

Nastel XRay Installation Guide

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Chapter 1: Introduction

Nastel XRay is designed with a flexible, modular, clustered, component architecture and may be deployed in various configurations to one or more Virtual Machine Images, based on user requirements. Nastel provides the following two standard configuration packages for Nastel XRay:

- **Standalone Appliance Configuration:** A single node standalone appliance suitable for Proofs of Concepts, and development environments.
- **Multi-Node Cluster Configuration:** A multi-node small cluster, which provides the performance, fault tolerance and scalability needed for on-premise production systems.

These packages are provided by Nastel as Linux TAR files, which can be deployed to any properly configured Linux environment.

1.1 How this Guide is Organized

- <u>Chapter 1:</u> Introduction
- <u>Chapter 2:</u> Overview
- <u>Chapter 3:</u> Prerequisites
- <u>Chapter 4:</u> Installation
- <u>Chapter 5:</u> Startup
- <u>Chapter 6:</u> System Validation
- <u>Chapter 7:</u> Component Shutdown
- Chapter 8: Troubleshooting

1.2 History of this Document

Table 1-1. Document History					
Release Date	Document Number	Version	Summary		
May 2019	XRIG15.001	15	Initial release		
June 2019	XRIG15.002	15	Miscellaneous updates in sections 3.1.2, 3.2.2 and 4.2.		
July 2019	XRIG15.003	15	Added descriptions to Table 3-1.		
September 2019	XRIG15.004	15	Created Chapter 2 and moved sections 1.2 – 1.5 to this new chapter. Updated proceeding chapter and section numbers accordingly. Minor updates to sections 4.1 and 4.2. Updates to #1 in section 4.2.3. Updates in #1b and #3 in section 4.2.4.		
February 2021	XRIG15.005	15	In section 4.1.4, add information on using the correct ZooKeeper folder. Update copyright year. Update "jKoolAdmin" to "Administrator." Update section 2.1 – added compatible web browsers. Updates in the following sections: 3.2 (#2), 4.1.2 (#5), command in 5.1.1, Table 5-2, section 4.1 (#4), Table 5-1. Rename config.sh to setup.sh.		

1.3 User Feedback

Nastel encourages all users and administrators to submit comments, suggestions, corrections, and recommendations for improvement for all documentation. Please send your comments via e-mail to: <u>support@nastel.com</u>. You will receive a response, along with status of any proposed change, update, or correction.

1.4 Release Notes

See README files located in the following location:

```
$APIN_HOME/misc/docs
```

1.5 Intended Audience

This guide is intended for systems administrators and operating engineers responsible for the installation and administration of the Nastel XRay environment.

1.6 Technical Support

Use one of the following methods for technical support:

- Call: 800-963-9822 ext. 1 If you are calling from outside the United States: 001-516-801-2100
- Email: support@nastel.com
- Resource center: <u>https://customers.nastel.com</u>
- Automated support system: <u>http://support.nastel.com/</u> (user ID and password required)

Chapter 2: Overview

2.1 Nastel XRay Component Architecture

A Nastel XRay system consists of the following components, which are installed and preconfigured for the two configurations discussed in this document.

- ZooKeeper 3.XX
- Database cluster
 - For 1.0 and earlier, SolrCloud 6.5.X
 - For 1.1, SolrCloud 6.6.X
- ActiveMQ 5.11+
- Kafka 1.0.0
- Storm 1.1.x
- AutoPilot M6 SU27+
 - o Domain Server
 - CEP Server
 - Nastel XRay Gateway expert
 - Nastel XRay Service expert
 - Nastel XRay DB Writer expert
 - Nastel XRay Cold Storage expert
 - Nastel XRay Trigger expert
 - Nastel XRay Metrics expert
 - Web Server (Tomcat 7.0.56+)
 - Nastel XRay/APInsight web UI
 - Nastel XRay web REST Admin module
- A compatible web browser: Google Chrome v27, Internet Explorer v11, Microsoft Edge v13, Mozilla Firefox v20, Safari v7, Opera v23

2.2 Standalone Appliance Configuration

The Nastel XRay Standalone Appliance consists of a single on-premise standalone node to be run on a single server. It is configured with all Nastel XRay components listed above (*Section 2.1*), which are preconfigured to work together. A default license is provided with a default Nastel XRay organization, repository, teams and configured users. The Nastel XRay Appliance is ready to run once deployed and configured.



Figure 2.2-A. Nastel XRay Single Node Appliance

2.3 Multi-Node Cluster Configuration

The Multi-Node Cluster system supports a 4 node Solr Database Cluster, to be deployed on separate virtual machines. All other Nastel XRay components and services are intended to remain on the Data Compute Node. Like the Standalone Appliance, all components are provided in Linux TAR file format, configured with all Nastel XRay components listed above (<u>Section 2.1</u>), which are pre-configured to work together after basic setup.

The Multi-Node Cluster system does not provide a preconfigured default configuration, a license file will need to be obtained from Nastel Support. Steps to configure the Solr Database cluster, the Nastel XRay organization, repositories, team and users, are provided later in this document.



Figure 2.3-A. Nastel XRay Data Compute Node

2.4 Other Configurations

Nastel XRay is fully scalable. Due to its flexible, modular, clustered, component architecture, the system may be deployed in many configurations across multiple Virtual Machines Images, based on specific user requirements. Contact your Nastel Sales Representative or Nastel Professional Services for assistance with designing a Nastel XRay cluster to support your unique requirements.

Chapter 3: Prerequisites

The following prerequisites must be in place before installation.

3.1 System Requirements

3.1.1 Standalone Appliance Requirements

- Operating System: Linux 64 bit OS, CentOS 7 or equivalent of Red Hat or Fedora
- CPU: Minimum 2 CPUs (4 virtual CPUs)
- **Memory:** Minimum 32 GB RAM (48 GB RAM recommended)
- File System: Minimum 500 GB free space, Solid-State Disc (SSD) preferred
- Recommended Install folder: /opt/nastel

3.1.2 Multi-Node Cluster Requirements

For a production system deployment, please contact your Nastel Sales representative, Nastel Support, or Nastel Professional Services to properly size the Nastel XRay nodes for your environment. The specifications provided below are minimum requirements for a cluster intended to support approximately 5 GB per day of streaming data, with a retention period of 14 days.

Nastel XRay Data Compute Node (qty 1) :

- Operating System: Linux 64 bit OS, CentOS 7 or equivalent of RedHat or Fedora
- CPU: Minimum 8 virtual CPUs
- Memory: Minimum 32 GB RAM
- File System: Minimum 100 GB free space, SSD preferred
- Recommended Install folder: /opt/nastel

Nastel XRay Data Index Nodes (qty 4) :

- Operating System: Linux 64 bit OS, CentOS 7 or equivalent of RedHat or Fedora
- **CPU:** Minimum 4 virtual CPUs
- Memory: Minimum 8 GB RAM
- File System: Minimum 500 GB free space, SSD preferred
- Recommended Install folder: /opt/nastel

3.2 Disable Swap

Swap must be turned off within the operating system on all virtual machine servers running Nastel XRay Compute Node or Nastel XRay Data Index Node. To disable swap, perform the following:

1) Identify configured swap devices and files with the following command:

cat /proc/swaps

2) Turn off all swap devices and files with the following command:

swapoff -a

3) Remove any matching references found in /etc/fstab.

3.3 Ulimits Requirements

The required minimum ulimits (ulimit –a) for virtual machine servers running Nastel XRay Compute Node or Nastel XRay Data Index Node are listed below. These must be set before starting Nastel XRay for the first time. If they are not set, root level access is required to set them.

```
core file size (blocks, -c) 0
data seg size (kbytes, -d) unlimited
scheduling priority (-e) 0
file size (blocks, -f) unlimited
pending signals (-i) 1031597
max locked memory (kbytes, -1) 64
max memory size (kbytes, -m) unlimited
open files (-n) 32768
pipe size (512 bytes, -p) 8
POSIX message queues (bytes, -q) 819200
real-time priority (-r) 0
stack size (kbytes, -s) 8192
cpu time (seconds, -t) unlimited
max user processes (-u) 1031597
virtual memory (kbytes, -v) unlimited
file locks (-x) unlimited
```

3.3.1 Ulimit Configuration Files

The system reads ulimits from the /etc/security/limits.conf configuration file by default. Individual *.conf files are then read from the /etc/security/limits.d/ directory. The files are parsed one after another in the order of "C" locale. The effect of the individual files is the same as if all files were concatenated together in the order of parsing. If a configuration file is explicitly specified with a module option, then the files in the /etc/security/limits.d/ directory will not be parsed.

Within the two locations where ulimits can be configured, update the following configuration files based on your operating system.

CentOS

```
/etc/security/limits.conf
/etc/security/limits.d/90-nproc.conf
/etc/security/limits.d/20-nproc.conf
```

RHEL 5, RHEL 6, RHEL 7

```
/etc/security/limits.conf
/etc/security/limits.d/90-nproc.conf
```

3.3.2 Soft / Hard Limits

Two types of values are used to define limits: Soft and Hard. A Soft limit can be adjusted up to the Hard limit. A Hard limit can only be lessened and is the maximum resource limit a user may have.

Using the command, ulimit -n, the user will be presented with the Soft limit. If the /etc/security/limits.conf file has a hard value set, it will not be presented by default.

To view Soft limits, use the following command:

```
# ulimit −n −S
```

To view Hard limits, use the following command:

```
# ulimit -n -H
```

3.3.3 Setting User Process Limits

The allowed number of processes must be limited for each Nastel user. By default, the rules are read from the /etc/security/limits.conf file. To limit the number of processes for each Nastel user, modify this file using the following commands. Replace <*username*> with the username that will run XRay Processes.

Limit the maximum number of open files. We recommend the following minimum limits for both nofile and nproc settings.

```
# cat /etc/security/limits.conf | grep nofile | grep -v ^#
<username> soft nofile 32768
<username> hard nofile 32768
```

Limit the maximum number of processes. We recommend the following minimum limits for both nofile and nproc settings.

```
# cat /etc/security/limits.conf | grep nproc | grep -v ^#
<username> soft nproc 1031597
<username> hard nproc 1031597
```

3.4 Linux Firewall

By default, CentOS and other Linux distributions have an active firewall that block ports which are needed to connect to Nastel XRay services remotely. The following ports should be opened, as these are the ports Nastel XRay utilizes:

- ZooKeeper: 2181
- Solr: 8983
- ActiveMQ: 8161
- Storm: 8088
- AutoPilot Domain Server: 2323, 3000
- AutoPilot XRay CEP: 3005
- AutoPilot XRay UI CEP : 3010
- Nastel XRay: 8080
- Nastel XRay Gateway: 6580

The following commands can be used to check the firewall status, temporarily stop/disable the firewall, or re-enable/re-start the default firewall on CentOS 7.

```
>systemctl stop firewalld
>systemctl disable firewalld
>systemctl enable firewalld
```

3.5 Linux ID

Create the Linux user ID (UID) and group which will be used to start all Nastel XRay services.

The default user and group are **nastel:nastel**, this can be changed to any value. The UID and group must own all files and directories under \$APIN_HOME.

3.6 Installation Path

Determine the installation path prior to deployment. The default assumed is $\verb|opt/nastel|$. However, any location can be used

Chapter 4: Installation

4.1 Nastel XRay Standalone Appliance

Below are the installation and startup steps for a Nastel XRay Standalone Appliance configuration.

4.1.1 Step 1: Confirm Minimum Server Requirements

Confirm that the server meets the minimum requirements specified within *Sections* <u>3.1</u>, <u>3.2</u> and <u>3.3</u> prior to performing the next steps.

