtGdiScaleViewportExtEx
NtGdiScaleWindowExtEx
NtGdiSelectBitmap
NtGdiSelectBrush
NtGdiSelectClipPath
NtGdiSelectFont
NtGdiSelectPalette
NtGdiSelectPen
NtGdiSetBitmapAttributes
NtGdiSetBitmapBits
NtGdiSetBitmapDimension
NtGdiSetBoundsRect
NtGdiSetBrushAttributes
NtGdiSetBrushOrg
NtGdiSetColorAdjustment
NtGdiSetColorSpace
NtGdiSetDIBitsToDeviceInternal
NtGdiSetDeviceGammaRamp
NtGdiSetFontEnumeration
NtGdiSetFontXform
NtGdiSetIcmMode
NtGdiSetLayout
NtGdiSetLinkedUFIs
NtGdiSetMagicColors

NtGdiSetMetaRgn
NtGdiSetMiterLimit
NtGdiSetOPMSigningKeyAndSequenceNumbers
NtGdiSetPUMPDOBJ
NtGdiSetPixel
NtGdiSetPixelFormat
NtGdiSetPrivateDeviceGammaRamp
NtGdiSetRectRgn
NtGdiSetSizeDevice
NtGdiSetSystemPaletteUse
NtGdiSetTextCharacterExtra
NtGdiSetTextJustification
NtGdiSetUMPDSandboxState
NtGdiSetVirtualResolution
NtGdiSetupPublicCFONT
NtGdiSfmGetNotificationTokens
NtGdiStartDoc
NtGdiStartPage
NtGdiStretchBlt
NtGdiStretchDIBitsInternal
NtGdiStrokeAndFillPath
NtGdiStrokePath
NtGdiSwapBuffers
NtGdiTransformPoints
NtGdiTransparentBlt
NtGdiUMPDEngFreeUserMem
NtGdiUnloadPrinterDriver
NtGdiUnmapMemFont
NtGdiUnrealizeObject
NtGdiUpdateColors
NtGdiUpdateTransform
NtGdiWidenPath
NtGdiXFORMOBJ_bApplyXform
NtGdiXFORMOBJ_iGetXform
NtGdiXLATEOBJ_cGetPalette
NtGdiXLATEOBJ_hGetColorTransform
NtGdiXLATEOBJ_iXlate
NtHWCursorUpdatePointer
NtInputSpaceRegionFromPoint
NtIsOneCoreTransformMode
NtMITAccessibilityTimerNotification

NtMITActivateInputProcessing
NtMITBindInputTypeToMonitors
NtMITCoreMsgKGetConnectionHandle
NtMITCoreMsgKOpenConnectionTo
NtMITCoreMsgKSend
NtMITDeactivateInputProcessing
NtMITDisableMouseIntercept
NtMITDispatchCompletion
NtMITEnableMouseIntercept
NtMITGetCursorUpdateHandle
NtMITInitMinuserThread
NtMITMinuserSetInputTransformOffset
NtMITMinuserWindowCreated
NtMITMinuserWindowDestroyed
NtMITPostMouseInputMessage
NtMITPostThreadEventMessage
NtMITPostWindowEventMessage
NtMITPrepareReceiveInputMessage
NtMITPrepareSendInputMessage
NtMITProcessDelegateCapturedPointers
NtMITSetForegroundRoutingInfo
NtMITSetInputCallbacks
NtMITSetInputDelegationMode
NtMITSetInputObservationState
NtMITSetInputSuppressionState
NtMITSetKeyboardInputRoutingPolicy
NtMITSetKeyboardOverrideState
NtMITSetLastInputRecipient
NtMITSynthesizeKeyboardInput
NtMITSynthesizeMouseInput
NtMITSynthesizeMouseWheel
NtMITSynthesizeTouchInput
NtMITUninitMinuserThread
NtMITUpdateInputGlobals
NtMITWaitForMultipleObjectsEx
NtMapVisualRelativePoints
NtMinGetInputTransform
NtMinInteropCoreMessagingWithInput
NtMinQPeekForInput
NtMinQSuspendInputProcessing
NtMinQUpdateWakeMask

