

Sitecore and Solr -- How to Integrate Apache Solr with Sitecore 9.1 using SearchStax

Overview

SearchStax® can be used to enable Apache Solr on a Sitecore website.

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Install Sitecore 9.1 without Solr

Windows 10 Required

Note that a stand-alone installation of Sitecore 9.1 requires a Windows 10 computer. Other prerequisites may be found in the Sitecore installation documents.

This section describes how to install Sitecore 9.1 locally without Solr. We'll connect it to a SearchStax Solr deployment in a subsequent step.

1. Visit the Sitecore Experience Platform 9.1 Initial Release (https://dev.sitecore.net/Downloads/Sitecore_Experience_Platform/91/Sitecore_Experience_Platform_91_Initial_Release.aspx) page. Under *Download Options for On Premises Deployment*, download *Packages for XP Single*.

The screenshot shows a web browser window with the URL https://dev.sitecore.net/Downloads/Sitecore_Experience_Platform/91/Sitecore_Experience_Platform_91_Initial_Release.aspx. The page title is "Download options".

Resource	Description
Sitecore Installation Framework	Follow this link to download the Sitecore Installation Framework (SIF) PowerShell module. Please refer to the Sitecore Experience Platform installation guide for further information on how to install Sitecore with SIF.
ZIP archive of the Sitecore site root folder	Choose this link to install Sitecore manually (without the help of the setup.exe installation program).
Scripts for Sitecore Security database	The package contains the set of scripts for moving Sitecore Security membership provider from the Core database to individual or existing one.
Sitecore Remote Distributed Deployment SIF Templates	The package contains Sitecore Install Framework deployment templates that can be used to deploy Sitecore Experience Platform remotely to a scalable distributed server cluster from a single workstation or server.

Below this table, there is a section titled "Download options for On Premises deployment" with another table:

Resource	Description
Packages for XP Single	Packages for XP Single (XPO) Instance configuration.
Packages for XP Scaled	Individual packages for each of the dedicated XP Scaled (XPI) roles.
Packages for XM Scaled	Individual packages for each of the dedicated XM Scaled (XMI) roles.

Farther down the same web page, under *Release Information*, download the *Installation Guide* and the *Quick Installation Guide*.

The screenshot shows the "Release information" section of the same web page. It contains a table with the following data:

Resource	Description
Release notes	A list of features, improvements, and fixes that have been implemented in this release.
Known issues	Choose this link to access the Sitecore Knowledge Base.
Quick installation guide	How to install the XP Single topology on a developer workstation.
Installation guide	The installation procedure for the Sitecore Experience Platform.
Upgrade guide	To upgrade from a previous Sitecore version please follow the instructions in this guide.
Assembly list	Complete list of assemblies shipped with this release.

2. With the exception of Solr, install all the prerequisite sub-components as mentioned in the installation guide.

3. Make the following changes in the configuration files.

A. **XP0-SingleDeveloper.ps1**: Change the \$Prefix to "sitecore".

```

1 | # The Prefix that will be used on SOLR, Website and Database instances.
   | -$Prefix = "sc910"
2 | +$Prefix = "sitecore"

```

Comment out the Solr root and service details:

```
17 # The Folder that Solr has been installed to.
18 -$SolrRoot = "C:\Solr-7.2.1"
19 ##$SolrRoot = "C:\Solr-7.2.1"
19 # The Name of the Solr Service.
20 -$SolrService = "Solr-7.2.1"
21 ##$SolrService = "Solr-7.2.1"
```

```
- SolrRoot = $SolrRoot
- SolrService = $SolrService
53 + #SolrRoot = $SolrRoot
54 + #SolrService = $SolrService
```

B. **XP0-SingleDeveloper.json**: Comment out or remove the **XConnectSolr** and **SitecoreSolr** "includes:"

```
550 "XConnectCertificates": {
551     "Source": ".\createcert.json"
552 },
- "XConnectSolr": {
-     "Source": ".\xconnect-solr.json"
- },
553 "XConnectXP0": {
554     "Source": ".\xconnect-xp0.json"
555 },
- "SitecoreSolr": {
-     "Source": ".\Sitecore-solr.json"
- },
556 "SitecoreXP0": {
557     "Source": ".\Sitecore-XP0.json"
558 }
```

