QA Checks
User Guide

This document is intended for support staff and engineers that build and maintain servers within your various environments.

This document refers to version 3.17 and above of the scripts

Contents

Copyright (C) My Random Thoughts

Overview

The QA checks came about as a need to verify the build of new servers for our various customers and their environments. All new server builds are done with a custom gold image; however this image still lacks many of the additional tools and configuration settings needed before it can be accepted into support. Most of this extra tooling and configuration is automated, however checks are still needed to make sure each customer has their specific settings in place.

The previous method was a manual process of checking about 45 items listed in a spreadsheet and marking them passed or failed. This typically took about 2 hours per server. The QA scripted checks can be completed in about 60 seconds.

Technical Details

The scripts are written in the Microsoft PowerShell language, with version 2.0 in mind. This is the basic version installed by default on Windows Server 2008 R2.

The script will run on almost all Windows Operating systems, as long as PowerShell version 2.0 or greater is installed, and the PowerShell window is run with administrative privileges.

Supported Operating Systems

Windows Server 2008 R2
Windows Server 2012
Windows Server 2012 R2
Windows Server 2016

Unsupported Operating Systems

Windows 2003 Server
Windows Server 2008
Any non-server operating system

While the scripts will work and produce results on the above list, they are not supported and some scripts may fail to run completely.

The Checks

There are over 100 different checks split over 9 sections. These are run whenever the QA script is executed against one or more servers and can usually take anywhere between 30 seconds and a couple of minutes to complete, per server. The script is set to run 5 checks concurrently (configurable).

Each check is written to be as efficient as possible; however due to the nature of some of them they may take a little longer than normal. With this in mind, each individual check has a timeout of 60 seconds (configurable). This should give them plenty of time to complete their task.

For a current list of checks and sections, they are listed in Appendix C. The GitHub page will always be up to date and should be used for any updates: https://github.com/My-Random-Thoughts/Server-QA-Checks

Copyright (C) My Random Thoughts

Quick Start

If you want to see how things turn out, and don't want to start changing setting just yet, simply follow the steps below to produce your first report…

1. Copy the compiled QA script to the target server,
2. On the target server, open an elevated PowerShell window,
3. Change to the folder when the script is saved,
4. If required enter the following command:
   `Set-ExecutionPolicy –ExecutionPolicy Bypass –Force`
5. Execute the QA script file:
   `.\QA_v3.17.xxxx.ps1 –ComputerName localhost`
6. Wait for the script to complete

This will execute the QA scripts and produce a report for you. This is stored in {system-drive}:\QA\Reports. This location is configurable once you get up and running.

Customising the settings

To get the most out of the QA scripts, they should be configured for your environment. The default settings are quite strict in terms of security settings and permissions; this is because they were originally designed for an environment with very high security requirements.

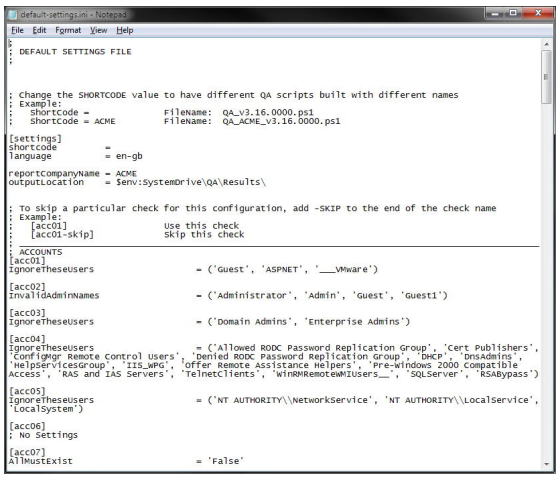
Do not change or save over the "default-setting.ini" file as this will be over written every time you download the latest updates to the QA scripts. Always take a backup before editing - just in case.

There are two ways of editing the settings:

1. Manually copy and edit the INI file using notepad or other simple text editor,
2. Use the QA Settings Configurator that was written specifically for this task.

Simple Text Editor

Using notepad or other text editor simply open your settings INI file.



