Windows Storport Device Driver: WMI Objects

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This document describes how to interact with the base WMI objects that have been implemented for the Windows NVMe Community Driver. The driver's WMI implemtation is intended as a starting point for further WMI object development. It is not intended as a complete WMI solution for this driver.

The methods described here are just a few quick ways to interact with the NVMe Driver's WMI objects. A description of how to use WMI in a production environment is beyond the scope of this document.

This document will describe access the driver's WMI objects using two different tools – CIM Studio and WBEMtest.

The examples will handle the WMI objects specified in nvmeMofData.mof. Here are the details of those two objects:

- NVMe_QueryDevInfo data object:

```
class NVMe_QueryDevInfo
 {
   string  InstanceName;
   boolean Active;

  uint32 maxDataXferSize;
 uint32 numberOfNamespaces;
   NVMe_DataType Data;
 };
```

- NVMe_Method object contains the following two methods:

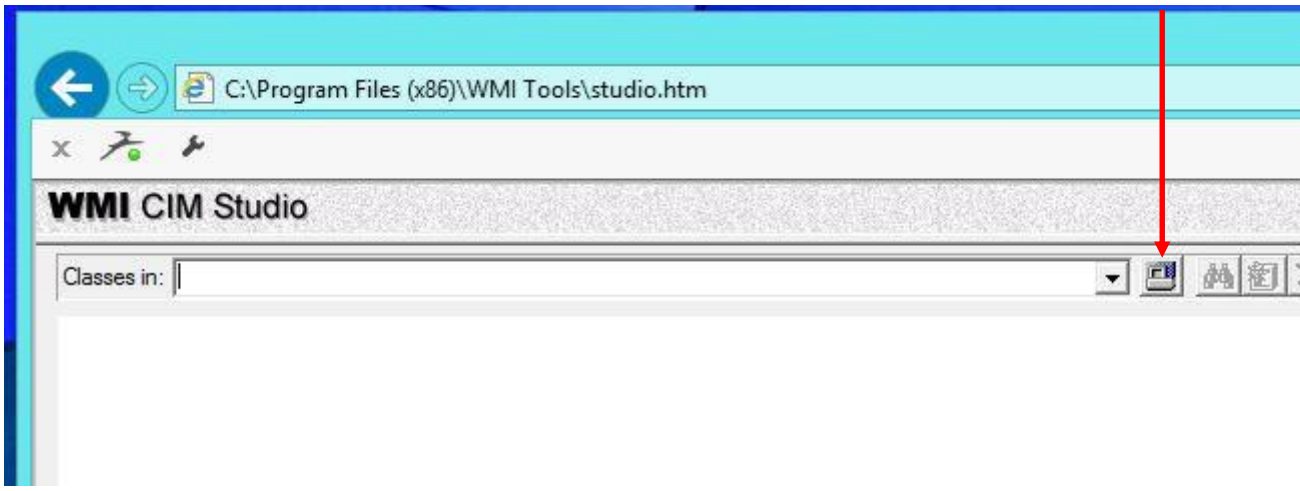
```
  void GetControllerInfo(
       [out]  uint16 pciVendorId,
       [out]  uint16 pciSsVendId
       );

 void GetNameSpaceInfo(
       [in]   uint32  lunId,
       [out]  uint64  nSize,
       );
```

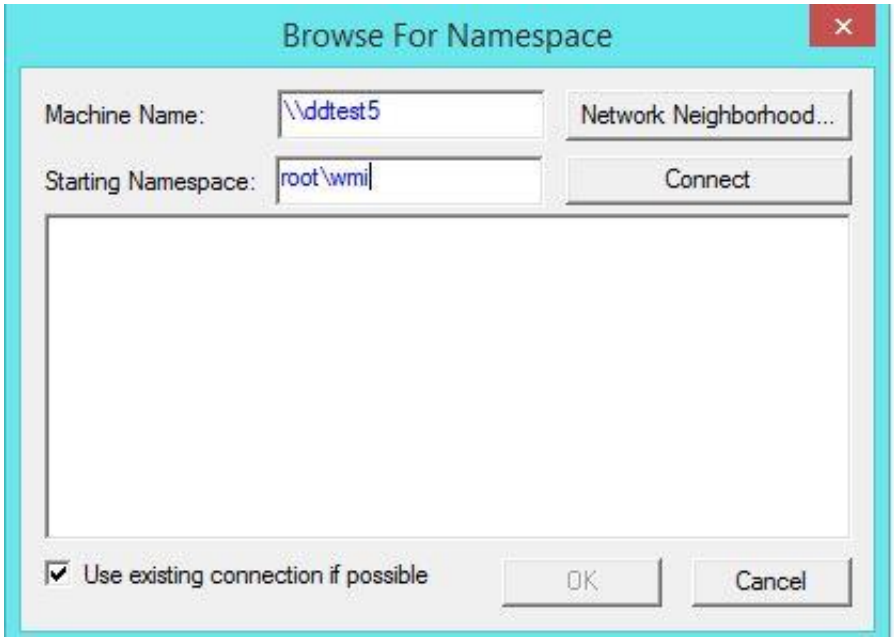
CIM Studio

CIM Studio can be downloaded from Microsoft's website. Search for "WMI administrative tools" to find the current download page. Download and install the tools.

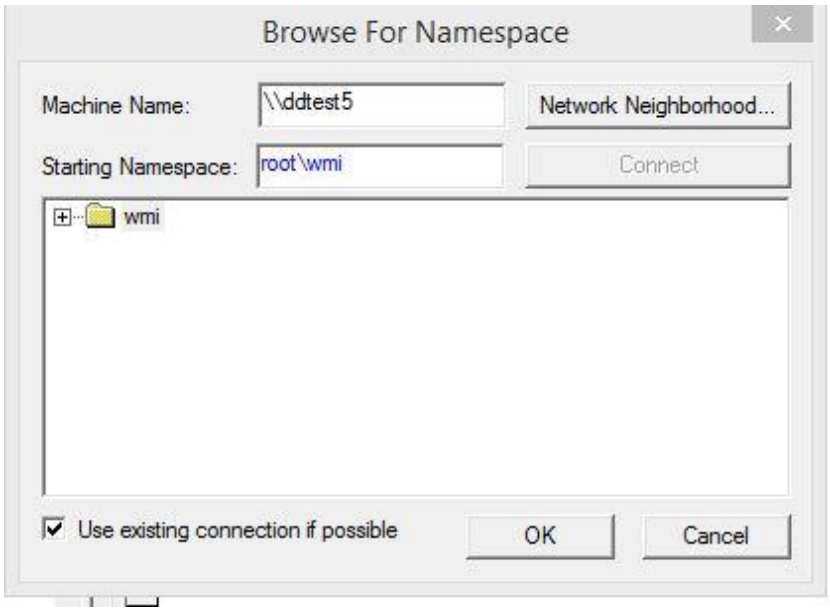
1. Start CIM Studio running on Internet Explorer (elevated) to access WMI on local or remote system.
    a. Enter “C:\Program Files (x86)\WMI Tools\studio.htm” in the Address Bar
    b. Allow blocked content
    c. Setup the correct emulation mode – F12 Followed by setting “Document Mode = 7”
2. Connect to the WMI namespace
    a. Cancel the “connect to namespace” window if it appears
    b. Go to the “Browse for Namespace” window using the icon pointed to here here