NtModerncoreBeginLayoutUpdate
NtModerncoreCreateDCompositionHwndTarget
NtModerncoreCreateGDIHwndTarget
NtModerncoreDestroyDCompositionHwndTarget
NtModerncoreDestroyGDIHwndTarget
NtModerncoreEnableResizeLayoutSynchronization
NtModerncoreGetNavigationWindowVisual
NtModerncoreGetResizeDCompositionSynchronizationObject
NtModerncoreGetWindowContentVisual
NtModerncoreIdleTimerThread
NtModerncoreIsResizeLayoutSynchronizationEnabled
NtModerncoreProcessConnect
NtModerncoreRegisterEnhancedNavigationWindowHandle
NtModerncoreRegisterNavigationWindowHandle
NtModerncoreSetNavigationServiceSid
NtModerncoreUnregisterNavigationWindowHandle
NtNotifyPresentToCompositionSurface
NtOpenCompositionSurfaceDirtyRegion
NtOpenCompositionSurfaceSectionInfo
NtOpenCompositionSurfaceSwapChainHandleInfo
NtQueryCompositionInputIsImplicit
NtQueryCompositionInputQueueAndTransform
NtQueryCompositionInputSink
NtQueryCompositionInputSinkLuid
NtQueryCompositionInputSinkViewId
NtQueryCompositionSurfaceBinding
NtQueryCompositionSurfaceHDRMetadata
NtQueryCompositionSurfaceRenderingRealization
NtQueryCompositionSurfaceStatistics
NtRIMAddInputObserver
NtRIMAreSiblingDevices
NtRIMDeviceIoControl
NtRIMEnableMonitorMappingForDevice
NtRIMFreeInputBuffer
NtRIMGetDevicePreparsedData
NtRIMGetDevicePreparsedDataLockfree
NtRIMGetDeviceProperties
NtRIMGetDevicePropertiesLockfree
NtRIMGetPhysicalDeviceRect
NtRIMGetSourceProcessId
NtRIMObserveNextInput

NtRIMOnPnpNotification
NtRIMOnTimerNotification
NtRIMQueryDevicePath
NtRIMReadInput
NtRIMRegisterForInput
NtRIMRemoveInputObserver
NtRIMSetExtendedDeviceProperty
NtRIMSetTestModeStatus
NtRIMUnregisterForInput
NtRIMUpdateInputObserverRegistration
NtSetCompositionSurfaceAnalogExclusive
NtSetCompositionSurfaceBufferCompositionMode
NtSetCompositionSurfaceBufferCompositionModeAndOrientation
NtSetCompositionSurfaceBufferUsage
NtSetCompositionSurfaceDirectFlipState
NtSetCompositionSurfaceHDRMetaData
NtSetCompositionSurfaceIndependentFlipInfo
NtSetCompositionSurfaceOutOfFrameDirectFlipNotification
NtSetCompositionSurfaceStatistics
NtSetCursorInputSpace
NtSetPointerDeviceInputSpace
NtSetShellCursorState
NtTokenManagerConfirmOutstandingAnalogToken
NtTokenManagerCreateCompositionTokenHandle
NtTokenManagerCreateFlipObjectReturnTokenHandle
NtTokenManagerCreateFlipObjectTokenHandle
NtTokenManagerDeleteOutstandingDirectFlipTokens
NtTokenManagerGetAnalogExclusiveSurfaceUpdates
NtTokenManagerGetAnalogExclusiveTokenEvent
NtTokenManagerGetOutOfFrameDirectFlipSurfaceUpdates
NtTokenManagerOpenEvent
NtTokenManagerOpenSection
NtTokenManagerOpenSectionAndEvents
NtTokenManagerThread
NtUnBindCompositionSurface
NtUpdateInputSinkTransforms
NtUserAcquireIAMKey
NtUserAcquireInteractiveControlBackgroundAccess
NtUserActivateKeyboardLayout
NtUserAddClipboardFormatListener
NtUserAddVisualIdentifier