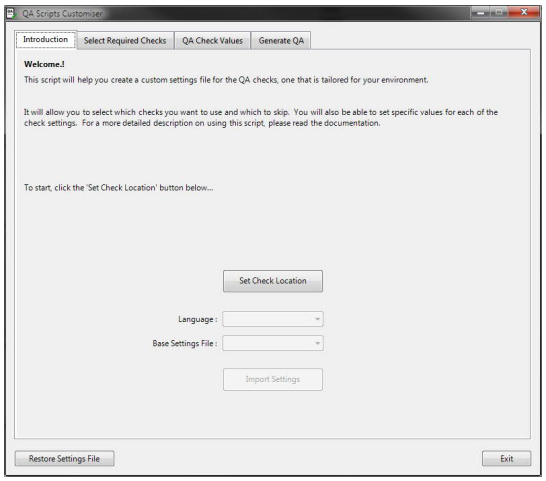
Use this method you need to make a quick change to an existing settings file you have already created. It's not recommended for large edits due to potential mistakes being made. Once you have completed your edits you will need to recompile the checks into a single QA Script. See Appendix A for details.

QA Settings Configurator

The configurator is a PowerShell script that helps you configure a new settings file for your environment. Using Windows Forms, it presents a nice GUI interface that makes it easier to create or edit your settings.

Page: Introduction

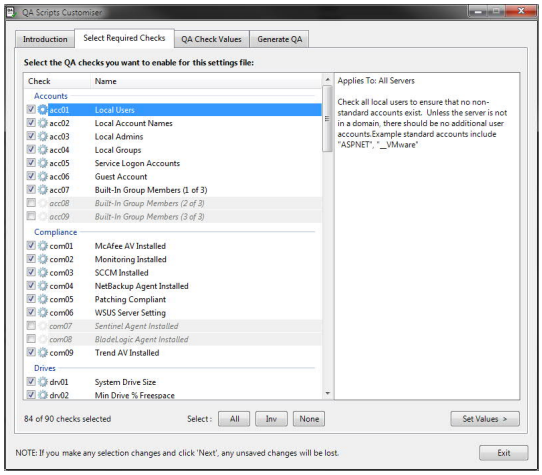
To start, execute the `QA-Settings-Configurator.ps1` script in a PowerShell window. After a few seconds, the following window will appear:



Click the "Set Check Location" button and select the folder where all the checks are located. Next, select the language (currently only English) and a base settings file to use. If you are just starting out, then only the "default-settings" will be available. Click "Import Settings" when ready.

Page: Select Required Checks

The next page lists all the available checks and shows which of them are currently enabled. In the default settings file several checks are set to disabled. If you want to use them, simply tick the box next to the name.

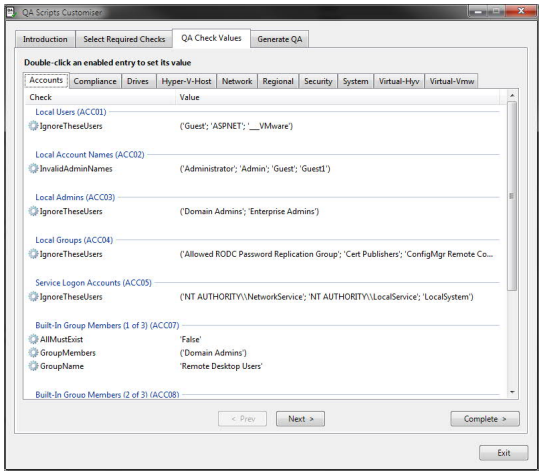


The checks are grouped into sections to help make sense of the larger number of checks. From the screen shot above you can see three of the section: Accounts, Compliance and Drives. The full list is shown later in this document.

Selecting each check will show you some basic information about the check on the right hand side of the window. Once you have selected all the checks you want to include in your settings file, click the "Set Values >" button.

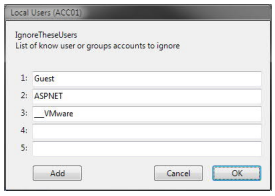
Page: QA Check Values

This page contains several tabs, one for each of the script sections. If too many tabs are shown, some small arrows will appear on the right hand side of the tab list. Be mindful of this if you are switching tabs a lot. Use the "< Prev" and "Next >" buttons to help.



Each section tab lists the checks that you have selected as well as any required information for those checks. The default values are already filled in, but you should change this to suit your own environment. The first time you start this process it may take a while to gather all the information you need.