C. **Sitecore-XPO**: Comment out or remove the **UpdateSolrSchema** task:

```
509         "Action": "Start"
510     }
511 },
-   "UpdateSolrSchema": {
-     "Description": "Update the solr schemas.",
-     "Type": "SitecoreUrl",
-     "Params": {
-       "SitecoreInstanceRoot": "[concat('http://', parameter('DnsName'))]",
-       "SitecoreActionPath": "sitecore/admin/PopulateManagedSchema.aspx?indexes=all",
-       "UserName": "admin",
-       "Password": "[variable('Sitecore.Admin.Password')]"
-     }
-   },
512   "DisplayPassword": {
513     "Description": "Displays the admin password.",
514     "Type": "WriteInformation",
```

D. **xconnect-xp0**: Comment out or remove the **ConfigureSolrSchemas** task.

```
757     }
758   ]
759 },
-   "ConfigureSolrSchemas": {
-     "Description": "Applies schema to the new cores.",
-     "Type": "ManageSolrSchema",
-     "Params": [
-       {
-         "Address": "[parameter('SolrUrl')]",
-         "Core": "[variable('Xdb.Name')]",
-         "ArgumentsFile": "[variable('Solr.Config.Path')]"
-       },
-       {
-         "Address": "[parameter('SolrUrl')]",
-         "Core": "[variable('Xdb.Rebuild.Name')]",
-         "ArgumentsFile": "[variable('Solr.Config.Path')]"
-       }
-     ]
-   },
760 },
761   "UninstallTasks": {
762     "StopServices": {
```

5. Once all the above changes have been made, go ahead with the Sitecore installation by running the

PowerShell script `.\XP0-SingleDeveloper.ps1` as recommended in the Sitecore installation guide.

```
Administrator: Windows PowerShell
PS C:\Sitecore> .\XP0-SingleDeveloper.ps1
```

Create a New Deployment in SearchStax

Assuming you have already created a SearchStax account (`./accountsetup/`) and do not already have a deployment set up, click on the **Cloud Manager** tab and then click on the **Create Deployment** button at the top. Enter a deployment name, and select the most appropriate provider, region, plan, and Solr version for your needs.

The screenshot shows the 'Create Deployment' interface in the Sitecore Cloud Manager. The 'Deployment Name' field is set to 'SitecoreUAT'. Under 'Cloud Provider', three options are available: Amazon Web Services, Microsoft Azure (which is selected), and Google Cloud Provider. The 'Region' is set to 'West US (California)'. Under 'Plan', two options are shown: 'Dedicated Node' and 'Dedicated Cluster'. The 'Dedicated Cluster' option is selected and highlighted with a blue bar that reads: 'For load testing & production use. Three nodes high performance cluster with High-Availability.' Below this, a card for the 'DC4' plan is shown, featuring '4GB memory, 32GB storage' and a price of '\$655/mo'. At the bottom, there is a section for 'Additional Nodes (@ \$218/node)' with a counter set to 0.

Cloud Provider

A self-managed Sitecore project may use any of our cloud providers for the Solr deployment.

Single Node or Cluster

Sitecore will work with a single-node deployment (the "DN" series of SearchStax deployments) for purposes of testing and evaluation. However, a production system requires a SearchStax cluster (the "DC" series) to

provide high-availability and failover features.

Sitecore/Solr Compatibility

The following table shows Solr versions that are compatible with both Sitecore (<https://kb.sitecore.net/articles/227897>) and with SearchStax. These combinations have been tested; other combinations may or may not work successfully.

Sitecore	Solr
XP 8.2	5.5.0
XP 9.0	6.6.2
XP 9.1	7.2.1

Once you create your deployment, you will see it in the Solr Deployments dashboard.