4.1.2 Step 2: Extract the Install File

Upload and extract the install file by performing the following:

- 1. Log in as the Nastel user (or other user that will run all Nastel XRay services).
- 2. Create a Temp directory within the user's Home directory: /home/nastel/temp
- Upload Xray_x.x.xx_UIv.xx_GMvx.x.tar.Z (x.x.x represents the version number) and place it in the temp directory created. Be sure that the file is owned by the user and group nastel:nastel. Do this with the following command:

>chown nastel:nastel Xray x.x.xx UIv.xx GMvx.x.tar.Z

- 4. Create the Nastel directory within the /opt directory. Be sure that the Nastel user has write permissions for this directory.
- 5. Extract Xray_x.x.xx_Ulv.xx_GMvx.x.tar.Z into the /opt directory by using the following commands:

```
>cd /opt
>tar -xzvf /home/nastel/temp/Xray_x.x.xx_UIv.xx_GMvx.x.tar.Z
```

6. Change to the folder: InstallationPath/sbin/.

IMPORTANT: As of version 1.3, XRay requires an SQL database server (either PostgreSQL or MySQL) to run the job scheduler service.

This XRay Deployment Pack includes the PostgreSQL database server. In the file "installed_services.conf", the service PostgreSQL is enabled by default:

pgsql=yes

This is required for the Xray services to start automatically.

4.1.3 Step 3: Set Environment Variables

Open the **apin_env.sh** file and modify the following environment variables based on your configuration:

- APIN_HOME: Set this to the XRay installation path, for example: APIN_HOME=/opt/Nastel
- ZK_HOST: Set this to the ZooKeeper server location. Include the port number, for example: ZK_HOST=localhost:2181

4.1.4 Step 4: First-time Solr Initialization Setup



For database cluster versions 1.0 and earlier, SolrCloud 6.5.X is required. For database cluster version 1.1, SolrCloud 6.6.X is required. Solr 6.X requires Java V8. Other XRay components can run with higher Java versions.

Ensure ZooKeeper and Solr are up and running before running the Solr configuration script. The XRay Solr configuration script is **setup.sh** and is located in <code>\$APIN_HOME/sbin</code>. Run **setup.sh**. as follows and follow the onscreen instructions:

run ./setup.sh all

Confirm Correct ZooKeeper Folder is Being Used: Nastel XRay Solr scripts and the Solr ZooKeeper configuration must use the same ZooKeeper folder (zkchroot, to use ZooKeeper terminology). If not, when the Solr collection configurations are loaded, Solr will not pick up the changes.

To verify the correct folder is being used, compare the values being used by the Nastel XRay Solr script with the value in the Solr configuration. The script will output a line similar to the following:

Using Zookeeper at: localhost:2181

The value being used by Solr is defined in <solr-home>/bin/solr.in.sh, as follows:

ZK HOST="localhost:2181"

These two values need to match. If there is a ZooKeeper zkchroot specification (starting with '/' after port number), e.g. ZK_HOST="localhost:2181/solr", then you will have to change one of them so that they either both do not have any zkchroot specification, or they both have the same one. To change it in Solr configuration, simply add or remove the "/solr" from ZK_HOST. By default, Nastel XRay Solr scripts do not use this, add the following to a command line to have them use it:

```
-zr /solr
```

4.1.5 Step 5: Start Nastel XRay

Run all Nastel startup scripts located in <code>\$APIN_HOME/sbin</code> to start Nastel XRay. For usage and to start Nastel XRay please run: ./start.sh all

4.1.6 Optional: User Environment Setup

Optional environment variable configuration: Please note that to run the standalone appliance as delivered in the package, it is not necessary to set the environment variables at the user or system level, however in some cases, such as deployment of a single server development environment, it may be desirable to set them.

For the Nastel user or other user that will run the Nastel services, add the following lines to their .bash_profile:

export APIN_HOME=<path_to_XRay_filesystem>
export APIN LOGS=\$APIN HOME/AutoPilotM6/logs

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Only the environment variable \$APIN_HOME requires the full path to the installation directory. All other environment variables will be built from this variable.

Optionally, the user's **.bash_profile** can be set up to run the **apin_env.sh** script edited for the target environment as per <u>Section 4.1.2</u>.



If needed, the Standalone Appliance database can be built from scratch. See <u>Section 4.2.5, Initialize</u> <u>the Database</u>, for more information

4.1.7 License File

The Nastel XRay Standalone Appliance comes with a default license file, however, it may be necessary to update this with a license file more suitable to a given customer use case. See the below table for the quota specifications of the default license.

	Table 4-1. Standalone License Quotas					
Quota	Limit	Description				
DataPoints	500,000	Defines the total number of data points (total number of Activities, Events, and Snapshots) that can be stored in the data store at any one time (based on Retention).				
MaxMsgSize	1KB	Defines the maximum number of bytes that is stored in the Message field of Events (generally represents the payload of the data involved in the Event).				
MaxOrganizations:	2	The maximum number of Organizations that can be defined in the entire system (has no effect for Default or organization-specific license).				
MaxPropValueRollup	100	During the stitching process of grouping related Events/Activities into a single Activity, we merge the custom properties (Properties field) of all the child Events and SubActivities up to the root-level Activity. This limit controls the number of such properties that are stored in the root-level Activity. If the total property count would exceed this limit, the additional properties are not rolled up. Which properties are rolled up and which are not is indeterminate.				

MaxRepositories	2	The maximum number of Repositories that can be defined in the entire system (for Master License) or in a specific organization (for Default or organization-specific license).
MaxTeams	2	The maximum number of Teams that can be defined in the entire system (for Master License) or in a specific organization (for Default or organization-specific license)
MaxTokens	2	The maximum number of Access Tokens that can be defined in the entire system (for Master License) or in a specific organization (for Default or organization-specific license).
MaxUsers	5	The maximum number of Users that can be defined in the entire system (for Master License) or in a specific organization (for Default or organization-specific license).
RateLimitBytes	50КВ	Defines the maximum streaming rate, in bytes per second, which data can be sent to the system. If data comes in at a higher rate, the defined OveragePolicy will be applied to the connection.
RateLimitCount	50	Defines the maximum streaming rate, in messages per second, which data can be sent to the system. If data comes in at a higher rate, the defined OveragePolicy will be applied to the connection.
StreamBytesPerDay	5GB	Total number of bytes that can be streamed in per calendar day. This is computed based on the total length of the streamed JSON message.
StreamMsgsPerDay	1,000,000	Total number of individual messages that can be streamed in per calendar day.
OveragePolicy	Throttle	 Defines what action is taken when the streaming rate exceeds either RateLimitBytes or RateLimitCount: THROTTLE – the connection is throttled so that the processing rate on the connection is the minimum of RateLimitBytes and RateLimitCount DROP – messages are dropped until the streaming rate slows down to the limits defined by RateLimitBytes and RateLimitCount ALLOW – no action is taken and the streaming is allowed to continue at the current rate
Retention	5 Days	Defines the length of time, in seconds, that data is kept. When the Retention time expires, the data is deleted from the database.

4.2 Nastel XRay Multi-Node Cluster

Below are the installation and startup steps for a Nastel XRay Multi-Node Small Cluster, with one Nastel XRay Data Compute Node and four Nastel XRay Data Index Nodes.

4.2.1 Step 1: Install the Multi-Node Cluster

For the Data Compute Node:

- 1. Log in as the Nastel user (or other user that will run all Nastel XRay services).
- 2. Create a Temp directory within the user's Home directory: /home/nastel/temp
- 3. Upload **XRay_DCN_x.x.x.tar.gz** and place it in the Temp directory created. Be sure that the file is owned by the user and group **nastel:nastel**. Do this by using the following command:

```
>chown nastel:nastel XRay DCN x.x.x.tar.gz
```

- 4. Create the Nastel directory within the /opt directory. Be sure that the Nastel user has write permissions for this directory.
- 5. Extract XRay_DCN_x.x.x.tar.gz into the /opt directory. Use the following commands:

```
>cd /opt
>tar -xzvf /home/nastel/temp/XRay DCN x.x.x.tar.gz
```

For the Data Index Nodes:

- 1. Log in as the Nastel user (or other user that will run all Nastel XRay services).
- 2. Create a Temp directory within the user's Home directory: /home/nastel/temp
- 3. Upload XRay_DIN_x.x.x.tar.gz and place it in the temp directory created. Be sure that the file is owned by the user and group nastel:nastel. Use the following command:

```
>chown nastel:nastel XRay DIN x.x.x.tar.gz
```

- 4. Create the Nastel directory within the /opt directory. Be sure that the Nastel user has write permissions for this directory.
- 5. Extract XRay_DIN_x.x.x.tar.gz into the /opt directory. Use the following commands:

```
>cd /opt
>tar -xzvf /home/nastel/temp/XRay DIN x.x.tar.gz
```

6. Repeat these steps for each of the four **DIN** nodes.

4.2.2 Step 2: Set Environment Variables

For the Multi-Node Small Cluster the environment variables should be set on each of the nodes in the cluster.

For the user that will run the Nastel XRay process, the following environment variables must be created. All scripts and components are configured to use these.

For the **DCN** node set the following environment variables:

- a. APIN_HOME
- b. APIN_LOGS
- c. APM6_HOME
- d. JAVA_HOME
- e. KFKA_HOME

For each of the four **DIN** nodes, set the following environment variables:

- a. APIN_HOME
- b. JAVA_HOME

c. SOLR_HOME

For the Nastel user or other user that will run the Nastel services, add the following lines to the user's **.bash_profile**:

```
export APIN_HOME=<path_to_XRay_filesystem>
export APIN_LOGS=$APIN_HOME/AutoPilotM6/logs
export APM6_HOME=$APIN_HOME/AutoPilotM6
export JAVA_HOME=$APIN_HOME/java/current
export SOLR_HOME=$APIN_HOME/solr/current
export KFKA_HOME=$APIN_HOME/kafka/current
export PATH=$PATH:$APIN_HOME/sbin/:$JAVA_HOME/bin:$KFKA_HOME/bin
```



Please note that only the environment variable \$APIN_HOME requires the full path to the installation directory. All other environment variables will be built from this variable.

Optionally, the user's **.bash_profile** can be configured to run the **apin_env.sh** script edited for the target environment as per <u>Section 4.1.2</u>.

4.2.3 Step 3: Start the Solr Cluster

Before continuing, the below files must be edited for proper connectivity between the DIN Nodes and the DCN.



In order to complete the additional configuration described in this section, you will need to know the Admin User Name, Organization Name, Team Name, Repository Name, and Token Name for your environment. Contact Nastel for additional information.

1. If you have not set the environment variable ZK_HOST within the apin_env.sh file, set it now (please see <u>Section 4.1.2</u>). Edit the solr.in.sh file located in <code>\$APIN_HOME/solr/current/bin</code>. Update the following entry with the IP address of your ZooKeeper host (the DCN Node), and save the file.

```
ZK HOST="<zookeeperIP>:2181"
```



<zookeeperIP> must be set to the IP address of the DCN, since that is where ZooKeeper will be running. This step must be completed on all 4 DIN nodes before they can be started.

