



Elasticsearch Setup Guide

Release 02

ROSS

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David Ross
CEO, Ross Video
drross@rossvideo.com

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Inception/Streamline · Elasticsearch Setup Guide

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Patent numbers 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455; 7,602,446; 7,834,886; 7,914,332; 8307284, 2039277; 1237518; 1127289 and other patents pending.

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Ross Video Limited (Ross) warrants its Inception and Streamline Server systems to be free from defects under normal use and service a time period of 15 months from the date of shipment:

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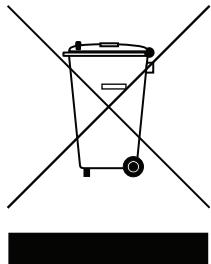
For customers that require a longer warranty period, Ross offers an extended warranty plan to extend the standard warranty period by one year increments. For more information about an extended warranty for your Inception or Streamline Server system, contact your regional sales manager.

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The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

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The crossed-out wheeled bin symbol invites you to use these systems.



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所有产品都具有“环保使用期限” (EFUP) 和有害物质表。目前，我们正在更新我们所有的产品手册。

有害物质表在我们的网站:

<http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html>

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Introduction

A Word of Thanks

Thank you for choosing Ross Video Inception as your newsroom and social media management solution, or Ross Video Streamline as your media asset management solution.

We are committed to providing you with the highest level of customer satisfaction possible. If, for any reason, you have questions or comments, please call Ross Video at +1-613-652-4886 or send us an e-mail at techsupport@rossvideo.com.

We hope that you visit our website www.rossvideo.com to stay up to date with ongoing software releases, join our customer forum and learn more about the complete range of Ross Video products.

Note that software maintenance and extended warranties are available for your system to protect and extend the life of your investment. Our sales team are more than happy to provide further information on the plans available. Members of our sales team promptly respond to e-mails sent to: solutions@rossvideo.com.

Again, thank you for your purchase of an Inception or Streamline Server system from Ross Video. We are confident of your future pleasure with your choice.

Yours Sincerely,

A handwritten signature in black ink that reads "Jenn Jarvis". The signature is fluid and cursive, with "Jenn" on the left and "Jarvis" on the right.

Jenn Jarvis
Marketing Product Manager – Editorial
jjarvis@rossvideo.com

About This Guide

This guide contains the following chapters that cover the installation and configuration of Elasticsearch software on an Inception or Streamline Server:

- Chapter 1, “**Introduction**” summarizes the guide and provides important terms, conventions, and features.
- Chapter 2, “**Elasticsearch Setup**” provides instructions for setting up Elasticsearch to work with Inception or Streamline.

If you have questions pertaining to the operation of the Ross Video product, please contact us at the numbers listed in the section “**Contacting Technical Support**” on page 1–3. Our technical staff is always available for consultation, training, or service.

Documentation Conventions

This guide uses special text formats to identify parts of the user interface, text that a user must enter, or a sequence of menus and submenus that a user must follow to reach a particular command.

Interface Elements

Bold text identifies a user interface element such as a dialog box, a menu item, or a button. For example:

In the **Media Manager Client**, click **Channel 1** the **Channels** section.

User Entered Text

Courier text identifies text that a user must enter. For example:

In the **File Name** box, enter `Channel01.property`.

Referenced Guides

Italic text identifies the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the section “**Twitter Configuration**” on page 3–6 in the *Inception User Guide*.

Menu Sequences

Menu arrows identify a sequence of menu items that a user must follow to reach a particular command. For example: if a procedure step contains “**Server > Save As**,” a user should click the **Server** menu and then click **Save As**.

Important Instructions

Star icons identify important instructions or features. For example:

- ★ After installing Inception Server software, you must obtain Inception feature licenses from Ross Video Technical Support before users can access Inception features.

Getting Help

To access the Inception or Streamline Server Online Help system, click the  **Help** icon in the main toolbar. For help about the currently open panel, click the  **Help** button in a panel title bar to view a help topic about the panel.