The screenshot shows the 'Solr Deployments' dashboard. A table lists the deployment details:

Name	Type	Plan	Nodes	Provider	Version	Status	Health	Options
SitecoreUAT	Silver	Dedicated Node	DN4	1	Microsoft Azure - West US (California)	7.2.1	Running	OK

Clicking on the name of the deployment gives you pertinent information about your deployment's servers. The **Solr HTTP Endpoint** takes you to your Solr server dashboard.

The screenshot shows the 'Settings' page for the Solr deployment. The 'Solr HTTP Endpoint' is highlighted with a red arrow and points to the URL: <https://ss916715-westus-azure.searchstax.com/solr/>. Below this, the 'Zookeeper Ensemble' is listed as `ss916715-2-westus-aznrm.searchstax.com:2181,ss916715-3-westus-aznrm.searchstax.com:2181,ss916715-1-westus-aznrm.searchstax.com:2181`. There is also an 'API Termination Protection' button.

The 'Servers' section shows a table of the deployment's nodes:

Node	Provider	HW Specs	Status	Options
ss916715-1 (10.27.0.4)	Microsoft Azure - West US (California)	4.0GB Memory, 32.0GB Storage	OK	Stop Solr
ss916715-2 (10.27.0.5)	Microsoft Azure - West US (California)	4.0GB Memory, 32.0GB Storage	OK	Stop Solr
ss916715-3 (10.27.0.6)	Microsoft Azure - West US (California)	4.0GB Memory, 32.0GB Storage	OK	Stop Solr

Showing 1 to 3 of 3 entries

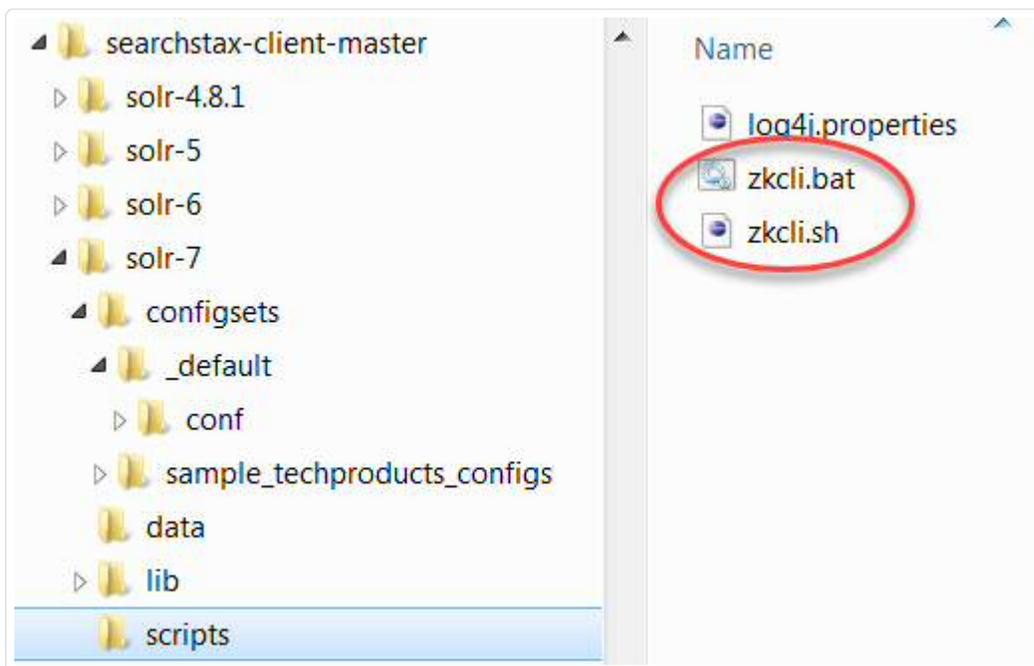
Install the Zookeeper Script

Apache ZooKeeper (<https://zookeeper.apache.org/>) is a centralized service for maintaining configuration information. In a SearchStax Solr deployment, Zookeeper acts as a centralized repository for your Solr configuration files.

