

# Announcing the Search Health Reports (SRx) for SharePoint Search Diagnostics

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Brought to you by [SearchEngineers@microsoft.com](mailto:SearchEngineers@microsoft.com), the **Search Health Reports (SRx)** is a PowerShell-driven tool for surfacing complex diagnostics for SharePoint Search through new multifaceted reports. The **SRx** includes a battery of tests that leverage a customized SSA object extended with contextual data from many disparate sources.

Our goal with this project is straightforward – empower users to **troubleshoot Search more effectively** so they can focus on solving business problems using Search.

## Getting Started

First, **download the SRxCore.zip** from **TechNet Gallery** to your SharePoint Search Farm and unzip the files on a SharePoint Server. Then, initialize the **SRx** environment by simply running the `.\initSRx.ps1` script (which exists in the root of the unzipped **SRx** folder) as demonstrated in the screen shot below:

```
Administrator: Search Health Reports (SRx) - 2017.1.6.3
Windows PowerShell
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PS C:\Users\bspndr> S:\SRxCore\initSRx.ps1
[initSRx] Loading SRx logging module...
[initSRx] Custom config (default): S:\SRxCore\etc\SRxMgmt\custom.config.json
[initSRx] Current log file: S:\SRxCore\var\log\Session\SRx-20170109160811-8108.1
log
[initSRx] Appending the Scripts folder (S:\SRxCore\lib\Scripts) to $ENV:Path
[initSRx] Temporary SRx Storage: S:\SRxCore\var\temp
[initSRx] Adding the SharePoint PowerShell Snapin
[initSRx] Checking Modules in S:\SRxCore\Modules\Core
> Loading: ConvertTo-SRxXML
> Loading: Enable-SRxCoreUtilities
> Loading: Enable-SRxDatabaseUtilities
> Loading: Enable-SRxLogParser
> Loading: Enable-SRxProcMon
> Loading: Enable-SRxRemoteUtilities
> Loading: Enable-SRxULSUtilities
> Loading: New-SRxReport
> Loading: Test-SRx
> Loading: Write-SRxConsole
[initSRx] Checking Modules in S:\SRxCore\Modules\SP2016
> Loading: Get-SRxFarm
[initSRx] Checking Modules in S:\SRxCore\Modules\Search
> Loading: Enable-SRxCloudDiag
> Loading: Enable-SRxCrawlDiag
> Loading: Enable-SRxIndexDiag
> Loading: Enable-SRxQueryDiag
> Loading: Enable-SRxSearchFarmDiag
> Loading: Get-SRxSSA
> Loading: New-SRxSearchServerObject

Running: $global:xFarm = Get-SRxFarm

Running: $global:xSSA = Get-SRxSSA | Enable-SRxCrawlDiag | Enable-SRxQueryDiag | Enable-SRxIndexDiag
[Get-SRxSSA] Extending $xSSA with core methods and properties
[Get-SRxSSA] Extending SRx Server objects...
[Get-SRxSSA] Extending SRx Components...
* [Enable-SRxCrawlDiag] Extending $xSSA...
* [Enable-SRxQueryDiag] Extending $xSSA...
* [Enable-SRxIndexDiag] Extending $xSSA...

Search Health Reports (SRx)

Thank you for using this project to analyze and troubleshoot your Search environment.
For any questions or feedback regarding this, please feel free to contact us at:
SearchEngineers@microsoft.com

...and to learn more about proactive reporting and enhanced diagnostics of Search with
the Search Health Reports Dashboard (SRx), contact your TAM to help get us engaged.

PS C:\Users\bspndr> █
```

This initialization script loads the custom PowerShell modules and creates a globally scoped `$xSSA`, an extended Search Service Application object with many custom properties and methods.

