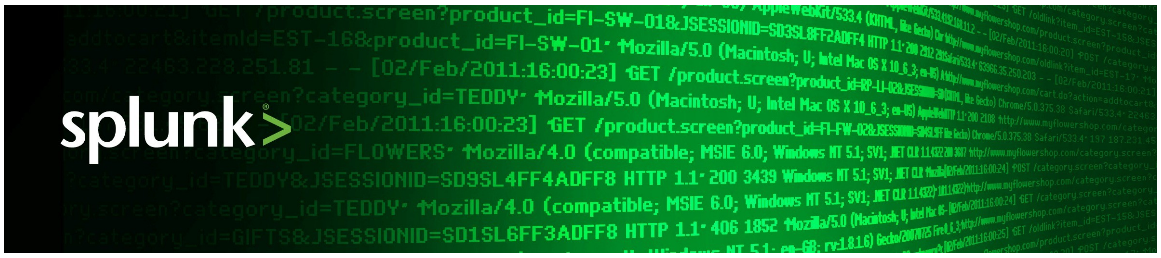

Hunk 6.0

Hunk User Manual

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Introduction

Meet Hunk

Hadoop lets you store massive amounts of structured, polystructured and unstructured data, however extracting value from that data can be a hard and time consuming task.

Hunk lets you access data in remote Hadoop clusters via virtual indexes and allows you to use the Splunk Processing Language to analyze your data using the full power of Hadoop.

With Hunk you can do the following with your Hadoop data:

- Process large amounts of structured, polystructured and unstructured data.
- Report and visualize large amounts of data.
- Preview report data to fine to your search-generating reports.
- Run combined reports on Hadoop data and data from your Splunk Enterprise indexes.
- Use SDKs and apps with Hadoop data.

Due to the nature of how data is stored in Hadoop, there are certain Splunk Enterprise index behaviors that cannot be duplicated:

- Hunk currently doesn't support real-time searching of Hadoop data, although preview functionality is available.
- Since events are not sorted in any particular order, any search command which depends on implicit time order will exhibit different behavior in Hunk. (For example: head, tail, delta, etc.) For more information about how certain timestamp-sensitive commands work with virtual indexes, see "Search a virtual index" in this manual.
- Data is not always returned as quickly as data is returned for a local index.
- Data model and report acceleration are not currently available in Hunk

To set up Hunk to work with your own HDFS data, see "About installing and configuring Hunk."

To learn about configuring and searching data in the Hunk user interface, see "Work in the Hunk user interface."

To learn more about how Hunk works, see "Hunk concepts."

To test drive Hunk on a virtual machine using sample data we provide, see the Tutorial.

FAQ

Q. Can you search Splunk indexes and Hadoop in the same query?

A. Yes! In order to do this, you install Splunk and add two licenses: one for Hunk and one for Splunk Enterprise.

Q. Are all the new Splunk Enterprise 6.0 reporting tools/functions available when searching Hadoop?

A. Yes, with a few exceptions. Accelerated Data Model is unsupported, since we do not have an index structure to store the analytics store data. A few commands (transaction & localize) that rely on event time order do not work. For information about search command behavior specific to Hunk, see Search a virtual index.

Q. What is the overhead on the Hadoop infrastructure to deploy from Splunk?

A. Minimal! You just need enough local disk to store the Splunk deployment and temporary disk usage needs. 5GB of local storage would more than meet your needs. There are no agents running. Hunk only executes processes on Hadoop as part of the MapReduce job and leaves no running processes behind.

Q. What happens to the virtual index after a report is complete?

A. Nothing. The virtual index waits, retaining the settings and information exactly as you configured it, ready for the next report you run.

Q. Does summary indexing work with Hunk?

A. Yes traditional summary indexing and `tscollect` are supported in Hunk.

Q. Is there a limit to the number of results that can be returned from an HDFS directory?

A. No.

Q. How does this affect ingest rates for licensing purposes?

A. It doesn't! Hunk processes data that is already in Hadoop, so you are not processing data in Splunk. Hunk pricing is not based on data the way it is in Splunk. For more information about pricing and licensing, see your sales representative.

Q. Where does the reduce phase/function execute?

A. In the search head.

Q. Which Hadoop distributions will work with Hunk?

A. All Apache Hadoop-based distributions, including Cloudera and Hortonworks, as well as MapR. For more information about system requirements for Hunk, see System and software requirements.

Q. Do you need a Splunk Enterprise license to run Hunk?

A. Hunk is a separate product and has its own license. You'll need a Splunk Enterprise license only if you want to run searches against Splunk Enterprise indexers.

Q. Can I use Hunk and Splunk together?

A. Absolutely. You can install both licenses on an installation of Splunk 6.0 build to analyze and compare data on local and virtual indexes.

Q. I'd like to give Hunk a spin, how can I get a copy to play with?

A: Download it! Splunk/Hunk downloads come with a "Trial" license which allows Hunk and Splunk Enterprise features for 60 days. After that, if you still want to use it, you'll need to contact a sales representative and purchase the full license.

Q. Why would I move data from Hadoop to Splunk?

A. Most likely, you wouldn't. Moving data is an expensive proposition, which is why we developed Hunk. The only reason you might move data in an HDFS directory into a local Splunk index is if you need to do needle-in-haystack type searches.

Q. Can you analyze data when some data is in Splunk and some in Hadoop?

A. Yes, you can analyze and correlate data that resides in different Hadoop clusters. You'll need both licenses: Hunk and Splunk Enterprise.

Q. Can I configure a Splunk search head to connect to Hadoop/Hunk?

A. No, you will need a license for Hunk and a search head configured specifically to work with virtual indexes.

Learn more and get help

You've got a variety of options for finding more information about Splunk:

- Splunk Support
- The Splunk Enterprise documentation
- Splunk Answers
- The #splunk IRC channel on EFNET

Hunk concepts

About virtual indexes

Virtual indexes let Hunk address data stored in external systems and push computations to those systems. With virtual indexes you can access and report on structured, unstructured and polystructured data residing your Hadoop cluster.

With virtual indexes, Hunk leverages the MapReduce framework to execute report-generating searches on Hadoop nodes. Data does not need to be pre-processed before it is accessed because Hunk lets you run analytics searches against the data where it rests in Hadoop.

Hunk treats Hadoop virtual indexes as read-only data stores and binds a schema to the data at search time. This means the data you report on with Hunk remains accessible in the same format as before to other systems and tools that use it, such as Hive and Pig.

Configuring virtual indexes

Before you set up a virtual index, you set up providers and configure an ERP. An ERP is a search helper process that we've created to carry out searches on Hadoop data. When you configure a provider, you tell Hunk details about your Hadoop cluster, which the ERP needs to carry out reporting tasks. See About external results providers for more information about ERPs.

You then configure virtual indexes by giving Hunk information about your Hadoop data, such as the data location, a set of whitelist and blacklisted files or directories. When properly configured, virtual indexes recognize certain directory structures and extract and use that information to optimize searches. For example, if your data is partitioned in a directory structure using dates, then Hunk can reduce the amount of data it processes by properly choosing to process only the data in relevant paths.

Learn more

- To configure your providers and virtual indexes using the CLI, see Set up a provider and virtual index."
- To set up new providers in the Hunk user interface, see "Add or edit an HDFS provider."

- To set new virtual indexes in the Hunk user interface, see "Add or edit a virtual index."

About external results providers

In order to access and process data in external systems, Hunk leverages External Result Providers (ERP) to carry out the implementation logic and details for data retrieval and computation. ERPs are a collection of helper processes provided with Hunk. You configure them in `indexes.conf` when you describe your provider and provider family.

About configuring an ERP

To configure a virtual index for data that resides in Hadoop, you first set up an ERP by telling Hunk about the Hadoop cluster. You can do this by adding a provider family.

You can add a provider by editing indexes.conf with the results provider name, location, etc. See "Set up a provider and virtual index" for information about setting up a provider with `indexes.conf`.

You can also set up a provider in Web UI. See "Add an HDFS provider" for more information.

After you set up a provider, you can configure virtual indexes by giving Hunk information about the data location. Hunk can be configured to recognize certain directory structures and extract and use that information to optimize searches. For example, if your data is partitioned in a directory structure using dates, then Hunk can reduce the amount of data it processes by properly choosing to process only the data in relevant paths.

You can learn more about how `indexes.conf` values are used, see indexes.conf in the Splunk Enterprise Admin Manual.

How Splunk returns reports on Hadoop data

When a report-generating search is initiated, Hunk uses the Hadoop MapReduce framework to process the data in place. All of the parsing of data, including source typing, event breaking, and time stamping that is normally done at index time is performed in Hadoop at search time.

Note that Hunk does not index this data, rather it processes it on every request. Here's a high level overview of how searches against Hadoop virtual indexes operate:

1. The user initiates a report-generated search on a virtual index (see "Search a virtual index" for more information about generating report-generated searches).

