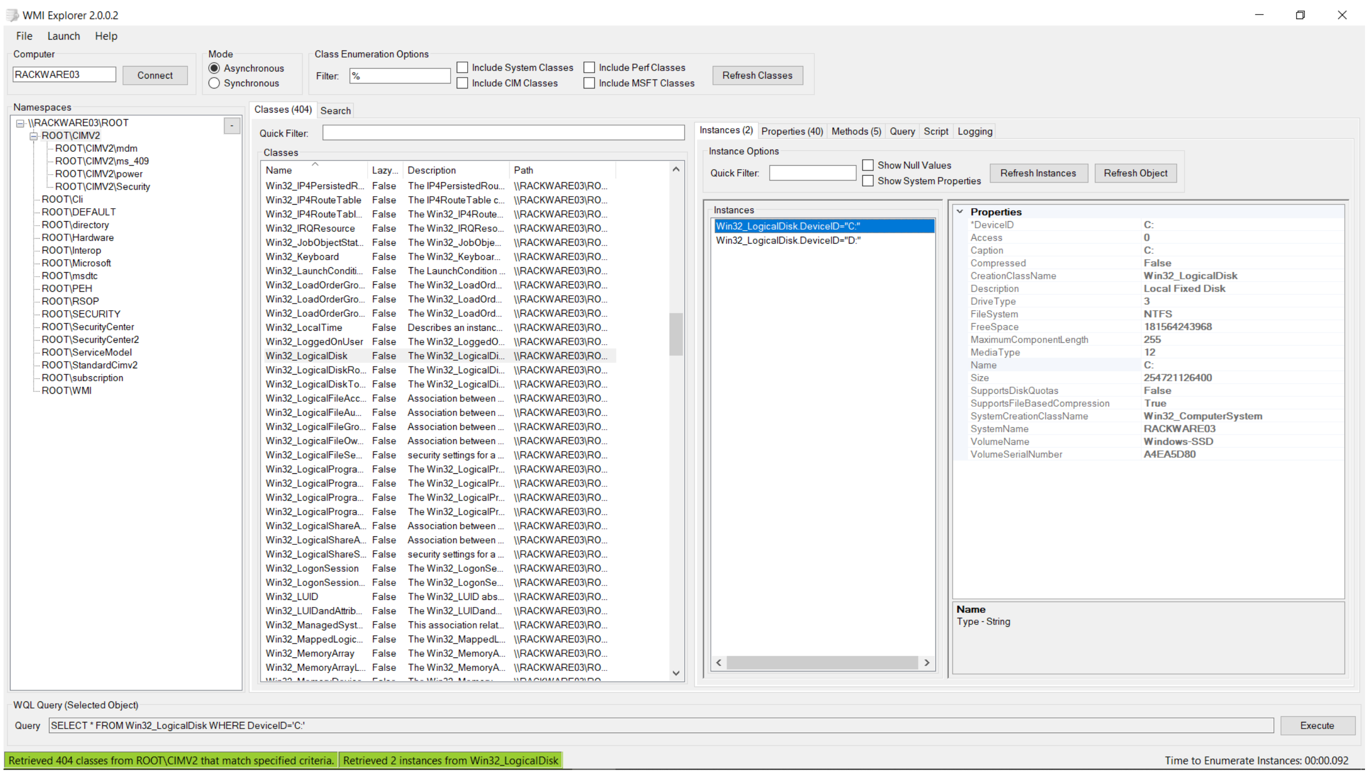
WMI Structure

The entire WMI repository is organised into Namespaces, Classes and Instances. Each namespace contains classes which are themselves organized in a hierarchy and may contain child namespaces.

We can use the WMI Explorer to explore all the WMI namespaces, classes and instances of a particular system.