### Worth noting:

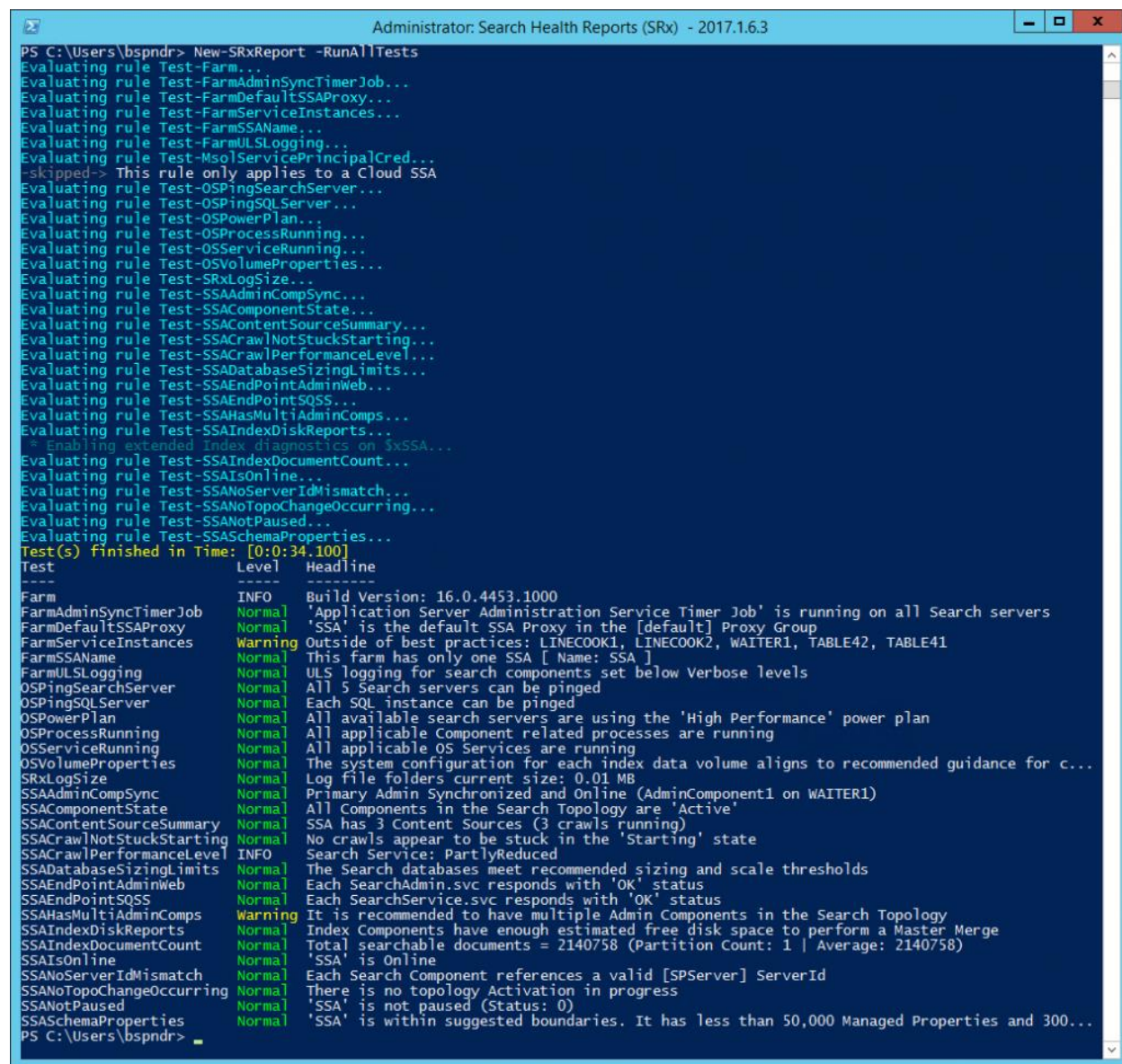
The SRx does not persist after closing a PowerShell window, so **each time you open a new PowerShell window, start by running `.\initSRx.ps1` to initialize the SRx** and you'll be good to go from there.

## Generating Test Results

[UPDATE 3/25/2016] For a summary on each test, please refer to the "SRx – Test Documentation.pdf" linked to from the SRx Core page.

From an initialized environment, you can then run a report including all of the tests with the following command:

`New-SRxReport -RunAllTests`



```
PS C:\Users\bspndr> New-SRxReport -RunAllTests
Evaluating rule Test-Farm...
Evaluating rule Test-FarmAdminSyncTimerJob...
Evaluating rule Test-FarmDefaultSSAProxy...
Evaluating rule Test-FarmServiceInstances...
Evaluating rule Test-FarmSSAName...
Evaluating rule Test-FarmULSLogging...
Evaluating rule Test-MsolServicePrincipalCred...
-skipped-> This rule only applies to a Cloud SSA
Evaluating rule Test-OSPingSearchServer...
Evaluating rule Test-OSPingSQLServer...
Evaluating rule Test-OSPowerPlan...
Evaluating rule Test-OSProcessRunning...
Evaluating rule Test-OSServiceRunning...
Evaluating rule Test-OSVolumeProperties...
Evaluating rule Test-SRxLogSize...
Evaluating rule Test-SSAAdminCompSync...
Evaluating rule Test-SSAComponentState...
Evaluating rule Test-SSAContentSourceSummary...
Evaluating rule Test-SSACrawlNotStuckStarting...
Evaluating rule Test-SSACrawlPerformanceLevel...
Evaluating rule Test-SSADatabaseSizingLimits...
Evaluating rule Test-SSAEndPointAdminWeb...
Evaluating rule Test-SSAEndPointSQSS...
Evaluating rule Test-SSAHasMultiAdminComps...
Evaluating rule Test-SSAIndexDiskReports...
* Enabling extended Index diagnostics on %$SSA...
Evaluating rule Test-SSAIndexDocumentCount...
Evaluating rule Test-SSAIsOnline...
Evaluating rule Test-SSANoServerIdMismatch...
Evaluating rule Test-SSANoTopoChangeOccurring...
Evaluating rule Test-SSANotPaused...
Evaluating rule Test-SSASchemaProperties...
Test(s) finished in time: [0:0:34.100]
Test          Level      Headline
-----
Farm          INFO      Build Version: 16.0.4453.1000
FarmAdminSyncTimerJob  Normal    'Application Server Administration Service Timer Job' is running on all Search servers
FarmDefaultSSAProxy    Normal    'SSA' is the default SSA Proxy in the [default] Proxy Group
FarmServiceInstances   Warning   Outside of best practices: LINECOOK1, LINECOOK2, WAITER1, TABLE42, TABLE41
FarmSSAName            Normal    This farm has only one SSA [ Name: SSA ]
FarmULSLogging         Normal    ULS logging for search components set below Verbose levels
OSPingSearchServer     Normal    All 5 Search servers can be pinged
OSPingSQLServer        Normal    Each SQL instance can be pinged
OSPowerPlan            Normal    All available search servers are using the 'High Performance' power plan
OSProcessRunning       Normal    All applicable Component related processes are running
OSServiceRunning       Normal    All applicable OS Services are running
OSVolumeProperties     Normal    The system configuration for each index data volume aligns to recommended guidance for c...
SRxLogSize             Normal    Log file folders current size: 0.01 MB
SSAAdminCompSync       Normal    Primary Admin Synchronized and Online (AdminComponent1 on WAITER1)
SSAComponentState      Normal    All Components in the Search Topology are 'Active'
SSAContentSourceSummary Normal    SSA has 3 Content Sources (3 crawls running)
SSACrawlNotStuckStarting Normal    No crawls appear to be stuck in the 'Starting' state
SSACrawlPerformanceLevel INFO      Search Service: PartlyReduced
SSADatabaseSizingLimits Normal    The Search databases meet recommended sizing and scale thresholds
SSAEndPointAdminWeb    Normal    Each SearchAdmin.svc responds with 'OK' status
SSAEndPointSQSS        Normal    Each SearchService.svc responds with 'OK' status
SSAHasMultiAdminComps  Warning   It is recommended to have multiple Admin Components in the Search Topology
SSAIndexDiskReports    Normal    Index Components have enough estimated free disk space to perform a Master Merge
SSAIndexDocumentCount  Normal    Total searchable documents = 2140758 (Partition Count: 1 | Average: 2140758)
SSAIsOnline            Normal    'SSA' is Online
SSANoServerIdMismatch  Normal    Each Search Component references a valid [SPServer] ServerId
SSANoTopoChangeOccurring Normal    There is no topology Activation in progress
SSANotPaused           Normal    'SSA' is not paused (Status: 0)
SSASchemaProperties     Normal    'SSA' is within suggested boundaries. It has less than 50,000 Managed Properties and 300...
```

As seen above, this battery of tests verifies that applicable servers can be pinged, component-related processes and services are running, component states are all 'Active', internal Search WCF EndPoints can be browsed, Index components have sufficient space to complete a Master Merges, the Legacy Admin is synchronized with the Admin Component, and more.

