

Perfmon Collection Setup Instructions for Windows Server 2008R2+

Performance statistics are critically vital for the long-term health and capacity management of an enterprise environment. Unless a third-party performance statistics collection utility, such as Microsoft System Center, is already in place in an environment, Perfmon on each Windows Server can be configured to constantly record performance statistics for future use.

Open Windows Perfmon and expand the Data Collector Sets, User Defined tree item.



Right-click on User Defined, select New, and select Data Collector Set.



Name the Data Collector Set appropriately, and select Create manually (Advanced).





Select Create data logs and then check Performance Counter. Select Next.

Create new Data Collector Set.
What type of data do you want to include?
 Create data logs Performance counter Event trace data System configuration information Performance Counter Alert
Next Finish Cancel

Set the Sample interval to thirty seconds. We find we get solid granularity without consuming much disk space at 30 seconds. Next, click the 'Add' button, then select the following counters.



Note: If a counter has multiple instances of a selected object, make sure you select **<All instances>** instead of **Total** so the counters are separated appropriately. This option helps you get individual statistics for objects like CPU cores or disk drive letters.



elect counters from computer:			Counter	Parent	Inst	Computer	
<local computer=""> V</local>	Browse		Memory				^
Pacer Pipe	~		Available MBytes				
Paging File			Page Faults/sec				
% Usage			Pages/sec				
% Usage Peak							
Per Processor Network Activity Cycles	~						
Per Processor Network Interface Card Activit	y — ∨						
Physical Network Interface Card Activity —	~						
PhysicalDisk	~	~					

Windows Server Counters

Note: Warning and alerting thresholds are given as a starting point for some counters to be used with monitoring tooling. Use these as a starting point and tailor to your environment. If no value is listed, then this counter is relatively subjective, based on your environment and workload characteristics, and blanket thresholds cannot be given without further workload context.

Counter Group	Counter Set	Warning	Alerting
Memory	Available Mbytes	< 2000	< 1000
	Page Faults / sec		
	Page Reads / sec		
	Page Writes / sec		
	Pages / sec		
Network Interface	Bytes Received / sec		
	Bytes Sent / sec		
Paging File	% Usage		
PhysicalDisk	% Idle Time		
	Avg. Disk Bytes / Read		
	Avg. Disk Bytes / Write		
	Avg. Disk sec / Read	> 0.025	> 0.030
	Avg. Disk sec / Write	> 0.020	> 0.025
	Disk Read Bytes / sec		
	Disk Reads / sec		
	Disk Write Bytes / sec		
	Disk Writes / sec		
Processor	% Privileged Time		
	% Processor Time		
	% User Time		
Processor Information	% of Maximum Frequency	< 100	< 100



System	Processor Queue Length	> 3x CPU count	> 5x CPU count
System	Thousson Queue Length		

If this server is virtualized on VMware vSphere, add the following VMware-specific counters.

Counter Group	Counter Set	Warning	Alerting
VM Memory	Memory Active in MB		
	Memory Ballooned in MB	> 0	> 0
	Memory Swapped in MB	> 0	> 0
	Memory Used in MB		
VM Processor	% Processor Time		
	CPU stolen time	> 0.025	> 0.035
	Effective VM Speed in MHz		
	Host processor speed in MHz		

If the server is virtualized on Microsoft Hyper-V, add the following Hyper-V-specific counters.

Counter Group	Counter Set	Counters (Otherwise select all)
Overall health	Hyper-V Virtual Machine Health Summary	%Guest Run (_Totals)
		%Hypervisor Run Time (_Totals)
		%Idle Run Time (_Totals)
	Hyper-V Hypervisor	
Processor	Hyper-V Hypervisor Logical Processor	
	Hyper-V Hypervisor Root Virtual Processor	
	Hyper-V Hypervisor Virtual Processor	
Memory	Hyper-V Hypervisor Partition	2M GPA Pages
		Deposited Pages
		Virtual Processors
	Hyper-V Root Partition	
	Hyper-V VM Vid Partition	Physical Pages Allocated
		Remote Physical Pages
Networking	Hyper-V Virtual Switch	
	Hyper-V Legacy Network Adapter	
	Hyper-V Virtual Network Adapter	
Storage	Hyper-V Virtual Storage Device	
	Hyper-V Virtual IDE Controller	

If the server a Microsoft Hyper-V host, add the following Hyper-V-specific counters. Select all instances for each counter.