Computer: RACKWARE03

Mode: [✓ Asynchronous] Synchronous

Filter: %

Namespaces:

```
\\RACKWARE03\ROOT
  ROOT\CIMV2
    ROOT\CIMV2\mdm
    ROOT\CIMV2\ms_409
    ROOT\CIMV2\power
    ROOT\CIMV2\Security
  ROOT\Cli
  ROOT\DEFAULT
  ROOT\directory
  ROOT\Hardware
  ROOT\Interop
  ROOT\Microsoft
  ROOT\msdtc
  ROOT\PEH
  ROOT\RSOP
  ROOT\SECURITY
  ROOT\SecurityCenter
  ROOT\SecurityCenter2
  ROOT\ServiceModel
  ROOT\StandardCimv2
  ROOT\subscription
  ROOT\WMI
```

Classes

Name	Lazy...	Description	Path
Win32_IP4PersistedR...	False	The IP4PersistedRou...	\\RACKWARE03\RO...
Win32_IP4RouteTable	False	The IP4RouteTable c...	\\RACKWARE03\RO...
Win32_IP4RouteTabl...	False	The Win32_IP4Route...	\\RACKWARE03\RO...
Win32_IRQResource	False	The Win32_IRQReso...	\\RACKWARE03\RO...
Win32_JobObjectStat...	False	The Win32_JobObje...	\\RACKWARE03\RO...
Win32_Keyboard	False	The Win32_Keyboar...	\\RACKWARE03\RO...
Win32_LaunchConditi...	False	The LaunchCondition ...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LocalTime	False	Describes an instanc...	\\RACKWARE03\RO...
Win32_LoggedOnUser	False	The Win32_LoggedO...	\\RACKWARE03\RO...
Win32_LogicalDisk	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalDiskRo...	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalDiskTo...	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalFileAcc...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileAu...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileGro...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileOw...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileSe...	False	security settings for a ...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
Win32_LogicalShareA...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalShareA...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalShareS...	False	security settings for a ...	\\RACKWARE03\RO...
Win32_LogonSession	False	The Win32_LogonSe...	\\RACKWARE03\RO...
Win32_LogonSession...	False	The Win32_LogonSe...	\\RACKWARE03\RO...
Win32_LUID	False	The Win32_LUID abs...	\\RACKWARE03\RO...
Win32_LUIDandAttrib...	False	The Win32_LUIDand...	\\RACKWARE03\RO...
Win32_ManagedSyst...	False	This association relat...	\\RACKWARE03\RO...
Win32_MappedLogic...	False	The Win32_MappedL...	\\RACKWARE03\RO...
Win32_MemoryArray	False	The Win32_MemoryA...	\\RACKWARE03\RO...
Win32_MemoryArrayL...	False	The Win32_MemoryA...	\\RACKWARE03\RO...

Instances

```
Win32_LogicalDisk.DeviceID="C:"
Win32_LogicalDisk.DeviceID="D:"
```

Properties

*DeviceID	C:
Access	0
Caption	C:
Compressed	False
CreationClassName	Win32_LogicalDisk
Description	Local Fixed Disk
DriveType	3
FileSystem	NTFS
FreeSpace	181564243968
MaximumComponentLength	255
MediaType	12
Name	C:
Size	254721126400
SupportsDiskQuotas	False
SupportsFileBasedCompression	True
SystemCreationClassName	Win32_ComputerSystem
SystemName	RACKWARE03
VolumeName	Windows-SSD
VolumeSerialNumber	A4EA5D80

Name
Type - String

WQL Query (Selected Object)