SearchStax users do not have direct access to the Zookeeper configsets as they would in a local Solr installation. Instead, they interact with Zookeeper through a modified version of Solr's standard **zkcli** script. SearchStax provides both Linux and Windows versions of the script.

You can download the zkcli ZIP file here: [searchstax-client-master.zip](https://github.com/searchstax/searchstax-client/archive/master.zip) (<https://github.com/searchstax/searchstax-client/archive/master.zip>).

Unzip the file. The top-level directory is `\searchstax-client-master`. Navigate to the `solr-5`, `solr-6`, or `solr-7` **scripts** subdirectory (such as `\searchstax-client-master\solr-7\scripts`). Locate **zkcli.sh** and **zkcli.bat** in that directory. These are the Windows and Linux versions of the script, respectively.



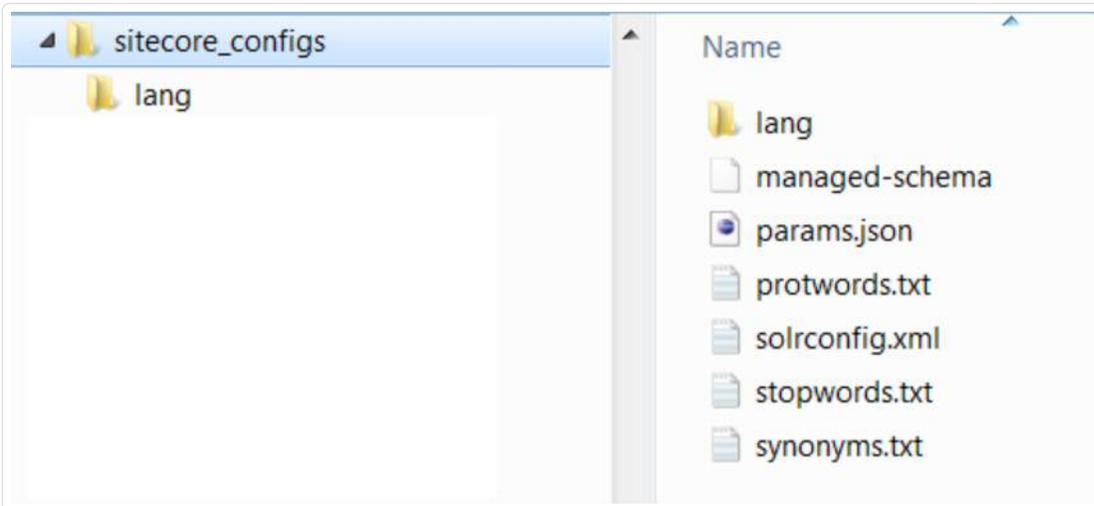
Learn about zkcli

The zkcli script is an all-purpose toolkit for managing Zookeeper on a cloud deployment. See *What else can I do with the zkcli script?* ([../hc/zkcli-zookeeper-searchstax.html](https://site-qa.searchstax.com/docs/sitecore-9-1-solr-noscript/..hc/zkcli-zookeeper-searchstax.html))

Upload the Sitecore Configuration Files

Follow these steps to upload the Sitecore Solr configuration to Zookeeper:

1. Download Solr 7.2.1 (<https://archive.apache.org/dist/lucene/solr/7.2.1/solr-7.2.1.zip>) and extract the file onto a local system.
2. Locate the **_default** folder under **solr-7.2.1.zip\solr-7.2.1\server\solr\configsets_default**.
3. Copy the contents of the **_default** folder (not the folder itself) into to a new **sitecore_configs** folder. The new folder can be anywhere, such as C:\sitecore_configs. It should look like this when you are finished:



4. In this new folder, open the **solrconfig.xml** file. Set the **update.autoCreateFields** setting to false (update.autoCreateFields:false).
5. Open the **managed-schema** file in the **conf** folder and do the following:
 - a. Set the value in **<uniqueKey>id</uniqueKey>** to **_uniqueid**.
 - b. In the fields section, add the following field configuration for **_uniqueid**:

```
<field name="_uniqueid" type="string" indexed="true" required="true" stored="true"/>
```