2. Hunk recognizes that the request is for a virtual index, and rather than searching a local index, Hunk spawns an ERP process to help with the request. (You configure this process when you set `indexes.conf` in the `provider-family:hadoop` stanza. See "Set up a provider and virtual index" for more information.)

3. Based on your configuration, Hunk passes configuration and run-time data, including the parsed search string etc, to the ERP in a JSON format.

4. If this is the first time a search is executed for a particular provider family, the ERP process sets up the necessary Hunk environment in HDFS by copying a Hunk package to HDFS and copying the knowledge bundles to HDFS.

5. The ERP process analyses the request from the Hunk search: It identifies the relevant data to be processed and generates tasks to be executed on Hadoop. It then spawns a MapReduce job to perform the computation.

6. For each task, the MapReduce job first checks to see whether the Hunk environment is up-to-date, checking for the correct Splunk package and knowledge bundle. If not found, the task copies the Splunk package from HDFS (see step 4) then extracts it into the configured directory. It then copies the bundles from HDFS (see step 4) and expands them in the correct directory within the TaskTracker.

7. The map task proceeds to spawn a Hunk search process on the TaskTracker node to handle all the data processing.

8. The map task then feeds data to the Hunk search process and it consumes its output - which becomes the output of the map task. This output is stored in HDFS.

9. The ERP processes on the search head constantly poll HDFS to pick up the results and feed them to the search process running on the search head.

10. The Hunk search process on the search head uses these results to create the reports (executing the reduce step). The report is constantly updated as new data arrives.

Install Hunk

About installing and configuring Hunk

This chapter walks you through every step in the process of configuring Hunk and setting up providers and virtual indexes.

To set up Hunk and virtual indexes, just follow the steps in this chapter to install Splunk and then license and configure Hunk. Since Hunk uses a lot of Splunk functionality, we also recommend that you check out some of the Splunk Enterprise documentation, especially the Search Manual and Search Tutorial.

If you are not ready to configure Hunk on your own system and just want to try it out

Skip this chapter entirely and head to the Tutorial in this manual. The tutorial will walk you through setting up an instance of Hunk in a Hadoop Virtual Machine using provided sample data. It's a great way to play with Hunk functionality without the commitment of configuring it to work with you HDFS directories.

System and software requirements

Before you get started, make sure you have the following in place:

- Access to at least one Hadoop cluster (with data in it!) and the ability to run MapReduce jobs on that data. Hunk is supported on the following Hadoop distributions and versions:
    - Apache Hadoop
        - 0.20.203.0
        - 1.0.2
        - 1.0.3
        - 1.0.4
        - 2.0.0
    - Cloudera Distribution Including Apache Hadoop
        - 3u4
        - 3u6 (Kerberos)
        - 4

        - ◊ 4.2
        - ◊ 4.3.0
        - ◊ 4.4 (HA NN and HA JT)
    - ♦ Hortonworks Data Platform (HDP)
        - ◊ 1.0
        - ◊ 1.1
        - ◊ 1.3
        - ◊ 1.3.2
        - ◊ 2.0.0
    - ♦ MapR 2.1.0

What you need on your Hadoop nodes

On Hadoop TaskTracker nodes you need:

- A directory on the *nix file system running your Hadoop nodes that meets the following requirements:
    - ♦ One gigabyte of free disk space for a copy of Splunk.
    - ♦ 5-10GB of free disk space for temporary storage (this is used by the search processes).

What you need on your Hadoop filesystem

On your Hadoop filesystem (HDFS or otherwise) you will need:

- A subdirectory under `jobtracker.staging.root.dir` (usually /user/) with the name of the user account under which Hunk is running on the search head. For example, if Hunk is started by user "hunk" and `jobtracker.staging.root.dir=/user/` you would need to have a directory `/user/hunk` that is accessible by user "hunk"

- A subdirectory under the above directory that can be used by this Hunk server for intermediate storage, e.g. `/user/hunk/server01/`

Download and install Splunk

To install Hunk on your system, you download the Linux distribution for Splunk 6.0 and install it, then add a Hunk license.

You can find the correct version to download here:
http://www.splunk.com/download/hunk

You must configure this installation to run on a search head that resides on a *nix platform. You can run Hunk on any machine that meets the requirements for a search head. For more information about search heads, see Configure the search head.

Note: Hunk is not supported on Windows.

If you want to learn more about installing or updating Splunk, see "Install on Linux" in the Installation manual.

Install Splunk

Before you get started, take a look at the system requirements and configuration prerequisites.

- System and Software requirements

RedHat RPM install

To install the Splunk RPM in the default directory `/opt/splunk`:

```
rpm -i splunk_package_name.rpm
```

To install Splunk in a different directory, use the `--prefix` flag:

```
rpm -i --prefix=/opt/new_directory splunk_package_name.rpm
```

To upgrade an existing installation that resides in /opt/splunk using the RPM:

```
rpm -U splunk_package_name.rpm
```

To upgrade an existing installation that was done in a different directory, use the `--prefix` flag:

```
rpm -U --prefix=/opt/existing_directory splunk_package_name.rpm
```

Note: If you do not specify with `--prefix` for your existing directory, rpm will install in the default location of `/opt/splunk`.

For example, to upgrade to the existing directory of `$SPLUNK_HOME=/opt/apps/splunk` enter the following:

```
rpm -U --prefix=/opt/apps splunk_package_name.rpm
```

If you want to automate your RPM install with kickstart, add the following to your kickstart file:

```
./splunk start --accept-license
./splunk enable boot-start
```

Note: The second line is optional for the kickstart file.

Debian DEB install

To install the Splunk DEB package:

```
dpkg -i splunk_package_name.deb
```

Note: You can only install the Splunk DEB package in the default location, `/opt/splunk`.

Tar file install

To install on a Linux system, expand the tarball into an appropriate directory using the `tar` command:

```
tar xvzf splunk_package_name.tgz
```

The default install directory is `splunk` in the current working directory. To install into `/opt/splunk`, use the following command:

```
tar xvzf splunk_package_name.tgz -C /opt
```

Note: When you install with a tarball:

- Some non-GNU versions of `tar` might not have the `-C` argument available. In this case, if you want to install in `/opt/splunk`, either `cd` to `/opt` or place the tarball in `/opt` before running the `tar` command. This method will work

for any accessible directory on your machine's filesystem.
- Splunk does not create the `splunk` user automatically. If you want Hunk to run as a specific user, you must create the user manually before installing.
- Ensure that the disk partition has enough space to hold the uncompressed volume of the data you plan to keep indexed.

Start Splunk

Startup options

The first time you start Splunk after a new installation, you must accept the license agreement. To start Hunk and accept the license in one step:

```
$SPLUNK_HOME/bin/splunk start --accept-license
```

Note: There are two dashes before the `accept-license` option.

Launch Splunk Web and log in

After you start Splunk and accept the license agreement,

1. In a browser window, access Hunk Web at `http://<hostname>:port`.

- `hostname` is the host machine.
- `port` is the port you specified during the installation (the default port is 8000).

2. Splunk Web prompts you for login information (default, username `admin` and password `changeme`) before it launches.

License Hunk

In order to set up and search virtual indexes, you install Splunk and then install a Hunk license. You can install Hunk and Splunk licenses and run reports that include data from local and virtual indexes.

For more information about the different types of licenses you can install, see "How Splunk licensing works" in the Splunk Enterprise Administration Guide.

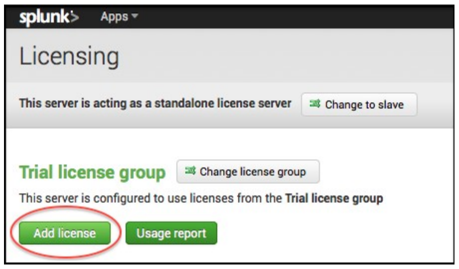
Before you execute this task, you must have procured a Hunk license and placed it somewhere that Splunk is able to access is (for example, your desktop or the server on which you have installed Splunk). If you do not have a Hunk License and are unsure how to get one, contact your Sales Account representative.

Add a Hunk license

To add a new license:

1. Select **Settings > Licensing**.

2. Click **Add license**.



Licensing

This server is acting as a standalone license server

Trial license group

This server is configured to use licenses from the **Trial license group**

3. Either click **Choose file** and browse for your Hunk license file and select it, or click **copy & paste the license XML directly...** and paste the text of your license file into the provided field.

4. Click **Install**. If this is the first license that you are installing, you must restart Splunk for the license to take effect and Hunk functionality to become available.

Use Hunk and Splunk together

If you want to search local indexes (data sent from forwarders to Splunk indexers) and Hadoop directories at the same time, you can install licenses for both Hunk and Splunk.

For more information about licensing, see "Download and Install Hunk."

When you set up Splunk with the specific purpose of configuring Hunk (whether you also plan to use Splunk Enterprise functionality as well), you configure your MapReduce user as the user who runs Splunk during the initial configuration.

However, if you are installing a Hunk license on a pre-existing and already configured Splunk installation, you will likely need to reconfigure the original

Splunk user to have proper permissions against Hadoop.