Query: `SELECT * FROM Win32_LogicalDisk WHERE DeviceID='C:'`

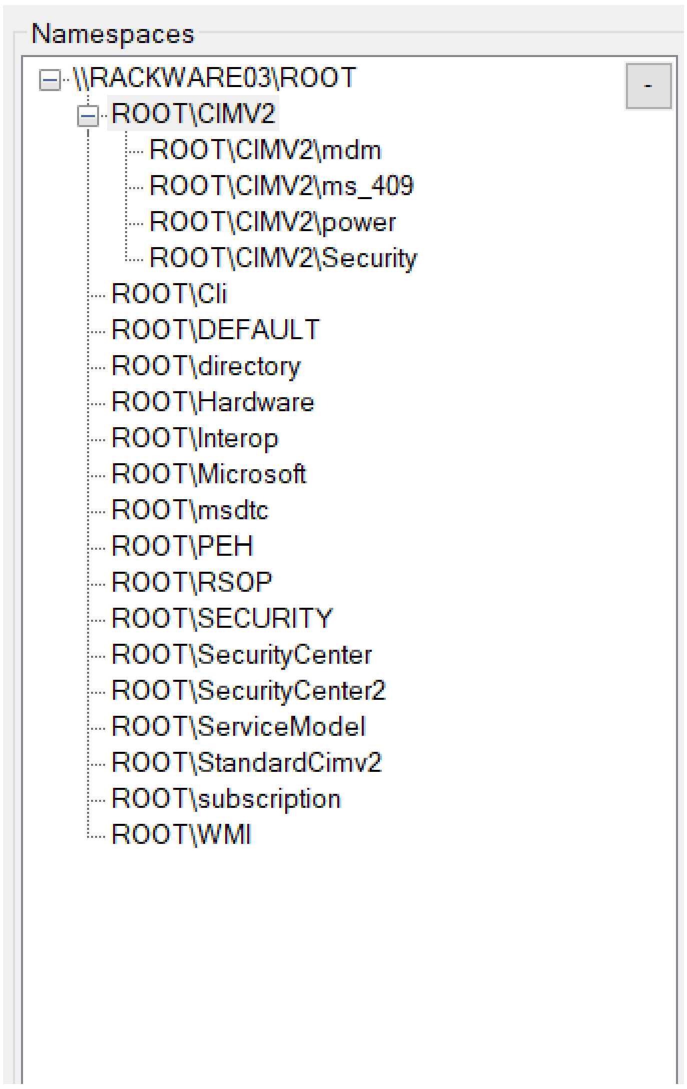
```
Retrieved 404 classes from ROOT\CIMV2 that match specified criteria. | Retrieved 2 instances from Win32_LogicalDisk
Time to Enumerate Instances: 00:00.092
```

Namespaces

A namespace is a logical grouping of classes which belong to the same management environment. To find useful information, you need to know a Class Name *plus* the Namespace where it lives.

A Namespace organizes information similar to folders in a filesystem. The top “folder” of the WMI namespace is always called `root`.

The `Get-CimInstance` command cannot search recursively through all namespaces. It always searches only one namespace, and if you don’t specify one, it uses the default namespace `root/cimv2`.