The Online Help system contains the following navigation tabs to locate and access Online Help topics:

- **Contents** — table of contents
- **Search** — full text search
- **Favorites** — preferred information storage and access

Ross Video product guides are also supplied as print-ready PDF files in the **Printing and Guides Download** section of the Online Help system.

The Inception and Streamline Online Help systems contain information about how to configure and use the application. There are two separate Online Help systems; one for the Configuration interface, and one for the User interface.

Contacting Technical Support

Technical Support is staffed by a team of experienced specialists ready to assist you with any question or technical issue.

Ross Video has technical support specialists strategically located around the globe to ensure a prompt response to technical inquiries. Our primary technical support center is located in Ottawa, Ontario, Canada. In addition, we have offices in The United Kingdom (London), Australia (Sydney), and Singapore with satellite locations in New York City, The Netherlands, and China. As we expand our presence globally, we are constantly evaluating other key locations to have a local technical support specialist in order to better service our customers.

North America

Our North America center located in Ottawa, Ontario, Canada and is open Monday to Friday 8:30 a.m. to 6:00 p.m. EST, with 24/7/365 on-call service after hours.

Our telephone number is: +1-613-686-1557

Toll free within North America: +1 844-652-0645

EMEA

Our EMEA center is open Monday to Friday 8:30 a.m. to 5:00 p.m. GMT. After hours support is provided by our North America location.

Our telephone number is: +44 (0)1189502446

International toll free: +800 3540 3545

If the local support specialist is not available, your call will be transferred automatically to our North America center.

Australia

Our Sydney, Australia office is located in Alexandria, NSW.

Our local support telephone number is: 1300 007 677

If the local support specialist is not available, your call will be transferred automatically to our North America center.

Online

E-mail: techsupport@rossvideo.com

Website: open a support request using the link <http://www.rossvideo.com/support/tech-support.html> to open a support request.

Elasticsearch Setup

This chapter provides instructions for setting up Elasticsearch to work with Inception or Streamline.

This chapter discusses the following topics:

- Java
- Elasticsearch
- Kibana
- Search Index Settings
- Load Balance Elasticsearch

Java

Inception and Streamline package their own version of the Java JRE as a part of its installation. Elasticsearch requires a working JRE on the system, currently Java 8. It is a good idea to install the JDK, which includes the JRE and useful trouble shooting tools.

To install the Java JDK

1. Use the following URL to open the **Utilities** folder on the Ross Video FTP Server:
`ftp://ftp.rossvideo.com/Utilities/`
2. Download the **jdk-8u161-windows-x64.exe** installer.
3. Double-click the **jdk-8u161-windows-x64.exe** installer to install the JDK.
4. Complete the following steps to set the **JAVA_HOME** environment variable:
 - a. Open the **System** control panel.
 - b. In the **System** control panel, select **Advanced System Settings** to open the **System Properties** dialog box.
 - c. In the **System Properties** dialog box, click **Environment Variables** to open the **Environment Variables** dialog box.
 - d. Use the **Environment Variables** dialog box to create a **System** variable that sets the **JAVA_HOME** environment variable to the JDK installation location (`C:\Program Files\Java\jdk1.8.0_161`).
5. Install the Java JDK on each Inception or Streamline Server computer in your system (repeat steps 1 to 4).

Elasticsearch

Inception and Streamline work with version 5.2.2 of Elasticsearch.

To install Elasticsearch

1. Extract the supplied zip file to `C:\Program Files\Elasticsearch`.
2. Open ports **TCP 9200** and **TCP 9300** between the servers to enable inter cluster communication.
Inception and Streamline use port TCP 9200 to connect to Elasticsearch.
3. Install Elasticsearch on each Inception or Streamline Server computer in your system (repeat steps 1 and 2).

Configuration

Elasticsearch configuration settings reside in a couple of configuration files.