 Start ZooKeeper on the DCN node. Run the xray_zoo_start.sh. script located in \$APIN_HOME/sbin/. This will start ZooKeeper on the DCN so that the Solr Cluster can be configured (Solr configuration must be complete before you can continue). Execute the following commands:

```
>cd /$APIN_HOME/sbin/
>./xray zoo start.sh
```

- 3. Start Solr on each of the four DIN nodes:
 - a. Run the **xray_solr_start.sh** script located in <code>\$APIN_HOME/sbin/</code> to start Solr on each of the four Solr nodes. Do this by executing the following commands on each of the four nodes:

```
>cd $APIN_HOME/sbin/
>./xray solr start.sh
```

4.2.4 Step 4: Confirm Solr Cluster is Running

- 1. Validate ZooKeeper is started on DIN:
 - a. Confirm ZooKeeper is running by issuing the following command.

```
>ps -ef | grep zookeeper
```

This command returns information about the running ZooKeeper process:

```
[nastel@localhost bin]$ ps -ef | grep zookeeper
nastel 12771 49795 0 17:31 pts/0 00:00:00 grep --
color=auto zookeeper
nastel 51497
                  1 0 Feb13 pts/0
                                       00:01:56
/datafs/apps/xray/nastel/java/current/bin/java -
Dzookeeper.log.dir=. -Dzookeeper.root.logger=INFO,CONSOLE -cp
/datafs/apps/xray/nastel/zookeeper/current/bin/../build/classes:
/datafs/apps/xray/nastel/zookeeper/current/bin/../build/lib/*.ja
r:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/slf4j-
log4j12-
1.7.25.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib
/slf4j-api-
1.7.25.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib
/netty-
3.10.6.Final.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/
../lib/log4j-
1.2.17.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib
/jline-
0.9.94.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib
/audience-annotations-
0.5.0.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../zook
eeper-
3.4.13.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../src
/java/lib/*.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/.
./conf: -Dcom.sun.management.jmxremote -
Dcom.sun.management.jmxremote.local.only=false
org.apache.zookeeper.server.quorum.QuorumPeerMain
/datafs/apps/xray/nastel/zookeeper/current/bin/../conf/zoo.cfg
```

b. Confirm that the ZooKeeper PID (Process ID) was created in the proper location by running the following command. You should see a file named zookeeper_server.pid with a date and timestamp corresponding to when the start command was issued.

```
ls -l $APIN_HOME/zookeeper/current/dataDir
```

```
>cat $APIN_HOME/zookeeper/current/dataDir/zookeeper_server.pid
7331[nastel@ip-172-31-76-185 bin]$
```

Where 7331 is the Zookeeper PID.

- 2. Validate that Solr is running on all four DIN nodes:
 - a. Confirm Solr is running by issuing the following command. This command returns information about the running Solr process.

>ps -ef |grep solr

This command returns information about the running Solr process:

```
[nastel@localhost bin]$ ps -ef |grep solr
nastel 12717 49795 0 17:29 pts/0 00:00:00 grep --
color=auto solr
nastel
        53383
                  1 0 Feb13 pts/0
                                      00:06:41
/datafs/apps/xray/nastel/java/current/bin/java -server -Xms4000m
-Xmx4000m -XX:NewRatio=3 -XX:SurvivorRatio=4 -
XX:TargetSurvivorRatio=90 -XX:MaxTenuringThreshold=8 -
XX:+UseConcMarkSweepGC -XX:+UseParNewGC -XX:ConcGCThreads=4 -
XX:ParallelGCThreads=4 -XX:+CMSScavengeBeforeRemark -
XX:PretenureSizeThreshold=64m -XX:+UseCMSInitiatingOccupancyOnly
-XX:CMSInitiatingOccupancyFraction=50 -
XX:CMSMaxAbortablePrecleanTime=6000 -
XX:+CMSParallelRemarkEnabled -XX:+ParallelRefProcEnabled -XX:-
OmitStackTraceInFastThrow -verbose:gc -XX:+PrintHeapAtGC -
XX:+PrintGCDetails -XX:+PrintGCDateStamps -XX:+PrintGCTimeStamps
-XX:+PrintTenuringDistribution -
XX:+PrintGCApplicationStoppedTime -
Xloggc:/datafs/apps/xray/nastel/solr/logs/solr gc.log -
XX:+UseGCLogFileRotation -XX:NumberOfGCLogFiles=9 -
XX:GCLogFileSize=20M -DzkClientTimeout=15000 -
DzkHost=localhost:2181/solr -
Dsolr.log.dir=/datafs/apps/xray/nastel/solr/logs -
Djetty.port=8983 -DSTOP.PORT=7983 -DSTOP.KEY=solrrocks -
Duser.timezone=UTC -
Djetty.home=/datafs/apps/xray/nastel/solr/current/server -
Dsolr.solr.home=/datafs/apps/xray/nastel/solr/solrData/data -
Dsolr.install.dir=/datafs/apps/xray/nastel/solr/current -
Dlog4j.configuration=file:/datafs/apps/xray/nastel/solr/solrData
/log4j.properties -Xss256k -Dsolr.log.muteconsole -
XX:OnOutOfMemoryError=/datafs/apps/xray/nastel/solr/current/bin/
oom solr.sh 8983 /datafs/apps/xray/nastel/solr/logs -jar
start.jar --module=http
```

b. Check the Solr logs by running the following commands. The log files should show normal startup of Solr.

```
>cd $APIN_HOME/solr/logs
>cat solr.log
```

3. Confirm Solr is properly connected to ZooKeeper, and that ZooKeeper shows all Solr nodes active. Do this by running the following command from DIN Node 1 to validate ZooKeeper and Solr.

```
>cd $APIN_HOME/solr/current/bin
>./solr zk ls/solr/live nodes -z <zookeeperIP>:2181
```

This command returns a list of 4 active Solr Nodes, for example:

```
Connecting to zookeeper at 172.18.140.25:2181 ...
Getting listing for zookeeper node /solr/live_nodes from
zookeeper at 172.18.140.25:2181 recurse: false
172.18.140.22:8983_solr
172.18.140.24:8983_solr
172.18.140.21:8983_solr
172.18.140.23:8983_solr
```

4. Validate Solr from the UI is accessible on all nodes from a web browser. Launch a web browser and navigate to the Solr URL for each of the four Solr nodes.

				Use <u>original UI</u> 🛞
	Instance		System 0.00 0.00 0.00	G
50li -	🚇 Start	about an hour ago	Physical Memory 10.5%	
🍘 Dashboard	😤 Versions			
🚵 Logging	solr-spec	6.6.6		
🝚 Cloud	solr-impl	6.6.6 68fa249034ba8b273955f20097700dc2fbb7a800 - ishan - 2019-03-29 09:13:13	File Descriptor Count 3.2%	
🗇 Collections	nucene-spec	6.6.6		
🧸 Java Properties	lucene-impl	6.6.6 68fa249034ba8b273955f20097700dc2fbb7a800 - ishan - 2019-03-29 09:07:55	130	
📄 Thread Dump				
No collections	MVC 🚊		JVM-Memory 5.1%	
🌉 available	🧟 Runtime	Oracle Corporation Java HotSpot(TM) 64-Bit Server VM 1.8.0_151 25.151-b12		
	Processors	4		
 No cores available 	🔳 Args	-DSTOP.KEY=solrocks	201.60 MB	
Go and create one		-DSTOP.PORT=7983 -Djetty.home=/opt/nastel/xray/nastel/solr/current/server		3.83 GB
		-Djetty.port=8983		

Figure 4.2.4-A. Validate Solr

4.2.5 Step 5: Initialize the Database

The process of initializing the database is performed once as part of the Multi-Node Cluster installation process. These steps can be used to rebuild the database from scratch, if needed, on both the Standalone Appliance or the Multi-Node Cluster.

4.2.5.1 Prepare the Scripts

Complete the steps in this section from DIN Node 1.

 Update the below lines of the create-cores.sh script located in: /opt/Nastel/misc/jkool-dbapi/current/schemas
 Please note, current is a soft link to the latest version of the dbapi directory. These changes only need to be performed on one instance of the DIN. It will need to be the host where you will run the jkool-dbapi scripts for Solr database configuration and maintenance. This DIN should be designated as DIN 1 of 4.

SOLR HOME=\$APIN HOME/solr/current

ZKHOST=<*zookeeperIP*>

<zookeeperIP> must be set to the IP address of the DCN, since that is where ZooKeeper will
be running.

ZKPORT=2181

The default port for ZKPORT is 2181, but needs to be updated to ensure that the Solr files are located in the dedicated path within the ZooKeeper hierarchy.



The **create-cores.sh** script is preconfigured to create a configuration optimized for the recommended 4 node DIN Solr cluster. If you are using this script to create DB tables for a different configuration, such as a single DIN node, or possibly 6 or 8 DIN nodes, contact Nastel support for assistance in updating the **create-cores.sh** script to suit your desired configuration.

```
76-185 current]$
 opt/nastel/xray/nastel/misc/tools/jkool-dbapi/current
nastel@ip-172-31-76-185 current]$ cd ../../
nastel@ip-172-31-76-185 tools]$ ls -1
 otal 8
drwxrwxr-x. 3 nastel nastel 4096 May 2 2017 jesl
drwxrwxr-x. 4 nastel nastel 4096 Jul 3 18:48 jkool-dbapi
nastel@ip-172-31-76-185 tools]$ cd jkool-dbapi/
[nastel@ip-172-31-76-185 jkool-dbapi]$ ls -1
otal 8
drwxrwxr-x. 6 nastel nastel 4096 Jun 28 23:48 jkool-dbapi-0.15.21
drwxr-xr-x. 8 nastel nastel 4096 Jul 8 22:17 jkool-dbapi-solr-1.1.24
nastel@ip-172-31-76-185 jkool-dbapi]$ cd current/
nastel@ip-172-31-76-185 current]$ ls -1
otal 24
drwxr-xr-x. 3 nastel nastel 4096 Jul 1 16:59 bin
drwxr-xr-x. 2 nastel nastel 4096 Jun 28 21:10 config
drwxrwxr-x. 2 nastel nastel 4096 Jun 28 21:10 lib
drwxrwxr-x. 2 nastel nastel 4096 Jul 1 17:19 log4
drwxr-xr-x. 32 nastel nastel 4096 Jul 8 19:48 schemas
                                        8 20:39 scripts
lrwxr-xr-x. 3 nastel nastel 4096 Jul
```

Figure 4.2.5.1-A. Script Location

2. The **jkool-cmd.sh** script is located in:

\$APIN HOME/misc/tools/jkool-dbapi/current/bin

4.2.5.2 Execute the Scripts to Create Solr Cores

 Create the database tables in SolrCloud (requires curl) by running the create-cores.sh script. Run the script by using the following command:

```
>cd $APIN_HOME/misc/tools/jkool-dbapi/current/scripts/solr
>./create-cores.sh
```

Successful completion of this command will show all Solr cores created and Solr configurations uploaded.

2. Perform the following to validate that the database tables have been created. Wait approximately one minute before performing the below to allow the collections to be

generated.

a. Enter the following command from the command line on DIN Node 1:

```
>cd $APIN_HOME/solr/current/bin
>./solr zk ls /solr/collections -z <zookeeperIP>:2181
```

This command returns a list of the collections that were created by running the **create-cores.sh** script. The figure below displays the list of collections that should be returned. Repeat this step if you do not get the same collections returned.



Figure 4.2.5.2-A. Returned Collections

- Launch a web browser and navigate to the Solr URL for each of the four Solr nodes. See <u>Section 6.2</u> below in this document for more information on validating Solr. You should see a list of the cores and collections across all 4 nodes, with 4 shards and 2 replicas for each collection.
- 3. Run admin.jkql:

```
bin/jkool-cmd.sh -run -f:scripts/admin.jkql
-C:http://172.31.76.185:8983 -U:Administrator -P:admin
```

4.2.5.3 Prepare Initial Database

1. The Nastel XRay Standalone Appliance comes with a default license file, however it may be necessary to update this with a license file more suitable to a given customer use case. For the Nastel XRay Multi-Node Small Cluster, a license file must be obtained from Nastel prior to

completing the installation and configuration. At a minimum, Solr must be running when loading the license file.