When running this set of tests, you can also output more details about the test results by adding the *Details* flag, such as (and this is also an example of handling when things go bad):

`New-SRxReport -RunAllTests -Details`

```
Administrator: Search Health Reports (SRx) - 2016.3.25.4
PS C:\Users\bspender> New-SRxReport -RunAllTests -Details
.....
Test(s) finished in time: [0:0:10.041]
Test      Level  Headline
-----
FarmAdminSyncTimerJob Error  'Application Server Administration Service' is not running: table41
          * LINECOOK2 : 'job-application-server-admin-service' has not run in 35 minutes
          * table41 : 'job-application-server-admin-service' does not appear to be running

FarmDefaultSSAProxy Warning SSA is not the default Service Application in one or more Proxy Groups
          * Proxy Group [custom] for http://srx.chotchkies.lab/ ==> No SSA Proxy defined
          * Proxy Group monkiesProxyHere ==> No SSA Proxy defined

FarmHasOnlyOneSSA Normal This farm has only one SSA [ Name: SSA ]
FarmServiceInstanceOnline Warning Outside of best practices: LINECOOK2, LINECOOK1, waiter1, table41, TABLE42, WAITER2
          * SQSS Instance is on a server without a QPC
            - waiter1, WAITER2
          * WFE Service Instance is on a Search server (*acceptable on Crawlers)
            - LINECOOK2, LINECOOK1, table41, TABLE42
          * Search Admin Web Service Instance is on a server without an Admin Component
            - table41

OSPingSearchServer Error The following Servers cannot be pinged: LINECOOK2
OSPingSQLServer Normal The SQL instance 'theKitchen' can be pinged
OSProcessRunning Error Unable to verify (Servers cannot be pinged): LINECOOK2

The following servers cannot be reached (unable to verify the state of processes):
[LINECOOK2]
  AnalyticsProcessingComponent2
  ContentProcessingComponent2

OSServiceRunning Error Servers with OS Services not running: LINECOOK2, table41
[table41]
  SharePoint Timer Service : Stopped
  SharePoint Administration : Stopped

The following servers cannot be reached (unable to verify the state of OS Services):
[LINECOOK2]
  SharePoint Server Search : 'unknown'
  SharePoint Search Host Controller : 'unknown'
  SharePoint Administration : 'unknown'
  SharePoint Timer Service : 'unknown'

SSAAdminSynchronized Normal Primary Admin Synchronized and Online (AdminComponent1 on WAITER2)
SSAComponentState Error Servers with SSA Components not 'Active': LINECOOK2, TABLE41, TABLE42
[ContentProcessingComponent2]
  ServerName: LINECOOK2
  State: Unknown
  Message: Node not found

[AnalyticsProcessingComponent2]
  ServerName: LINECOOK2
  State: Unknown
  Message: Node not found

[IndexComponent1]
  ServerName: TABLE41
  State: Degraded
  Message: List of degraded cells: Cell:IndexComponent1-SP477c853074e7I.0.1(Index out...)

[IndexComponent4]
  ServerName: TABLE42
  State: Degraded
  Message: List of degraded cells: Cell:IndexComponent4-SP477c853074e7I.1.0;

SSACrawlNotStuckInStarting Warning One or more crawls may potentially be stuck...
[1] Local SharePoint sites | Initiating request to start... [Status: 0][Substatus: 0]

SSADatabaseSizingLimits Normal Links and Crawl Store Databases meet recommendations for items in the content corpus.
SSAHasContentSources Normal SSA has 4 Content Sources (2 crawls running)
SSAIndexDiskReports Error Index Components estimated to exceed the free disk space: TABLE41, TABLE42

ServerName : TABLE41
Name       : IndexComponent1
Cell       : [I.0.1]
Part       : 1
State      : Degraded
Merging    : False
Checkpoint : 6864 MB
IndexFiles : 8907 MB
Pct        : 832.41%
Path       : T:\Index\I.R.1\SP477c853074e7.7.I.0.1\

ServerName : TABLE42
Name       : IndexComponent4
Cell       : [I.1.0]
Part       : 0
State      : Degraded
Merging    : False
Checkpoint : 8354 MB
IndexFiles : 9026 MB
Pct        : 1175.37%
Path       : T:\Index\I.R.0\SP477c853074e7.7.I.1.0\

SSAIndexDocumentCount Normal Total searchable documents = 266468 (Partition Count: 2 | Average: 133234)
SSAIsOnline Normal 'SSA' is Online
SSANotPaused Error 'SSA' is paused for external reason (user initiated); Status: 128
SSASearchAdminEndPoints Normal Each SearchAdmin.svc responds with 'OK' status
SSASearchServiceEndPoints Error [The following service Endpoints (SearchService.svc) cannot be reached; The following...
[waiter1] @[Status=ProtocolError; ResponseUri=http://waiter1:32843/e8c1377139704bda...
[waiter1] @[Status=ProtocolError; ResponseUri=https://waiter1:32844/e8c1377139704bda...

TopologyHasMultiAdminComps Normal SSA has 2 Admin Components
TopologyNoServerIdMismatch Normal Each Search Component references a Valid ServerId
TopologyNotBeingModified Normal There is no topology Activation in progress
PS C:\Users\bspender>
```