Double-clicking the first item in the screen shot ("IgnoreTheseUsers") shows us the following window:



It shows the name of the value and a short description. It also shows the current value for this check. The window allows you to change the current values or add new values. In this particular example, the check will see if any local users exist on the server. If there are known domain admin accounts that you want to exclude from this check, this is where you would add them.

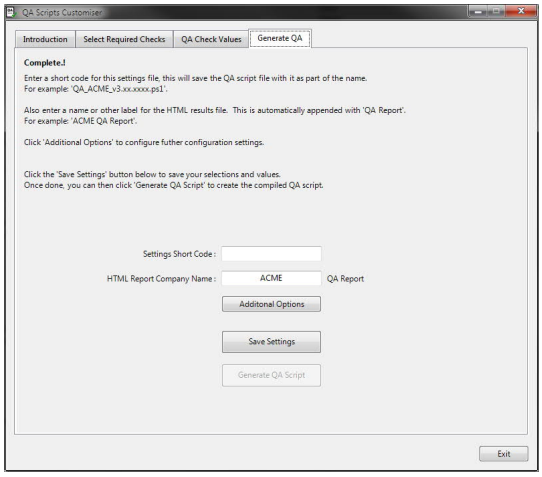
Make sure you examine each value for the checks in every section. In most cases the defaults will work for you.

When you are done editing any values in all the tab sections, click the "Complete >" button to move onto the last page.

Copyright (C) My Random Thoughts

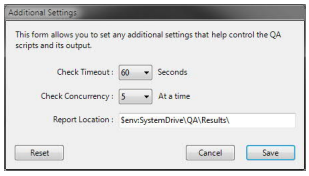
Page: Generate QA

This last page allows you to set a short code for the settings file you are creating as well as the name that appears as the header on the HTML report.



Additional Options

Clicking on the Additional Options button will open a new window that will allow you to change a few more options.



Click “Save” once you are done.

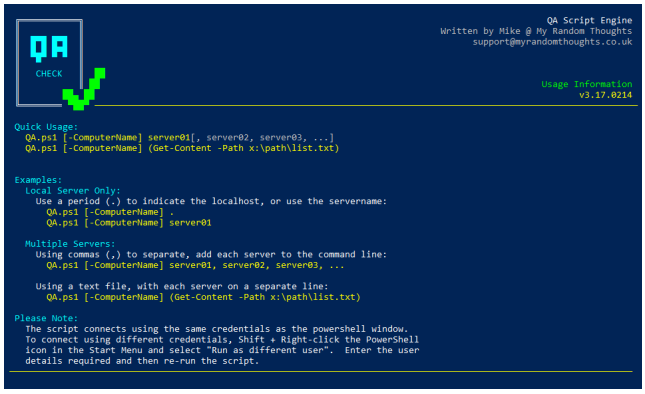
On the last tab, once you have entered the required values click the “Save Settings” button and give your settings file a name.

Once saved, you can now automatically compile your QA script by clicking the “Generate QA Script” button. This will take a couple of seconds and it will tell you when it’s complete. The generation button performs the same compile function as described in Appendix A, and must be done after any settings changes.

Copyright (C) My Random Thoughts

Help Screen

When executing the QA script without any command line arguments, the help screen is shown.



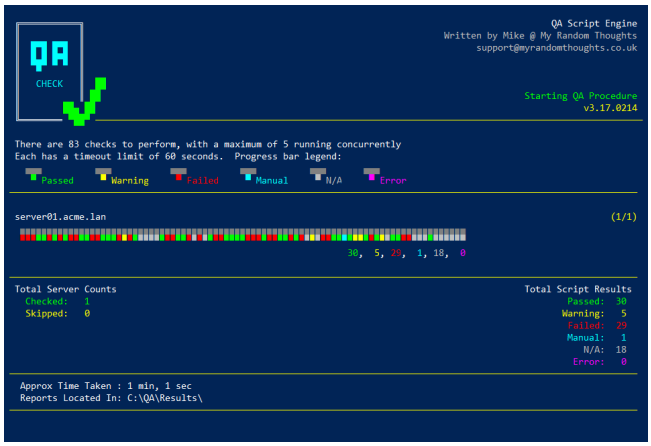
It gives an overview and examples of the basic command line to get up and running. For a full list of all the command line options and an explanation of their use, see Appendix B.