For example, if you have installed Splunk as root (which is **not** the recommended path) and then you install Hunk, MapReduce jobs will be spawned as the root user, which will most likely not be allowed by your Hadoop administrator. You can resolve this by giving your MapReduce user permissions to Splunk and then reassigning your MapReduce user as the Splunk/Hunk user. See "Run reports as a different user" to reassign your MapReduce user.

Uninstall Hunk

RedHat Linux

To uninstall from RedHat Linux

```
rpm -e splunk_product_name
```

Debian Linux

To uninstall from Debian Linux:

```
dpkg -r splunk
```

To purge (delete everything, including configuration files):

```
dpkg -P splunk
```

Once you have uninstalled Hunk, we recommend that you also clean up your HDFS temporary storage and remove the Splunk package installed on your Hadoop node.

Manage Hunk using the configuration files

Set up your Splunk search head instance

After you have installed Splunk, you'll need to configure a search head to support the providers and virtual indexes you will add later.

See "Set up a provider and virtual index" for more information about configuring providers and virtual indexes.

1. Keep a copy of the .tgz version of Splunk on your search head (you need this package even after installing it on the search head).

During the first virtual index search, Splunk copies this package to HDFS then extracts it into all TaskTracker nodes that participate in the search. The extracted package is used to process search results in Hadoop.

If you installed Splunk using a download other than the .tgz, you can download a copy of the `Splunk_package.tgz` file to install on your search head.

2. If you have not done so already, install Java on the Splunk search head. You'll need this to access the Hadoop cluster.

3. Install the Hadoop client libraries on your search head. Keep in mind that the client libraries must be the same version as your Hadoop cluster. For instructions on how to download and install Hadoop Client libraries, as well the JDK, see Install Hadoop CLI in the Hadoop Connect manual.

Set up a provider and virtual index in the configuration file

Configure providers and virtual indexes for Hadoop data

Once you have successfully installed and licensed Hunk, you can modify `indexes.conf` to create a provider and virtual index or use Hunk Web to add virtual indexes and providers.

- To add a virtual index in the Hunk user interface, see Add a virtual index in this manual.
- To add a new provider, see Add an HDFS provider in this manual.

Edit Indexes.conf

Gather up the following information before you edit Indexes.conf

You'll need to know the following information about your search head, file system, and Hadoop configuration:

- The host name and port for the NameNode of the Hadoop cluster.
- The host name and port for the JobTracker of the Hadoop cluster.
- Installation directories of Hadoop client libraries and Java.
- Path to a writable directory on the DataNode/TaskTracker *nix filesystem, the one for which the Hadoop user account has read and write permission.
- Path to a writable directory in HDFS that can be used **exclusively** by this Hunk search head.

Create indexes.conf

Edit `indexes.conf` to establish a virtual index. This is where you tell Splunk about your Hadoop cluster and about the data you want to access via virtual indexes.

Create a copy of `indexes.conf` and place it into your local directory. In this example we are using:

$SPLUNK_HOME/etc/system/local
Note: The following changes to indexes.conf become effective at search time, no restart is necessary.

Create a provider

1. For each different Hadoop cluster you need to create a separate `provider` stanza. In this stanza, you provide the path to your Java installation and the path to your Hadoop library, as well as other MapReduce configurations that you want to use when running searches against this cluster.

The attributes in the `provider` stanza is merged with the `family` stanza, which it inherits from. The "vix." prefix is stripped from each attribute and the values are passed to the MapReduce job configuration.

You must configure the provider first. You may configure multiple indexes for a provider.

```
[provider:MyHadoopProvider]
vix.family                  = hadoop
vix.env.JAVA_HOME           = /path_to_java_home
vix.env.HADOOP_HOME         = /path_to_hadoop_client_libraries
```

2. Tell Splunk about the cluster, including the NameNode and JobTracker as well as where to find and where to install your Splunk .tgz copy.

```
vix.mapred.job.tracker = jobtracker.hadoop.splunk.com:8021
vix.fs.default.name = hdfs://hdfs.hadoop.splunk.com:8020
vix.splunk.home.hdfs = /<the path in HDFS that is dedicated to this
search head for temp storage>
vix.splunk.setup.package = /<the path on the search head to the package
to install in the data nodes>
vix.splunk.home.datanode = /<the path on the TaskTracker's Linux
filesystem on which the above Splunk package should be installed>
```

Create a virtual index

1. Define one or more virtual indexes for each provider. This is where you can specify how the data is organized into directories, which files are part of the index and some hints about the time range of the content of the files.

```
[hadoop]
vix.provider          = MyHadoopProvider
vix.input.1.path      =
/home/myindex/data/${date_date}/${date_hour}/${server}/...
vix.input.1.accept    = \.gz$
vix.input.1.et.regex  = /home/myindex/data/(\d+)/(\d+)/
vix.input.1.et.format = yyyyMMddHH
vix.input.1.et.offset = 0
vix.input.1.lt.regex  = /home/myindex/data/(\d+)/(\d+)/
vix.input.1.lt.format = yyyyMMddHH
vix.input.1.lt.offset = 3600
```

- For `vix.input.1.path`: Provide a fully qualified path to the data that belongs in this index and any fields you want to extract from the path.

For example:

```
/some/path/${date_date}/${date_hour}/${host}/${sourcetype}/${app}/...
```

Items enclosed in ${}'s are extracted as fields and added to each search result from that path. The search will ignore the directories which do not match the search string, thus significantly aiding performance.

- For `vix.input.1.accept` provide a regular expression whitelist of files to match.

- For `vix.input.1.ignore` provide a regular expression blacklist of files to ignore. Note, ignore takes precedence over accept.

2. Use the regex, format, and offset values to extract a time range for the data contained in a particular path. The time range is made up of two parts: earliest time `vix.input.1.et` and latest time `vix.input.1.lt`. The following configurations can be used:

- For `vix.input.1.et/lt.regex`, provide a regular expression that matches a portion of the directory which provides date and time, to allow for interpreting time from the path.
  Use capturing groups to extract the parts that make up the timestamp. The values of the capturing groups are concatenated together and are interpreted according to the specified format. Extracting a time range from the path will significantly speed searching for particular time windows by ignoring directories which fall outside of the search's time range.

- For `vix.input.1.et/lt.format`, provide a date/time format string for how to interpret the data extracted from the above regex. The format string specs can be found in the SimpleDateFormat.

</br>The following two non-standard formats are also supported: `epoch` to interpret the data as an epoch time and `mtime,/code> to use the modification time of the file rather than the data extracted by the regex.`

- For <code>vix.input.1.et/lt.offset, you can optionally use it to provide an offset to account for timezone and/or safety boundaries.

Set provider configuration variables

Hunk also provides preset configuration variables for each provider you create. You can leave the preset variables in place or edit them as needed. If you want t edit them, see Provider Configuration Variables in the reference section of this manaual.

Note: If you are configuring Hunk to work with YARN, you must add new settings. See "Required configuration variables for YARN" in this manual.

Edit props.conf (optional) to define data processing

Optionally, you can edit props.conf to define how to process data files. Index and search time attributes are accepted for either type. The example below shows how twitter data (json object representing tweets) is processed using index and search time props. It shows a single line json data, with _time being a calculated field (note we've disabled index-time timestamping)

```
[source::/home/somepath/twitter/...]
priority         = 100
sourcetype       = twitter-hadoop
SHOULD_LINEMERGE = false
DATETIME_CONFIG  = NONE

[twitter-hadoop]
KV_MODE          = json
EVAL-_time       = strptime(postedTime, "%Y-%m-%dT%H:%M:%S.%lZ")
```

Add a sourcetype

If you want to search your virtual indexes by sourcetype, you must first configure them for your data via `props.conf`.

Any common data input format can be a source type, though most source types are log formats. If your data is unusual, you might need to create a source type with customized event processing settings. And if your data source contains heterogeneous data, you might need to assign the source type on a per-event (rather than a per-source) basis.

See "Why sourcetypes matter" in the Splunk Enterprise documentation to learn more about why you might want to use sourcetyping in your HDFS data.

To add a sourcetype to an HDFS data source, you can simply add a stanza to `$SPLUNK_HOME/etc/system/local/props.conf`. When defining sourcetypes for HDFS data, keep in mind that searches of HDFS data occur at search-time, not index time and that Hunk only reads the latest timestamps and not original HDFS timestamps. As a result, timestamp recognition may not always works as expected.

In the example below, we add two sourcetypes. A new sourcetype `access_combined` represents data from the access_combined log files. `mysqld` will let you search data from the specified <mysqld.log</code> file(s):

```
[source::.../access_combined.log]
sourcetype=access_combined
priority=100

[source::.../mysqld.log]
sourcetype=mysqld
priority=100
```

(You do not need to restart Hunk)

Once you do this, you can search your HDFS by sourcetypes. For more information about searching, including searching by sourcetypes, see "Use fields to search" in the Splunk Enterprise Search Tutorial.