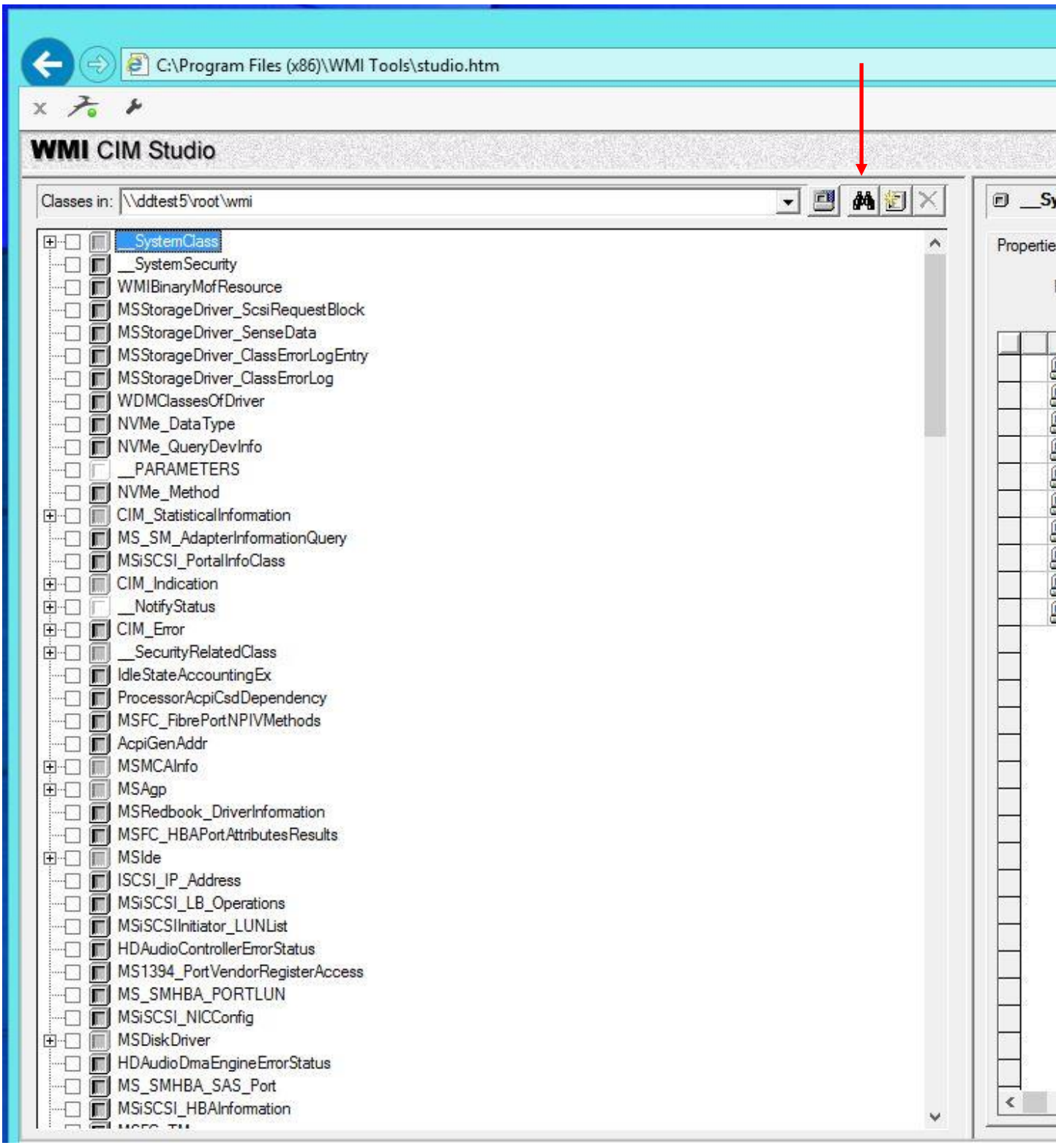
    c. In the “Browse for Namespace” window, enter “\\xxxSysName” as the target system name – xxxSysName is the name of your target system. Enter “root\wmi” in the “Starting Namespace” field. Hit “Connect”



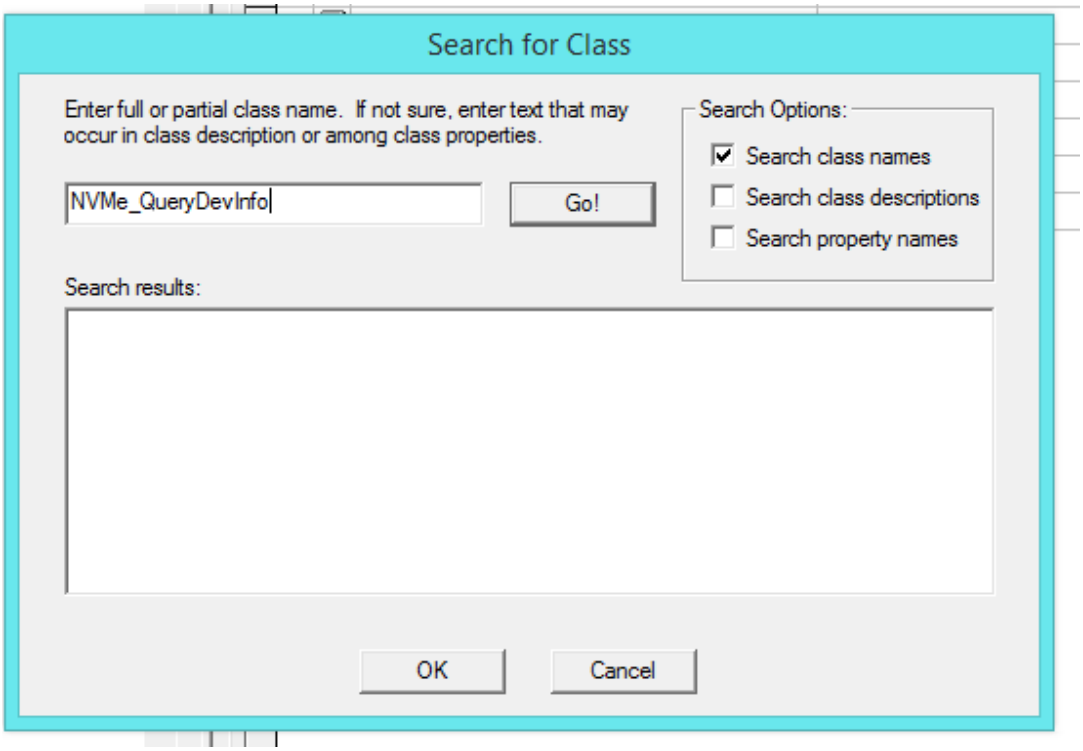
d. If prompted, enter the appropriate credentials for the target system
e. Hit “ok” to display WMI objects