NtUserAlterWindowStyle
NtUserAssociateInputContext
NtUserAttachThreadInput
NtUserAutoPromoteMouseInPointer
NtUserAutoRotateScreen
NtUserBeginLayoutUpdate
NtUserBeginPaint
NtUserBitBltSysBmp
NtUserBlockInput
NtUserBreak
NtUserBroadcastThemeChangeEvent
NtUserBuildHimcList
NtUserBuildHwndList
NtUserBuildNameList
NtUserBuildPropList
NtUserCalcMenuBar
NtUserCalculatePopupWindowPosition
NtUserCallHwnd
NtUserCallHwndLock
NtUserCallHwndLockSafe
NtUserCallHwndOpt
NtUserCallHwndParam
NtUserCallHwndParamLock
NtUserCallHwndParamLockSafe
NtUserCallHwndSafe
NtUserCallMsgFilter
NtUserCallNextHookEx
NtUserCallNoParam
NtUserCallNoParamTranslate
NtUserCallOneParam
NtUserCallOneParamTranslate
NtUserCallTwoParam
NtUserCanBrokerForceForeground
NtUserChangeClipboardChain
NtUserChangeDisplaySettings
NtUserChangeWindowMessageFilterEx
NtUserCheckAccessForIntegrityLevel
NtUserCheckDesktopByThreadId
NtUserCheckImeHotKey
NtUserCheckMenuItem
NtUserCheckMenuRadioItem

NtUserCheckProcessForClipboardAccess
NtUserCheckProcessSession
NtUserCheckWindowThreadDesktop
NtUserChildWindowFromPointEx
NtUserClearForeground
NtUserClipCursor
NtUserCloseClipboard
NtUserCloseDesktop
NtUserCloseWindowStation
NtUserCompositionInputSinkLuidFromPoint
NtUserCompositionInputSinkViewInstanceldFromPoint
NtUserConfigureActivationObject
NtUserConfirmResizeCommit
NtUserConsoleControl
NtUserConvertMemHandle
NtUserCopyAcceleratorTable
NtUserCountClipboardFormats
NtUserCreateAcceleratorTable
NtUserCreateActivationGroup
NtUserCreateActivationObject
NtUserCreateCaret
NtUserCreateDCompositionHwndTarget
NtUserCreateDesktop
NtUserCreateDesktopEx
NtUserCreateEmptyCursorObject
NtUserCreateInputContext
NtUserCreateLocalMemHandle
NtUserCreatePalmRejectionDelayZone
NtUserCreateWindowEx
NtUserCreateWindowGroup
NtUserCreateWindowStation
NtUserCtxDisplayIOctl
NtUserDdeGetQualityOfService
NtUserDdeInitialize
NtUserDdeSetQualityOfService
NtUserDefSetText
NtUserDeferWindowDpiChanges
NtUserDeferWindowPos
NtUserDeferWindowPosAndBand
NtUserDelegateCapturePointers
NtUserDelegateInput

NtUserDeleteMenu
NtUserDeleteWindowGroup
NtUserDestroyAcceleratorTable
NtUserDestroyActivationGroup
NtUserDestroyActivationObject
NtUserDestroyCursor
NtUserDestroyDCompositionHwndTarget
NtUserDestroyInputContext
NtUserDestroyMenu
NtUserDestroyPalmRejectionDelayZone
NtUserDestroyWindow
NtUserDisableImmersiveOwner
NtUserDisableProcessWindowFiltering
NtUserDisableThreadIme
NtUserDiscardPointerFrameMessages
NtUserDispatchMessage
NtUserDisplayConfigGetDeviceInfo
NtUserDisplayConfigSetDeviceInfo
NtUserDoSoundConnect
NtUserDoSoundDisconnect
NtUserDownlevelTouchpad
NtUserDragDetect
NtUserDragObject
NtUserDrawAnimatedRects
NtUserDrawCaption
NtUserDrawCaptionTemp
NtUserDrawIconEx
NtUserDrawMenuBarTemp
NtUserDwmGetDxRgn
NtUserDwmGetRemoteSessionOcclusionEvent
NtUserDwmGetRemoteSessionOcclusionState
NtUserDwmHintDxUpdate
NtUserDwmKernelShutdown
NtUserDwmKernelStartup
NtUserDwmStartRedirection
NtUserDwmStopRedirection
NtUserDwmValidateWindow
NtUserECQueryInputLangChange
NtUserEmptyClipboard
NtUserEnableChildWindowDpiMessage
NtUserEnableIAMAccess