Note the following when adding a sourcetype:

- INDEXED_TIME extractions do not work with Hunk
- While search time extractions should work with Hunk, it's easier to use the `SimpleCSVRecordReader` to do what you're looking for (if the file has a header) by adding it to the default list:

```
#append the SimpleCSVRecordReader to the default list:
vix.splunk.search.recordreader =
...,com.splunk.mr.input.SimpleCSVRecordReader
vix.splunk.search.recordreader.csv.regex = <a regex to match csv files>
vix.splunk.search.recordreader.csv.dialect = tsv
```

Configure Hunk to run reports as a different user

By default, Hunk runs and spawns MapReduce jobs as the OS user used to install and run the search head server. If you install a Hunk license on an existing Splunk installation that has already been configured, or if your MapReduce user changes, you may need to reconfigure your Hunk user in order to run MapReduce jobs.

To run MapReduce jobs as a different user, you spawn the Splunk MapReduce process in the search head as that user. To do this you:

- Give your MapReduce user permissions to Splunk.
- Assign your MapReduce user as the Hunk user.

We do the rest by providing a script that changes the user before running the ERP process

Reconfigure your user for Hunk:

1. Create a *nix user on the machine your search head resides on and give it the name of the user you want to use to run MapReduce jobs. For this example, let's call this *nix user "NewUser".

2. Set the `umask` for the *nix account that was originally used to install Splunk. For this example, let's call this original user "SplunkUser".

```
umask [-S ] [SplunkUser]
```

This makes the files created by "SplunkUser" readable to the "NewUser" *nix user account you just created. If you want to learn more about the `umask` command, check out the following article: http://en.wikipedia.org/wiki/Umask.

3. Set Splunk's internal `umask` so that files Splunk creates are readable to NewUser. You do this in `launch.conf` like so.

$SPLUNK_HOME/etc/splunk-launch.conf
SPLUNKD_MINIMAL_UMASK=<octal>

Example : SPLUNKD_MINIMUM_UMASK=0002

4. Give "SplunkUser" Passwordless sudo permissions, so they can run as "NewUser" for bin bash by adding the following line via `visudo`:

```
SplunkUser  ALL=(NewUser) NOPASSWD: /bin/bash
```

5. Disable `requiretty` for "SplunkUser". Via `visudo` add the following line (otherwise the virtual index search and you will see something like this: "sudo: sorry, you must have a tty to run sudo.")

Defaults:SplunkUser !requiretty

6. Update `indexes.conf` to tell Hunk to run MapReduce jobs as "NewUser". This can be updated in the provider or the virtual index stanza.

vix.env.MAPREDUCE_USER=NewUser

7. Make sure the following are executable by both "SplunkUser" and "NewUser":

- The `hadoop` script in your `$HADOOP_HOME/bin` directory exists.
- The `Hadoop CLI` script in your `$HADOOP_HOME` directory is executable.
- The `SplunkMR` jars in `$SPLUNK_HOME/bin/jars` exist.

- Any Splunk jars in the "NewUser" home directory must also be executable by "SplunkUser".

- Any Splunk jars in the "HunkUser" home directory, must be executable by "NewUser".

8. Restart Hunk to propagate your changes.

Work in the Hunk user interface

About the Hunk user interface

The Hunk user interface consist of several pages that become available when you license Hunk on a Splunk 6.0 installation.

These pages let you:

- Add and edit HDFS providers
- Add and edit virtual indexes
- Run search-generated reports on your configured HDFS directories

To learn more about Hunk works, also check out the Hunk concepts chapter in this manual.

To test drive Hunk on a virtual machine with some sample data (that we provide) see the Tutorial in this manual.

Add or edit an HDFS provider

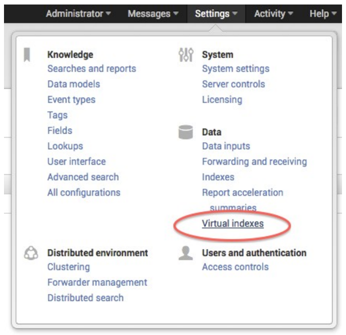
Before you add a new virtual index, you need to set up the provider for that index. You can set up multiple providers with multiple indexes for one provider. When you add a virtual index, you need to have the following information at hand:

- The host name and port for the NameNode of the Hadoop cluster.
- The host name and port for the JobTracker of the Hadoop cluster.
- Installation directories of Hadoop command line libraries and Java installation.
- Path to a writable directory on the DataNode/TaskTracker *nix filesystem, the one for which the Hadoop user account has read and write permission.
- Path to a writable directory in HDFS that can be used exclusively by Splunk on this search head.

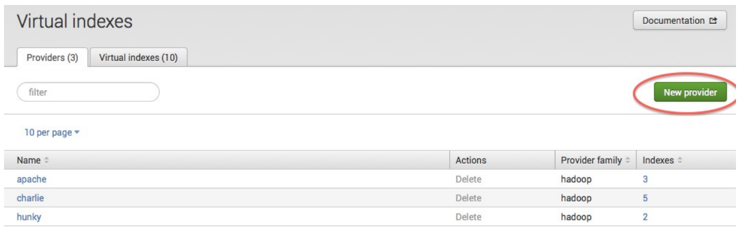
You can also add HDFS proviers and virtual indexes by editing indexes.conf. See "Set up a virtual index" in this manual for instructions on setting up virtual indexes in the configuration file.

Add a provider

1. In the top menu, select **Settings > Virtual Indexes**.

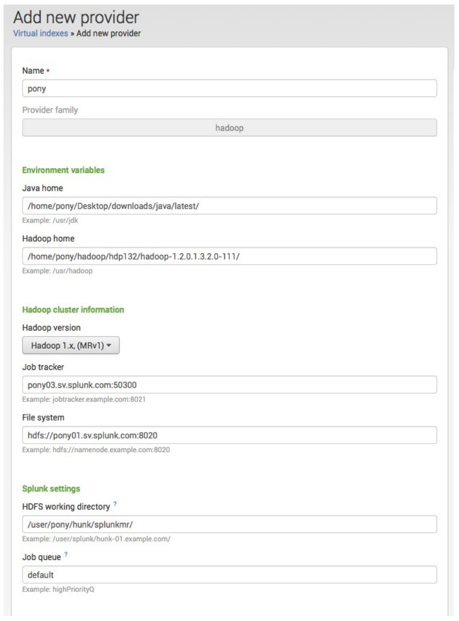


2. Select the **Providers** tab in the Virtual Indexes page and click **New Provider** or the name of the provider you want to edit.



Name	Actions	Provider family	Indexes
apache	Delete	hadoop	3
charlie	Delete	hadoop	5
hunky	Delete	hadoop	2

The Add New/Edit Provider page appears:



Name *
pony

Provider family
hadoop

Environment variables

Java home
/home/pony/Desktop/downloads/java/latest/
Example: /usr/jdk

Hadoop home
/home/pony/hadoop/hdp132/hadoop-1.2.0.1.3.2.0-111/
Example: /usr/hadoop

Hadoop cluster information

Hadoop version
Hadoop 1.x, (MRv1)

Job tracker
pony03.sv.splunk.com:50300
Example: jobtracker.example.com:8021

File system
hdfs://pony01.sv.splunk.com:8020
Example: hdfs://namenode.example.com:8020

Splunk settings

HDFS working directory ?
/user/pony/hunk/splunkmr/
Example: /user/splunk/hunk-01.example.com/

Job queue ?
default
Example: highPriorityQ

3. Give your provider a **Name**.

4. Select the **Provider Family** in the drop down list (note that this field cannot be edited).

5. Provide the following **Environment Variables**:

- **Java Home**: provide the path to your Java instance.
- **Hadoop Home**: Provide the path to your Hadoop client directory.

6. Provide the following **Hadoop Cluster Information:**

- Hadoop Version: Tell Hunk which version of Hadoop the cluster is running one of: Hadoop 1.0, Hadoop 2.0 with MRv1 or Hadoop 2.0 with Yarn
- **JobTracker:** Provide the path to the Job Tracker.
- **File System:** Provide the path to the default file system.

7. Provide the following **Splunk Settings:**

- **HDFS working directory:** This is a path in HDFS (or whatever the default file system is) that you want Hunk to use as a working directory.
- **Job queue:** This is job queue where you want the MapReduce jobs for this provider to be submitted to.

8. The **Additional Settings** fields specify your provider configuration variables. Hunk populates these preset configuration variables for each provider you create. You can leave the preset variables in place or edit them as needed. If you want to learn more about these settings, see Provider Configuration Variables in the reference section of this manual.

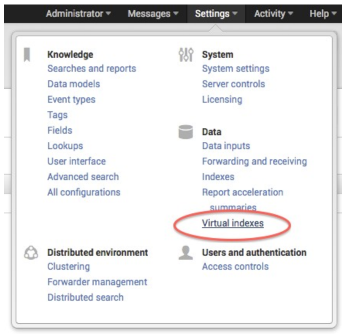
Note: If you are configuring Hunk to work with YARN, you must add new settings. See "Required configuration variables for YARN" in this manual.