3. Search for NVMe Driver objects
    a. Select the “Binoculars” icon

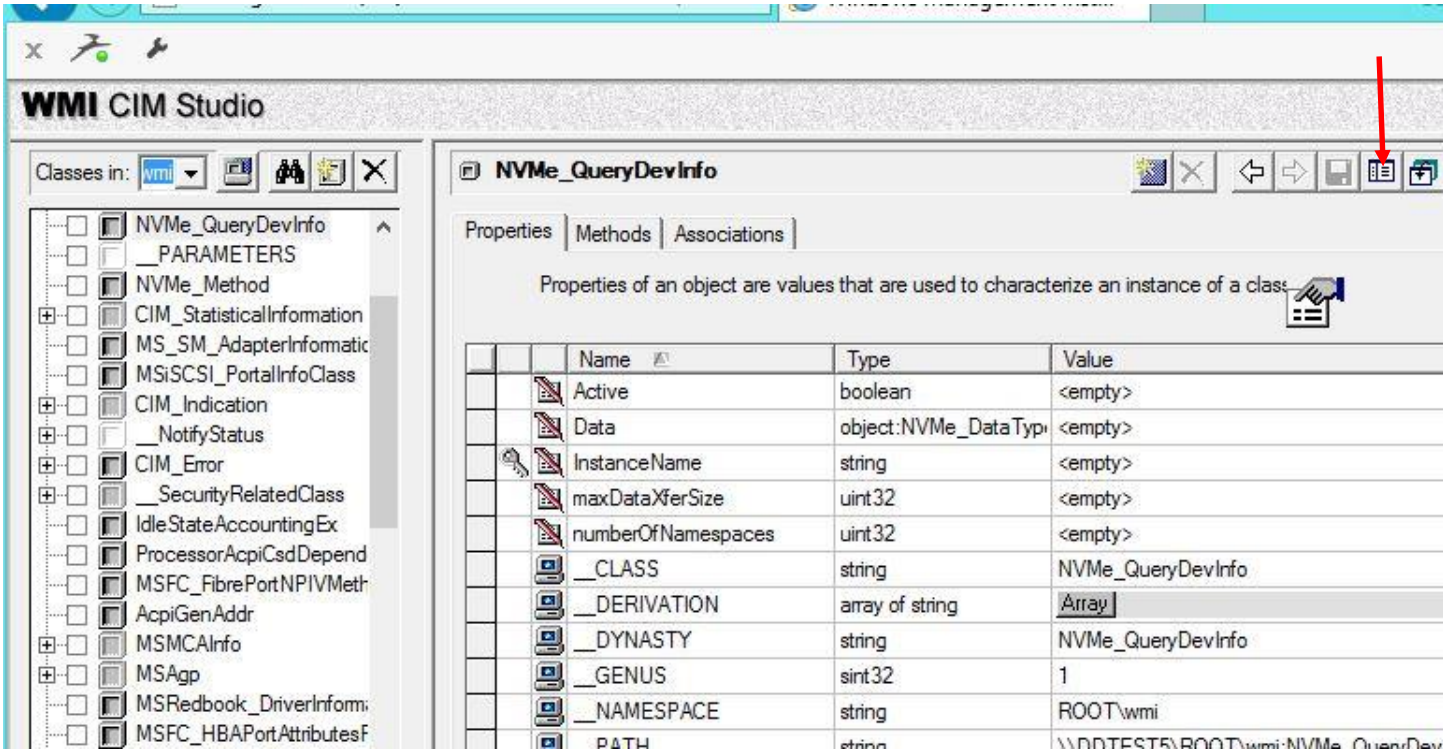


b. Enter the name of the NVMe WMI Object (e.g. `NVMe_QueryDevInfo`)

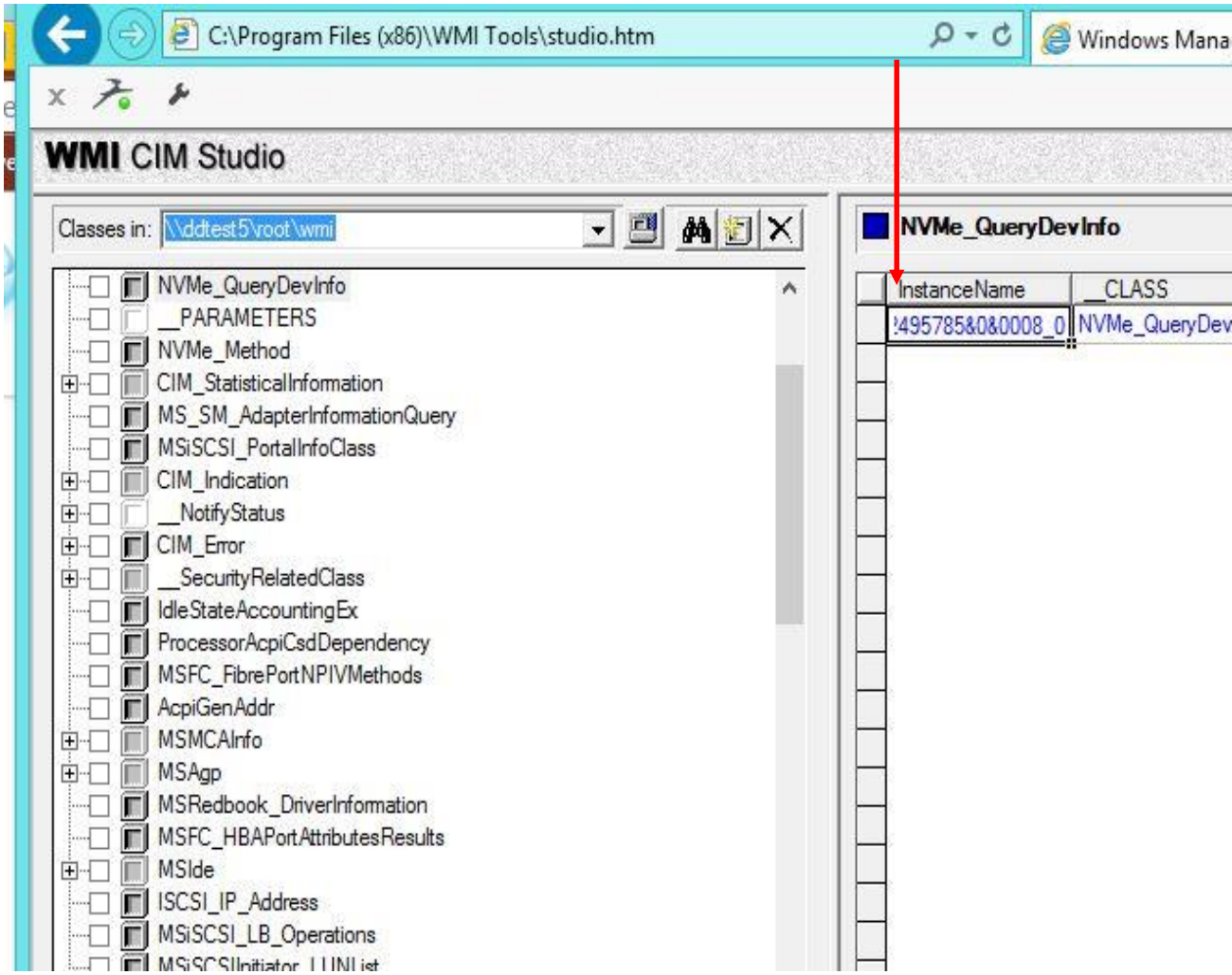


c. Hit “Go!”, Select “NVMe_QueryDevInfo” in the “Search results” area and hit “OK”