Place the Nastel XRay license file obtained from Nastel into the following directory: \$APIN_HOME/misc/tools/jkool-dbapi/current/scripts

2. Make copies of the following script files located in:

\$APIN HOME/misc/tools/jkool-dbapi/current/scripts

- a. Copy admin.jkql to admin.jkql.bak
- b. Copy xray-admin.jkql to xray-admin.jkql.bak
- 3. Edit **admin.jkql** as follows:

Create User 'Admin' Password='admin', Active=true;



4. Edit xray-admin.jkql as follows. Please note the addition of the last line. This must be added prior to running the script to create the first organization, which is the default. In most cases only one organization is needed, but if additional organizations are added, this setting will need to be commented out or removed.

```
Signin 'Admin' using 'admin';
Create Organization '<yourorgname>' Owner='U:Admin';
Create Team '<yourteamname>' Orgname='<yourorgname>', Owner='U:Admin';
Create Repository '<yourreponame>' Orgname='<yourorgname>',
Owner='U:Admin';
Create Token '<reponame>@<orgname>' Orgname='<yourorgname>',
Reponame='<yourreponame>';
Alter Organization 'OrgName' Properties+=('IsDefaultOrganization'=true);
```



<yourorgname> is the name of your organization, noted in your license.
<orgname> can be anything, but should be relevant to your organization name and installation.

5. Save the files after editing.

4.2.5.4 Load the License File

- To load the license, use the command 'jkool-cmd.sh -loadlic' provided with the XRay_dbapi package located on Solr Node 01 in the '\$APIN_HOME/misc/tools/jkool-dbapi/current' directory.
- 2. Load the license by running the following commands:

```
>cd $APIN_HOME/misc/tools/jkool-dbapi/current
run
>bin/jkool-cmd.sh -loadlic -f:<path_to_lic-file> -C:<solr-url>
-U: Administrator -P:<pwd>
```

Example:

```
>bin/jkool-cmd.sh -loadlic -f:$APIN_HOME/misc/tools/jkool-
dbapi/current/scripts/<newlicense.lic> -C:<u>http://localhost:8983</u>
-U: Administrator -P:admin
```

3. View the license by running the command, get license, from the Nastel XRay UI or Query Browser.

					= Console = +	
Temporary viewlet	×					
jKQL> get license						
Name	Content	DataPoints	Expiration	Features	MaxMsg Size	MaxOrganizations
Master	Product: JKool Organization: JKool Features: * DataPoints: Unlimited Retention: Unlimited MaxMsgSize: 1KB RateLimitBytes: Unlimited OveragePolicy: ALLOW MaxPropValueRollup: 100 MaxUsers: Unlimited MaxRepositories: Unlimited MaxRorganizations: Unlimited MaxOrganizations: Unlimited MaxOrganizations: Unlimited StreamBytesPerDay: Unlimi StreamMsgsPerDay: Unlimi Expiration: None	Unlimited	None	•	1КВ	Unlimited

Results in the Nastel XRay UI should be similar to the following figure.

Figure 4.2.5.4-A. Nastel XRay UI – Get License Command

Results in the Query Browser should be similar to the following figure.



Figure 4.2.5.4-B. Query Browser – Get License Command

4.2.5.5 Load Feature Set

1. Use the jkool-cmd.sh script to load the defined feature set:

```
>cd $APIN_HOME/misc/tools/jkool-dbapi/current/
Run
>bin/jkool-cmd.sh solr -load -f:$APIN_HOME/misc/tools/jkool-
dbapi/current/scripts/features.csv -C:http://<solrip>:8983 -
S:http://<solrip>:8983 -U:Administrator -P:admin
```

```
Example:
> bin/jkool-cmd.sh -load -f:$APIN_HOME/misc/tools/jkool-
dbapi/current/scripts/features.csv -C:http://localhost:8983
-U: Administrator -P:admin
```

4.2.5.6 Populate Initial Database

1. Use the jkool-cmd.sh script to create the Nastel XRay administrator user as follows:

```
>cd $APIN_HOME/misc/tools/jkool-dbapi/current/bin
>./jkool-cmd.sh solr -run -f:$APIN_HOME/misc/tools/jkool-
dbapi/current/scripts/admin.jkql -C:http://<solrip>:8983 -
S:http://<solrip>:8983 -U:Administrator -P:admin
```

To confirm the administrator user was successfully created, within Solr select **jkooladmin.registeredusers** from the drop-down list on the left side of the screen. A screen similar to the following will display.

Not secure 192.168.111.135:8983/solr/#/jkooladmin.regil	adusers/query 12
	Use aris
Request-Handler (qt)	Rts http://192.168.111.135.6983/solid/jkooladmin.registeredusers/select?indent-on6q-*+&wt-json
/select	
common	"responsereauer 11 "24Connected" trans-
oard q	"status" ().
ig *:*	"Qlime":19,
	"parans": {
fo	"q":"";*",
tions	"indent": "on",
roperties	"wt*:"json",
sort	"_":"1545543179428")),
i Dump	"response":{"numFound":2,"start":0,"maxScore":1.0,"docs":{
start, rows	
in.reg 👻 0	unaquexey::[(_kmin(_j), "unaquexey::[(_kmin(_j), "unaquexey:[(_kmin(_j),,,,,,,, .
	vrsion_101755054/50/521220, "scenae":
rview 1	*utime*:1544536252708708.
lysis	"b props showlandingPage":true.
aimport df	"ctime":1544536254785792,
	"active":true),
uments	
Raw Query Parameters	"_uniqueKey":"[\"jKoolAdmin\"]",
key1=val1&key2=val2	"usernm":"jKoolAdnin",
wt	"utime":1544536335520474,
am json	"C_STATS_pAd_update.time.tast":1344536/2581/25/00,
ema 🖉 indent	b _ props_yma_bukkt_Uths :realse,
	prove a contraction provide a contraction of the co
aebugquery	"active" true.
ictor 👻 🔲 diaman	"i_stats_failed_logins_since_login.count":0,
L dismax	<pre>"i_stats_login.count":6,</pre>
edismax	"t_stats_login.time.last":1544536335502131,
li hi	"_version_":1619563732626571264)]
facet))
spatial	
spellcheck	
Execute Query	
	🗟 Dorumanthion - 🕸 Issue Tracker - 🏟 ISC Channel - 🖂 Community forum - 🗐 Calc Ouer

Figure 4.2.5.6-A. Solr – Confirm Creation of Admin User

 Use the jkool-cmd.sh script to create a default organization, repository, team and token, as follows:

```
>cd $APIN_HOME/misc/tools/jkool-dbapi/current/bin
>./jkool-cmd.sh solr -run -f:$APIN_HOME/misc/tools/jkool-
```