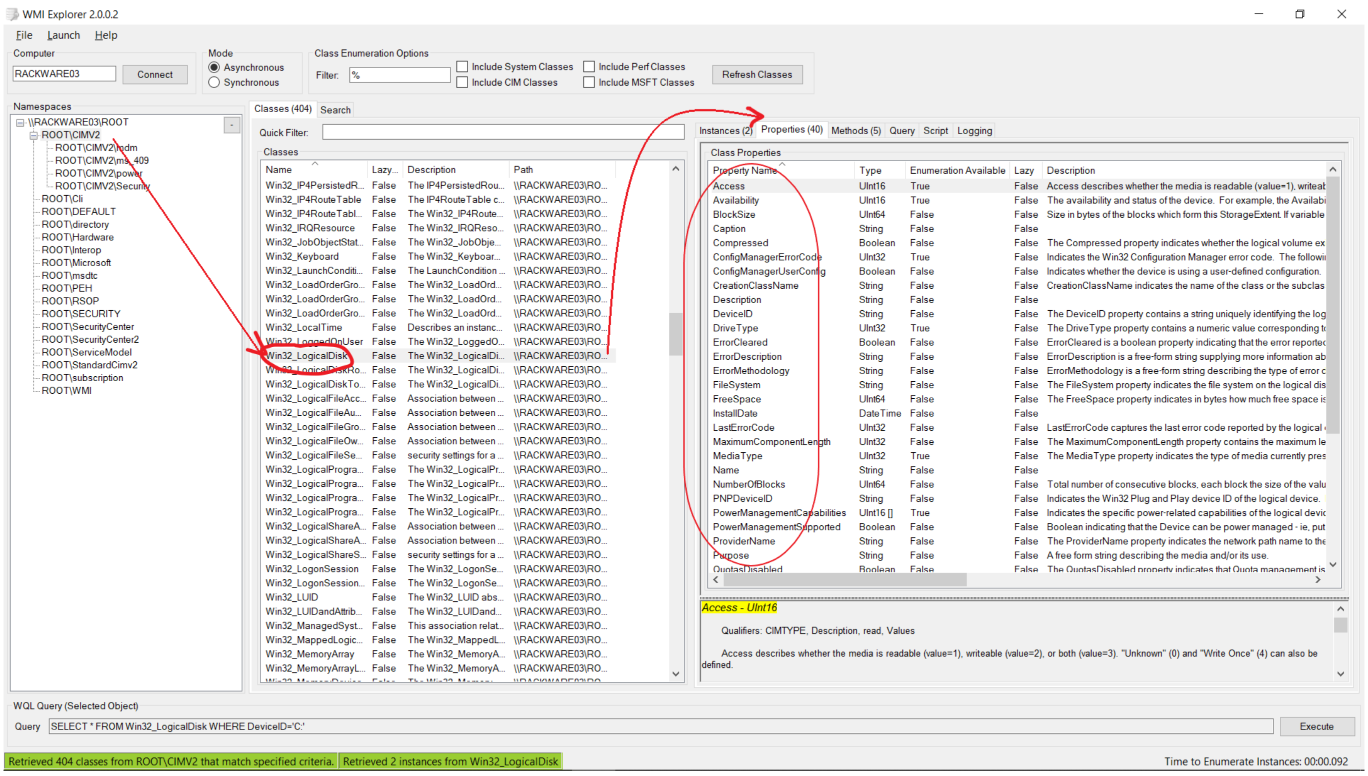


```
\\RACKWARE03\ROOT
    ROOT\CIMV2
        ROOT\CIMV2\mdm
        ROOT\CIMV2\ms_409
        ROOT\CIMV2\power
        ROOT\CIMV2\Security
    ROOT\Cli
    ROOT\DEFAULT
    ROOT\directory
    ROOT\Hardware
    ROOT\Interop
    ROOT\Microsoft
    ROOT\msdtc
    ROOT\PEH
    ROOT\RSOP
    ROOT\SECURITY
    ROOT\SecurityCenter
    ROOT\SecurityCenter2
    ROOT\ServiceModel
    ROOT\StandardCimv2
    ROOT\subscription
    ROOT\WMI
```

Classes

A WMI class is used as the recipe to create an instance of a WMI object. We can look at a WMI class just like we look at classes in the Object Oriented Programming paradigm. Similar to an OOP class, the WMI class also defines properties and methods.

For example let's look at the default namespace `root/cimv2`. In it, we look at the class called `Win32_LogicalDisk`. This class has a large number of properties (eg. Size, Free Space, FileSystem,etc.). These properties are the attributes that any instance of `Win32_LogicalDisk` should have.



Computer: RACKWARE03

Mode: [✓ Asynchronous] Synchronous

Class Enumeration Options — Filter: %

☐ Include System Classes ☐ Include Perf Classes ☐ Include CIM Classes ☐ Include MSFT Classes

Namespaces

```
\\RACKWARE03\ROOT
  ROOT\CIMV2
    ROOT\CIMV2\mdm
    ROOT\CIMV2\ms_409
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    ROOT\CIMV2\Security
  ROOT\Cli
  ROOT\DEFAULT
  ROOT\directory
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  ROOT\Interop
  ROOT\Microsoft
  ROOT\msdtc
  ROOT\PEH
  ROOT\RSOP
  ROOT\SECURITY
  ROOT\SecurityCenter
  ROOT\SecurityCenter2
  ROOT\ServiceModel
  ROOT\StandardCimv2
  ROOT\subscription
  ROOT\WMI
```