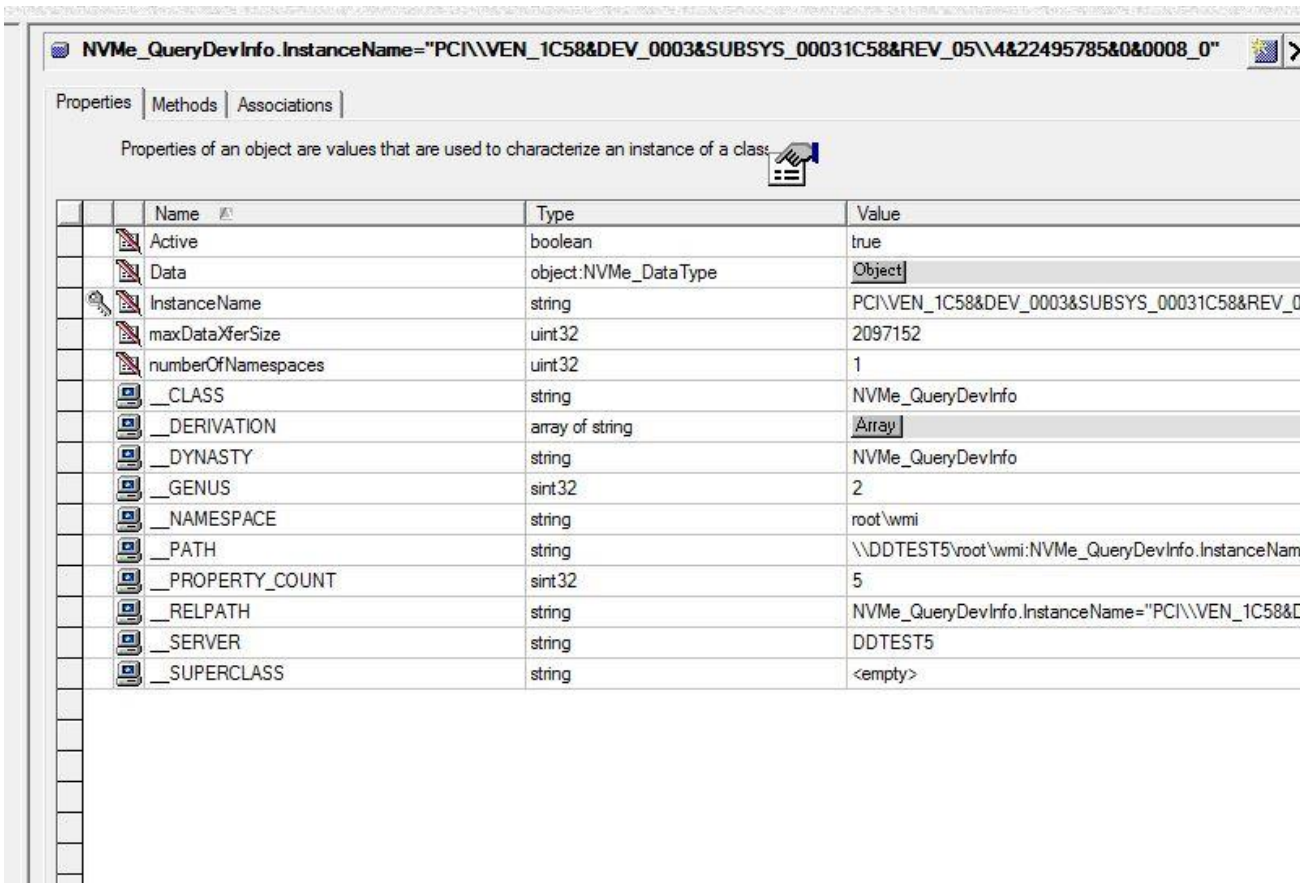
d. Display the instance of the object by selecting the “instances” icon