To configure Elasticsearch

1. On each Inception or Streamline Server computer in your system, edit the **elasticsearch.yml** file as follows:
 - a. Open an **Administrator** command prompt.
 - b. Enter the follow command to change to the Elasticsearch configuration folder:
`cd C:\Program Files\Elasticsearch\config\`
 - c. Use a text editor to open and edit the **elasticsearch.yml** file.
 - d. In the **elasticsearch.yml** file, locate the following setting:

`#network.host:`

`e. Remove the leading # character from the network.host setting and change the set IP address to 0.0.0.0 so that other systems can access Elasticsearch on the Inception or Streamline Server. The updated setting looks as follows:`

`network.host: 0.0.0.0`

f. Locate the following setting:

```
#discovery.zen.ping.unicast.hosts:
```

g. Remove the leading # character from the **discovery.zen.ping.unicast.hosts** setting and add the hostnames or IP address of your Inception or Streamline Servers to the setting. The following setting is an example of a configured **discovery.zen.ping.unicast.hosts** setting:

```
discovery.zen.ping.unicast.hosts:  
["192.0.2.1", "192.0.2.2", "192.0.2.3", "192.0.2.4"]
```

h. Locate the following setting:

```
#discovery.zen.minimum_master_nodes:
```

i. Remove the leading # character from the **discovery.zen.minimum_master_nodes** setting and use the following settings for your type of system:

- **Standalone or Enterprise** — use the following formula to set the minimum master nodes:

$$(\text{<Total Number of Inception or Streamline Servers>} / 2) + 1$$

The following setting is an example of a configured **discovery.zen.minimum_master_nodes** setting for an Inception or Streamline system with four servers ($(4 / 2) + 1 = 3$):

```
discovery.zen.minimum_master_nodes: 3
```

- **Redundant** — use the following minimum master node settings for the servers in your system:

- › **Server 1** — **discovery.zen.minimum_master_nodes: 1**

- › **Server 2** — **discovery.zen.minimum_master_nodes: 2**

j. If the Elasticsearch installation partition does not have space to store Elasticsearch data, use the **path.data** setting to store data on a partition with enough space. Locate the following setting:

```
#path.data:
```

k. Remove the leading # character from the **path.data** setting and change the set folder path to a folder on a partition with enough space to store data, for example:

```
path.data: E:\Elasticsearch\data
```

The **path.data** setting is an optional setting. If you do not remove the leading # character from the **path.data** setting, Elasticsearch stores data in the Elasticsearch installation folder.

l. If the Elasticsearch installation partition does not have space to store logs, use the **path.logs** setting to store Elasticsearch logs on a partition with enough space. Locate the following setting:

```
#path.logs:
```

m. Remove the leading # character from the **path.logs** setting and change the set folder path to a folder on a partition with enough space to store Elasticsearch logs, for example:

```
path.data: E:\Elasticsearch\logs
```

The **path.logs** setting is an optional setting. If you do not remove the leading # character from the **path.logs** setting, Elasticsearch stores logs in the Elasticsearch installation folder.

n. Save the updated **elasticsearch.yml** file and exit the text editor.

2. On each Inception or Streamline Server computer in your system, edit the **jvm.options** file as follows:
 - a. Open an **Administrator** command prompt.
 - b. Enter the follow command to change to the Elasticsearch configuration folder:

```
cd C:\Program Files\Elasticsearch\config\
```
 - c. Use a text editor to open and edit the **jvm.options** file.
 - d. In the **jvm.options** file, locate the following setting:
`-Xms2g`
 - e. To set the initial heap size to 4g, replace the **-Xms2g** setting with **-Xms4g**.
 - f. locate the following setting:
`-Xmx2g`
 - g. To set the maximum heap size to 4g, replace the **-Xmx2g** setting with **-Xmx4g**.
 - h. Save the updated **jvm.options** file and exit the text editor.

Service

Elasticsearch runs as a service on each Inception or Streamline Server computer in your system.