The SRx also extends and replaces my [previously published Indexer Reports](#), which you can generate in the SRx using the following:

`$xSSA | Get-SRxIndexReports -DiskReport`

```
Administrator: Search Health Reports (SRx) - 2017.1.6.3
PS C:\Users\bspndr> Get-SRxIndexReports -DiskReport

[ SSA | Constellation: B9E7B8 ]

-----
ServerName Name State Primary SystemMgr Legacy Admin
-----
WAITER1 AdminComponent1 Active True True True

--[ Search System Diagnostics
-----
ServerName Name Cell Part State Primary Generation Docs(+dups) Searchable AvgDoc Merging Checkpoint
-----
TABLE42 IndexComponent2 [I.0.0] 0 Active True 5,504 5,940,634 2,140,758 6 KB False 36 GB
TABLE41 IndexComponent1 [I.1.0] 0 Active False 5,504 5,945,284 2,140,758 6 KB False 36 GB

--[ Master Merge Diagnostics
-----
ServerName Name Cell Part Checkpoint Index Files MM (Est.) MM (Pending) Free Space %(MM/Free)
-----
TABLE42 IndexComponent2 [I.0.0] 0 36 GB 37 GB 54 GB 17 GB 143 GB 12.09%
TABLE41 IndexComponent1 [I.1.0] 0 36 GB 37 GB 54 GB 17 GB 143 GB 12.19%

--[ Disk Volume Diagnostics
-----
ServerName Name Cell Part Vol Block Idx Cmp Capacity Index Files Path
-----
TABLE42 IndexComponent2 [I.0.0] 0 S: 64 KB No No 200 GB 37 GB s:\Index\I.R.0\SP0cc7a47f3dea.2.I.0.0\
TABLE41 IndexComponent1 [I.1.0] 0 S: 64 KB No No 200 GB 37 GB s:\Index\I.R.0\SP0cc7a47f3dea.2.I.1.0\

Admin Health Report for Index System SP0cc7a47f3dea of Constellation B9E7B8
-----
Name Message Level
-----
active_indexrouters[SP0cc7a47f3dea] [I.0.0] Info
healthreport_time_milliseconds[AdminComponent1.GenerationController] 0.00 Info
healthreport_time_milliseconds[AdminComponent1.IndexClusterManager1] 125.00 Info
healthreport_time_milliseconds[AdminComponent1.IndexController1] 0.00 Info
healthreport_time_milliseconds[Microsoft.Ceres.SearchCore.Query.MarsLookupComponent.MarsLookupComponent] 0.00 Info
healthreport_total_time_milliseconds 125.00 Info
in_sync[SP0cc7a47f3dea.0] [I.0.0, I.1.0] Info
left_behind[SP0cc7a47f3dea.0] [I.1.0, I.0.0] Info
members[SP0cc7a47f3dea.0] 1.0.0 Info
primary[SP0cc7a47f3dea.0] 1.0.0 Info
```

## Looking Forward...

As Search PFEs, we are working with several of our dedicated customers to build upon the *SRx Core* by developing the **Search Health Reports Dashboard (SRx)**, which entails a custom SharePoint hosted site collection for rendering diagnostic gauges, KPIs, and proactive reporting. Over the last few months, this project significantly matured with expanding functionality and robustness – for that, **a giant thank you goes out for the heavy lifting from Eric Dixon, Brent Groom, and Russ Maxwell.**

...and to learn more about the **Search Health Reports Dashboard (SRx)**, contact your TAM to help get us engaged.

And the legalese:

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