Quick Filter:

Classes

Name	Lazy...	Description	Path
Win32_IP4PersistedR...	False	The IP4PersistedRou...	\\RACKWARE03\RO...
Win32_IP4RouteTable	False	The IP4RouteTable c...	\\RACKWARE03\RO...
Win32_IP4RouteTabl...	False	The Win32_IP4Route...	\\RACKWARE03\RO...
Win32_IRQResource	False	The Win32_IRQReso...	\\RACKWARE03\RO...
Win32_JobObjectStat...	False	The Win32_JobObje...	\\RACKWARE03\RO...
Win32_Keyboard	False	The Win32_Keyboar...	\\RACKWARE03\RO...
Win32_LaunchConditi...	False	The LaunchCondition ...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LoadOrderGro...	False	The Win32_LoadOrd...	\\RACKWARE03\RO...
Win32_LocalTime	False	Describes an instanc...	\\RACKWARE03\RO...
Win32_LoggedOnUser	False	The Win32_LoggedO...	\\RACKWARE03\RO...
Win32_LogicalDisk	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalDiskRo...	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalDiskTo...	False	The Win32_LogicalDi...	\\RACKWARE03\RO...
Win32_LogicalFileAcc...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileAu...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileGro...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileOw...	False	Association between ...	\\RACKWARE03\RO...
Win32_LogicalFileSe...	False	security settings for a ...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
Win32_LogicalProgra...	False	The Win32_LogicalPr...	\\RACKWARE03\RO...
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Win32_LogonSession...	False	The Win32_LogonSe...	\\RACKWARE03\RO...
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Win32_LUIDandAttrib...	False	The Win32_LUIDand...	\\RACKWARE03\RO...
Win32_ManagedSyst...	False	This association relat...	\\RACKWARE03\RO...
Win32_MappedLogic...	False	The Win32_MappedL...	\\RACKWARE03\RO...
Win32_MemoryArray	False	The Win32_MemoryA...	\\RACKWARE03\RO...
Win32_MemoryArrayL...	False	The Win32_MemoryA...	\\RACKWARE03\RO...

Class Properties

Property Name	Type	Enumeration Available	Lazy	Description
Access	UInt16	True	False	Access describes whether the media is readable (value=1), writeab
Availability	UInt16	True	False	The availability and status of the device. For example, the Availabi
BlockSize	UInt64	False	False	Size in bytes of the blocks which form this StorageExtent. If variable
Caption	String	False	False	
Compressed	Boolean	False	False	The Compressed property indicates whether the logical volume ex
ConfigManagerErrorCode	UInt32	True	False	Indicates the Win32 Configuration Manager error code. The followi
ConfigManagerUserConfig	Boolean	False	False	Indicates whether the device is using a user-defined configuration.
CreationClassName	String	False	False	CreationClassName indicates the name of the class or the subclas
Description	String	False	False	
DeviceID	String	False	False	The DeviceID property contains a string uniquely identifying the log
DriveType	UInt32	True	False	The DriveType property contains a numeric value corresponding t
ErrorCleared	Boolean	False	False	ErrorCleared is a boolean property indicating that the error reporte
ErrorDescription	String	False	False	ErrorDescription is a free-form string supplying more information ab
ErrorMethodology	String	False	False	ErrorMethodology is a free-form string describing the type of error c
FileSystem	String	False	False	The FileSystem property indicates the file system on the logical dis
FreeSpace	UInt64	False	False	The FreeSpace property indicates in bytes how much free space is
InstallDate	DateTime	False	False	
LastErrorCode	UInt32	False	False	LastErrorCode captures the last error code reported by the logical
MaximumComponentLength	UInt32	False	False	The MaximumComponentLength property contains the maximum le
MediaType	UInt32	True	False	The MediaType property indicates the type of media currently pres
Name	String	False	False	
NumberOfBlocks	UInt64	False	False	Total number of consecutive blocks, each block the size of the valu
PNPDeviceID	String	False	False	Indicates the Win32 Plug and Play device ID of the logical device.
PowerManagementCapabilities	UInt16 []	True	False	Indicates the specific power-related capabilities of the logical devic
PowerManagementSupported	Boolean	False	False	Boolean indicating that the Device can be power managed - ie, put
ProviderName	String	False	False	The ProviderName property indicates the network path name to the
Purpose	String	False	False	A free form string describing the media and/or its use.
QuotasDisabled	Boolean	False	False	The QuotasDisabled property indicates that Quota management is