To install and run Elasticsearch as a service

1. Open an **Administrator** command prompt.
2. Enter the follow command to change to the Elasticsearch folder:

```
cd C:\Program Files\Elasticsearch\bin\
```
3. Enter the follow command to install Elasticsearch as a service:
`elasticsearch-service.bat install`
4. Enter the follow command to start the Elasticsearch service:
`net start elasticsearch-service-x64`
5. Use a web browser to open the following URL to check that the Elasticsearch service is running:
`http://localhost:9200`

Your web browser should display a message that looks like the following message:

```
{
  "name" : "1_DJp9A",
  "cluster_name" : "elasticsearch",
  "cluster_uuid" : "QrOS1IIfSe-547g1PhohaQ",
  "version" : {
    "number" : "5.2.2",
    "build_hash" : "f9d9b74",
    "build_date" : "2017-02-24T17:26:45.835Z",
    "build_snapshot" : false,
    "lucene_version" : "6.4.1"
  },
  "tagline" : "You Know, for Search"
}
```

6. Complete the following steps to switch the Elasticsearch service to automatic startup:
 - a. From the Windows Desktop, press **Windows Key+R**.
The **Run** dialog box opens.
 - b. In the **Open** box, type the following application name:
`services.msc`
 - c. Click **OK**.
The **Services** window opens.
 - d. In the **Services** list, right-click the **Elasticsearch** service.
The **Properties** dialog box opens.
 - e. Use the list to change **Manual** to **Automatic**.
 - f. Save your change.
7. Install and run the Elasticsearch service on each Inception or Streamline Server computer in your system (repeat steps 1 and 6).

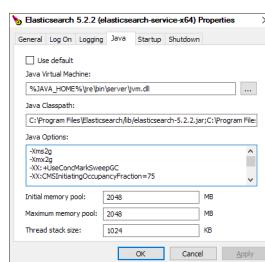
Change Java Heap Sizes

After you install and start the Elasticsearch a service on a Inception or Streamline Server computer, you must use the Elasticsearch Manager to change Java heap size settings.

To change the heap size settings

1. Open an **Administrator** command prompt.
2. Enter the follow command to change to the Elasticsearch folder:
`cd C:\Program Files\Elasticsearch\bin\`
3. Enter the follow command to install Elasticsearch as a service:
`elasticsearch-service.bat manager`
The **Elasticsearch Properties** dialog box opens.
4. Click the **Java** tab.

The **Java** tab opens



5. In the **Java Options** section, locate the following setting:
`-Xms2g`
6. Replace `-Xms2g` with `-Xms4g` to set the initial heap size to 4g.

7. locate the following setting:
-Xmx2g
8. Replace **-Xmx2g** with **-Xmx4g** to set the maximum heap size to 4g.
9. In the **Initial memory pool** box, enter 4096.
10. In the **Maximum memory pool** box, enter 4096.
11. Click **OK**.

Elasticsearch saves the Java heap size setting changes and the **Elasticsearch Properties** dialog box closes.

Kibana

Kibana is the user interface for Elastic search. Kibana is to Elasticsearch as MySQL workbench is to MySQL and Pgadmin is to PostgreSQL.

Inception and Streamline work with version 5.2.2 of Kibana.

To install Kibana

- Extract the supplied zip file to C:\Program Files\Kibana.

Configuration

Kibana configuration settings reside in a single configuration file.

To configure Kibana

1. Use a text editor to edit the following configuration file:

config\kibana.yml

2. Add the following settings to the configuration file:

```
# bind to 0.0.0.0 so that other systems (other than localhost) can access it
server.host: 0.0.0.0
```

3. Save the configuration file.

Run Kibana

Kibana does not have a batch file to easily install it as a service.