NtUserEnableMenuItem
NtUserEnableMouseInPointer
NtUserEnableMouseInPointerForWindow
NtUserEnableMouseInputForCursorSuppression
NtUserEnableNonClientDpiScaling
NtUserEnableResizeLayoutSynchronization
NtUserEnableScrollBar
NtUserEnableSoftwareCursorForScreenCapture
NtUserEnableTouchPad
NtUserEnableWindowGDIScaledDpiMessage
NtUserEnableWindowGroupPolicy
NtUserEnableWindowResizeOptimization
NtUserEndDeferWindowPosEx
NtUserEndMenu
NtUserEndPaint
NtUserEndTouchOperation
NtUserEnumDisplayDevices
NtUserEnumDisplayMonitors
NtUserEnumDisplaySettings
NtUserEvent
NtUserExcludeUpdateRgn
NtUserFillWindow
NtUserFindExistingCursorIcon
NtUserFindWindowEx
NtUserFlashWindowEx
NtUserForceWindowToDpiForTest
NtUserFrostCrashedWindow
NtUserFullscreenControl
NtUserFunctionalizeDisplayConfig
NtUserGetActiveProcessesDpis
NtUserGetAltTabInfo
NtUserGetAncestor
NtUserGetApplImeLevel
NtUserGetAsyncKeyState
NtUserGetAtomName
NtUserGetAutoRotationState
NtUserGetCIMSSM
NtUserGetCPD
NtUserGetCaretBlinkTime
NtUserGetCaretPos
NtUserGetClassInfo

NtUserGetClassInfoEx
NtUserGetClassName
NtUserGetClipCursor
NtUserGetClipboardAccessToken
NtUserGetClipboardData
NtUserGetClipboardFormatName
NtUserGetClipboardOwner
NtUserGetClipboardSequenceNumber
NtUserGetClipboardViewer
NtUserGetComboBoxInfo
NtUserGetControlBrush
NtUserGetControlColor
NtUserGetCurrentDpiInfoForWindow
NtUserGetCurrentInputMessageSource
NtUserGetCursor
NtUserGetCursorDims
NtUserGetCursorFrameInfo
NtUserGetCursorInfo
NtUserGetDC
NtUserGetDCEx
NtUserGetDManipHookInitFunction
NtUserGetDesktopID
NtUserGetDisplayAutoRotationPreferences
NtUserGetDisplayAutoRotationPreferencesByProcessId
NtUserGetDisplayConfigBufferSizes
NtUserGetDoubleClickTime
NtUserGetDpiForCurrentProcess
NtUserGetDpiForMonitor
NtUserGetDpiSystemMetrics
NtUserGetExtendedPointerDeviceProperty
NtUserGetForegroundWindow
NtUserGetGUIThreadInfo
NtUserGetGestureConfig
NtUserGetGestureExtArgs
NtUserGetGestureInfo
NtUserGetGlobalIMEStatus
NtUserGetGuiResources
NtUserGetHDevName
NtUserGetHimetricScaleFactorFromPixelLocation
NtUserGetIconInfo
NtUserGetIconSize

NtUserGetImeHotKey
NtUserGetImeInfoEx
NtUserGetInputContainerId
NtUserGetInputEvent
NtUserGetInputLocaleInfo
NtUserGetInteractiveControlDeviceInfo
NtUserGetInteractiveControlInfo
NtUserGetInteractiveCtrlSupportedWaveforms
NtUserGetInternalWindowPos
NtUserGetKeyNameText
NtUserGetKeyState
NtUserGetKeyboardLayout
NtUserGetKeyboardLayoutList
NtUserGetKeyboardLayoutName
NtUserGetKeyboardState
NtUserGetLayeredWindowAttributes
NtUserGetListBoxInfo
NtUserGetListboxString
NtUserGetMediaChangeEvents
NtUserGetMenuBarInfo
NtUserGetMenuIndex
NtUserGetMenuitemRect
NtUserGetMessage
NtUserGetMonitorBrightness
NtUserGetMouseMovePointsEx
NtUserGetObjectInformation
NtUserGetOemBitmapSize
NtUserGetOpenClipboardWindow
NtUserGetOwnerTransformedMonitorRect
NtUserGetPhysicalDeviceRect
NtUserGetPointerCursorId
NtUserGetPointerDevice
NtUserGetPointerDeviceCursors
NtUserGetPointerDeviceInputSpace
NtUserGetPointerDeviceOrientation
NtUserGetPointerDeviceProperties
NtUserGetPointerDeviceRects
NtUserGetPointerDevices
NtUserGetPointerFrameArrivalTimes
NtUserGetPointerFrameTimes
NtUserGetPointerInfoList