Counter Group	Counter Set
Hyper-V Hypervisor Partition	Virtual Processors
Hyper-V Hypervisor Virtual Processor	% Guest Run Time
	% Hypervisor Run Time
	% Remote Run Time
	% Total Run Time



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CPU Wait Time Per DispatchHyper-V Virtual Network AdapterBytes Received / secBytes Sent / secBytes Sent / secHyper-V Virtual Storage DeviceRead Bytes / secWrite Bytes / secRead Operations / secWrite Operations / secWrite Operations / secQueue LengthLatency		
Hyper-V Virtual Network Adapter Bytes Received / sec Bytes Sent / sec Bytes Sec / sec Hyper-V Virtual Storage Device Read Bytes / sec Write Bytes / sec Read Operations / sec Write Operations / sec Queue Length Latency Latency		CPU Wait Time Per Dispatch
Bytes Sent / sec Hyper-V Virtual Storage Device Read Bytes / sec Write Bytes / sec Read Operations / sec Write Operations / sec Queue Length Latency	Hyper-V Virtual Network Adapter	Bytes Received / sec
Hyper-V Virtual Storage Device Read Bytes / sec Write Bytes / sec Read Operations / sec Write Operations / sec Queue Length Latency Latency		Bytes Sent / sec
Write Bytes / sec Read Operations / sec Write Operations / sec Queue Length Latency	Hyper-V Virtual Storage Device	Read Bytes / sec
Read Operations / sec Write Operations / sec Queue Length Latency		Write Bytes / sec
Write Operations / sec Queue Length Latency		Read Operations / sec
Queue Length Latency		Write Operations / sec
Latency		Queue Length
		Latency

If the server contains one or more SQL Server instances, add the following counters for each SQL Server instance. If you are using one or more named SQL Server instances, please update the Counter Group name with "MSSQL\$InstanceName:" instead of "SQL Server:".

Counter Group	Counter Set	Warning	Alerting
Process (sqlservr.exe)	% Privileged Time		
	% Processor Time		
SQL Server:Access Methods	Forwarded Records/sec		
	Full Scans/sec		
	Index Searches/sec		
	Page Splits/sec		
SQL Server:Batch Resp Statistics	*		
SQL Server:Buffer Manager	Buffer cache hit ratio		
	Free List Stalls/sec		
	Lazy writes/sec		
	Page life expectancy	< 1000	< 500
	Page reads/sec		
	Page writes/sec		
SQL Server:Buffer Node	Local node page lookups/sec		
	Page life expectancy	< 1000	< 500
	Remote node page lookups/sec		
SQL Server:Databases	Transactions/sec		
SQL Server:General Statistics	User Connections		
SQL Server:Latches	Latch Waits/sec		
SQL Server:Locks	Lock Waits/sec		
	Number of Deadlocks/sec	> 0	> 0
SQL Server: Memory Manager	Target Server Memory (KB)		
	Total Server Memory (KB)		
	Memory Grants Pending	> 0	> 0
SQL Server:SQL Statistics	Batch Requests / sec		
	SQL Compilations / sec		
	SQL Re-compilations / sec		



Click OK when finished selecting the available counters. Select Next.

Note: Regardless if you are investigating a known issue, or just want ongoing metrics for advanced analysis purposes, set the sample interval to 30 seconds.

DataCollector01 Properties X
Performance Counters File
Performance counters:
Wemory\Available MBytes Add
Wemory Pages/sec Remove WISSQLSERVER:Access Methods\Forwarded Rec Remove WISSQLSERVER:Access Methods\Laboration and the searches WisSQLSERVER:Access Methods\Laboration and the searches WISSQLSERVER:BUTTer Manager 'Butter cache hit WisSQLSERVER:Butter Manager 'Free List Stalls/sec WISSQLSERVER:Butter Manager 'Free pages ✓
Log format: Binary V Sample interval: Units: Maximum samples: 30 Seconds V 0 ×

Set the root directory for the log files to be placed, if different than default.