Access - UInt16

Qualifiers: CIMTYPE, Description, read, Values

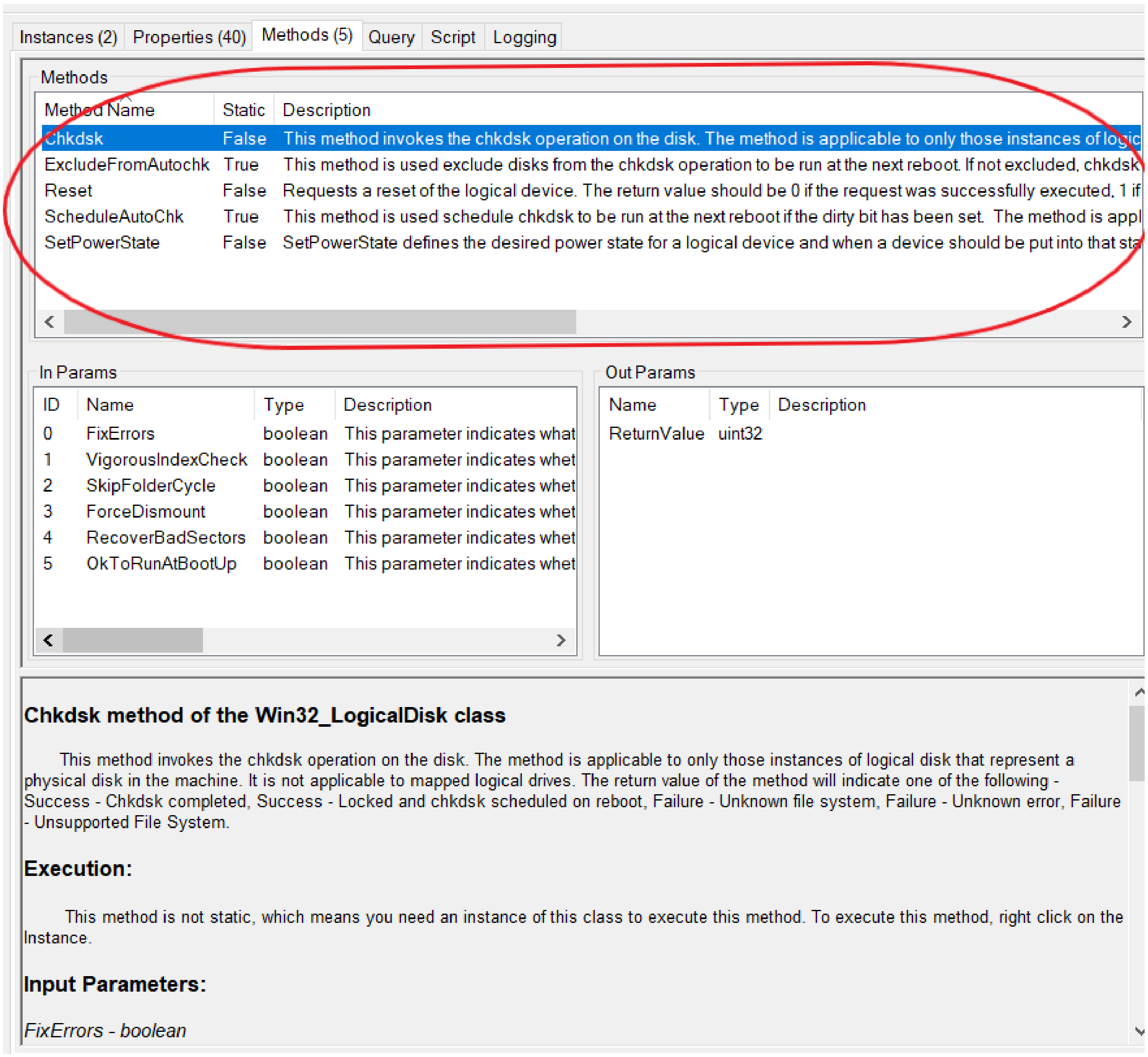
Access describes whether the media is readable (value=1), writeable (value=2), or both (value=3). "Unknown" (0) and "Write Once" (4) can also be defined.