NtUserGetPointerInputTransform
NtUserGetPointerProprietaryId
NtUserGetPointerType
NtUserGetPrecisionTouchPadConfiguration
NtUserGetPriorityClipboardFormat
NtUserGetProcessDpiAwareness
NtUserGetProcessDpiAwarenessContext
NtUserGetProcessUIContextInformation
NtUserGetProcessWindowStation
NtUserGetProp
NtUserGetQueueEventStatus
NtUserGetQueueStatus
NtUserGetQueueStatusReadonly
NtUserGetRawInputBuffer
NtUserGetRawInputData
NtUserGetRawInputDeviceInfo
NtUserGetRawInputDeviceList
NtUserGetRawPointerDeviceData
NtUserGetRegisteredRawInputDevices
NtUserGetRequiredCursorSizes
NtUserGetResizeDCompositionSynchronizationObject
NtUserGetScrollBarInfo
NtUserGetSharedWindowData
NtUserGetStats
NtUserGetSystemDpiForProcess
NtUserGetSystemMenu
NtUserGetThreadDesktop
NtUserGetThreadState
NtUserGetTitleBarInfo
NtUserGetTopLevelWindow
NtUserGetTouchInputInfo
NtUserGetTouchValidationStatus
NtUserGetUniformSpaceMapping
NtUserGetUpdateRect
NtUserGetUpdateRgn
NtUserGetUpdatedClipboardFormats
NtUserGetUserStartupInfoFlags
NtUserGetWOWClass
NtUserGetWindowBand
NtUserGetWindowCompositionAttribute
NtUserGetWindowCompositionInfo

NtUserGetWindowDC
NtUserGetWindowDisplayAffinity
NtUserGetWindowFeedbackSetting
NtUserGetWindowGroupId
NtUserGetWindowMinimizeRect
NtUserGetWindowPlacement
NtUserGetWindowProcessHandle
NtUserGetWindowRgnEx
NtUserGhostWindowFromHungWindow
NtUserHandleDelegatedInput
NtUserHardErrorControl
NtUserHideCaret
NtUserHidePointerContactVisualization
NtUserHiliteMenuItem
NtUserHungWindowFromGhostWindow
NtUserHwndQueryRedirectionInfo
NtUserHwndSetRedirectionInfo
NtUserImpersonateDdeClientWindow
NtUserInheritWindowMonitor
NtUserInitBrushes
NtUserInitTask
NtUserInitialize
NtUserInitializeClientPfnArrays
NtUserInitializeGenericHidInjection
NtUserInitializeInputDeviceInjection
NtUserInitializePointerDeviceInjection
NtUserInitializePointerDeviceInjectionEx
NtUserInitializeTouchInjection
NtUserInjectDeviceInput
NtUserInjectGenericHidInput
NtUserInjectGesture
NtUserInjectKeyboardInput
NtUserInjectMouseInput
NtUserInjectPointerInput
NtUserInjectTouchInput
NtUserInteractiveControlQueryUsage
NtUserInternalClipCursor
NtUserInternalGetWindowIcon
NtUserInternalGetWindowText
NtUserInternalToUnicode
NtUserInvalidateRect

NtUserInvalidateRgn
NtUserIsChildWindowDpiMessageEnabled
NtUserIsClipboardFormatAvailable
NtUserIsMouseInPointerEnabled
NtUserIsMouseInputEnabled
NtUserIsNonClientDpiScalingEnabled
NtUserIsResizeLayoutSynchronizationEnabled
NtUserIsTopLevelWindow
NtUserIsTouchWindow
NtUserIsWindowBroadcastingDpiToChildren
NtUserIsWindowGDIScaledDpiMessageEnabled
NtUserKillTimer
NtUserLayoutCompleted
NtUserLinkDpiCursor
NtUserLoadKeyboardLayoutEx
NtUserLockCursor
NtUserLockWindowStation
NtUserLockWindowUpdate
NtUserLockWorkStation
NtUserLogicalToPerMonitorDPIPhysicalPoint
NtUserLogicalToPhysicalDpiPointForWindow
NtUserLogicalToPhysicalPoint
NtUserMNDragLeave
NtUserMNDragOver
NtUserMagControl
NtUserMagGetContextInformation
NtUserMagSetContextInformation
NtUserManageGestureHandlerWindow
NtUserMapPointsByVisualIdentifier
NtUserMapVirtualKeyEx
NtUserMarkWindowForRawMouse
NtUserMenuItemFromPoint
NtUserMessageCall
NtUserMinInitialize
NtUserMinMaximize
NtUserModifyUserStartupInfoFlags
NtUserModifyWindowTouchCapability
NtUserMoveWindow
NtUserMsgWaitForMultipleObjectsEx
NtUserNavigateFocus
NtUserNotifyIMEStatus