To run Kibana

1. Open an Administrator command prompt.
2. Enter the follow command to run Kibana:

bin\kibana.bat

3. Use a web browser to open the following URL to check that the Kibana is running:

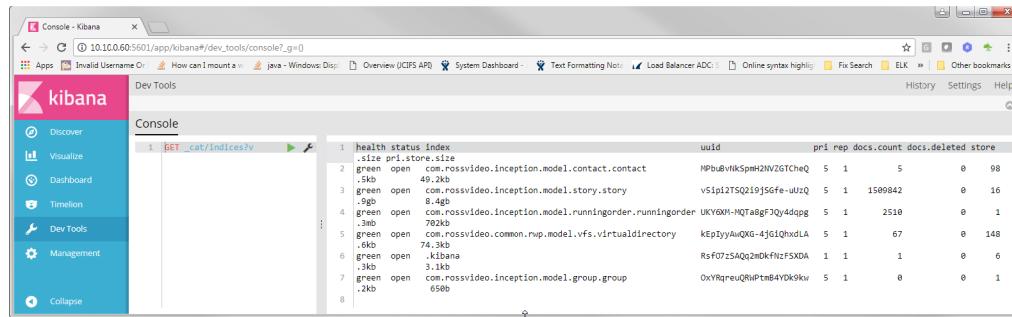
<http://localhost:5601>

Kibana Basics

The following sections contain information about getting started with Kibana when working with Inception or Streamline:

Dev Tools Tab

This tab enables you to issue restful commands to Elasticsearch. One useful one is enumerating all the indexes using GET _cat/indices?v.



index	status	size	pri	rep	docs.count	docs.deleted	store	
.size.pri.store.size	green	open	com.rossvideo.inception.model.contact.contact	5	1	5	0	98
.2kb	green	open	com.rossvideo.inception.model.story.story	5	1	1509842	0	16
.9gb	green	open	com.rossvideo.inception.model.runningorder.runningorder	8	1	2510	0	1
.7gb	green	open	com.rossvideo.common.rwp.model.vfs.virtualdirectory	5	1	67	0	148
.5kb	green	open	.kibana	1	1	1	0	6
.3kb	green	open	.3.1kb	0xYRqreuQRWptm8AYD9kr	5	1	0	1
.6kb	green	open	com.rossvideo.inception.model.group.group	6598				

Set MAX_RESULT_WINDOW for Elasticsearch

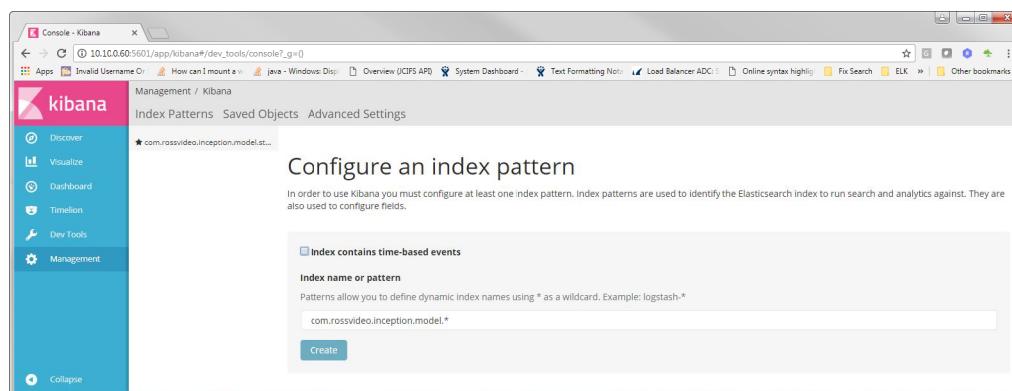
Using the dev tools tab set the max_result_window value for all indices to be a value at least as large as this setup will ever have (5000000 in this example).

```
PUT /_template/my_global_template
{
  "template": "*",
  "order": 0,
  "settings": {
    "max_result_window": 5000000
  }
}
```