 Create new Data Collector Set.
Where would you like the data to be saved?
Root directory: %systemdrive%\PerfLogs\Admin\HFX Performance Collection Browse
Next Finish Cancel

Select Finish to Save and close the new Collector Set.



 Create new Data Collector Set.
Create the data collector set?
Run as: <default> Change</default>
Open properties for this data collector set Start this data collector set now
Save and close
Next Finish Cancel

Right click on the new User Defined Collection Set, and click Properties.



In the Directory tab, verify that the root directory and Subdirectory names are appropriate.



	HFX Performance Collection Properties			
ieneral	Directory Security Schedule Stop Condition Task			
Root d	rectory:			
stemd	ive%\PerfLogs\Admin\HFX Performance Collection Browse			
Subdire	ctory:			
Subdire	ctory name format:			
ууууМ	Mdd\-NNNNNN >			
✓ Pre	Prefix subdirectory with computer name Senal number: 1			
Serial r	umber:			

Under the Schedule tab, click Add and select the following day at 12:00 AM. If you select the current day, the log file will not start squarely at midnight and a daily analysis will take a bit more time.

HFX F	Performance Collection Properties
General Directory	Security Schedule Stop Condition Task
Start D 12:00 AM E	Folder Action X
	Active range Beginning date: 9/26/2013
	9/26/2013
Add	Start time: 12:00:00 AM Monday Saturday Saturday Sunday Mednesday Thursday Thursday
All schedule	I Friday OK Cancel

Select the Stop Condition tab. We will be sampling every 30 seconds on this server, and wish to stop the counter each night just before midnight, with a time duration of 1439 minutes. Check the Overall duration checkbox and set the value to 1439 minutes. Click OK to close out of the collector properties window.



HFX Prop	erties		ß			×
General	Directory	Security	Schedule	Stop Condition	Task	
✓ Ove	rall <u>d</u> uration	:	<u>U</u> nits: Minutes	~		
	lestart the d luration: taximum Siz	ata collect	or set at limit U <u>n</u> its: Seconds MB	ts.		
Stop	Stop when all data collectors have finished.					
		[ОК	Cancel		Apply

Right click on the new Collection set and select properties.



Select the File tab, enter 'yyyyMMdd' into the File name format, and check the box for 'Prefix file with computer name'. Make sure to check 'Append' on the Log mode. Select OK to save.

DataCollector01 Properties X		
Performance Counters File		
Log file name:		
DataCollector01		
File name format:		
yyyyMMdd >		
Log mode Overwrite Append Circular (requires a non-zero maximum file size)		
Example file name: C:\PerfLogs\Admin\HFX System St\DB01_DataCollector0120170921.blg OK Cancel Apply		



Right click on the User Defined Collection set again, and select Data Manager. This next step controls the amount of space consumed by the Perfmon data collection files.



Under the Data Manager tab, set the minimum free disk, maximum folders (equal to the number of days you wish to retain), Resource policy, and then check 'Apply policy before the data collector starts' and 'Enable data management and report generation'. In this example, 500MB of free space on the C: drive will be retained, 120 days of logging will be stored, the oldest file will be deleted in order, and performance reports will automatically be created each night.

Minimum f	Actions Rules	Maximum folders:	
500	∧ MB	120	
Resource poli	cy:		
Delete oldes	t ∀		
	cv before the dat	a collector set starts	
Maximum	root path size:		
0	↑ MB		
Report file na	me:		
report.html			
Event file nar	ne:		
✓ Enable da	ta management a	and report generation	

Next, we must clean up after the creation of the daily Perfmon reports. Select the Actions tab and select Add.