Running The Checks...

Against The Local Server

As with the quick start instructions, to run the checks against the local server simply add `localhost` as the computer name. You can also use a full stop (`.`) or the environment variable `$env:ComputerName`

The screen shot below shows a complete scan against a random server. As you can see it fails on a lot of checks.



During the QA process a coloured progress bar is shown. Each coloured bit is the result of the check that was performed. Note that since checks are performed concurrently, the order of the bits will appear random. The colour coding is shown on the screen, as well as below:

Green	The check passed all requirements,
Yellow	There was a warning for this check,
Red	The check failed one or more requirements,
Blue	This check needs to a manual confirmation,
Grey	This check is not applicable to this server,
Purple	There was a critical error with this check.

Against Multiple Servers

One of the great features of the QA scripts is that it can check remote servers too. This means you don't need to log on to each server in order to run the scripts.

There are two ways in which you can specify multiple servers. The first is to type them all out on the command line, separated with commas...

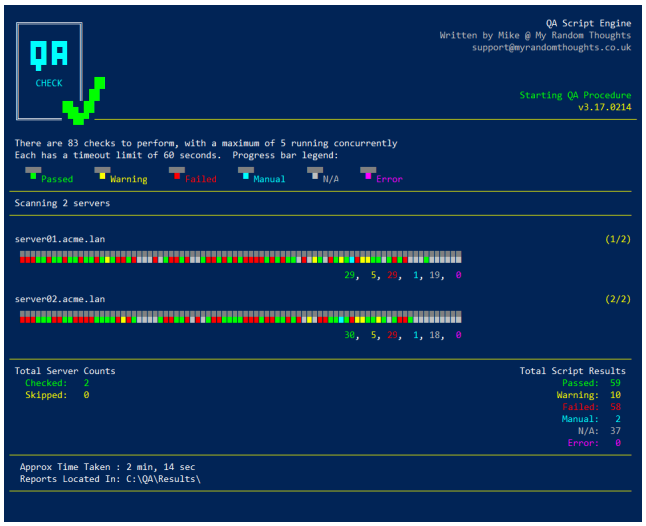
```
.\QA.ps1 -ComputerName server01, server02, server03, server04, …
```

The second way is via a text file with each server listed on its own line...

```
.\QA.ps1 -ComputerName (Get-Content -Path c:\path\file.txt)
```

The `Get-Content` command will read in the file and pass it to the QA scripts.
If you know anything about PowerShell you will see that you can use any command that returns a list of server names in this way. For example, the Active Directory command: `Get-ADComputer`.

When running against more than one server, a progress bar will appear for each server in turn. Once all servers have been completed the scan results will then be displayed. This is shown in the screen shot below:



Viewing The Results

While the coloured bars are pretty, they don't give us any information as to which particular checks passed or failed. If you specified the CSV or XML command line options, there will be different reports you can look at for the scan. The location of all the reports is set to {system-drive}:\QA\Reports (configurable).

The first report is the one that is always generated for every server scanned:

HTML Report

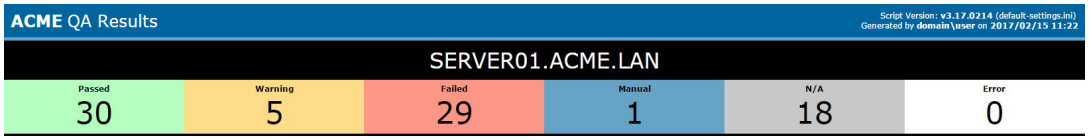
The HTML report give a great visual overview of the results as well as any details on why a particular check returned the result it did. There is also hover help available for each of the checks, giving even more information about the check that was performed.