e. Double-click on the object's instance

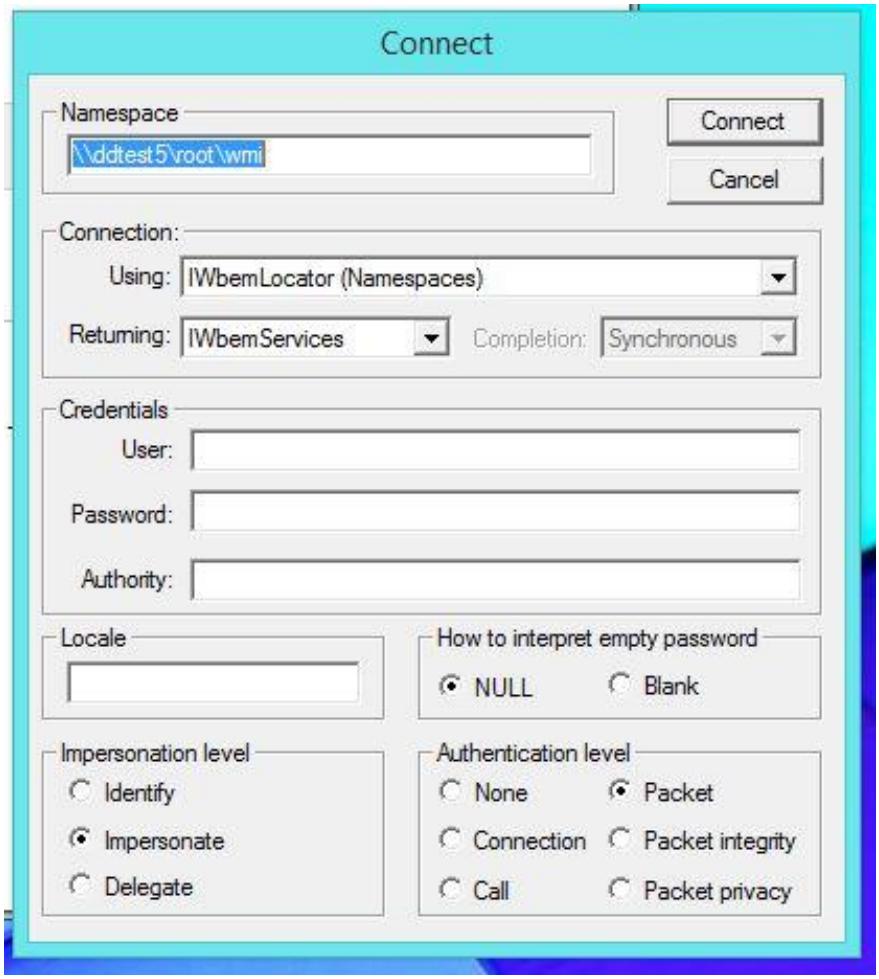


f. View the object's member data

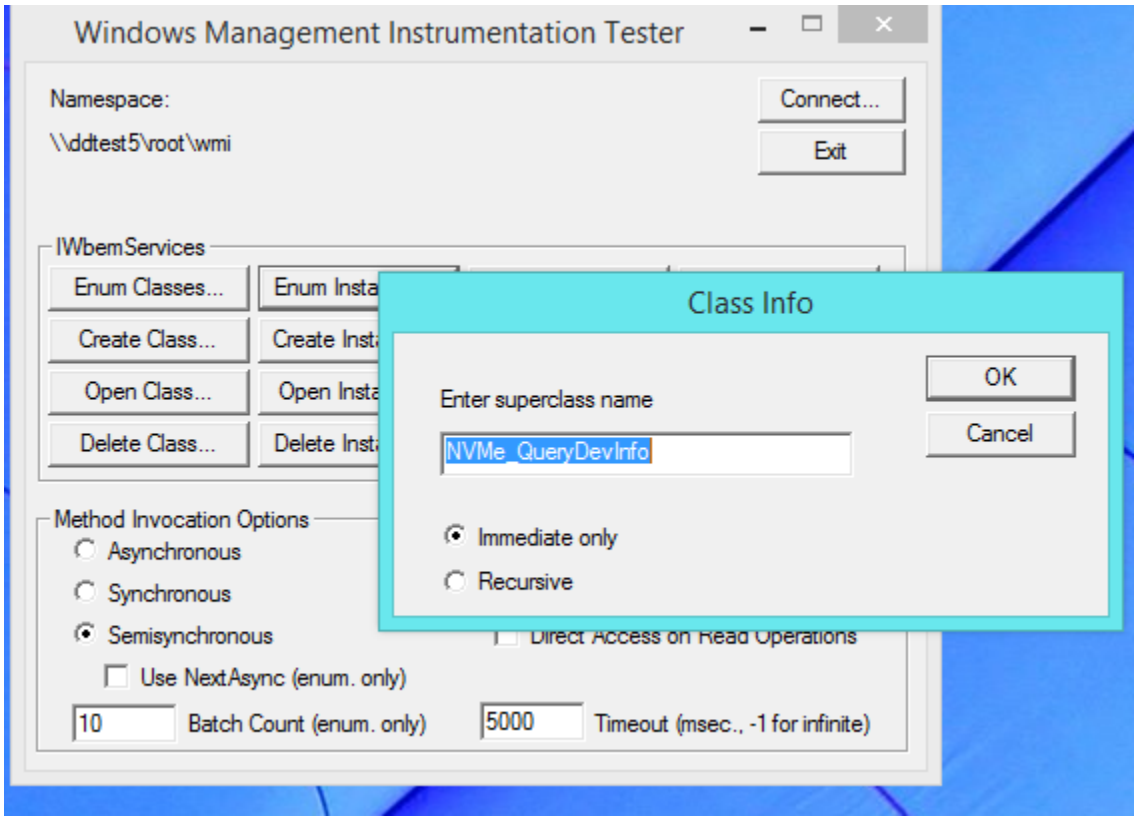


WBEMtest.exe

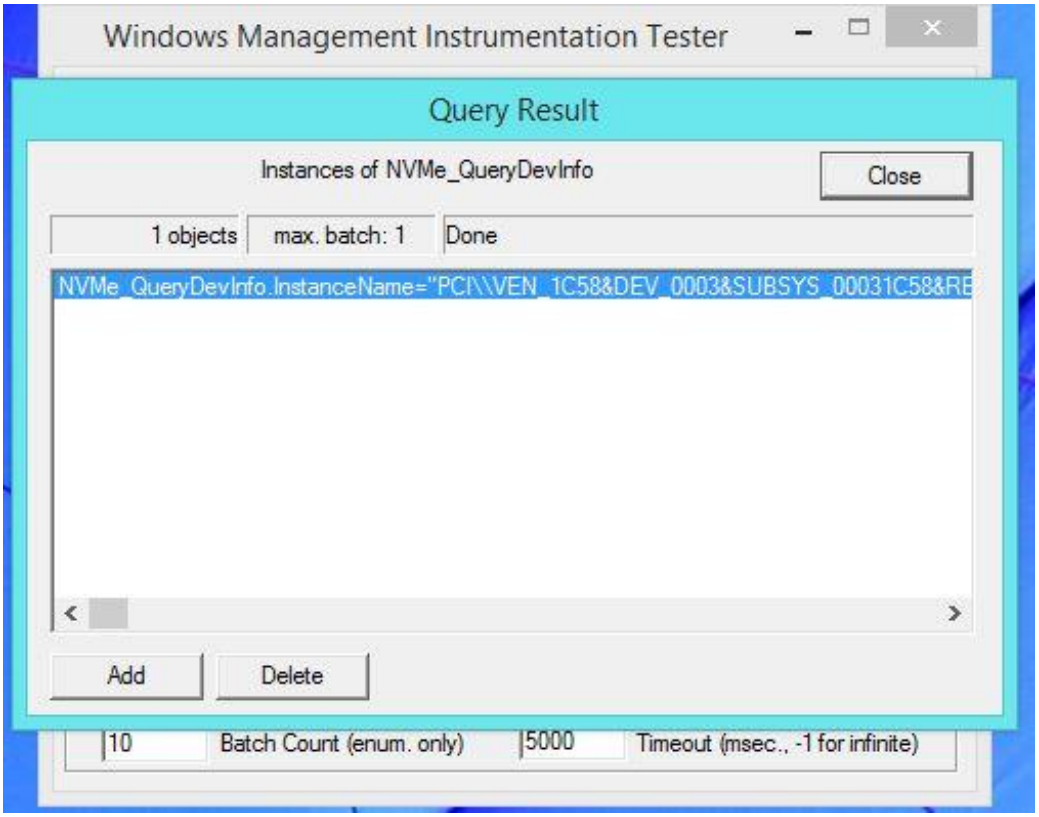
1. Start WBEMtest.exe.
2. Connect to the WMI namespace
    a. Hit “connect” on WBEMtest window
    b. In the “Connect” window, enter “\\xxxSysName\root\wmi” as the path to your namespace. xxxSysName is the name of your target system. It may be omitted if running WBEMtest from the target system. Hit “Connect”



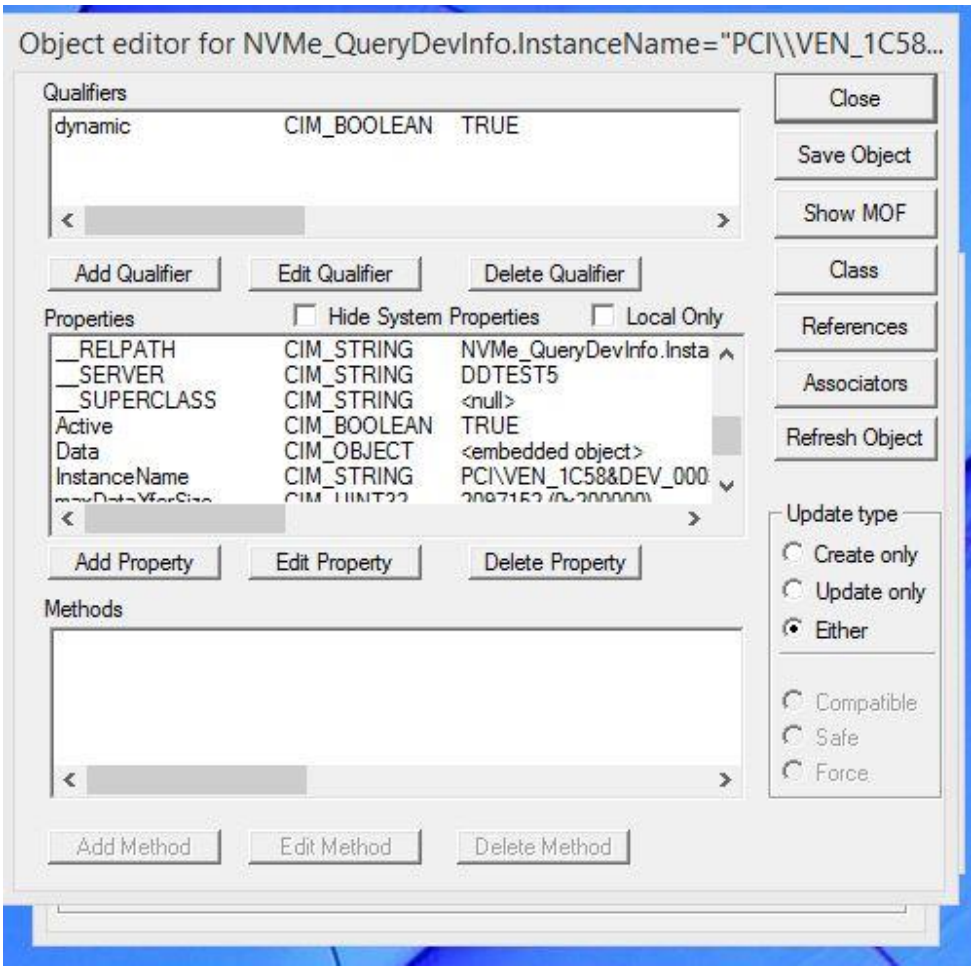
3. Find instances of driver's WMI objects
    a. Select "Enum Instances" from WBEMtest's main window
    b. Enter the name of the Class (e.g. NVMe_QueryDevInfo) and hit "OK"