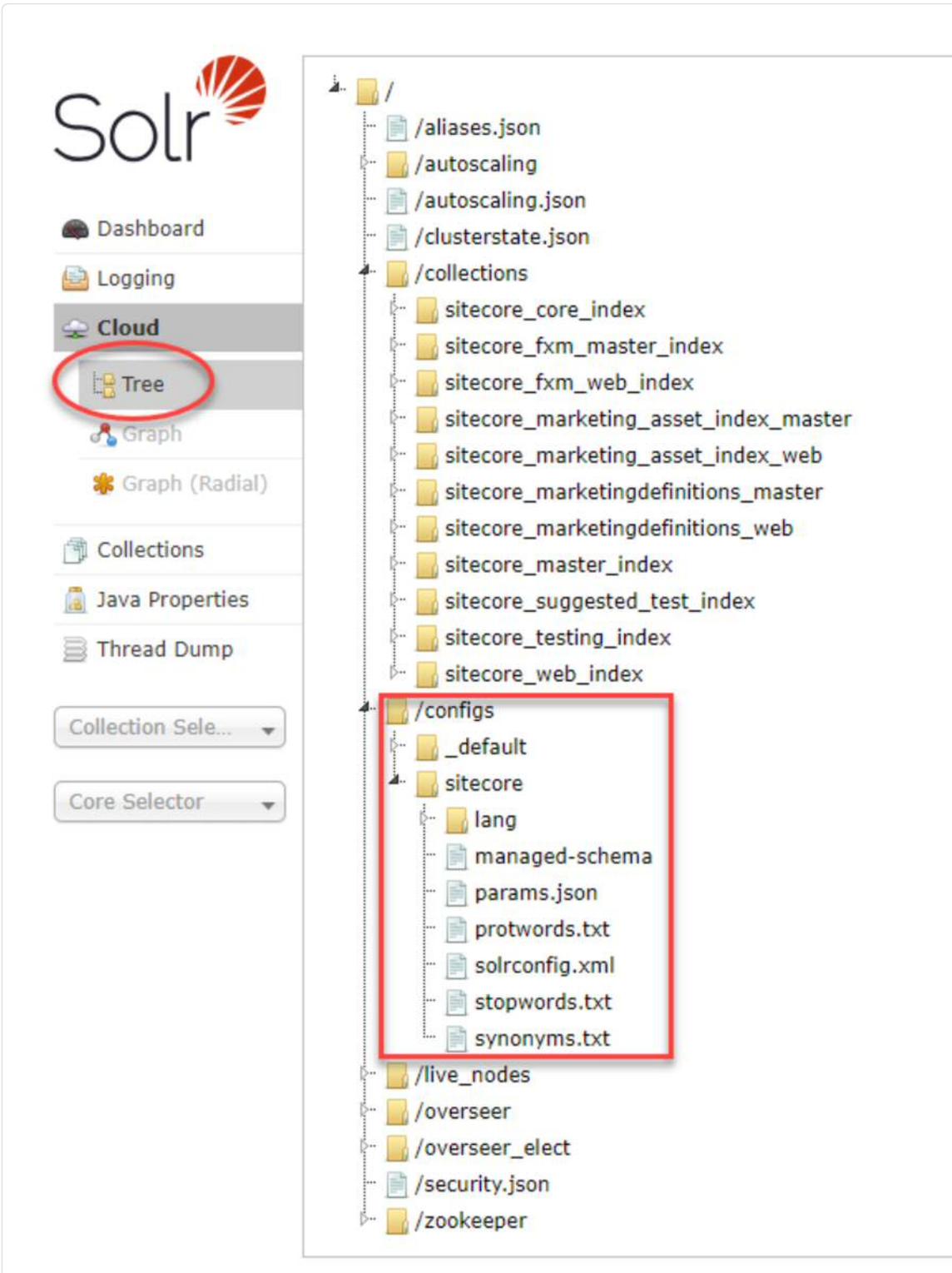
3. Use the **zkcli.bat** script to run this command:

```
zkcli.bat -zkhost <zookeeper URLs> -cmd upconfig -d sitecore_configs -n sitecore
```

where **<zookeeper URLs>** corresponds to the URL of the Zookeeper ensemble in the **deployment details** page:



4. From the deployment details page, click the **Solr HTTP Endpoint** link to open the Solr Dashboard. Verify that the directory structure of **sitecore** is similar to that shown below.