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```
dbapi/current/scripts/xray-admin.jkql -C:http://<solrip>:8983 -
S:http://<solrip>:8983 -U:Admin -P:admin
```

To confirm the default organization was successfully created, within Solr select **jkooladmin.organizations** from the drop-down list on the left side of the screen. A screen similar to the following will display.

	core The town in the base so show a strengthe	auus/quey
		Use <u>origina</u>
	Request-Handler (nt)	The Network 2012 168 111 195-8082/koletionaladmin amanitationarkalaet/industanEu-=%#Eu-tinon
olr 🗧	/select	Turbitizet to its to contract the second
Οu		
	- common	"responseHeader" : (
ashboard	9	"KKonnecker": true,
ogging	x;x	"Office 192.
laud		parans":(
000	fq	"q":"","
ollections		"indent": "on",
va Properties		"wt":"json",
	sort	"_":15445431/9629");
read Dump		Comparison of manufacture ratio and a r
	start, rows	"_uniqueKey":"[\"jKool\"]",
admin.org 👻	0 10	"utime":1544536283423184,
Overview	fl	"orgam":"jKool",
Anaburie		"owner":"T:Administrator\$\$/Kool",
		"sprops_logouttext":"Thanks for using jKool",
Dataimport		"s props_iermsor/service/i : " , "
Documents		"s prost LandingPageTitle": "IT Operational Analytics Made Simple".
	Raw Query Parameters	"s_props_LandingPageSubtitle":'Hhere do you want to start?",
	keyl=vall&key2=val2	"s_props_RegistrationText":"#",
	wt	"s_props_RegistrationUr1":"#",
Stream	ison	* "s_props_Applogo": "
Schema	₹ indept	"s_props_Copyright":"Copyright 2018 Nastel Technologies, Inc. All Rights Reserved.",
		"sprops_subscriptionur1 : = ,
	debugQuery	s props Acolorot Link": "=".
Selector 👻	diemax	"b props_13DefaultOrganization":true,
		"s_props_ForgotPasswordUn1":"#",
	edismax	"b_props_ShowSubscription":false,
		"b_props_showRegistration":filse,
	I facet	
	i spatial	s pros Privacija ": "".
	spellcheck	"s_props_ApplogoUrl":"#",
	Execute Query	"_version_":1619583678210719744,
		"s_props_loginlogo":"
		"admusr":["I:Administrators\$5Kcol",
		"U:Admin\$jKool"],
		"userum :[] :[AddinistratorSs]Kool", "T-Omerand filesoff
		"U:]KoolAdmin"]]]
		1)

Figure 4.2.5.6-B. Solr – Confirm Creation of Organization

To confirm the default repository was successfully created, within Solr select **jkooladmin.repositories** from the drop-down list on the left side of the screen. A screen similar to the following will display.

← → C ▲ Not s	secure 192.168.111.135:8983/solr/#/jkooladmin.repositories	query	☆ Ө (
			Use <u>original UI</u> (+)
Cal	Request-Handler (qt)	E2 http://192.168.111.135/8983/solr/jkooladmin.repositories/select7indent=on&q=*/%&wt=json	
SOU	/select		
	- common	"responseleader": {	
Dashboard	a	"zkConnected":true,	
		"status":0,	
Logging		"QTime":10,	
😪 Cloud		"parans" : {	
A Collections	fq		
Conscions	E 5	Indem: : on , "ub" - "face"	
📓 Java Properties	sort	* : :]2400 } * ::]2400 }	
E Thread Dump		"response":{"numFound":2,"start":0,"maxScore":1.0,"docs":[
and the second		¢	
(and a start of the start of t	start, rows	"_uniqueKey":"[\"DefaultRepo\",\"jKool\"]",	
jkooladmin.rep •	0 10	"_version_":1619563645184029696,	
Coverview (fi	"utime":1546536251849016,	
T Analysis		"organ":'jKool",	
1	16	Owner: Truty Koolakanin',	
Dataimport		<pre>"repoint : DefaultRepoint / Control - Con</pre>	
😚 Documents		"ctime":1544538251849006.	
Files	Raw Query Parameters	"active":true,	
0	keyl=vall&key2=val2	"admusr":["T:Administrators\$jKool",	
Provery	wt	"U:jKoolAdmin"],	
eng Stream	ison	"usernm":["T:4dministrators\$jKool",	
IIFI Schema	- Devis	"T:Operators\$jKool",	
C	in indent	"U:]KoolAdmin"]},	
	U debugQuery	* undersaffere", *T1*zenerala 1001* 1*44/en11*1*	
Core Selector 👻	Ratio	version :/ilios6a5/272517424.	
	U dismax	"utime":1544536283038624.	
	💷 edismax	"b_props_Global":true,	
	li hi	"orgam":"jKool",	
	III facet	"owner":"U;jKoolAdmin",	
	spatial	"reponm":"sample_MQ",	
	spelicheck	"repoid":"sample_NQSjKool",	
		"ctime":1544536283038603,	
	Execute Query	active irrue,	
		dumist () () And in the total system ()	
		"userum":['T:Administrators\$fKool".	
		"T:Operators\$jkool",	
		"U:jKoolAdmin"]}]	
		33	
		Documentation 🐞 Issue Tracker 🔗 IRC	Channel 🖂 Community forum 🐻 Solr Ouery Syntax
			E course of the state of the st

Figure 4.2.5.6-C. Solr – Confirm Creation of Repository

To confirm the default team was successfully created, within Solr select **jkooladmin.teams** from the drop-down list on the left side of the screen. A screen similar to the following will display.

← → C ▲ Nots	ecure 192.168.111.135:8983/solr/#/jkooladmin.teams/query		x 🔒 📀
			Use <u>original UI</u> 🚯
Sal	Request-Handler (qt)	EB http://192.168.111.135/8983/solr/jkooladmin.teams/select?indent=on&q=*+&art=json	
SOL	/select	£	
	- common	"responseleader": (
Dashboard	q	"rkConnected":true,	
Logging	x,x	**************************************	
Cloud	#	"parans" : {	
() following	fq		
Collections	= •	"indert':on", "wt":fican".	
Java Properties	sort	"_":"154543179428"}),	
Thread Dump		"response":("numFound":1,"start":0,"maxScore":1.0,"docs":[
	start, rows	Contraction of the Contractio	
jkooladmin.tea 👻	0 10	uniqueky: [Uuraultean, y. ykou/], " version %10195046472097016.	
Overview	fl	"utime":1544536253283424,	
T Analysis		"orgnn": "jKoll",	
1 Participant	dŧ	"Owner": "U:SKOOLAGAINSSKOO!", "tabarga": "ng kilitaar"	
E Dataimport		"ctime":1544536253283418,	
🗂 Documents	David Charles Destanations	"admusr":["U:jKoolAdmin\$jKool"],	
🔜 Files	kavi =val18kav2=val2	"userm":["U:jKolAdmin\$jKol"]}]	
Le Query	na ya - rana ana ya - rana	11	
⁰tĝ Stream	wt		
Schema	P indent		
L	a indent		
	debugquery		
Core Selector 👻	🔲 dismax		
	edismax		
	l hi		
	acet		
	spatial		
	spellcheck		
	Execute Query		
		📄 Documentation 🌲 Issue Tracker 🛛 🏩 IRC Channel 🛛 Community forum	o Solr Query Syntax

Figure 4.2.5.6-D. Solr – Confirm Creation of Team

To confirm the default token was successfully created, within Solr select **jkooladmin.accesstokens** from the drop-down list on the left side of the screen. A screen similar to the following will display.

🗧 🔶 C 🔺 Not	ecure 192.168.111.135:8983/solr/#/jkooladmin.accesstoke	s/query	☆ \varTheta
			Use <u>original UI</u> (i
Solr	Request-Handler (qt) /select	## http://192.168.111.135.4943/soludimin.accesstelens/belic/trindenton6q-+*46wt-joon	
Dashboard	q q	"respondenate":("alConnected":true, "status":0,	
🔁 Logging	fo.	ុប្បដែល។ 58, "parans" 1 "q1"។ ទោះ	
Collections Java Properties		"indent":"on", "xt":"5son", 	
Thread Dump		///////////////////////////////////	
jkooladmin.acc 👻	0 10	"_uniputKys':"[\"Def=AultToken\")", "_version_":169568476465228, "etile":16458525428434.	
T Analysis		"ergmm":"jool", "reporm":"DefaultRepo",	
Dataimport	df	"repoid":"DFallRepoidSool", "acctma:"DFaluIToken", "ctime:15443525424400)]	
Courry	Raw Query Parameters key1=val1&key2=val2))	
ng Stream	vt json *		
(P) ocnema	le indent ☐ debugQuery		
Core Selector 👻	dismax		
	i hi facet		
	spatial spellcheck		
	Execute Query		
		📄 Documentation 🛛 😹 Issue Tracker 🏾 🧟 IRC Channel 🔛 Commun	nity forum 🛛 👩 Solr Query Syntax

Figure 4.2.5.6-E. Solr – Confirm Creation of Token

Chapter 5: Startup

5.1 Nastel XRay Standalone Appliance

The system's components can be started using an <u>interactive script</u>, <u>individual commands</u> or <u>component</u> <u>scripts</u>. Each method is explained below.

5.1.1 Startup with an Interactive Script

An interactive script is provided to start the complete system. Default configurations for the components will be used. Run the script by using the following commands. The script includes time delays, so please be sure to wait for the prompts to proceed.

> cd \$APIN_HOME/sbin

> ./start.sh all

The component startup actions will appear within the prompts as follows:

- Confirm no processes are running
- Start ZooKeeper
- Check ZooKeeper
- Start Solr Cloud this step may take some time
- Check Solr Cloud
- Start Kafka
- Check Kafka
- Start Active MQ
- Check Active MQ
- Start Storm components
 - Storm Nimbus
 - Storm Supervisor
 - Storm UI
 - Check Storm components
- Start AutoPilot components
 - Domain Server
 - CEP Server
 - Web Server
- Check AutoPilot components
- Check all components
- Start Storm Topology

5.1.2 Startup with Individual Scripts or Commands

The table below is a quick reference for starting the individual components in the correct order with either the startup scripts provided, or from the command line.



•

Run start.sh without parameters to display an explanation of options.

Table 5-1. Component Commands Quick Reference							
Component	Scripts						
Master Scripts Directory	\$APIN_HOME/sbin/						
Check Running Nastel XRay Processes	>cd \$APIN_HOME/sbin/ >./show.sh						
Start All Processes	>cd \$APIN_HOME/sbin \$./start.sh all						
Start ZooKeeper	<pre>>cd \$APIN_HOME/sbin/ >./start.sh zoo</pre>						
ZooKeeper Manual Start	>cd \$APIN_HOME/zookeeper/current >nohup bin/zkServer.sh start &						
Check ZooKeeper Process	>ps -ef grep zookeeper						
Start Solr	<pre>>cd \$APIN_HOME/sbin/ >./start.sh solr</pre>						
Solr Node Manual Start	>cd \$APIN_HOME/solr/current >bin/solr start						
Check Solr Process	>ps -ef grep solr						
Start Kafka Kafka Manual Start	>cd \$APIN_HOME/sbin/ >./start.sh kafsrv						
	<pre>>cd \$APIN_HOME/kafka/current >nohup bin/kafka-server-start.sh config/server.properties > kafka.out 2>&1 &</pre>						
	>ps -ef grep kafka						
Start ActiveMQ	<pre>>cd \$APIN_HOME/sbin/ >./start.sh mq</pre>						
ActiveMQ Manual Start	<pre>>cd \$APIN_HOME/actmq/current >nohup bin/activemq start &</pre>						
Check ActiveMQ Process	>ps -ef grep activemq						
Start Storm	<pre>>cd \$APIN_HOME/sbin/ >./start.sh storm</pre>						
Storm Manual Start	>cd \$APIN_HOME/storm/current						
Nimbus	>nohup bin/storm nimbus &						
Check Process	>ps -ef grep storm						
Supervisor	>nohup bin/storm supervisor &						
Check Process	>ps -ef grep storm						
Storm UI	>nohup bin/storm ui &						

Check Process	>ps -ef grep storm
Start APM6 All	>cd \$APIN_HOME/sbin/ >./start.sh ap
APM6 Domain Manual Start	>cd \$APIN_HOME/AutoPilotM6/naming >nohup ./ATPNAMES &
Check APM6 Domain Process	>ps -ef grep ATPNAMES
APM6 CEP Manual Start	>cd \$APIN_HOME/AutoPilotM6/localhost >nohup ./ATPNODE &
Check APM6 CEP Process	>ps -ef grep ATPNODE
APM6 WEB Manual Start	>cd \$APIN_HOME/sbin/ >./start.sh web
	>cd \$APIN_HOME/AutoPilotM6/apache-tomcat7 >bin/startup.sh

5.1.3 Manual Startup with Individual Commands

This section reviews the manual startup process where the user will change directories and start each component from its built-in start command. This is different from using the individual start scripts which allow the user to start components individually from a single location.

From a command line, start each of the components in the order listed below.

ZooKeeper

ZooKeeper must be running for Solr, Kafka and Storm. ZooKeeper is configured with **chroot** set to /solr which separates Solr records from Storm and Kafka records.

```
>cd $APIN_HOME/zookeeper/current/bin
>./zkServer.sh start &
>ps - ef | grep zookeeper
```

ZooKeeper data files can be found in: >cd \$APIN_HOME/zookeeper/zoo_data

Solr Cloud

Solr will start in Cloud mode with two nodes on the local host. It uses the same ZooKeeper instance as Storm. The Solr cloud nodes can be configured on other hosts.

```
>cd $APIN_HOME/solr/current
>bin/solr start (this starts node1 of the Solr cluster, on port 8983)
>ps -ef | grep solr
```

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Kafka

Kafka MUST be started before starting AutoPilot M6. Use the following to start Kafka:

```
>cd $APIN_HOME/kafka/current/bin
>nohup ./kafka-server-start.sh config/server.properties >kafka.out 2>&1 &
>ps -ef | grep kafka
```

Kafka data logs can be found in:

>cd \$APIN HOME/kafka/kafka-data-logs

ActiveMQ

ActiveMQ must be started before starting AutoPilot M6/XRay. Use the following to start ActiveMQ:

```
>cd $APIN_HOME/actmq/current
>nohup bin/activemq start &
>ps -ef | grep activemq
```

Storm – Real-time Cluster

A single-node Storm cluster is configured as the real-time engine which processes subscriptions and triggers. Storm uses ZooKeeper and the central repository of definitions that all Storm nodes require. ZooKeeper and Storm must be running before starting the Nastel XRay Subscription and Trigger Storm topologies.

```
>cd $APIN_HOME/storm/current
>nohup bin/storm nimbus &
>nohup bin/storm supervisor &
>nohup bin/storm ui &
>ps -ef | grep storm
```



You should see listings for the three storm components started.

AutoPilot M6 / Nastel XRay

Domain Server

```
>cd $APIN_HOME/AutoPilotM6/naming
>nohup ./ATPNAMES &
>ps -ef |grep ATPNAMES
```

CEP Server

```
>cd $APIN_HOME/AutoPilotM6/apache-tomcat
>bin/startup.sh
>ps -ef |grep Catalina
```

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Web Server

```
>cd $APIN_HOME/AutoPilotM6/localhost
>nohup ./ATPNODE &
>ps -ef | grep ATPNODE
```

Nastel XRay Subscription and Trigger Topologies

>cd \$APIN_HOME/AutoPilotM6/jkool/scripts
>./start-storm-topology.sh <STORM_HOME>
* <STORM_HOME> = `\$APIN_HOME/storm/current'

5.2 Nastel XRay Multi-Node Small Cluster

5.2.1 Prepare the Compute Node for the Multi-Node Small Cluster

Before starting the multi-node small cluster for the first time, the compute node must be configured to communicate with the 4 nodes Solr cluster.

Edit the global.properties file located in <code>\$APIN_HOME/AutoPilotM6</code>. Update the following entries with the IP addresses of your Solr hosts (the DIN Nodes), and save the file.