9. Click **Save**.

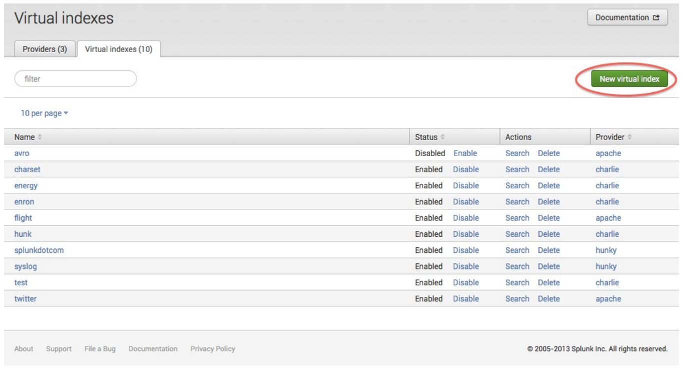
Add or edit a virtual index

You can also add HDFS providers and virtual indexes by editing indexes.conf. See "Set up a virtual index" in this manual for instructions on setting up virtual indexes in the configuration file.

1. Select **Settings > Virtual Indexes**.



2. Click the **Virtual Indexes** tab and click **New Virtual Index** or click the name of the index you want to edit.



Name	Status		Actions		Provider
avro	Disabled	Enable	Search	Delete	apache
charset	Enabled	Disable	Search	Delete	charlie
energy	Enabled	Disable	Search	Delete	charlie
enron	Enabled	Disable	Search	Delete	charlie
flight	Enabled	Disable	Search	Delete	apache
hunk	Enabled	Disable	Search	Delete	charlie
splunkdotcom	Enabled	Disable	Search	Delete	hunky
syslog	Enabled	Disable	Search	Delete	hunky
test	Enabled	Disable	Search	Delete	charlie
twitter	Enabled	Disable	Search	Delete	apache

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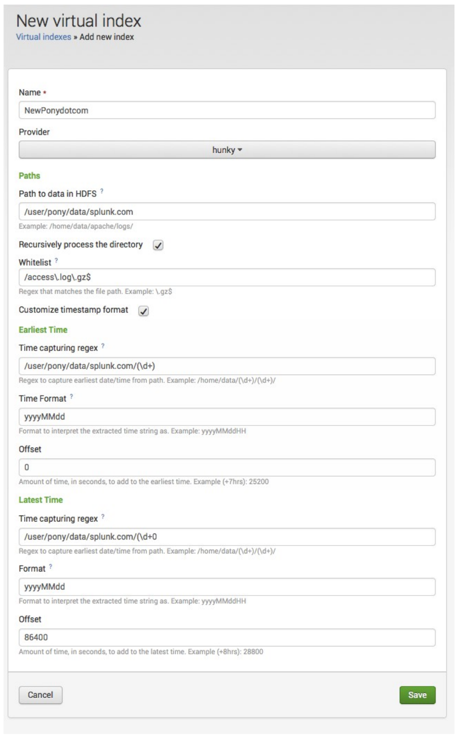
The New/Edit Virtual Index page appears:



New virtual index

Virtual indexes » Add new index

Name *: NewPonydotcom

Provider: hunky

Paths

Path to data in HDFS: /user/pony/data/splunk.com

Example: /home/data/apache/logs/

Recursively process the directory [✓]

Whitelist: /access\.log\.gz$

Regex that matches the file path. Example: \.gz$

Customize timestamp format [✓]

Earliest Time

Time capturing regex: /user/pony/data/splunk.com/(\d+)

Regex to capture earliest date/time from path. Example: /home/data/(\d+)/(\d+)/

Time Format: yyyyMMdd

Format to interpret the extracted time string as. Example: yyyyMMddHH

Offset: 0

Amount of time, in seconds, to add to the earliest time. Example (+7hrs): 25200

Latest Time

Time capturing regex: /user/pony/data/splunk.com/(\d+0

Regex to capture earliest date/time from path. Example: /home/data/(\d+)/(\d+)/

Format: yyyyMMdd

Format to interpret the extracted time string as. Example: yyyyMMddHH

Offset: 86400

Amount of time, in seconds, to add to the latest time. Example (+8hrs): 28800

3. In the **Name** field, provide a name for your virtual index.

4. Select a **Provider**. To add a new provider, see Add an HDFS provider.

5. Provide the following path information:

- **Path to data in HDFS:** This is the path to the data that Hunk will be accessing and reporting on. For example:

```
/home/data/apache/logs/
```

- **Recursively process the directory:** Check this if you want Hunk to (recursively) include the content of sub directories.

- **Whitelist:** Provide a regex that matches the file path. You can specify regular expressions to filter in/out files (based on the full path) that should/not be considered part of the virtual index. A common use case for using it is to ignore temporary files, or files that are currently being written to. Keep in mind that ignore takes precedence over accept. For example: `\.gz$`

6. Check**Customize timestamp format** to open the controls that allow you to customize how data is collected based on timestamp information. Use simple

date format to optionally customize the following:

- **Earliest Time:** Provide a regex that determines the earliest date/time that will be collected and processed based on timestamp. For example: `/home/data/(\d+)/(\d+)/`

- **Time Format:** For the earliest time above, provide a time format that describes how to interpret the extracted time string. For example:

```
yyyyMMddHH
```

- **Offset:** Amount of time, in seconds, to add to the earliest time. Example (+7hrs): 25200

- **Latest Time:**Provide a regex that determines the latest date/time that will be collected and processed based on the timestamp. For example:

```
/home/data/(\d+)/(\d+)/
```

- **Format**: For the latest time, specify the format that describes how to interpret the extracted time string. For example:

```
yyyyMMddHH
```

- **Offset:**Amount of time, in seconds, to add to the latest time. For example, +8hrs = 28800

Use search commands on a virtual index

Once you properly install and configure your virtual indexes, you can create reports and visualize data as you would against data in a traditional Splunk index. If you are using Hunk on top of Splunk, you can also choose to gather data from the virtual index alone; or you can query both local and virtual indexes for a single report.

For the most part, you can create reports for virtual indexes much as you would for local indexes. For more information about creating reports, see the Splunk Enterprise Search Manual.

Due to the size and the nature of Hadoop datastores, there are certain Splunk Enterprise index behaviors that cannot be duplicated:

- Hunk currently doesn't support real-time searching of Hadoop data, although preview functionality is available.
- Data is not always returned as quickly as data is returned for a local index.
- Data model acceleration is not available for virtual indexes.

Since events are not sorted, any search command which depends on implicit time order will not work exactly the way you'd expect. (For example: head, delta, or transaction.) This means that a few search commands operate differently when used on virtual indexes, mostly because of the way Hadoop reports timestamps.

You can still use these commands, and may particularly want to when creating a single report for local and virtual indexes, but you should be aware of how they operate and return data differently.

How Hunk reporting uses search language

For the most part, you can use Splunk Enterprise search language to create your reports. However, because Hunk does not support strict requirements on the order of events, there are a few differences.

The following commands are not supported when the search includes a virtual indexes:

- `transactions`
- `localize`

The following commands work on virtual indexes, but their results may differ from Splunk. This is because in Hunk, descending time order of events is not guaranteed:

- `streamstats`
- `head`
- `delta`
- `tail`
- `reverse`
- `eventstats`
- `dedup` (Since the command cannot distinguish order within an HDFS directory to pick the item to remove, Hunk will choose the item to remove based on modified time, or file order.)

Tutorial

Welcome to the Hunk tutorial

This tutorial shows you how to start using a simple installation of Hunk using a Hadoop Virtual Machine and some sample data.

- This tutorial shows you one relatively simple way to set up Hunk, add data (included) to HDFS, and configure a provider and index. We then show you how to check your data and run a few simple searches on the Hadoop directory. We are walking through the steps using the Cloudera Quickstart VM for VMware. If you wish to try out Hunk using YARN, we recommend you try using the Hortonworks Sandbox 2.0 here. See "System and Software requirements" for the full list of supported Hadoop distributions and versions.

- This tutorial does not teach you how to install Hunk to work with your existing HDFS infrastructure. For instructions on installing Hunk on your system see "Install and configure Hunk" in this manual.

- This tutorial does not deep dive into working with the search bar and writing search commands, which is discussed in great detail in the Splunk Enterprise documentation. If you are not already familiar with Splunk Enterprise's rich reporting functionality, we recommend you check out the Splunk Enterprise Search Manual.

- This tutorial uses a Hunk license installed on the free Splunk Enterprise download from `http://www.splunk.com`, which also includes a Splunk license. If you want to try working with sample data in local indexes and virtual indexes at the same time, also check out the Search Tutorial in the Splunk Enterprise documentation, which provides sample data and step by step instructions for setting up local indexes.