Create Sitecore Collections

Pay attention to ReplicationFactor

Use replicationFactor=1 for a single-node deployment. A three-node cluster should have replicationFactor=3. You need the same number of replicas as Solr servers.

When you have uploaded the Solr configuration to Zookeeper, you can create Sitecore collections by following these steps:

1. Navigate to the **Collections** page in the **Solr Dashboard**.
2. Click **Add Collection**.
3. In the **config set** field, click the **Sitecore** configuration.
4. Specify the following fields as shown:

The screenshot shows a web form for adding a collection. At the top, there are three buttons: '+ Add Collection', 'Create Alias', and 'Delete Alias'. Below these are four input fields: 'name:' with the value 'sitecore_master_index', 'config set:' with a dropdown menu showing 'sitecore', 'numShards:' with the value '1', and 'replicationFactor:' with the value '3'. A red annotation 'for a cluster' is placed next to the '3'. Below the fields is a 'Show advanced' checkbox which is checked. At the bottom, there are two buttons: a blue 'Add Collection' button with a green checkmark and a grey 'Cancel' button with a red X.

5. Repeat for all Sitecore indexes.
 - a. sitecore_master_index
 - b. sitecore_core_index
 - c. sitecore_web_index
 - d. sitecore_marketingdefinitions_master
 - e. sitecore_marketingdefinitions_web
 - f. sitecore_marketing_asset_index_master
 - g. sitecore_marketing_asset_index_web
 - h. sitecore_testing_index
 - i. sitecore_suggested_test_index
 - j. sitecore_fxm_master_index

k. sitecore_fxm_web_index

Configure Sitecore to Use SearchStax

Follow these steps to configure Sitecore to use SearchStax as the search provider:

1. Open the **web.config** file. Under **<AppSettings>**, change the value of the **search:define** key to "Solr".

```
<AppSettings>
  <add key="role:define" value="Standalone"/>
  <add key="search:define" value="Solr"/>
</AppSettings>
```

If there is no **search:define** key, you may add it.

2. Open the **ConnectionStrings.config** file in the **inetput\wwwroot\<Sitecore Instance name>.sc\App_Config** folder. Specify the value of the **solr.search** key:

```
<add name="solr.search" connectionString="<Load Balancer URL>"/>
```

The **<Load Balancer URL>** string mentioned above is the SearchStax **Solr HTTP Endpoint** with one very confusing difference: *The Sitecore connectionString has no slash on the end.* The Sitecore connectionString always ends with **"/solr"**.

Solr Basic Auth

Optionally, if you use SearchStax to configure Solr Basic Authentication (</docs/security#solrauth>), you will need to add a user's credentials to the connection string as shown:

```
<add name="solr.search" connectionString="https://username:password@<Load Balancer URL>"/>
```

Populate Schema from the Control Panel

Follow these steps to populate the Solr schema:

1. Log in to the **Sitecore Content Management** environment.
2. Open the **Sitecore Control Panel**.
3. In the Indexing tab, click **Populate Solr Managed Schema**.
4. Select all indexes and click **Populate**.

Schema Populate

Select the search indexes that you want to populate schema.

Populate schema

Select all | Unselect all

Local Indexes

- sitecore_core_index
- sitecore_master_index
- sitecore_web_index
- sitecore_marketingdefinitions_master
- sitecore_marketingdefinitions_web
- sitecore_marketing_asset_index_master
- sitecore_marketing_asset_index_web
- sitecore_testing_index
- sitecore_suggested_test_index
- sitecore_fxm_master_index
- sitecore_fxm_web_index

Questions?

Do not hesitate to contact the SearchStax Support Desk (<mailto:support@searchstax.com>).

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