NtUserNotifyProcessCreate
NtUserNotifyWinEvent
NtUserOpenClipboard
NtUserOpenDesktop
NtUserOpenInputDesktop
NtUserOpenThreadDesktop
NtUserOpenWindowStation
NtUserPaintDesktop
NtUserPaintMenuBar
NtUserPaintMonitor
NtUserPeekMessage
NtUserPerMonitorDPIPhysicalToLogicalPoint
NtUserPhysicalToLogicalDpiPointForWindow
NtUserPhysicalToLogicalPoint
NtUserPlayEventSound
NtUserPostKeyboardInputMessage
NtUserPostMessage
NtUserPostThreadMessage
NtUserPrintWindow
NtUserProcessConnect
NtUserProcessInkFeedbackCommand
NtUserPromoteMouseInPointer
NtUserPromotePointer
NtUserQueryActivationObject
NtUserQueryBSDRWindow
NtUserQueryDisplayConfig
NtUserQueryInformationThread
NtUserQueryInputContext
NtUserQuerySendMessage
NtUserQueryUserCounters
NtUserQueryWindow
NtUserRealChildWindowFromPoint
NtUserRealInternalGetMessage
NtUserRealWaitMessageEx
NtUserRedrawWindow
NtUserRegisterBSDRWindow
NtUserRegisterClassExWOW
NtUserRegisterClipboardFormat
NtUserRegisterDManipHook
NtUserRegisterEdgy
NtUserRegisterErrorReportingDialog

NtUserRegisterHotKey
NtUserRegisterManipulationThread
NtUserRegisterPointerDeviceNotifications
NtUserRegisterPointerInputTarget
NtUserRegisterRawInputDevices
NtUserRegisterServicesProcess
NtUserRegisterSessionPort
NtUserRegisterShellIPTPLListener
NtUserRegisterTasklist
NtUserRegisterTouchHitTestingWindow
NtUserRegisterTouchPadCapable
NtUserRegisterUserApiHook
NtUserRegisterWindowMessage
NtUserReleaseDC
NtUserReleaseDwmHitTestWaiters
NtUserRemoteConnect
NtUserRemoteRedrawRectangle
NtUserRemoteRedrawScreen
NtUserRemoteStopScreenUpdates
NtUserRemoveClipboardFormatListener
NtUserRemoveInjectionDevice
NtUserRemoveMenu
NtUserRemoveProp
NtUserRemoveVisualIdentifier
NtUserReportInertia
NtUserRequestMoveSizeOperation
NtUserResolveDesktop
NtUserResolveDesktopForWOW
NtUserRestoreWindowDpiChanges
NtUserSBGetParms
NtUserScrollDC
NtUserScrollWindowEx
NtUserSelectPalette
NtUserSendEventMessage
NtUserSendInput
NtUserSendInteractiveControlHapticsReport
NtUserSendMessageCallback
NtUserSendNotifyMessage
NtUserSendTouchInput
NtUserSetActivationFilter
NtUserSetActiveProcess