Note: Copying and pasting searches directly from the PDF document into Splunk Web is not recommended. In some cases, doing so causes errors because of hidden characters that are included in the PDF formatting.

Step 1: Set up a Hadoop Virtual Machine instance

The easiest way to get started sampling searches in Hunk is to install a Virtual Machine that comes preconfigured with Hadoop.

For this tutorial we are using using the Cloudera Quickstart VM for VMware. See System and Software requirements for the full list of supported Hadoop distributions and versions.

Setting up your Virtual Machine for this tutorial

This tutorial uses Cloudera Quickstart Virtual Machine. If you are using another VM with Hadoop instance, see that product's directions for installation and setup. If you wish to try out Hunk using YARN, we recommend you try using the Hortonworks Sandbox 2.0 here.

If you are following this example using Cloudera Quickstart for VM:

1. untar the Cloudera Quickstart VM on your computer:

tar ?xvf cloudera-quickstart-vm-4.3.0-vmware.tar.gz
2. Start and access the virtual machine.

3. Import the OVF file from VMware Fusion.

4. Start the VM and open the terminal to find the IP address of your virtual machine.

=Trying this tutorial with YARN

If you wish to try out Hunk using YARN, we recommend you try using the Hortonworks Sandbox 2.0 here.

Note: You can also use any of the virtual machines provided by Hortonworks here: http://hortonworks.com/products/hortonworks-sandbox.

You might need to assign more memory to Yarn that is defined by default. You can do this by editing the following property in `yarn-site.xml`. We recommend that YARN have at least 5120 MB assigned to it (how much you are able to assign to it depends on how much memory is assigned to your zVM):

<name>yarn.nodemanager.resource.memory-mb</name> <value>5120</value>

Step 2: Set up your data

1. Upload the `Hunkdata.json.gz` and Hunk installer to the virtual machine you configured in "Set up your virtual machine".

Once you have your virtual machine configured, you need to install the tutorial sample data: Hunkdata.json.gz.

2. SSH to your virtual machine, and move `Hunkdata.json.gz` and your Splunk downloadto the HDFS user?s home directory. (If you are using the Cloudera quickstart VM, the password for root user is ?cloudera?.)

```
scp Hunkdata.json.gz root@172.16.220.166:~
scp splunk-6.0-<version number>-Linux-x86_64.tgz root@172.16.220.166:~
ssh root@172.16.220.166
mv Hunkdata.json.gz ~hdfs (this is moves the data to the hdfs user)
```

3. Put the data into HDFS as the hdfs user

```
su - hdfs -c "hadoop fs -mkdir hdfs://localhost:8020/data"
su - hdfs -c "hadoop fs -put ~/Hunkdata.json.gz
hdfs://localhost:8020/data"
su - hdfs -c "hadoop fs -ls hdfs://localhost:8020/data"
```

Step 3: Set up an HDFS directory for Hunk access

This step shows you how to create a new HDFS directory that gives the root user access. This is needed for this specific example because we will install Splunk as root, and Splunk must have permissions for an HDFS directory.

Another option, if you are not following this example exactly, is to set up Splunk as one of the users that already has HDFS permissions.

```
su - hdfs -c "hadoop fs -mkdir hdfs://localhost:8020/user/root"
su - hdfs -c "hadoop fs -chown root:root
hdfs://localhost:8020/user/root"
hadoop fs -mkdir hdfs://localhost:8020/user/root/splunkmr
```

Run the following command to see the new directory and permissions:

```
hadoop fs -ls -R hdfs://localhost:8020/user/root
```

Step 4: Install and license Hunk

1. Copy the Splunk for Linux 64bit tgz version from `http://www.splunk.com/download/hunk` into your directory.

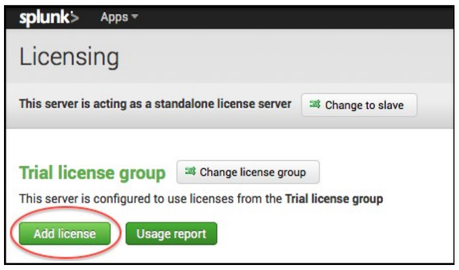
2. Untar your Splunk instance:

tar xf <package name>-Linux-x86_64.tgz
3. Start Splunk:

splunk/bin/splunk start --accept-license
4. Install your Hunk license:

- Select **Settings > Licensing**.

- Click **Add license**.



This server is acting as a standalone license server

This server is configured to use licenses from the Trial license group

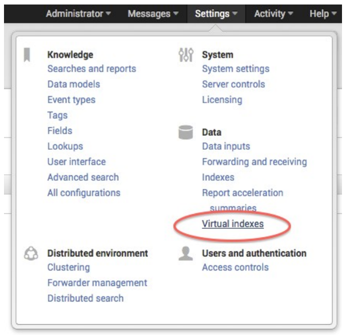
- Either click **Choose file** and browse for your Hunk license file and select it, or click **copy & paste the license XML directly...** and paste the text of your license file into the provided field.

- Click **Install**. If this is the first license that you are installing, you must restart Splunk for the license to take effect and Hunk functionality to become available.

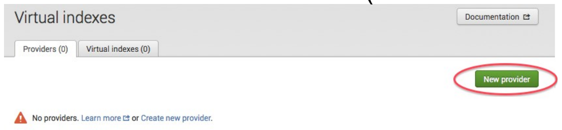
Step 5: Configure an HDFS provider

We will now give Hunk the information it needs to work with your Hadoop directory. For more detailed information about setting up a provider, see Add or edit an HDFS provider in this manual.

1. In Hunk Web, select **Manager > Virtual Indexes** in the menu bar.

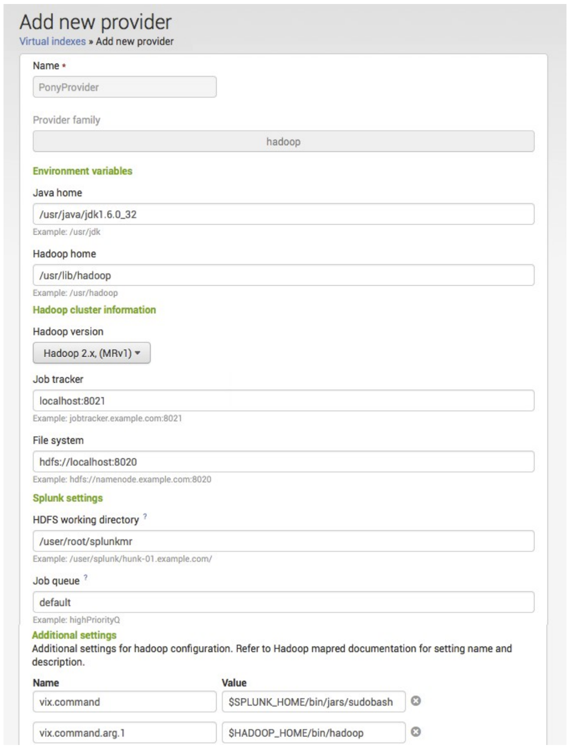


2. Click the **Provider** tab (if it is not already selected) and click **New Provider.**



No providers. Learn more or Create new provider.

The New Provider page appears:



Add new provider

Virtual indexes » Add new provider

Name *

PonyProvider

Provider family

hadoop

Environment variables

Java home

/usr/java/jdk1.6.0_32

Example: /usr/jdk

Hadoop home

/usr/lib/hadoop

Example: /usr/hadoop

Hadoop cluster information

Hadoop version

Hadoop 2.x, (MRv1)

Job tracker

localhost:8021

Example: jobtracker.example.com:8021

File system

hdfs://localhost:8020

Example: hdfs://namenode.example.com:8020

Splunk settings

HDFS working directory ?

/user/root/splunkmr

Example: /user/splunk/hunk-01.example.com/

Job queue ?

default

Example: highPriorityQ

Additional settings

Additional settings for hadoop configuration. Refer to Hadoop mapred documentation for setting name and description.

Name	Value
vix.command	$SPLUNK_HOME/bin/jars/sudobash
vix.command.arg.1	$HADOOP_HOME/bin/hadoop

3. Give your provider a **Name**. For our example, the name is "PonyProvider".

4. Select a **Provider Family**, if you are using our example, the option is "Hadoop".

5. In the **Java Home** field, provide the path to your Java instance. The path in our example is `/usr/java/jdk1.6.0_31`. (You can run `ls /usr/java` to verify your version for this example.)

6. In the **Hadoop Home** field, provide the path to your Hadoop client directory. In our example we are using `/usr/lib/hadoop`.

7. In the **Hadoop Version** field, tell Hunk which version of Hadoop you are using. Our example uses `Hadoop 2.x, (MRv1)`. Hunk currently supports MRv1 and MRv2. If you are using YARN, make sure you select it as your type.

8. In the **JobTracker** field, provide that host and port to where the JobTracker resides. In our example, this is `localhost:8021`. If you are using YARN, leave this field blank.

9. In the **File System** field, provide the URI to the default file system. In our example, this URI is: `hdfs://localhost:8020`.