HFX Performance Collection Properties		
Data Manager	Actions Rules	
Folder actions:	Folder Action ×	
	Condition Age: Units: 7 Days Folder size: 0 MB Action Copy cab file to this directory:	
Add	Create cab file Delete data files Delete cab file Delete cab file Delete report	
	OK Cancel	

Create three Actions. You can set the durations to any frequency you wish. As an example, the following creates three actions.

- 7 days, create cab and delete data files.
- 6 weeks, delete cab file
- 26 weeks, delete cab, data, and report files.

Your end result should resemble the following.

	HF	X Perfo	rmance Collection	Prope	rties	x
D	ata Manager	Actions	Rules			
	Folder actions	:	I			
	Age	Size	Cab	Data	Report	
	1 Week(s)	Any	Create	Delete		
	6 Week(s)	Any	Delete			
	DC WARKAN	A	Delete	Delete	Delete	

Now, to ensure that the log file starts at Midnight each night and stops other copies of the job that might be mis-scheduled, open Windows Task Scheduler. Perfmon actually uses the Windows Task Scheduler to routinely execute the job on the scheduled intervals. This job is well hidden. Expand Task Scheduler Library, Microsoft, windows, and select PLA.



0		Task Scheduler			
File Action View Help					
 Task Scheduler (Local) Task Scheduler Library Microsoft Microsoft Microsoft Active Directory Rights Management Services Client ApplD ApplD Application Experience ApployDeploymentClient Autochk CertificateServicesClient Chkdsk Customer Experience Improvement Program Data Integrity Scan Derice Setup IME MemoryDiagnostic MUI Multimedia NetCfg NetTrace 	II	Name Status Triggers HFX Performance Collection Ready At 12:00 AM every Sunday, Monday, Tuesday, Wednesday, T Server Manager Performanc Disabled At system startup < III > General Triggers Actions Conditions Settings History (disabled) Name: HFX Performance Collection Location: \Microsoft\Windows\PLA Author: Description:			
		Security options			
 System Plug and Play Power Efficiency Diagnostics 		When running the task, use the following user account: SYSTEM			

Right click on the job, and click Properties.



In the properties for the job, select the Triggers tab. Add a trigger to the Weekly trigger created by the Perfmon setup process. Select 'At startup' in the Begin the task dropdown. Click OK. This process starts up the Perfmon counter at the time of the next server startup.



	New Trigger
Begin the task: Settings	At startup v
No additional	settings required.
Advanced settii Delay task ti Repeat task Stop Stop task if Activate: Expire: V Enabled	ior: 15 minutes v t every: 1 hour v for a duration of: 1 day v all running tasks at end of repetition duration it runs longer than: 3 days v 12/30/2016 v 7:58:46 PM v Synchronize across time zones 12/30/2017 v 7:58:46 PM v Synchronize across time zones
	OK Cancel

Now select the Settings tab, and change the dropdown menu at the bottom from 'Do not start a new instance' to 'Stop the existing instance'. Also, check the box next to 'Run task as soon as possible after a scheduled start is missed.'

HFX Perfmon Collector Properties (Local Computer)				
General Triggers Actions Conditions Settings	History			
Specify additional settings that affect the behavior of	Specify additional settings that affect the behavior of the task.			
✓ Allow task to be run on demand				
Run task as soon as possible after a scheduled st	tart is missed			
If the task fails, restart every:	1 minute v			
Attempt to restart up to:	3 times			
Stop the task if it runs longer than:	3 days 🗸			
# the running task does not end when requested, force it to stop				
If the task is not scheduled to run again, delete i	If the task is not scheduled to run again, delete it after:			
If the task is already running, then the following rule applies:				
Do not start a new instance				
Do not start a new instance				
Run a new instance in parallel				
Queue a new instance Stop the misting instance	OK Cancel			

Perfmon is now configured to set up and record all vital base-level system statistics of this environment. Feel free to tailor the counters and configuration to your environment's requirements.

Note: A bug exists on Windows Server 2019 where the Perfmon collector fails to startup periodically during the evening recycling window. If this happens, refer to Microsoft's knowledge base at the following link:

https://learn.microsoft.com/en-us/troubleshoot/windows-server/performance/user-defined-dcs-doesnt-run-asscheduled