NtUserSetActiveProcessForMonitor
NtUserSetActiveWindow
NtUserSetApplmeLevel
NtUserSetAutoRotation
NtUserSetBridgeWindowChild
NtUserSetBrokeredForeground
NtUserSetCalibrationData
NtUserSetCapture
NtUserSetChildWindowNoActivate
NtUserSetClassLong
NtUserSetClassWord
NtUserSetClipboardData
NtUserSetClipboardViewer
NtUserSetConsoleReserveKeys
NtUserSetCoreWindow
NtUserSetCoreWindowPartner
NtUserSetCursor
NtUserSetCursorContents
NtUserSetCursorIconData
NtUserSetCursorPos
NtUserSetDbgTag
NtUserSetDebugErrorLevel
NtUserSetDesktopColorTransform
NtUserSetDesktopVisualInputSink
NtUserSetDialogControlDpiChangeBehavior
NtUserSetDimUndimTransitionTime
NtUserSetDisplayAutoRotationPreferences
NtUserSetDisplayConfig
NtUserSetDisplayMapping
NtUserSetFallbackForeground
NtUserSetFeatureReportResponse
NtUserSetFocus
NtUserSetForegroundWindowForApplication
NtUserSetFullscreenMagnifierOffsetsDWMUpdated
NtUserSetGestureConfig
NtUserSetImeHotKey
NtUserSetImeInfoEx
NtUserSetImeOwnerWindow
NtUserSetImmersiveBackgroundWindow
NtUserSetInformationProcess
NtUserSetInformationThread

NtUserSetInputServiceState
NtUserSetInteractiveControlFocus
NtUserSetInteractiveCtrlRotationAngle
NtUserSetInternalWindowPos
NtUserSetKeyboardState
NtUserSetLayeredWindowAttributes
NtUserSetLogonNotifyWindow
NtUserSetMagnificationDesktopMagnifierOffsetsDWMUpdated
NtUserSetManipulationInputTarget
NtUserSetMenu
NtUserSetMenuContextHelpId
NtUserSetMenuDefaultItem
NtUserSetMenuFlagRtoL
NtUserSetMirrorRendering
NtUserSetMonitorBrightness
NtUserSetMonitorWorkArea
NtUserSetMouseInputRateLimitingTimer
NtUserSetObjectInformation
NtUserSetParent
NtUserSetPrecisionTouchPadConfiguration
NtUserSetProcessDPIAware
NtUserSetProcessDpiAwareness
NtUserSetProcessDpiAwarenessContext
NtUserSetProcessInteractionFlags
NtUserSetProcessMousewheelRoutingMode
NtUserSetProcessRestrictionExemption
NtUserSetProcessUIAccessZorder
NtUserSetProcessWindowStation
NtUserSetProp
NtUserSetRipFlags
NtUserSetScrollInfo
NtUserSetSensorPresence
NtUserSetSharedWindowData
NtUserSetShellWindowEx
NtUserSetSysColors
NtUserSetSystemCursor
NtUserSetSystemMenu
NtUserSetSystemTimer
NtUserSetTargetForResourceBrokering
NtUserSetThreadDesktop
NtUserSetThreadInputBlocked

NtUserSetThreadLayoutHandles
NtUserSetThreadState
NtUserSetTimer
NtUserSetUserStartupInfoFlags
NtUserSetWinEventHook
NtUserSetWindowArrangement
NtUserSetWindowBand
NtUserSetWindowCompositionAttribute
NtUserSetWindowCompositionTransition
NtUserSetWindowDisplayAffinity
NtUserSetWindowFNID
NtUserSetWindowFeedbackSetting
NtUserSetWindowGroup
NtUserSetWindowLong
NtUserSetWindowPlacement
NtUserSetWindowPos
NtUserSetWindowRgn
NtUserSetWindowRgnEx
NtUserSetWindowShowState
NtUserSetWindowStationUser
NtUserSetWindowWord
NtUserSetWindowsHookAW
NtUserSetWindowsHookEx
NtUserSfmDestroyLogicalSurfaceBinding
NtUserSfmDxBindSwapChain
NtUserSfmDxGetSwapChainStats
NtUserSfmDxOpenSwapChain
NtUserSfmDxQuerySwapChainBindingStatus
NtUserSfmDxReleaseSwapChain
NtUserSfmDxReportPendingBindingsToDwm
NtUserSfmDxSetSwapChainBindingStatus
NtUserSfmDxSetSwapChainStats
NtUserSfmGetLogicalSurfaceBinding
NtUserShowCaret
NtUserShowCursor
NtUserShowScrollBar
NtUserShowSystemCursor
NtUserShowWindow
NtUserShowWindowAsync
NtUserShutdownBlockReasonCreate
NtUserShutdownBlockReasonQuery