10. For **HDFS working directory** provide the path in HDFS that you want Hunk to use as a working directory. For our example, this is `/user/root/splunkmr`.

11. If you are using YARN (Hortonworks for Sandbox 2.0), you will need to add a few new settings in the **Additional Settings** section. These are:

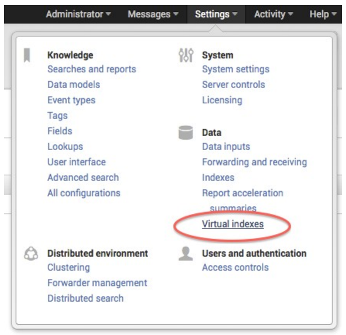
- vix.yarn.resourcemanager.address= <namenode>:8050
- vix.yarn.resourcemanager.scheduler.address= <namenode>:8030

12. Click **Save**.

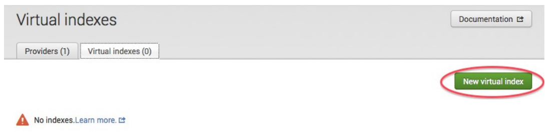
Step 6: Set up a Virtual Index

This step walks you through setting up a simple virtual index. If you would like more in-depth information about virtual index configuration, see "Add or edit a virtual index" in this manual.

1. Select **Manager > Virtual Indexes** in the menu bar.

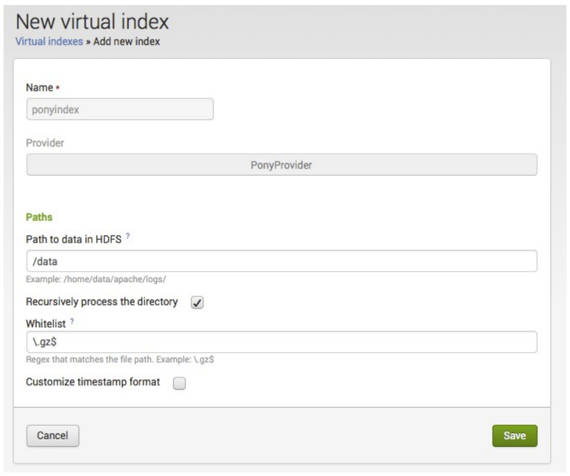


2. Click the **Virtual Index** tab (if it is not already selected) and click **New Virtual Index.**



No indexes. Learn more.

The New Virtual Index page appears:



Name * ponyindex

Provider PonyProvider

Paths

Path to data in HDFS ? /data

Example: /home/data/apache/logs/

Recursively process the directory ✓

Whitelist ? \.gz$

Regex that matches the file path. Example: \.gz$

Customize timestamp format ☐

3. Give your virtual index a **Name** in this example, we are using "ponyindex."

4. Provide the path to the data that Hunk will be accessing and reporting on. In our example, this is `/data`.

5. Optionally provide a **Whitelist**. In this example we are using `\.gz$`.

6. If you want to recursively process the directory, check the box. This is recommended.

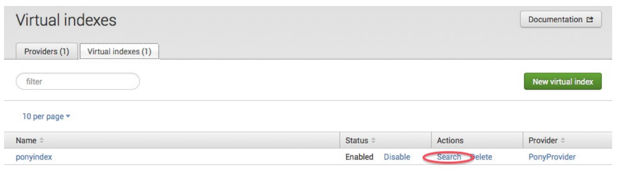
7. Click **Save** to save your index and return to the Virtual Indexes page.

Note that we won't be using the optional partitioning fields for this example, but if you would like to learn more about them, see Add a virtual index.

Step 7: Try a simple data search

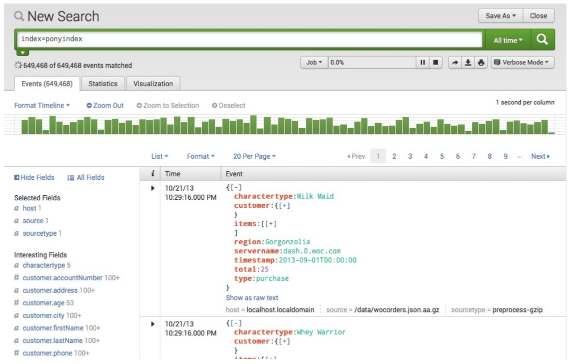
Let's try a simple search of our test data.

1. Click on the Search link for your new Virtual Index.



Name	Status		Actions		Provider
ponyindex	Enabled	Disable	Search	Delete	PonyProvider

2. Take a look at the data in "ponyindex."



```
index=ponyindex
```

649,468 of 649,468 events matched

Selected Fields
a host 1
a source 1
a sourcetype 1

Interesting Fields
a charactertype 5
# customer.accountNumber 100+
a customer.address 100+
# customer.age 53
a customer.city 100+
a customer.firstName 100+
a customer.lastName 100+
# customer.phone 100+

```
i  Time                   Event
>  10/21/13               {[-]
   10:29:16.000 PM          charactertype:Milk Maid
                            customer:{[+]
                            }
                            items:[[+]
                            ]
                            region:Gorgonzolia
                            servername:dash.0.woc.com
                            timestamp:2013-09-01T00:00:00
                            total:25
                            type:purchase
                          }
                          Show as raw text
                          host = localhost.localdomain   source = /data/wocorders.json.aa.gz   sourcetype = preprocess-gzip
>  10/21/13               {[-]
   10:29:16.000 PM          charactertype:Whey Warrior
                            customer:{[+]
                            }
```

3. Try the following simple search:

```
- index=ponyindex | rex field=source
"/data/(?<my_host>[^/]+)/(?<file_name>[^/]+)$" | stats count
values(sourcetype) as sourcetype values(tasktracker) as tasktracker by
my_host file_name
```

4. For time range, select "All time". If you do want to use time ranges in your eventual deployment, note that time-dependent search commands work differently (and occasionally not at all) on HDFS directories. For more information, see Search a virtual index.

5. Run your report. In the next step we will save this report and share it with other users.

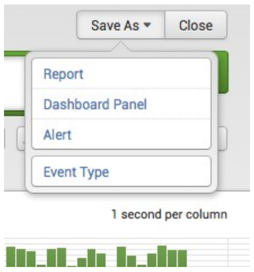
Step 8: Save a report

Let's use our simple search from Step 7 to create a saved report.

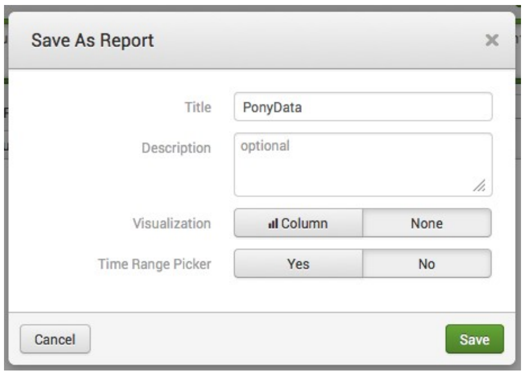
If you closed your search from the previous step, simply run it again:

```
- index=ponyindex | rex field=source
"/data/(?<my_host>[^/]+)/(?<file_name>[^/]+)$" | stats count
values(sourcetype) as sourcetype values(tasktracker) as tasktracker by
my_host file_name
```

1. Above the search bar, click **Save as** and select **Report**.



2. Enter a Title and Description (optional).


Save As Report

Title: PonyData
Description: optional
Visualization: Column | None
Time Range Picker: Yes | No

3. For Visualization, click **None**.

4. For the Time Range Picker, click **None.**

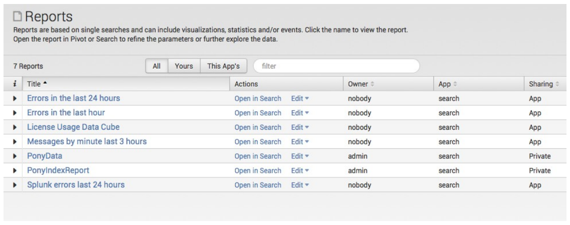
4. Click **Save**.

The **Your report has been created** window opens.

There are other options in this window. **Continue Editing** lets you refine the search and report format. You can also **Add to dashboard**, which we will address in the next step. You can also click **View** to view the report.

Find and share saved reports

You can access your saved reports by clicking on **Reports** in the app navigation bar.



Reports

Reports are based on single searches and can include visualizations, statistics and/or events. Click the name to view the report.
Open the report in Pivot or Search to refine the parameters or further explore the data.

7 Reports

i	Title	Actions		Owner	App	Sharing
	Errors in the last 24 hours	Open in Search	Edit	nobody	search	App
	Errors in the last hour	Open in Search	Edit	nobody	search	App
	License Usage Data Cube	Open in Search	Edit	nobody	search	App
	Messages by minute last 3 hours	Open in Search	Edit	nobody	search	App
	PonyData	Open in Search	Edit	admin	search	Private
	PonyIndexReport	Open in Search	Edit	admin	search	Private
	Splunk errors last 24 hours	Open in Search	Edit	nobody	search	App

When you save a new report, its Permissions are set to "Private" by default. This means that only you can view and edit the report. You can allow other apps to view, or edit, or view and edit the reports by changing its Permissions.