```
property jkool.db.url = http://<DIN_Node01>:8983,
http://<DIN_Node02>:8983, http://<DIN_Node03>:8983,
http://<DIN_Node04>:8983
property jkool.solr.url = http://<DIN_Node01>:8983, http://<DIN_Node02>:8983,
http://<DIN_Node03>:8983,
http://<DIN_Node04>:8983
```

5.2.2 Start Sequence and Location of Scripts for the Multi-Node Small Cluster

Start Sequence

In order for Nastel XRay to start and run properly, the components should always be started, and validated in the proper sequence. In the case of a multi-node cluster the 4 Solr nodes are all running on separate servers, which must all be started after ZooKeeper and before any of the other components.

- Start ZooKeeper on DCN
- Validate ZooKeeper
- Start Solr Cloud Node1 DIN01
- Start Solr Cloud Node2 DIN02
- Start Solr Cloud Node3 DIN03
- Start Solr Cloud Node4 DIN04
- Validate Solr Cloud Cluster
- Start Kafka DCN
- Check Kafka
- Start Active MQ DCN

- Check Active MQ DCN
- Start Storm components DCN (Optional)
 - Storm Nimbus
 - Storm Supervisor
 - Storm UI
- Check Storm components
- Start AutoPilot components DCN
 - Domain Server
 - CEP Server
 - Web Server
- Check AutoPilot components
- Check all components
- Start Storm Topology DCN (Optional)

Location of Scripts

Script files for the Multi-Node Small Cluster components are located in the following directory on each node in the cluster \$APIN_HOME/sbin/.

- On the DCN scripts are provided to start all components, though you will not need to run the Solr start scripts from the DCN in this configuration.
- On each of the 4 DIN Nodes, a script file is provided to start the Solr node on that server.

5.2.3 First Start of Multi-Node Small Cluster

If this is the first time starting the Multi-Node Small Cluster, then ZooKeeper and Solr may already be running after following the steps detailed in <u>Section 4.2 Nastel XRay Multi-Node Cluster</u>. If ZooKeeper and the Solr cluster are already running, run the startup procedure begging with starting Kafka.

5.2.4 Startup with Individual Scripts or Commands

The table below is a quick reference for starting the individual components in the correct order with either the startup scripts provided, or from the command line.



Run start.sh without parameters to display an explanation of options.

Table 5-2. Component Commands Quick Reference						
Component Scripts						
Master Scripts Directory \$APIN_HOME/sbin/						
Check Running Nastel XRay>cd \$APIN_HOME/sbin/Processes>./show.sh						
Start All Processes>cd \$APIN_HOME/sbin>./start.sh all						
Start ZooKeeper	>cd \$APIN_HOME/sbin/ >./start.sh zoo					

ZooKeeper Manual Start	>cd \$APIN_HOME/zookeeper/current >nohup bin/zkServer.sh start &				
Check ZooKeeper Process	>ps -ef grep zookeeper				
Start Solr (Each of the 4 Solr	>cd \$APIN_HOME/sbin/				
nodes needs to be started separately on the DIN nodes)	>./start.sh solr				
Solr Node Manual Start	>cd \$APIN_HOME/solr/current >bin/solr start				
Check Solr Process	>ps -ef grep solr				
Start Kafka	>cd \$APIN_HOME/sbin/ >./start.sh kafsrv				
Kafka Manual Start	<pre>>cd \$APIN_HOME/kafka/current >nohup bin/kafka-server-start.sh config/server.properties > kafka.out 2>&1 &</pre>				
	>ps -ef grep kafka				
Start ActiveMQ	>cd \$APIN_HOME/sbin/ >./start.sh mq				
ActiveMQ Manual Start:	>cd \$APIN_HOME/actmq/current >nohup bin/activemq start &				
Check ActiveMQ Process:	>ps -ei grep activemq				
Check ActiveMQ Process: Start Storm	<pre>>ps -et grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start	<pre>>ps -et grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus	<pre>>ps -et grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus &</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process	<pre>>ps -et grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor &</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process Storm UI	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm >nohup bin/storm ui &</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process Storm UI Check Process	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm >nohup bin/storm ui & >ps -ef grep storm</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process Storm UI Check Process Start APM6 All	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm >nohup bin/storm ui & >ps -ef grep storm >nohup bin/storm ui & >ps -ef grep storm</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process Storm UI Check Process Storm UI APM6 All APM6 Domain Manual Start	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm >nohup bin/storm ui & >ps -ef grep storm >cd \$APIN_HOME/sbin/ >./start.sh ap >cd \$APIN_HOME/AutoPilotM6/naming >nohup ./ATPNAMES &</pre>				
Check ActiveMQ Process: Start Storm Storm Manual Start Nimbus Check Process Supervisor Check Process Storm UI Check Process Storm UI Check Process Start APM6 All APM6 Domain Manual Start Check APM6 Domain Process	<pre>>ps -ef grep activemq >cd \$APIN_HOME/sbin/ >./start.sh storm >cd \$APIN_HOME/storm/current >nohup bin/storm nimbus & >ps -ef grep storm >nohup bin/storm supervisor & >ps -ef grep storm >nohup bin/storm ui & >ps -ef grep storm >cd \$APIN_HOME/sbin/ >./start.sh ap >cd \$APIN_HOME/AutoPilotM6/naming >nohup ./ATPNAMES & >ps -ef grep ATPNAMES</pre>				

Check APM6 CEP Process	>ps -ef grep ATPNODE
APM6 WEB Manual Start	>cd \$APIN_HOME/sbin/ >./start.sh web
	>cd \$APIN_HOME/AutoPilotM6/apache-tomcat7 >bin/startup.sh

Chapter 6: System Validation

To complete system validation, you must either have your server running with a desktop environment such as GNOME, or have X Windows with X11 forwarding set up and a tool such as Putty, Cygwin or MobaXterm.

Validation can also be done using a local web browser and a local terminal (Linux) or command prompt (Windows) version, or Nastel AutoPilot Enterprise Manager and a local installation of the Nastel XRay Query Browser package.

If validation is unsuccessful, please refer to <u>Chapter 8, Troubleshooting</u>, or try starting the individual components again.

If you are running a Linux desktop or remote X-Windows environment, you can access all components with the host name **localhost**. If you are using remote components you will need to know the IP address of your system. **localhost** will be used in the examples below.

6.1 Validate ZooKeeper

Enter the following in a command line:

```
>ps -ef | grep zookeeper
>echo stat | nc 127.0.0.1 2181
```

Results should be similar to the following:

```
[nastel@localhost bin]$ ps -ef | grep zookeeper
nastel 12771 49795 0 17:31 pts/0
                                     00:00:00 grep --color=auto zookeeper
                 1 0 Feb13 pts/0
nastel
        51497
                                     00:01:56
/datafs/apps/xray/nastel/java/current/bin/java -Dzookeeper.log.dir=. -
Dzookeeper.root.logger=INFO,CONSOLE -cp
/datafs/apps/xray/nastel/zookeeper/current/bin/../build/classes:/datafs/apps
/xray/nastel/zookeeper/current/bin/../build/lib/*.jar:/datafs/apps/xray/nast
el/zookeeper/current/bin/../lib/slf4j-log4j12-
1.7.25.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/slf4j-api-
1.7.25.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/netty-
3.10.6.Final.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/log4j
-1.2.17.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/jline-
0.9.94.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../lib/audience-
annotations-
0.5.0.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../zookeeper-
3.4.13.jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../src/java/lib/*.
jar:/datafs/apps/xray/nastel/zookeeper/current/bin/../conf: -
Dcom.sun.management.jmxremote -
Dcom.sun.management.jmxremote.local.only=false
org.apache.zookeeper.server.quorum.QuorumPeerMain
/datafs/apps/xray/nastel/zookeeper/current/bin/../conf/zoo.cfg
       _____
[nastel@localhost bin]$ echo stat | nc 127.0.0.1 2181
Zookeeper version: 3.4.13-2d71af4dbe22557fda74f9a9b4309b15a7487f03, built on
06/29/2018 04:05 GMT
```

```
Clients:

/0:0:0:0:0:0:0:1:34920[1](queued=0,recved=11401,sent=11402)

/0:0:0:0:0:0:0:1:36574[1](queued=0,recved=8973,sent=8973)

/127.0.0.1:38178[0](queued=0,recved=1,sent=0)

Latency min/avg/max: 0/0/201

Received: 83830

Sent: 86175

Connections: 3

Outstanding: 0

Zxid: 0xd423

Mode: standalone

Node count: 2504
```

6.2 Validate Solr

Before validating Solr, please confirm that the data was uploaded to Solr properly as described in <u>Section</u> <u>4.2.5</u>. Enter the following in a command line to validate Solr:

>ps -ef | grep solr

Results similar to the following screenshot should appear:

Figure 6.2-A. Validate Solr

To access the Solr UI from a web browser, use the following address: http://<*serverip*>:8983/solr

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		~ · ·
		Use <u>original U</u> (i)
or	visions visions 1772-21.0.7	
	⊖ikool activities ⊖shard2 ● 172,21,0,8	
Darbhoard		
Dashovaru	⊖ jkool bayessource fieldsshard2 ● 172,21.0.7	
Logging	(shard) 0172 21 0.7	
Cloud	⊖ jkool-dictionariesshard2 ● 172,21,0,8	
ciouu	○ sbard]	
te Tree	⊖ikool.events	
Graph	⊖jkool-inputdatarules	
🔹 Graph (Radial)		
	jkool.jobs	
- Dump	(shard) 172,21,0,7	
	⊖ jkool/logs shard2 ● 172,21,0,8	
Collections	(shard) = 172 21 0.8	
Java Properties	⊖ikool.macroclassesshard2 == 172,21,0,7	
Thread Dump	⊖ jkool macros ⊖ shard2 ● 172,21,0,7	
ollection Sele 👻	⊖itool.providers	
ore Selector	provide transformed to the stand of the stan	
	Osbardi 0172 21 0.8	
	jkooliresources osbard? • 172,21,0,7	
	(shard) 0172 21 0 7	
	jkool.sets shard2 172,21,0,8	
	⊖jkoolisnapshots	
	(shard) • 172.21.0.7	
	⊖jkool.sourcesshard2 ● 172.21.0.8	
	(shard) • 172,21,0,7	
	jkoohtopics shard2 • 172,21,0,8	
	⊖jkool.triggers	
	(shard) 0172,21,0,7	
	jkooladmin.accesstokens shard? 172.21.0.8	
	shardi • 172 21 0.7	
	jkooladmin.organizations share? ● 172.21.0.8	
	⊖jkooladmin:quotausageshard2€172,21.0.7	
	(shard) 172.21.0.8	
	jkooladmin.registeredusers shard? 0172.21.0.7	
	Ostard1 0172 21.0.7	
	picoladmin.repositories shard? \$172.210.8	
	shard] 172210.7	
	Opticoladmin.teams Option 172210.8	
	⊖imoreffeatures → hand2 = 172,210,7	
		Leader
	vicorrefiplocations onarda 172.21.0.8	O Active
cting	Sineruz 172.21.0.7	O Recovered

Figure 6.2-B. Solr

6.3 Validate Kafka

Enter the following in a command line to validate Kafka:

```
>ps -ef | grep kafka
>echo dump | nc localhost 2181 | grep brokers
```

Results similar to the following screenshot should appear:



Figure 6.3-A. Validate Kafka

The following command must be run on a ZooKeeper node to get the list of Kafka brokers from ZooKeeper.

> echo dump | nc localhost 2181 | grep brokers



Figure 6.3-B. Get List of Kafka Brokers from ZooKeeper

6.4 Validate ActiveMQ

Confirm that there are queues connected to Nastel XRay within ActiveMQ. To check this, launch ActiveMQ and go to **Queues** (located within the navigation menu). There should be three default queues.

ActiveN	IQ ™						The Apache Software Foundation http://www.apache.org/
Iome Queues Topics Subscribers Connecti Queue Name Create Queues	ons Network S	Scheduled Send					Support Queue Views Graph XML
Name †	Number Of Pending Messages	Number Of Consumers	Messages Enqueued	Messages Dequeued	Views	Operations	Topic Views
jkool.client.GlobalConnection.7596449c-3080-11e	0	1	86	86	Browse Active Consumers Active Producers atom rss	Send To Purge Delete	Subscribers Views XML
jkool.client.jKoolAdmin.035e0e11-3085-11e9-9b15	0	1	2	2	Browse Active Consumers Active Producers atom rss	Send To Purge Delete	Useful Links Documentation FAQ Downloads
jkool.service.admin.requests	0	4	94	94	Browse Active Consumers Active Producers atom rss	Send To Purge Delete	Poruns
jkool.service.requests	0	4	58	58	Browse Active Consumers Active Producers atom rss	Send To Purge Delete	
jkool.service.update.requests	0	4	148	148	Browse Active Consumers Active Producers atom rss	Send To Purge Delete	
opyright 2005-2015 The Apache Software Foundation.							

Figure 6.4-A. Default Queues

Enter the following in a command line:

UI Via Browser Userid:admin Pwd:admin

To access Active MQ from a web browser, use the following address:

http://<serverip>:8161/admin

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localhost : ActiveMQ Cor	× +					-	- 1	
(i) 11.0.0.113 :8161/a	dmin/index.jsp	Ċ	Q. Search		☆自	+	â	◙
Home Queues To Welcome! Welcome to the	plcs Subscribers Connections Network Scheduled Send	n-43699-1487694530321-0:1)		Sof	Th tware p://www Queu Graph XML	° Ap Four	ach ndati he.or Supp	ort
You can find mo Broker	re information about Apache ActiveMQ on the Apache ActiveMQ	Site			Topic	: View	IS	_
Name Version ID	localhost 5.11.1 ID:localhost.localdomain-43699-1487694530321-0:1				View	s ul Lin	rs ks	_
Uptime Store percent used Memory percent us Temp percent used	37 minutes 0 ed 0				Docum FAQ Downi Forum	nentati oads 15	on	_
Copyright 2005-2014	'he Apache Software Foundation.							

Figure 6.4-B. ActiveMQ

6.5 Validate Storm

Confirm that the status of the topology is Active. Also, the topology should have existing workers and executors. If the number of workers and/or executors is zero, the topologies may not function properly.

Enter the following in a command line:

>ps -ef | grep storm

To access the Storm UI from a web browser, use the following address: <u>http://localhost:8088</u>

Storm UI	× +												-		×
€ ③ 11.0.0.113	3:8088/index.html						C	Q. Search			☆	Ê	∔ ŝ	◙	≡
Storm UI															^
Cluster Sur	mmary														
Version	Nimbus uptime	Supervisors	Used	slots		Free slots		Total slots		Executor	s		Tasks		
0.9.5	40m 5s	1	4			0		4		76			76		
Tanalagy															
Name	unnary	ld		Status		Uptime		Num workers		Num execute	ors		Num tas	ks	
jKoolSubGridTopolog	9y	jKoolSubGridTopology-1-1486644560		ACTIVE	-	12d 4h 19m 47s		2		38			38		
jKoolTriggerGridTopo	ology	jKoolTriggerGridTopology-2-1486644560		ACTIVE	_	12d 4h 19m 47s		2		38			38		
Supervisor	summary														
ld					st		Uptime		Slots		Used s	lots			
3b86cace-fe9d-4144	-b4eb-d408112235ee			loc	alhost:		39m 57s	3	4		4				
Nimbus Co	nfiguration														
Кеу			-	Value											
dev.zookeeper.path				/tmp/dev-s	storm-zoo	okeeper									
drpc.childopts				-Xmx768n	m										
drpc.invocations.port	t			3773											
drpc.port				3772											
drpc.queue.size				128											
drpc.request.timeout	t.secs			600											
drpc.worker.threads				64											
java.library.path				/usr/local/	/lib:/opt/lo	cal/lib:/usr/lib									
logviewer.appender.n	name			A1											

Figure 6.5-A. Storm

6.6 Validate AutoPilot

Enter the following in a command line:

>ps -ef | grep ATPNODE >ps -ef | grep ATPNAMES >ps -ef | grep catalina

Results should be similar to the following:

```
[nastel@localhost bin]$ ps -ef |grep ATPNODE
```

```
nastel 5135 1 35 12:41 pts/0 01:50:49 /usr/lib/jvm/java-1.8.0-
openjdk-1.8.0.171-7.b10.el7.x86_64/jre/bin/java -server -Xmx4g -Xms4g -
XX:+UseGIGC -Xloggc:gc2g.log -XX:+PrintGCDetails -XX:+PrintGCDateStamps -
XX:+PrintGCTimeStamps -XX:MaxGCPauseMillis=500 -XX:ParallelGCThreads=8 -
XX:ConcGCThreads=4 -XX:InitiatingHeapOccupancyPercent=70 com.zerog.lax.LAX
/datafs/apps/xray/nastel/AutoPilotM6/localhost/./ATPNODE.lax
/tmp/env.properties.5135
```

nastel 13250 49795 0 17:54 pts/0 00:00:00 grep --color=auto ATPNODE

[nastel@localhost bin]\$ ps -ef |grep ATPNAMES

```
nastel 4995 1 0 12:41 pts/0 00:01:41 /usr/lib/jvm/java-1.8.0-
openjdk-1.8.0.171-7.b10.el7.x86_64/jre/bin/java -server -Xmx1024m -Xms1024m -
XX:+UseG1GC -Djdk.security.defaultKeySize=DSA:1024 com.zerog.lax.LAX
```

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/datafs/apps/xray/nastel/AutoPilotM6/naming/./ATPNAMES.lax /tmp/env.properties.4995 nastel 13322 49795 0 17:55 pts/0 00:00:00 grep --color=auto ATPNAMES _____ [nastel@localhost bin]\$ ps -ef |grep catalina 6046 1 1 12:45 pts/0 nastel 00:04:41 /datafs/apps/xray/nastel/java/current/bin/java -Djava.util.logging.config.file=/datafs/apps/xray/nastel/AutoPilotM6/apachetomcat/conf/logging.properties -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djkool.stream.url=http://localhost:6580 -Djkclient.message.expiry.msec=0 -Xms1g -Xmx2g -Dautopilot.home=/datafs/apps/xray/nastel/AutoPilotM6 -Djava.awt.headless=true -Djava.endorsed.dirs=/datafs/apps/xray/nastel/AutoPilotM6/apachetomcat/endorsed -classpath /datafs/apps/xray/nastel/AutoPilotM6/apachetomcat/bin/bootstrap.jar:/datafs/apps/xray/nastel/AutoPilotM6/apachetomcat/bin/tomcat-juli.jar -Dcatalina.base=/datafs/apps/xray/nastel/AutoPilotM6/apache-tomcat -Dcatalina.home=/datafs/apps/xray/nastel/AutoPilotM6/apache-tomcat -Djava.io.tmpdir=/datafs/apps/xray/nastel/AutoPilotM6/apache-tomcat/temp org.apache.catalina.startup.Bootstrap start nastel 13337 49795 0 17:56 pts/0 00:00:00 grep --color=auto catalina

Launch AutoPilot Enterprise Manager. Use the following login information:

User Name: Admin Password: admin Domain Server: <serverip>:2323



Figure 6.6-A. Log in to AutoPilot M6



Figure 6.6-B. Log on to AutoPilot

6.7 Validate Nastel XRay

To access the Nastel XRay UI from a web browser, use the following address: http://<*serverip*>:8080/*yourorgname*/login.jsp

Use the following log in credentials:

User Name: Admin Password: admin

	Admin
	•••••
	LOGIN
	Terms of Service Privacy Policy
	By logging in you agree to these terms.
Versio	n 1.0.8 Copyright 2018 Nastel Technologies, Inc. All

Figure 6.7-A. Nastel XRay Login

6.7.1 Validating with the Default Repository

If the preconfigured standalone appliance configuration is used, the below screen will appear. By default, the **DefaultRepo** repository will be loaded with a preconfigured dashboard named, **test**.

test * +			H 4 > H	Import Data 1
	V	Summary =		8
Activity Count D D D D Snapshot Count D D D D D D D D D D D D D D D D D D D	Event Count			
Event Severity	Ø	Comparison of Longest Ever	nts	2
KQL> Get number of Event for latest week group by Severity order by Severity	🗸 🗙 🛍 🗹 🔁 🗤	KOL> Compare only diffs Ion	gest 5 Event show as comparetable	≥ 0 🖬 🛱 2 ∨
		Compare		MQXF_CLOSE
		Correlator	32e5cc13-7979-11e8-e85b-000c2988/	781.4140514340415a41522
		EventID	32e804a3-7979-11e8-8852-000c2988	678f
		EventName	MOXF_CLOSE	
		MsgSignature	32e6cc13-7979-11e8-e856-000c2988	5781
		ApiCallerType	MOXACT_EXTERNAL	
		AplEnv	MQXE_OTHER	
		ApplFunction	-	
		ApplFunctionType	MQFUN_TYPE_UNKNOWN	
INFO: 100.00%		ApplType	MQAT_WINDOWS_NT	
		CommandLevel	750	~
		<		>
- Event Scorecard	1 Events 🖉	The 10 Worst Events		2
KQL> Get number of Event for latest hour group by Severity, EventName	ord 도 고 네 씁 값 🗸	KOL> Get worst 10 Event field	ds EventName, max(ElapsedTime), avg(.	- N 9 H # 2 V
Severity + EventName	Events Count			
INFO Streaming-session-shutdown-event	1			
	-			

Figure 6.7.1-A. DefaultRepo Repository

6.7.2 Validating with a New Repository

If a new repository has been created per the instructions in <u>Section 4.2</u>, the below screen will display. The new repository will be loaded with a prompt to create a new dashboard.

•		If it is in Viewlet +
	x	
	Create new Dashboard	
	Dashboard Name	
	Page Layout	
	One Column Two Columns Three Columns	
	Generate Initial viewfets	
	Cancel	

Figure 6.7.2-A. New Repository

On the *Create New Dashboard* prompt, enter a name within the **Dashboard Name** field, select the **Two Columns** layout and uncheck the **Generate Initial Viewlets** checkbox. Click **Create**.

Create new Das	hboard	
Dashboard Name	Test	
Page Layout		
One Column	Two Columns	Three Columns
Generate initial v	iewlets	
Cancel		Create

Figure 6.7.2-B. Create New Dashboard

A new dashboard named **Test**, with no viewlets is displayed:



Figure 6.7.2-C. New Dashboard

Right click on the dashboard tab, and select *Save* to save the new dashboard:



Figure 6.7.2-D. Save New Dashboard

Click **OK** on the following prompt:



Figure 6.7.2-E. Save Confirmation

To create a viewlet, click the blue **Viewlet** button located at the top right of the screen.



Figure 6.7.2-F. Viewlet Button

Select Create Viewlet with jKQL and click create:

Create/Open Viewlet	
 Create Viewlet with jKQL Create Viewlet with a Form Open Existing Viewlet 	
Cancel	Create

Figure 6.7.2-G. Create / Open Viewlet

Within the *Define Query* field, enter 'Get Events'. The UI will create a default viewlet name. Click **Create**.

Create View	vlet	•
Define Query	Get Events	
Viewlet Name	Viewlet 2	
Cancel		Create

Figure 6.7.2-H. Create Viewlet

With the new viewlet created, open the drop down menu and select *Save Viewlet*.

jKQL> Get Events		S I II II S II
		Edit Viewlet
		Save Viewlet
		Save As Viewlet
		Remove Viewlet
	No record found	Delete Viewlet
		Export to CSV

Figure 6.7.2-I. Save Viewlet

Click **OK** on the following prompt to save the viewlet.



Figure 6.7.2-J. Save Confirmation

Right click on the dashboard tab again, and select *Assign to Teams* to modify permissions of the 'Administrators' team.

Test		-		
-	Assign to Teams	Administrators		Summary +
- Viewlet 2	Save	DefaultTeam	Madify Parmission	
jKQL> Get Events	Save As	Operators		
	Set As Default	-		
	Configure			
		No record found	1	

Figure 6.7.2-K. Assign to Teams

6.8 Validate Streaming Data to Nastel XRay

Validate streaming data by running a test stream using the tnt4j-streams package located in <code>\$APIN_HOME/misc/tnt4j-streams/current</code> on the Standalone appliance or the DCN node of the Small Cluster.

First edit the file named tnt4j.properties to set two properties if needed, the properties are; 'event.sink.factory.Url' and 'event.sink.factory.Token'. These properties are already preset for the standalone appliance version, and may or may not need to be updated for the small cluster configuration.