NtUserShutdownReasonDestroy
NtUserSignalRedirectionStartComplete
NtUserSlicerControl
NtUserSoundSentry
NtUserStopAndEndInertia
NtUserSwitchDesktop
NtUserSystemParametersInfo
NtUserSystemParametersInfoForDpi
NtUserTestForInteractiveUser
NtUserThunkedMenuInfo
NtUserThunkedMenuItemInfo
NtUserToUnicodeEx
NtUserTrackMouseEvent
NtUserTrackPopupMenuEx
NtUserTransformPoint
NtUserTransformRect
NtUserTranslateAccelerator
NtUserTranslateMessage
NtUserUndelegateInput
NtUserUnhookWinEvent
NtUserUnhookWindowsHookEx
NtUserUnloadKeyboardLayout
NtUserUnlockWindowStation
NtUserUnregisterClass
NtUserUnregisterHotKey
NtUserUnregisterSessionPort
NtUserUnregisterUserApiHook
NtUserUpdateDefaultDesktopThumbnail
NtUserUpdateInputContext
NtUserUpdateInstance
NtUserUpdateLayeredWindow
NtUserUpdatePerUserSystemParameters
NtUserUpdateWindowInputSinkHints
NtUserUpdateWindowTrackingInfo
NtUserUpdateWindowTransform
NtUserUserHandleGrantAccess
NtUserValidateHandleSecure
NtUserValidateRect
NtUserValidateTimerCallback
NtUserVkKeyScanEx
NtUserWOWCleanup

NtUserWOWFindWindow
NtUserWaitAvailableMessageEx
NtUserWaitForInputIdle
NtUserWaitForMsgAndEvent
NtUserWaitForRedirectionStartComplete
NtUserWaitMessage
NtUserWin32PoolAllocationStats
NtUserWindowFromDC
NtUserWindowFromPhysicalPoint
NtUserWindowFromPoint
NtUserYieldTask
NtUserfnCOPYDATA
NtUserfnCOPYGLOBALDATA
NtUserfnDDEINIT
NtUserfnDWORD
NtUserfnDWORDOPTINLPMSG
NtUserfnGETTEXTLENGTHS
NtUserfnHkINDWORD
NtUserfnHkINLPCBTACTIVATESTRUCT
NtUserfnHkINLPCBTCREATESTRUCT
NtUserfnHkINLPDEBUGHOOKSTRUCT
NtUserfnHkINLPKBDLLHOOKSTRUCT
NtUserfnHkINLPMOUSEHOOKSTRUCT
NtUserfnHkINLPMSG
NtUserfnHkINLPMSLLHOOKSTRUCT
NtUserfnHkINLPRECT
NtUserfnHkOPTINLPEVENTMSG
NtUserfnINCNTOUTSTRING
NtUserfnINCNTOUTSTRINGNULL
NtUserfnINDEVICECHANGE
NtUserfnINLPCOMPAREITEMSTRUCT
NtUserfnINLPCREATESTRUCT
NtUserfnINLPDELETEITEMSTRUCT
NtUserfnINLPDRAWITEMSTRUCT
NtUserfnINLPHELPINFOSTRUCT
NtUserfnINLPHELPSTRUCT
NtUserfnINLPMDICREATESTRUCT
NtUserfnINLPWINDOWPOS
NtUserfnINOUTDRAG
NtUserfnINOUTLPMEASUREITEMSTRUCT
NtUserfnINOUTLPPPOINT5

NtUserfnINOUTLPPRECT
NtUserfnINOUTLPSCROLLINFO
NtUserfnINOUTLPWINDOWPOS
NtUserfnINOUTNCCALCSIZE
NtUserfnINOUTNEXTMENU
NtUserfnINOUTSTYLECHANGE
NtUserfnINPAINTCLIPBRD
NtUserfnINSIZECLIPBRD
NtUserfnINSTRING
NtUserfnINSTRINGNULL
NtUserfnOPTOUTLPDWORDOPTOUTLPDWORD
NtUserfnOUTDWORDINDWORD
NtUserfnOUTLPPRECT
NtUserfnOUTSTRING
NtUserfnPOPTINLPUINT
NtUserfnPOUTLPINT
NtUserfnSENTDDEMSG
NtValidateCompositionSurfaceHandle
NtVisualCaptureBits

Resources:

- I. <https://www.javatpoint.com/system-calls-in-operating-system>
- II. <https://github.com/j00ru/windows-syscalls>

The End.

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