Creating an Index Pattern

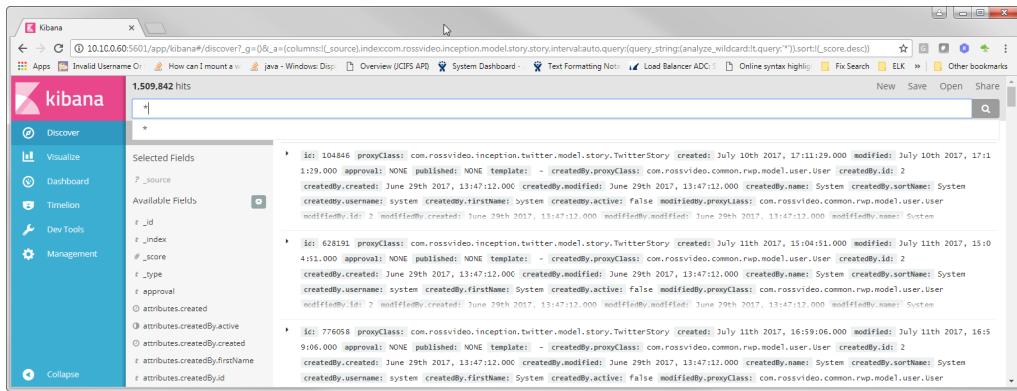
In order to browse your data in Kibana you need to tell it what indexes to look at. The first time you log in you will be prompted to configure an index pattern.

★ Clear the **Index contains time-based events** check box for most indexes within the Inception or Streamline data model.



Browsing the Data

Once you've configured index pattern(s) you can use the Discover path to browse your data.

A screenshot of the Kibana Discover interface. The left sidebar shows the 'Discover' tab is selected. The main area displays a table of search results with 1,509,842 hits. The first few results are shown as JSON documents. The first document is a 'TwitterStory' with ID 104846, created on July 10th, 2017, and modified on July 10th, 2017. The second document is another 'TwitterStory' with ID 628191, created on June 29th, 2017, and modified on July 11th, 2017. The third document is a 'TwitterStory' with ID 776058, created on June 29th, 2017, and modified on July 11th, 2017. The table includes columns for '_id', '_index', '_type', '_score', '_source', and '_type'.

Search Index Settings

Index settings within the Inception or Streamline framework are applied in a similar way to database settings. Basic settings (such as the type of index) can be found in the Search Index tab of the Inception or Streamline system configuration page. Advanced settings can be applied by editing the following files:

C:\Program Files\Ross Video\Inception\workspace\.metadata\.plugins\com.rossvideo.common.rwp\searchindex.ini

C:\Program Files\Ross Video\Streamline\workspace\.metadata\.plugins\com.rossvideo.common.rwp\searchindex.ini

★ Like the database.ini file, this file is only present after modifying a setting from the default value.

If the indexes are not yet present, Inception or Streamline creates them on startup (after the database initialization process). Inception or Streamline keeps track of the state of each index using the SEARCH_INDEX table. To have Inception or Streamline recreate the index, truncate (delete all records) from the SEARCH_INDEX table and restart Inception or Streamline.

Table 2.1 Search Index Properties

Property	Default	Description
searchindex.elasticsearch.discovery.enable	false	Whether to enable automatic discovery of servers in the Elasticsearch cluster.
searchindex.elasticsearch.dynamic.mapping	true	Global setting for dynamic mapping – had to be set to true for adding custom attributes on the fly. See Hibernate Search Documentation.
searchindex.elasticsearch.host	http://localhost:9200	The URL to hit for Elasticsearch. You can specify a space separated list for load balancing. See Hibernate Search Documentation.
searchindex.elasticsearch.index.schema.management.strategy	create	See Hibernate Search Documentation.
searchindex.elasticsearch.max_total_connection	25	Maximum number of simultaneous connections to the Elasticsearch cluster.
searchindex.elasticsearch.max_total_connection_per_route	2	Maximum number of simultaneous connections to a single Elasticsearch server.
searchindex.elasticsearch.password	changeme	Password for Elasticsearch.
searchindex.elasticsearch.refresh.after.write	false	See Hibernate Search.