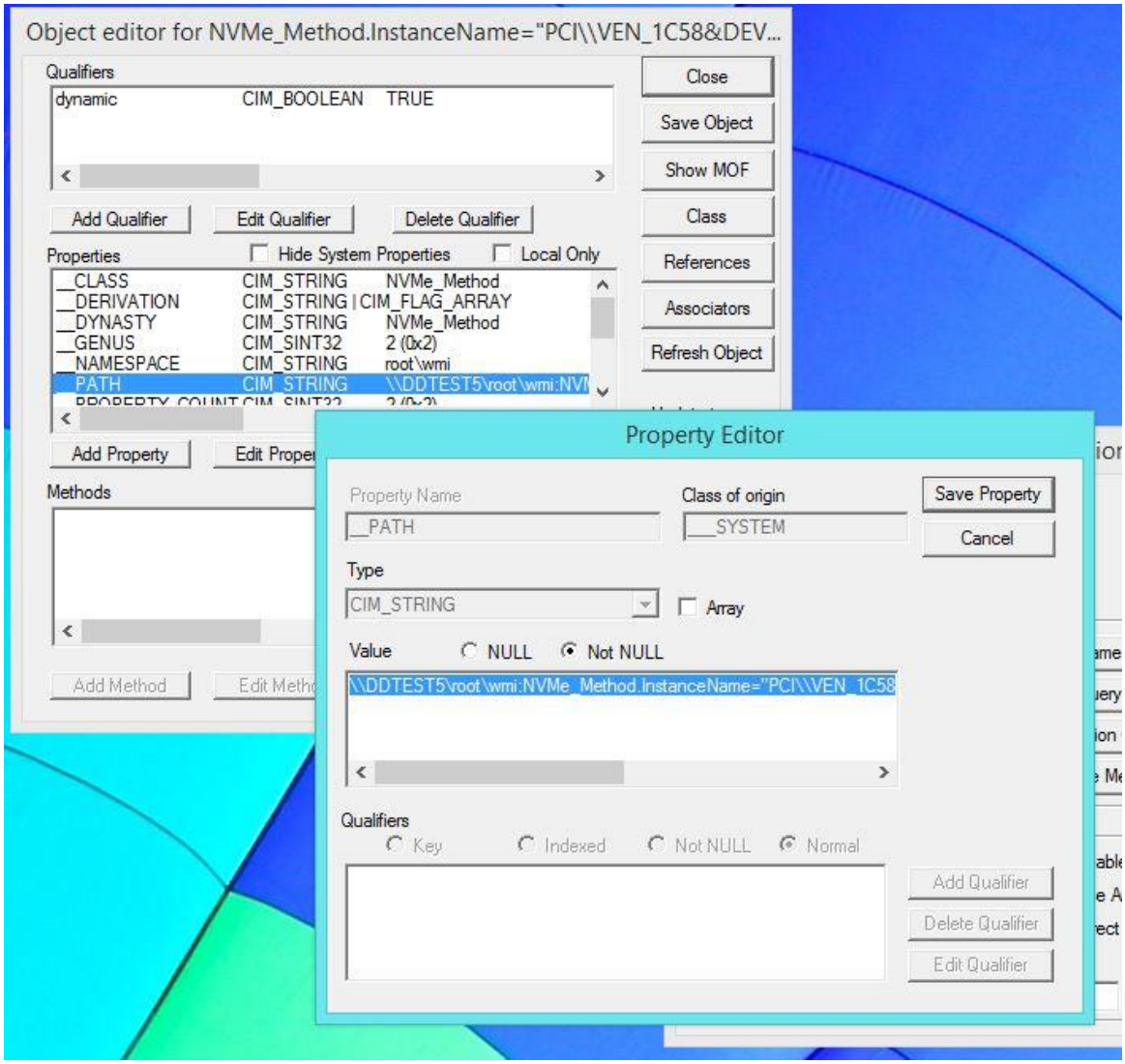
4. Display an instance of that object. In the “Query Result” window, double-click the object instace



5. View object's member data – scroll down in the properties section until you see the member data (e.g. InstanceName)

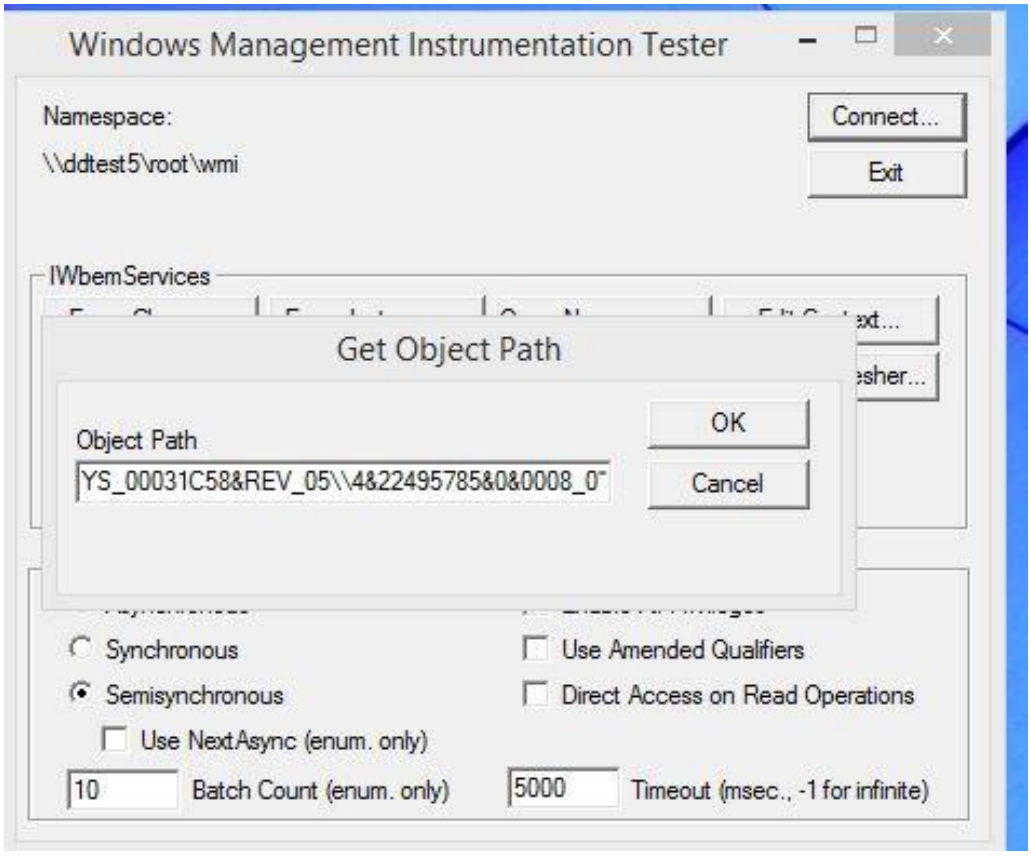


6. Execute Object Method - GetControllerInfo
    a. Use “Enum Instances” to find an instance of NVMe_Method and double-click on the results to display its member data.
    b. Scroll down and double-click on “ __PATH”. Save the path value (e.g. \\DDTEST5\root\wmi:NVMe_Method.InstanceName="PCI\\VEN_1C58&DEV_0003&SUBSYS_00031C58&REV_05\\4&22495785&0&0008_0”