Header

The HTML header (shown below) includes the overall scan information which could be used for auditing the build or maintenance processes:

- Script version and which settings file was used,
- Who ran this script and when,
- Overview count of the results for this particular server.

v1:



v2:

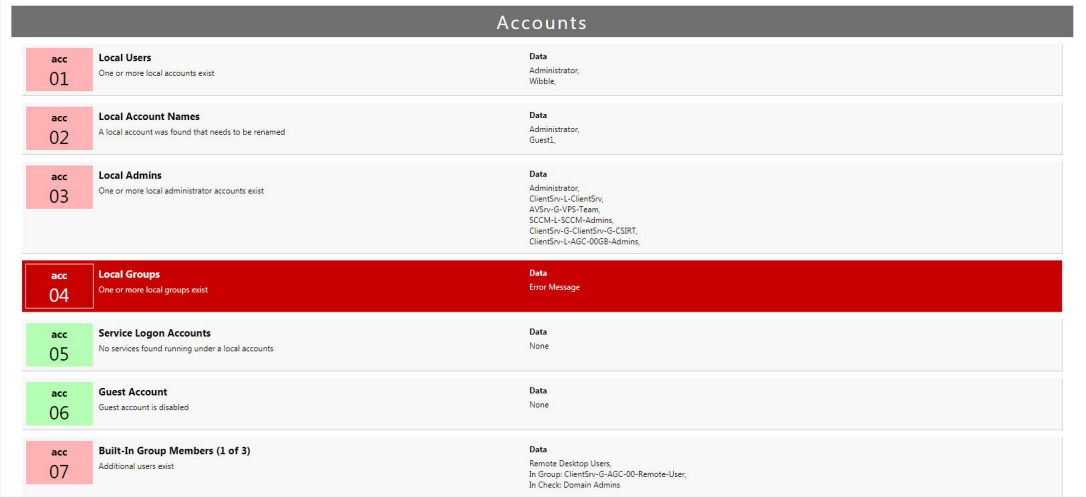
Body

The body of the HTML report lists each check grouped into their sections. The screen shot below shows the column headers and the first section (Accounts)

v1:

Name	Check	Result	Message	Data
Accounts				
Local Users	c-acc-01	Fail	One or more local accounts exist	Administrator, Wibble,
Local Account Names	c-acc-02	Fail	A local account was found that needs to be renamed	Administrator, Guest1,
Local Admins	c-acc-03	Fail	One or more local administrator accounts exist	Administrator, ClientSrv-L-ClientSrv, AVSrv-G-VPS-Team, SCCM-L-SCCM-Admins, ClientSrv-G-ClientSrv-G-CSIRT, ClientSrv-L-AGC-00GB-Admins,
Local Groups	c-acc-04	Fail	One or more local groups exist	__vmware__,
Service Logon Accounts	c-acc-05	Pass	No services found running under a local accounts	
Guest Account	c-acc-06	Pass	Guest account is disabled	
Built-In Group Members (1 of 3)	c-acc-07	Fail	Additional users exist	Remote Desktop Users, In Group: ClientSrv-G-AGC-00-Remote-User, In Check: Domain Admins

v2:

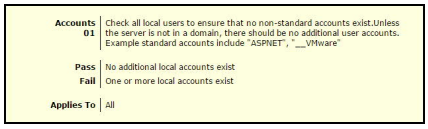


The columns for version 1 are:

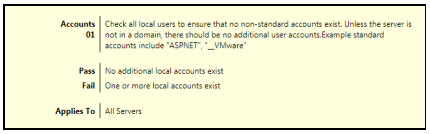
Name	A friendly name of the check,
Check	The internal name of the check (this is the name I use for reference),
Result	The overall result of the check,
Message	Short message describing the reason for the result value,
Data	Specific data related to the result value.

By default hover help is enabled for all the HTML reports. To view this, move your mouse cursor over the Results value for the check. A small window will show appear in the top left corner of the HTML page giving more information about the check. An example of this is shown below:

v1:



v2:



An optional command line parameter will remove this hover help; simply add the following to the end of your QA command line:

```
-SkipHTMLHelp
```

Removing the hover-help reduces the report file size from about 67KB to about 22KB for version 1 and from about 99KB to 53KB for version 2. When generating and storing a lot of files, this saving could help.

CSV / XML Reports

There is an option to create a CSV and/or a XML file containing all the details in the HTML report. The difference however is that when scanning multiple servers, only one report file will be generated of each type, containing all the servers and their details.

These can be used as part of an automation process to check the pass/fail values for a server.

Use the following command line options:

```
-GenerateCSV
-GenerateXML
```

Example Reports

The screen shots below show example data from the generated reports:

CSV Data...