WQL Query (Selected Object)

Query: `SELECT * FROM Win32_LogicalDisk WHERE DeviceID='C:'`

Retrieved 404 classes from ROOT\CIMV2 that match specified criteria. | Retrieved 2 instances from Win32_LogicalDisk | Time to Enumerate Instances: 00:00.092

Along with this, this class also specifies certain methods (functions) that it can perform. For example, the `Win32_LogicalDisk` class has the methods `Chkdsk`, `ExcludeFromAutochk`, `Reset`, `SchedultAutochk`, `SetPowerState`.



Method Name	Static	Description
Chkdsk	False	This method invokes the chkdsk operation on the disk. The method is applicable to only those instances of logic
ExcludeFromAutochk	True	This method is used exclude disks from the chkdsk operation to be run at the next reboot. If not excluded, chkdsk
Reset	False	Requests a reset of the logical device. The return value should be 0 if the request was successfully executed, 1 if
ScheduleAutoChk	True	This method is used schedule chkdsk to be run at the next reboot if the dirty bit has been set. The method is appl
SetPowerState	False	SetPowerState defines the desired power state for a logical device and when a device should be put into that sta

ID	Name	Type	Description
0	FixErrors	boolean	This parameter indicates what
1	VigorousIndexCheck	boolean	This parameter indicates whet
2	SkipFolderCycle	boolean	This parameter indicates whet
3	ForceDismount	boolean	This parameter indicates whet
4	RecoverBadSectors	boolean	This parameter indicates whet
5	OkToRunAtBootUp	boolean	This parameter indicates whet

Name	Type	Description
ReturnValue	uint32	

Chkdsk method of the Win32_LogicalDisk class

This method invokes the chkdsk operation on the disk. The method is applicable to only those instances of logical disk that represent a physical disk in the machine. It is not applicable to mapped logical drives. The return value of the method will indicate one of the following - Success - Chkdsk completed, Success - Locked and chkdsk scheduled on reboot, Failure - Unknown file system, Failure - Unknown error, Failure - Unsupported File System.

Execution:

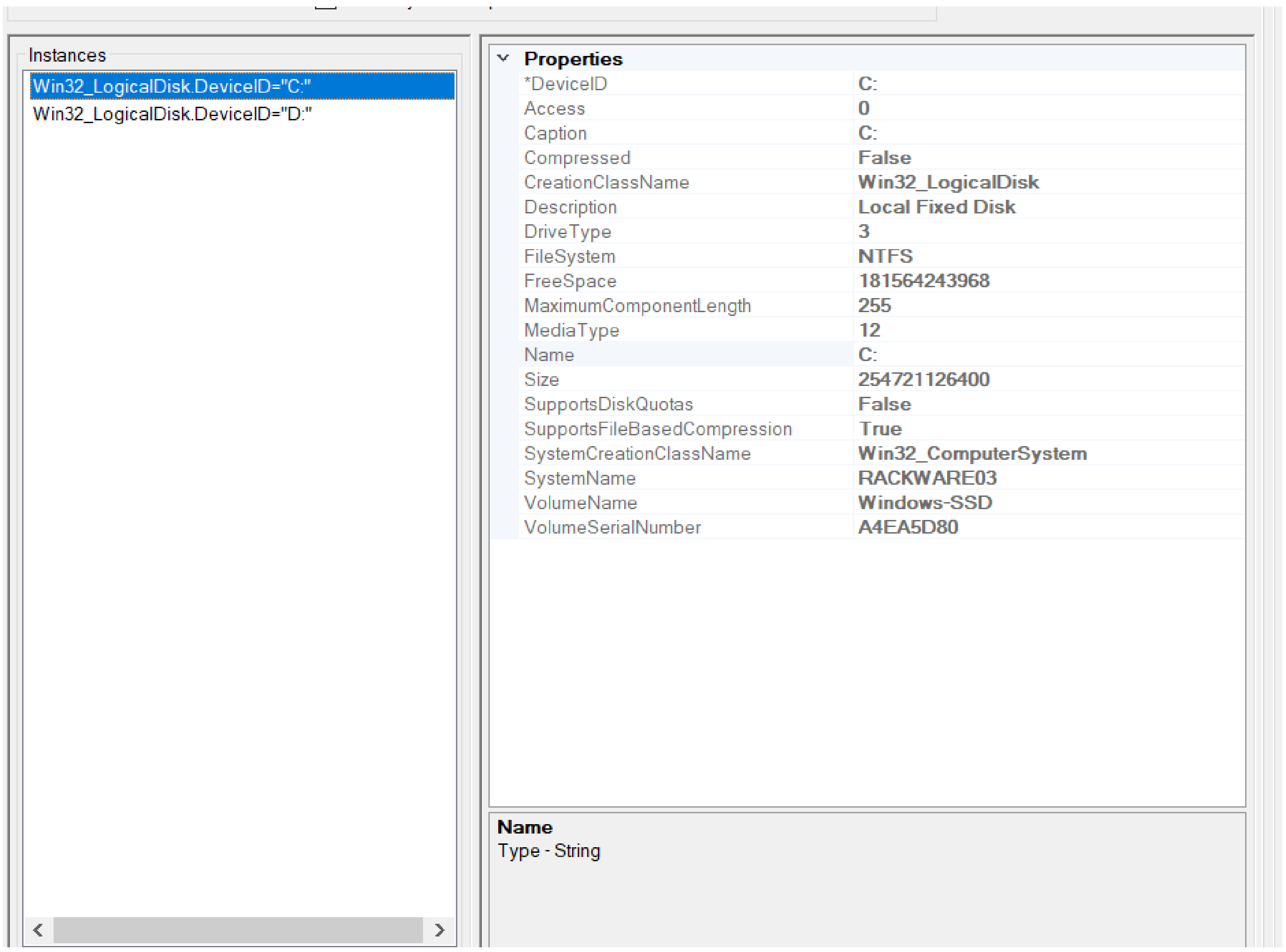
This method is not static, which means you need an instance of this class to execute this method. To execute this method, right click on the Instance.

Input Parameters:

FixErrors - boolean

Instances

An instance is an implementation of a WMI class. For example, we have the class `Win32_LogicalDisk`. The implementation of this class are the actual logical disks that we have in our system (i.e C:/, D:/, E:/, etc. drives).



Instances

Win32_LogicalDisk.DeviceID="C:"
Win32_LogicalDisk.DeviceID="D:"

Properties

*DeviceID	C:
Access	0
Caption	C:
Compressed	False
CreationClassName	Win32_LogicalDisk
Description	Local Fixed Disk
DriveType	3
FileSystem	NTFS
FreeSpace	181564243968
MaximumComponentLength	255
MediaType	12
Name	C:
Size	254721126400
SupportsDiskQuotas	False
SupportsFileBasedCompression	True
SystemCreationClassName	Win32_ComputerSystem
SystemName	RACKWARE03
VolumeName	Windows-SSD
VolumeSerialNumber	A4EA5D80

Name
Type - String

It is not necessary that every WMI class should have an instance in the system. For example, the class `Win32_Battery` class will not have an instance in a desktop. Similarly the `Win32_CDROMDrive` will not have any instance in a laptop without a CD drive installed.