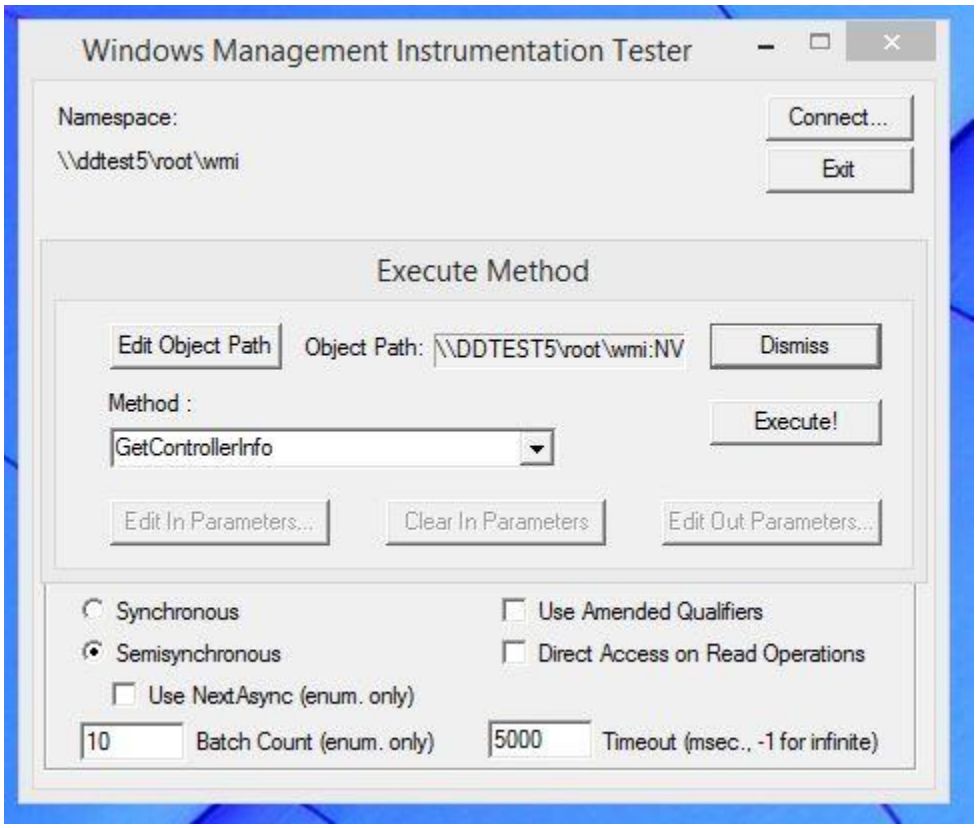


    c. Cancel out of all open WBEM windows except the main window.

d. Select “Execute Method…”. In the “Get Object Path” window, paste in the path that was found earlier. Hit “OK”

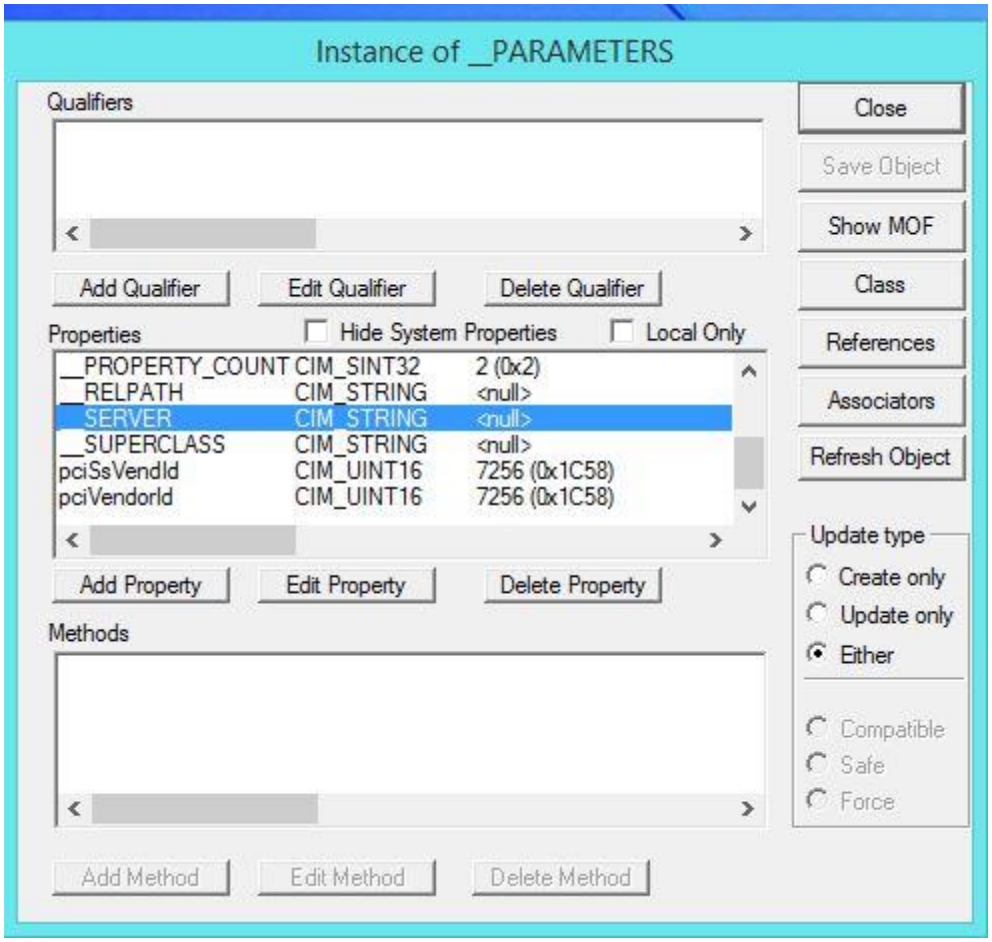


e. In the “Method:” selector, choose “GetControllerInfo” and hit “Execute!”



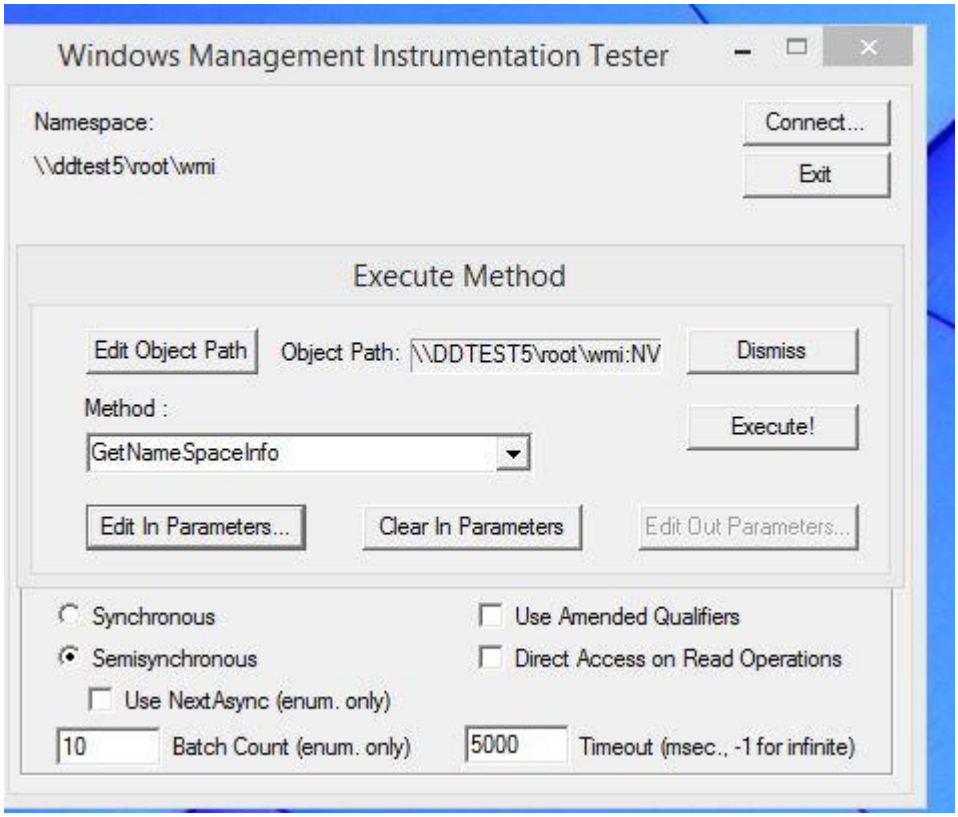
f. Clear out the “Method executed successfully!” message

g. Hit “Edit Out Parameters” to view the method results (pciSsVendId and pciVendorId)