	A	B	C	D	E	F	
1	server	name	check	datetime	result	message	data
2	server01.acme.lan	Local Users	c-acc-01-local-users	15/02/2017 11:22	Fail	One or more local accounts exist	Administrator, Wibble,
3	server01.acme.lan	Local Account Names	c-acc-02-local-account-names	15/02/2017 11:22	Fail	A local account was found that needs to be renamed	Administrator, Guest1,
4	server01.acme.lan	Local Admins	c-acc-03-local-admins	15/02/2017 11:22	Fail	One or more local administrator accounts exist	Administrator, ClientSrv-L-ClientSrv, AVSrv-G-VPS-Team, SCCM-L-SCCM-Admins, Clie
5	server01.acme.lan	Local Groups	c-acc-04-local-groups	15/02/2017 11:22	Fail	One or more local groups exist	__vmware__,
6	server01.acme.lan	Service Logon Accounts	c-acc-05-service-logon-accounts	15/02/2017 11:22	Pass	No services found running under a local accounts	
7	server01.acme.lan	Guest Account	c-acc-06-guest-account	15/02/2017 11:22	Pass	Guest account is disabled	

XML Data...


```
<Objects>
    <Object>
        <Property Name="server">server01.acme.lan</Property>
        <Property Name="name">Local Users</Property>
        <Property Name="check">c-acc-01-local-users</Property>
        <Property Name="datetime">2017-02-15 11:22</Property>
        <Property Name="result">Fail</Property>
        <Property Name="message">One or more local accounts exist</Property>
        <Property Name="data">Administrator, Wibble, </Property>
    </Object>
    <Object>
        <Property Name="server">server01.acme.lan</Property>
        <Property Name="name">Local Account Names</Property>
        <Property Name="check">c-acc-02-local-account-names</Property>
        <Property Name="datetime">2017-02-15 11:22</Property>
        <Property Name="result">Fail</Property>
        <Property Name="message">A local account was found that needs to be renamed</Property>
        <Property Name="data">Administrator, Guest1, </Property>
    </Object>
    <Object>
        <Property Name="server">server01.acme.lan</Property>
        <Property Name="name">Local Admins</Property>
        <Property Name="check">c-acc-03-local-admins</Property>
        <Property Name="datetime">2017-02-15 11:22</Property>
        <Property Name="result">Fail</Property>
        <Property Name="message">One or more local administrator accounts exist</Property>
        <Property Name="data">Administrator, ClientSrv-L-ClientSrv, AVSrv-G-VPS-Team, SCCM-L-S
    </Object>
```

Appendix A – Recompiling the QA scripts

Whenever a change is made to the settings file or any of the individual checks, you will need to recompile the QA script. The reason for compiling into a single file is to make the completed script portable without having 100's of separate files all over, potentially being of different versions.

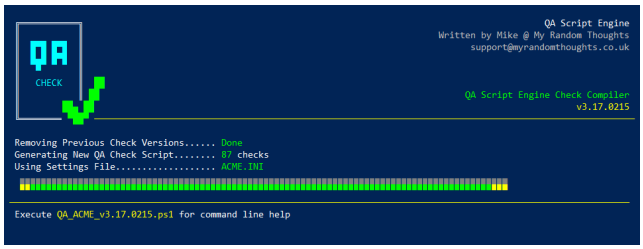
To start, open a normal PowerShell window and change to the folder containing all the script files. Typing the following command will compile all the scripts using the default settings file:

```
.\Compiler.ps1
```

To tell the compile script to use one of your settings files type:

```
.\Comiler.ps1 –Settings {name_of_file}.ini
```

The screen shot below shows the completed process for a settings file called ACME.INI:



As you can see, the QA script filename contains the short code that is used for this settings file.

Appendix B - Command Line Options

There are several command line options that can be used with the QA scripts. These are detailed below:

`-ComputerName`	Allows you to add one or more servers to scan.
`-SkipHTMLHelp`	Removes the hover help from the HTML report.
`-GenerateCSV`	Outputs a single results.csv file for all servers scanned.
`-GenerateXML`	Outputs a single results.xml file for all servers scanned.
`-DoNotPing`	In some environments PING (ICMP) traffic is disabled. Use this command to bypass this requirement.
`-Help`	Shows the help screen.
`-Verbose`	Performs one check at a time, for use when debugging checks.