```
>cd $APIN_HOME/misc/tnt4j-streams/current/config
>vi tnt4j.properties
```

These properties are set as follows for the standalone appliance.

```
event.sink.factory.Url: http://localhost:6580
event.sink.factory.Token: DefaultRepo@Nastel
```

If you have created a new org, repo and token as part of configuring the small cluster, you will need to edit the value of event.sink.factory.Token to the value of the token you have created. The value of event.sink.factory.Url does not need to be edited as long **asten4j-streams** is being run on the same host as the DCN.

To test streaming, use the single-log sample provided with the package, by running the **run.sh** script from the following location: \$APIN HOME/misc/tnt4j-streams/current/run/single-log

```
>cd $APIN_HOME/misc/tnt4j-streams/current/run/single-log
> ./run.sh
```

You should see the following in results with no exceptions or errors:

```
[nastel@localhost single-log]$ ./run.sh
2019-05-12 19:05:17,607 INFO [main!StreamsAgent] - jKool TNT4J-Streams
v.1.7.0-20190328102040 (JVM v.18.0_151) session starting as standalone
application...|RUNTIME=8853@localhost.localdomain#SERVER=localhost.local
domain#NETADDR=127.0.0.1#DATACENTER=UNKNOWN#GEOADDR=0,0
2019-05-12 19:05:17,688 INFO [main!StreamsAgent] - Loading TNT4J-
Streams data source configuration from file: tnt-data-source.xml |
```

RUNTIME=8853@localhost.localdomain#SERVER=localhost.localdomain#NETADDR= 127.0.0.1#DATACENTER=UNKNOWN#GEOADDR=0,0

2019-05-12 19:05:20,668 DEBUG [9:FileLineStream:FileStream!JKCloudActivityOutput]'DefaultParseableInpu tStreamOutput' built new tracker instance '69465387-750a-11e9-b652-525400031131' for thread

'9':com.jkoolcloud.tnt4j.TrackingLogger@elc7f0f{logger:TrackerImpl{jid=7 bcefd4c,name=com.jkoolcloud.tnt4j.streams.outputs.AbstractJKCloudOutput, keep.context=false,

sink=com.jkoolcloud.jesl.tnt4j.sink.JKCloudEventSink@12a7f0f9{piped.sink : com.jkoolcloud.tnt4j.sink.impl.slf4j.SLF4JEventSink@753b79e7}{url:

http://localhost:6580, token: xxxxxxxxxxstel, jk.handle: com.jkoolcloud.jesl.net.JKClient@18328448}}

RUNTIME=8853@localhost.localdomain#SERVER=localhost.localdomain#NETADDR= 127.0.0.1#DATACENTER=UNKNOWN#GEOADDR=0,0

2019-05-12 19:05:21,688

INFO[9:FileLineStream:FileStream!JKCloudActivityOutput] - Stream session status (SUCCESS) message sent! |

RUNTIME=8853@localhost.localdomain#SERVER=localhost.localdomain#NETADDR= 127.0.0.1#DATACENTER=UNKNOWN#GEOADDR=0,0

```
2019-05-12 19:05:21,690 DEBUG
[9:FileLineStream:FileStream!JKCloudActivityOutput] - Closing stream
output 'DefaultParseableInputStreamOutput' tracker '69465387-750a-11e9-
b652-525400031131': com.jkoolcloud.tnt4j.TrackingLogger@elc7f0f{logger:
TrackerImpl{jid=7bcefd4c,
name=com.jkoolcloud.tnt4j.streams.outputs.AbstractJKCloudOutput,
keep.context=false,
sink=com.jkoolcloud.jesl.tnt4j.sink.JKCloudEventSink@12a7f0f9{piped.sink
: com.jkoolcloud.tnt4j.sink.impl.slf4j.SLF4JEventSink@753b79e7}{url:
http://localhost:6580, token: xxxxxxxxxstel, jk.handle:
com.jkoolcloud.jesl.net.JKClient@18328448}} |
RUNTIME=8853@localhost.localdomain#SERVER=localhost.localdomain#NETADDR=
127.0.0.1#DATACENTER=UNKNOWN#GEOADDR=0,0
```

```
2019-05-12 19:05:21,756 INFO
[9:FileLineStream:FileStream!FileLineStream] - Stream 'FileStream'
statistics: [activities.total=10, activities.current=10,
activities.skipped=0, activities.filtered=0, activities.lost=0,
bytes.total=978, bytes.streamed=960, time.elapsed=00:00:00.970,
rate.average=10.40aps]|RUNTIME=8853@localhost.localdomain#SERVER=localho
st.localdomain#NETADDR=127.0.0.1#DATACENTER=UNKNOWN#GEOA
```

Now log into the XRay UI, open a temporary viewlet and type in the query "get events for the past hour." You should see two events; one Start and one Stop as per the screenshot.

	Temporary viewlet ×							
јКС	jKQL> get events for the last hour つ 山 曲 ご 🗸				୦ 🔟 🛱 🏹 🗸			
	EventID	ParentID	EventName	EventType	Severity	StartTime	EndTime	ElapsedTime
	6aa4ab3b-750a-11e9-a483		Streaming-session-start-ev	START	1 INFO	5/12/2019, 7:05:20 PM	5/12/2019, 7:05:20 PM	<u>0</u>
	6b58e01a-750a-11e9-a483		Streaming-session-shutdov	STOP	1 INFO	5/12/2019, 7:05:21 PM	5/12/2019, 7:05:21 PM	<u>0</u>

Figure 6.8-A. Start and Stop Events

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Chapter 7: Component Shutdown

All components are shutdown manually or by doing a clean reboot of the OS. Manual shutdowns are done as follows:

Stop Storm Topologies

```
>cd $APIN_HOME/AutoPilotM6/jkool/scripts
>./stop-storm-topology.sh $APIN HOME/storm/current
```

Stop AutoPilot

Web Server

Kill AP WebServer Process (using the shutdown script does not always end the process, so kill must be done).

```
>cd $APIN_HOME/AutoPilotM6/apache-tomcat7
>bin/shutdown.sh
```

- CEP Server
 Kill the ATPNODE Process
- Domain Server Kill the ATPNAMES Process

Stop Storm Components

The following command returns the 5 running Storm processes:

>ps -ef |grep storm

Kill all Storm processes:

- Storm Nimbus (and spawned child processes)
- Storm Supervisor
- Storm UI

Stop ActiveMQ

```
>cd $APIN_HOME/actmq/current
>./activemq stop
```

Stop Kafka

```
>cd $APIN_HOME/kafka/current
>bin/kafka-server-stop.sh
```

Stop Solr

```
>cd $APIN_HOME/solr/current/bin
>./solr stop -all
>./solr2 stop -all
```

Stop ZooKeeper

./zkServer.sh stop

Chapter 8: Troubleshooting

A script runs to collect and compress all log files into a **tar.gz** file for Nastel Support. The best place to locate issues is the log files for each component. The log file locations for each component are listed in the table below.

Table 8-1. Log File Locations			
Component	Log File Location		
Solr	\$APIN_HOME/solr/solr/var/logs		
Kafka	\$APIN_HOME/kafka/current/logs		
	\$APIN_HOME/kafka-data-logs		
ActiveMQ	<pre>\$APIN_HOME/actmq/current/activemq.logcd</pre>		
ZooKeeper	<pre>\$APIN_HOME/zookeeper/current/bin/zookeeper.[log out]</pre>		
Storm	<pre>\$APIN_HOME/storm/apache-storm-0.9.5/logs</pre>		
	Note : worker-* files are for the Nastel XRay subscription and trigger topologies. Others are for Storm.		
AutoPilot/XRay	\$APIN_HOME/AutoPilotM6/logs/log4j		
	<pre>\$APIN_HOME/AutoPilotM6/apache-tomcat7/logs</pre>		

8.1 Installation Errors

The following are potential errors that could appear during installation:

Table 8-2. Installation Errors			
Error	Error Possible Resolution		
There are no queues in Active MQ.	Within the global.properties file located in \$APIN_HOME/AutoPilotM6, confirm that the correct value is set for the following property: jkool.service.conn.str=localhost:61616		
	If ActiveMQ is running on a local machine, use the address, localhost: 61616.		
	If ActiveMQ is not on a local machine, use the server address of where ActiveMQ is running: jkool.service.conn.str= <server_address>:61616</server_address>		
The topology does not have workers.	Repeat the configuration of Storm and upload the topologies. See <u>Section</u> <u>5.1.3</u> and <u>Section 6.5</u> for more information.		
The expert(s) is/are	Kafka		
stopped in AutoPilot.	Confirm Kafka is running.		
	Check whether or not there are created topics in Kafka.		
	• If Kafka is not running properly, search for the following within the node.properties file:		

jkool.kafka.server=< <i>kafka_server_address</i> >:9092
If it is missing, Nastel XRay will search for Kafka within localhost:9092.
AutoPilot
• Try to start the experts in AutoPilot via M6 Enterprise Manager.

8.2 ZooKeeper Error

Issue: An error similar to the following is encountered.

```
2019-06-20 02:32:11,401 [myid:3] - INFO [main:FileSnap@86] - Reading
snapshot /local/home/venomhq/apinsight/nastel/zookeeper2/zoo data/version-
2/snapshot.11b500009387
2019-06-20 02:32:11,599 [myid:3] - ERROR [main:Util@214] - Last transaction
was partial.
2019-06-20 02:32:11,601 [myid:3] - ERROR [main:QuorumPeer@692] - Unable to
load database on disk
java.io.IOException: The accepted epoch, 12ab is less than the current
epoch, 12ac
        at
org.apache.zookeeper.server.quorum.QuorumPeer.loadDataBase(QuorumPeer.java:6
89)
2019-06-20 02:32:11,603 [myid:3] - ERROR [main:QuorumPeerMain@92] -
Unexpected exception, exiting abnormally
java.lang.RuntimeException: Unable to run quorum server
        at.
org.apache.zookeeper.server.quorum.QuorumPeer.loadDataBase(QuorumPeer.java:6
93)
Caused by: java.io.IOException: The accepted epoch, 12ab is less than the
current epoch, 12ac
        at.
org.apache.zookeeper.server.quorum.QuorumPeer.loadDataBase(QuorumPeer.java:6
89)
        ... 4 more
```

Resolution: Run the following command.

cp currentEpoch acceptedEpoch

Restart Solr and allow it to recover.

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