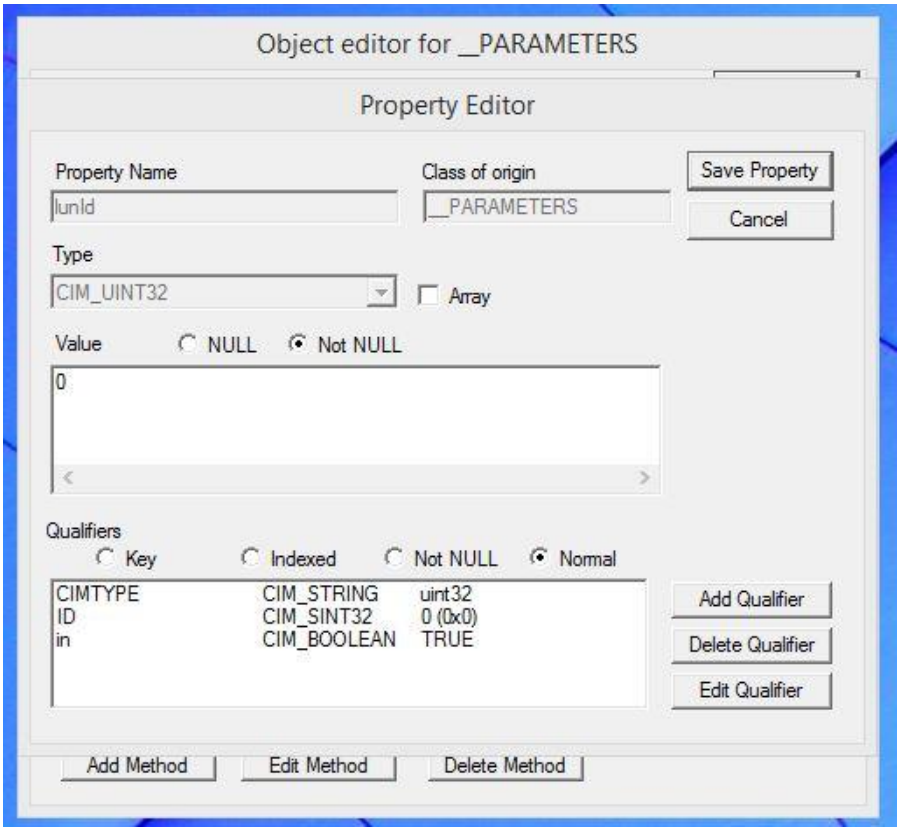


h. Close the “Instance of _PARAMETERS” window

7. Execute Object Method - GetNameSpaceInfo
    a. Select the “GetNameSpaceInfo” method and hit the “Edit In Parameters” button

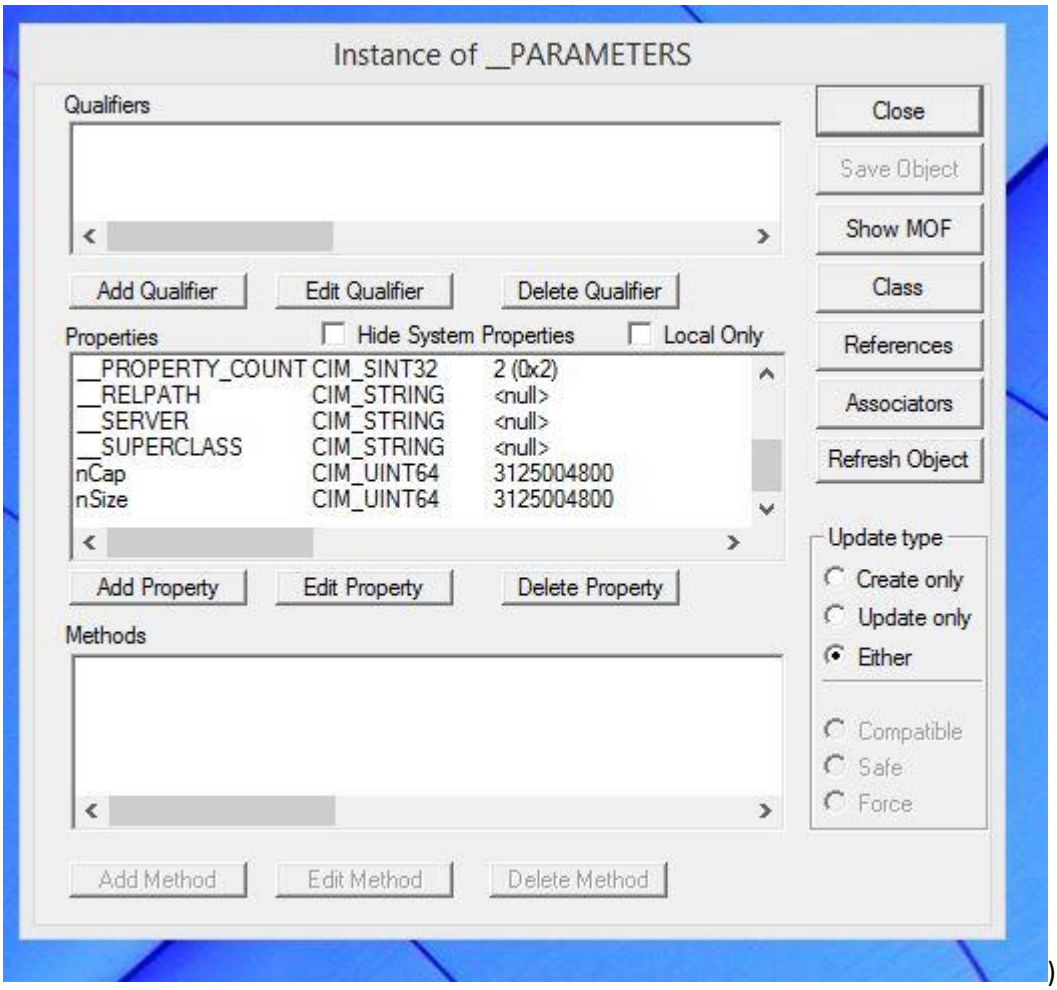


b. Specify the method's input data, "lunid". The method will return data for this lun.
    i. In the Properties section, scroll down and double-click on "lunid".
    ii. Set the "lunid" value by specifying "Not NULL" and putting in a value for the "lunid" (e.g. 0). Hit "Save Property" followed by "Save Object".



c. Hit the "Execute!" button
d. Clear out the "Method executed successfully!" message

8. Hit “Edit Out Parameters” to view the method results (nCap and nSize)



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