To share the new report with everyone,

1. Under Actions, click **Edit** and select **Edit Permissions**. This opens the **Edit Permissions** dialog.

2. Next to **Display for**, click **App** and check the box under **Read** for **Everyone**.

3. Click Save.

Back at the Reports listing page, your new report permissions are now available to the **App**.

A note about report acceleration

As of 6.0, Report Acceleration is not available for virtual indexes, though if you are running Hunk and Splunk Enterprise together, you can still use report acceleration on your Splunk Enterprise local indexes. See "Accelerate Reports" topic in the Splunk Enterprise Reporting Manual for more information.

Learn more

The tutorial you've just completed only shows you a fraction of what you can do with Hunk. With a few exceptions, you can run searches and reports on virtual indexes much as you would using Splunk Enterprise on local indexes. If you are new to Splunk and are not familiar with the Splunk Web and Splunk Enterprise features, we recommend you take a look at the Splunk Enterprise documentation set to learn more about what you can do with Hunk.

Learn more about writing reported-generating searches

See the Splunk Enterprise Search tutorial to learn more about how to use search language.

See Search reference manual for information about search commands.

Make sure you also read Search a virtual index in this manual to understand how time-related commands work specific to virtual indexes.

Learn more about reporting and knowledge objects

See the Reporting Manual in the Splunk Enterprise Documentation to learn more about saving and sharing reports.

Check out the Splunk Enterprise Dashboards and Visualizations Manual and Knowledge Manager Manual to see what else you can do with your report-generated searches.

Reference

Troubleshoot Hunk

This section describes some of the issues you may have with various components of your configuration and possible ways to resolve those issues.

For more troubleshooting questions and answers, and to post questions yourself, search for Hunk issues in Splunk Answers.

`Issue: Splunk throws a "failed search" message.`

For example:

```
[APACHE] External result provider name=APACHE asked to finalize the
search
[APACHE] MapReduce job id=job_201303081521_0020 failed, state=FAILED,
message=# of failed Map Tasks exceeded allowed limit. FailedCount: 1.
LastFailedTask: task_201303081521_0020_m_000000
```

This sort of error appears because of java child processes that are also running. Check the MapReduce logs, where you should see something like the following:

```
TaskTree [pid=7535,tipID=attempt_201303061716_0093_m_000000_0] is
running beyond memory-limits.
Current usage : 2467721216bytes. Limit : 2147483648bytes. Killing task.
```

To resolve this, edit `indexes.conf` as follows:

```
vix.mapred.child.java.opts = -server -Xmx1024m
```

`Issue: A reporting search throws an error.`

If a reporting search throws the following error:

```
INFO mapred.JobClient: Cleaning up the staging area
hdfs://qa-centos-amd64-26.sv.splunk.com:8020/user/apatil/.staging/job_201303061716_0033
ERROR security.UserGroupInformation: PriviledgedActionException
as:apatil cause:org.apache.hadoop.ipc.RemoteException:
java.io.IOException:
job_201303061716_0033(-1 memForMapTasks -1 memForReduceTasks): Invalid
job requirements.
at
org.apache.hadoop.mapred.JobTracker.checkMemoryRequirements(JobTracker.java:5019)
```

Try adding the following parameters to `indexes.conf`

```
vix.mapred.job.map.memory.mb = 2048
 vix.mapred.job.reduce.memory.mb = 256
```
Issue: Hadoop fails to start

Make sure that the user account has proper permission to the needed Hadoop directories.

Performance best practices

When your raw HDFS data is subjected to the search process, the data passes through index-time processing. (Index time extractions run at search time and cannot be turned off.)

In order to more efficiently process this data, you should optimize your index-time settings, particularly timestamping and aggregation. The following settings added to your data source in props.conf can be configured to improve performance:

- `DATETIME_CONFIG`
- `MAX_TIMESTAMP_LOOKAHEAD`
- `TIME_PREFIX`
- `TIME_FORMAT`
- `SHOULD_LINEMERGE`
- `ANNOTATE_PUNCT`

For example, for single line, non-timestamped data, the following settings can improve throughput roughly four times over:

```
[source::MyDataSource]
ANNOTATE_PUNCT   = false
SHOULD_LINEMERGE = false
DATETIME_CONFIG  = none
```
Note: If you need to use timestamping, we strongly recommend that you use `TIME_PREFIX` and `TIME_FORMAT` to improve processing.

The table below shows examples of possible timestamping and breaking options and how long (in seconds) that combination can take when processing a file with 10 million single line events:

Timestamping and breaking options:	Time:
Default configuration	190 seconds
`MAX_TIMESTAMP_LOOKAHEAD = 30`	179
	105

MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false	
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false TIME_PREFIX = ^	107
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false TIME_FORMAT = %a, %d %b %Y %H:%M:%S %Z	51
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false TIME_PREFIX = ^ TIME_FORMAT = %a, %d %b %Y %H:%M:%S %Z	53
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false TIME_FORMAT = %a, %d %b %Y %H:%M:%S %Z ANNOTATE_PUNCT = false	44
SHOULD_LINEMERGE = false	109
SHOULD_LINEMERGE = false TIME_PREFIX = ^	99
SHOULD_LINEMERGE = false TIME_FORMAT = %a, %d %b %Y %H:%M:%S %Z	54
SHOULD_LINEMERGE = false TIME_PREFIX = ^ TIME_FORMAT = %a, %d %b %Y %H:%M:%S %Z	54
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false DATETIME_CONFIG = NONE	49
SHOULD_LINEMERGE = false DATETIME_CONFIG = CURRENT	50
MAX_TIMESTAMP_LOOKAHEAD = 30 SHOULD_LINEMERGE = false DATETIME_CONFIG = NONE ANNOTATE_PUNCT = false	35

Provider Configuration Variables

When you configure an HDFS provider, Hunk automatically sets a number of configuration variables. You can use the preset variables, or you can modify them as needed by editing the provider.

- For more information about editing them in the configuration file, see "Set up a provider and virtual index in the configuration file."
- For information about editing providers in the Hunk user interface, see "Add an HDFS provider."
- For information about setting provider configuration variables for YARN, see "Required configuration variables for YARN."

Setting:	Use it to:
`vix.splunk.setup.onsearch`	Determines whether to perform setup (install & BR) on search.
`vix.splunk.setup.package`	Location for the Splunk `.tgz` package that Splunk can install and use on data nodes (in `vix.splunk.home.datanode`). A value of `current` uses current install.
`vix.splunk.home.datanode`	`SPLUNK_HOME` on the DataNode and/or TaskTracker
`vix.splunk.home.hdfs`	The location of scratch space on HDFS for this Splunk instance.
`vix.splunk.search.debug`	Determines whether search is run in debug mode.
`vix.splunk.search.recordreader`	Provides a comma separated list of data pre-processing classes This value must extend `BaseSplunkRecordReader` and return data to be consumed by Splunk as the value
`vix.splunk.search.recordreader.avro.regex`	

	Specifies a regex that files must match in order to be considered avro files, defaults to `\.avro$`.
`vix.splunk.search.mr.threads`	Determines the number of threads to use when reading map results from HDFS.
`vix.splunk.search.mr.maxsplits`	Determines the maximum number of splits in an MapReduce job.
`vix.splunk.search.mr.poll`	Determines the polling period for job status, in milliseconds.
`vix.splunk.search.mixedmode`	Determines whether mixed mode execution is enabled
`vix.splunk.search.mixedmode.maxstream`	Determines the maximum number of bytes to stream during mixed mode. The default value is 10GB. A value of `0` indicates that there is no stream limit. Bytes will cease streaming after the first split that takes the value over the limit.
`vix.splunk.jars`	Provides a comma-delimted list of dirs/jars to use in SH and MR

Required configuration variables for YARN

If you are using YARN, you must add resource manager settings to the configuration variable settings:

- vix.yarn.resourcemanager.address= <namenode>:<port>
- vix.yarn.resourcemanager.scheduler.address= <namenode>:<port>

If you installed Hortonworks for Sandbox 2.0), add the following settings/port:

- vix.yarn.resourcemanager.address= <namenode>:8050
- vix.yarn.resourcemanager.scheduler.address= <namenode>:8030

If you are using the Cloudera VM for Yarn, add the following settings/port:

- vix.yarn.resourcemanager.address = <your namenode>:8032
- vix.yarn.resourcemanager.scheduler.address = <your namenode>:8030

Release Notes

Known issues

This topic lists known issues for Hunk.

Known issues for Hunk 6.0

- Subsearches against virtual indexes may fail with a license error. (SPL-74861)
- When reporting on a search head configured to both search virtual indexes and Splunk indexers, you may experience errors when fetching events while in "Verbose Mode". (SPL-75588)