Copyright (C) My Random Thoughts

Appendix C – List Of Check And Their Sections

Accounts

These checks are for local user and group configurations

acc01	Local Users	
acc02	Local Account Names	
acc03	Local Admins	
acc04	Local Groups	
acc05	Service Logon Accounts	
acc06	Guest Account	
acc07	Built-In Group Members (1 of 3)	
acc08	Built-In Group Members (2 of 3)	Disabled by default
acc09	Built-In Group Members (3 of 3)	Disabled by default

Compliance

These checks are to make sure the servers meet your tooling compliance targets

com01	McAfee Antivirus Installed	
com02	SCOM Monitoring Installed	
com03	SCCM Installed	
com04	NetBackup Agent Installed	
com05	Last Patch Date	
com06	WSUS Server	
com07	Sentinel Agent Installed	Disabled by default
com08	BladeLogic Agent Installed	Disabled by default
com09	Trend Micro Antivirus Installed	
com10	Software Installed	Disabled by default
com11	Services Installed	Disabled by default
com12	Only One Server Role	

Drives

These are drive and storage related checks

drv01	System Drive Space
drv02	Minimum Drive Free Space
drv03	Page File Size And Location
drv04	CD/DVD Drive
drv05	Shared Folders
drv06	SAN Storage
drv07	Disk Management Agent
drv08	Drive NTFS Format
drv09	Drive Partition Type

Copyright (C) My Random Thoughts

Hyper-V Host

These checks are for Microsoft Hyper-V host servers. For Hyper-V guest servers, see the Virtual-HYV section.

hvh01	Server Core Edition
hvh02	No Other Server Roles
hvh03	VM Storage Location
hvh04	Integration Services
hvh05	Jumbo Frames
hvh06	Generation Type

Network

These checks are for all network related functions

net01	No IPv6
net02	Unused Network Interfaces
net03	Network Adapter Labels
net04	Binding Order
net05	Network Speed And Duplex
net06	Network Agent
net07	Network Teaming
net08	Management Adapter
net09	Static Routes
net10	Power Management
net11	DNS Settings
net12	File And Print Services
net13	NetBIOS Setting

Regional

These checks are to make sure the servers are in the correct region

reg01	Local Time Setting
reg02	Time Zone Setting
reg03	Location
reg04	Language

Security

These are all security related and are quite strict by default

sec01	SChannel 1 - Ciphers
sec02	SChannel 2 - Hashes
sec03	SChannel 3 - Key Exchange Algorithms
sec04	SChannel 4 - Protocols
sec05	SChannel 5 - Cipher Order
sec06	Reject Enumerate Accounts
sec07	Reject Enumerate Shares
sec08	Domain Credential Caching
sec09	Request Admin Elevated Prompt
sec10	Anonymous Pipe Share Access
sec11	IIS Default Page
sec12	SMB Signing On
sec13	RSA Authentication

Copyright (C) My Random Thoughts

sec14	Firewall Rules	
sec15	Firewall State	
sec16	Open Ports	
sec17	SMBv1 Disabled	

System

These checks are all system related

sys01	Pending Reboot	
sys02	Windows Licence	
sys03	Services Not Started	
sys04	Services Not Stopped	
sys05	System Event Log	
sys06	Application Event Log	
sys07	Devices Status	
sys08	Custom Event Log	Disabled by default
sys09	Scheduled Tasks	
sys10	Print Spooler	
sys11	Auto-Run Disabled	
sys12	SNMP Configuration	
sys13	Domain Member	
sys14	Power Plan Setting	
sys15	Hibernation Settings	
sys16	Remote Desktop Settings	
sys17	Terminal Services Licenced	
sys18	Current OU Location	
sys19	HP SMH Version	
sys20	Dell OMA Version	
sys21	Gold Image	
sys22	All RAM Visible	

Virtual

These checks are for VMware ESX guest servers.

vmw01	Tools Version
vmw02	Time Sync Setting
vmw03	NIC Type
vmw04	LSI SAS Controller
vmw05	SCSI Drive Count
vmw06	Total VM Size
vmw07	CD/DVD/Floppy Drive Mounted
vmw08	Failover Clustering

Copyright (C) My Random Thoughts