Table 2.1 Search Index Properties

Property	Default	Description
searchindex.elasticsearch.required.index.status	yellow	The required status for a given index – if it doesn't meet this status hibernate search fails to start up. See Hibernate Search Documentation.
searchindex.elasticsearch.username	elastic	Username for Elasticsearch.
searchindex.massindex.batch.size	25	Batch size to use when pulling records out of the database for mass indexing.
searchindex.massindex.threads	2	Number of threads to use while mass indexing. 2 is a conservative value but beware when increasing this number – if Elasticsearch can't keep up, you can run out of heap space.
searchindex.search.index.base	Search index file system Windows: C:\ProgramData\Ross Video\Inception\Search Index Windows: C:\ProgramData\Ross Video\Streamline\Search Index	The location on the file system where the search index resides (if you are using file system index type).
searchindex.search.index.type	filesystem	The type of index to use. Possible values: - none - elasticsearch - filesystem - infinispan (experimental) - jgroupsSlave (experimental) - jgroupsMaster (experimental)
searchindex.search.services.jgroups.clustername	Hibernate Search Cluster	See Hibernate Search Documentation.
searchindex.use.index.for.grids	false	Use the search index when rendering grids (defaulting to false for now due to the current design – setting this to true would sometimes require users to manually refresh after adding new content).

Streamline Search Index Property Configuration

- ★ On each Streamline Server computer in your system, you must add a Streamline specific search property setting to the **searchindex.ini** file.

To set the **searchindex.elasticsearch.refresh.after.write** search index property for Streamline

1. On each Streamline Server computer in your system, locate the **searchindex.ini** file in the following folder:

C:\Program Files\Ross Video\Streamline\workspace\.metadata\.plugins\com.rossvideo.common.rwp
2. Use a text editor to open and edit the **searchindex.ini** file.
3. In the **searchindex.ini** file, add the following search index property:

<entry key="searchindex.elasticsearch.refresh.after.write">true</entry>
4. Save the updated **searchindex.ini** file and exit the text editor.

Load Balance Elasticsearch

For performance and redundancy, you can load balance Elasticsearch across the servers in your Inception or Streamline system. Complete the following procedure on each Inception or Streamline Server in your system:

To load balance Elasticsearch

1. Log in to your Inception or Streamline Server as an administrator.

2. On the main toolbar, click the  Configuration icon.

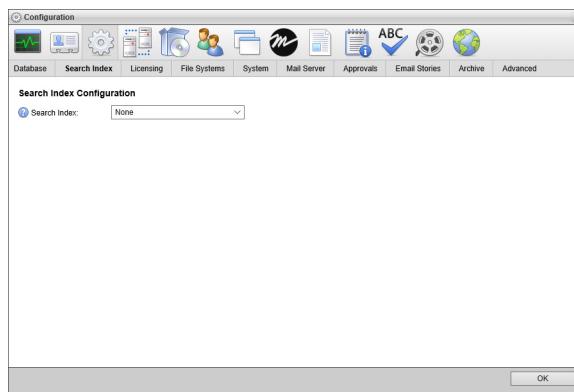
The **Configuration** window opens.

3. On the **Configuration** window toolbar, click the  System icon.

The **System** panel opens.

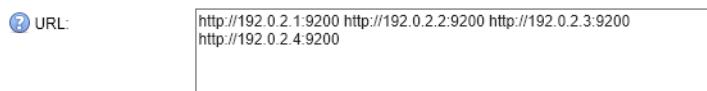
4. Click the **Search Index** tab.

The **Search Index** tab opens.



5. Use the **Driver** list to select **Elasticsearch**.

6. In the **URL** box, enter the hostnames or IP addresses set for the **discovery.zen.ping.unicast.hosts** setting in the **elasticsearch.yml** file as a URL and port number (`http://<search server>:<port number>`). Use a space to separate consecutive URLs. The following setting is an example of a configured **URL** setting:



On each Inception or Streamline Server computer in your system, rotate the order of the URLs that you set for the **URL** setting.

7. In the **Username** box, enter the username that Inception or Streamline uses to access the external search service.

8. In the **Password** box, enter the password associated with the username.

For security purposes, dots replace the entered password.

9. In the bottom toolbar, click **OK**.

The **Configuration** window closes.