

LAB ASSIGNMENT - 5

Name: Ashwin Balaji

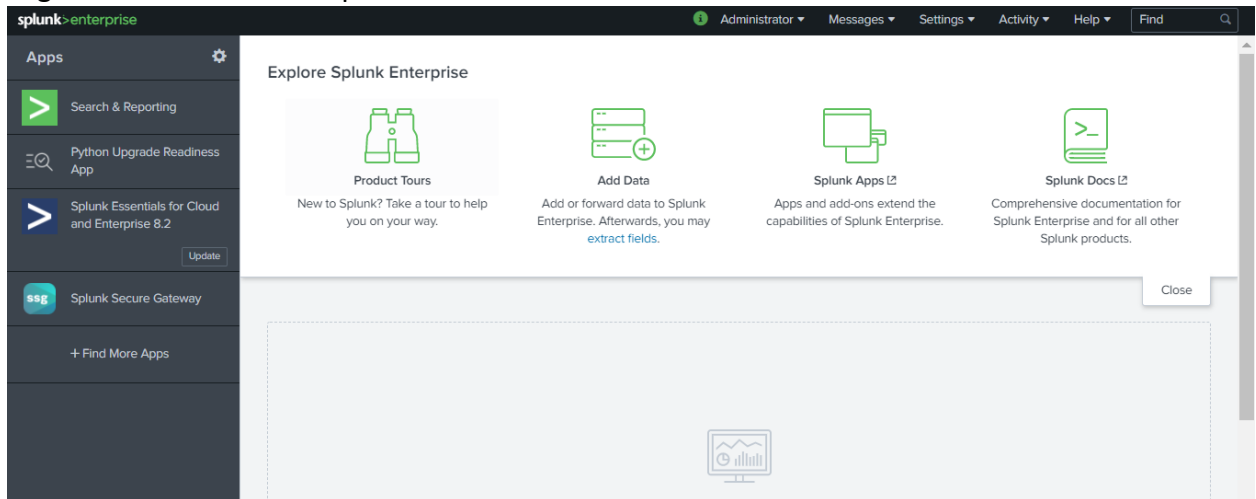
Roll Number: 2020PMD4221

Course: M.Tech (Mobile Computing and Data Analytics)

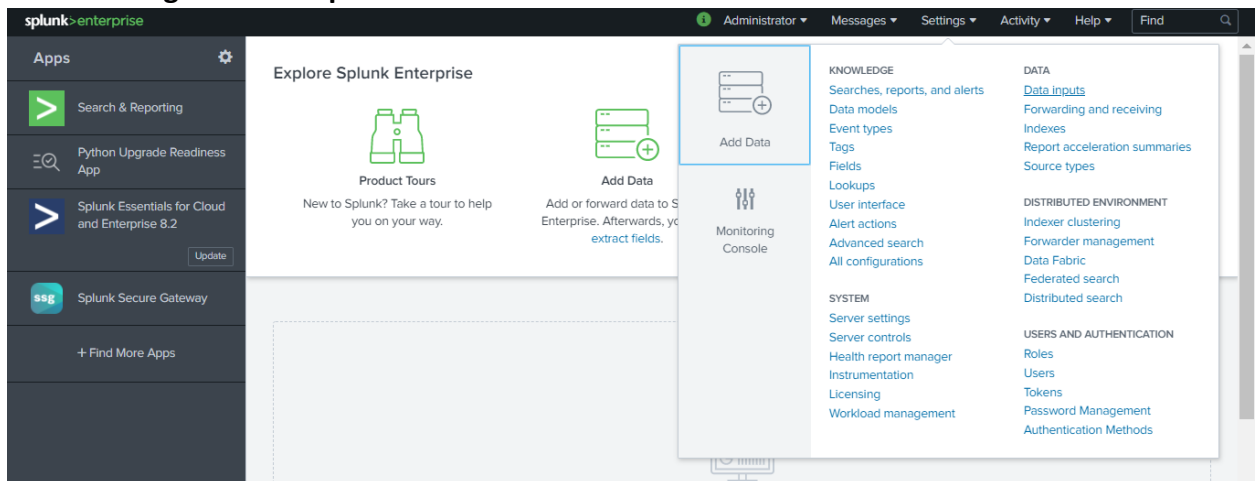
Title: To perform the Log analysis using SPLUNK

Theory:

1. Download [SPLUNK Enterprise](#)
2. Login with username and password



3. Go to **Settings -> Data Inputs**



4. Here we might encounter **Local Inputs and Forward Inputs**

Set up data inputs from files and directories, network ports, and scripted inputs. If we want to set up forwarding and receiving between two Splunk instances, go to Forwarding and receiving.

splunk>enterprise Apps ▾ Administrator ▾ Messages ▾ Settings ▾ Activity ▾ Help ▾ Find 🔍

Data inputs

Set up data inputs from files and directories, network ports, and scripted inputs. If you want to set up forwarding and receiving between two Splunk instances, go to [Forwarding and receiving](#).

Local inputs

Type	Inputs	Actions
Local event log collection Collect event logs from this machine.	-	Edit
Remote event log collections Collect event logs from remote hosts. Note: this uses WMI and requires a domain account.	1	+ Add new
Files & Directories Index a local file or monitor an entire directory.	11	+ Add new
Local performance monitoring Collect performance data from local machine.	0	+ Add new
Remote performance monitoring Collect performance and event information from remote hosts. Requires domain credentials.	0	+ Add new

Forwarded inputs

Type	Inputs	Actions
Windows Event Logs Collect event logs from forwarders.	0	+ Add new
Files & Directories Monitor files or directories on forwarders.	0	+ Add new
Windows Performance Monitoring Collect performance data from forwarders.	0	+ Add new
TCP Configure a forwarder to listen on a TCP port for incoming data.	0	+ Add new
UDP Configure a forwarder to listen on a UDP port for incoming data.	0	+ Add new
Scripts Collect data from scripts installed on forwarders.	0	+ Add new

- A) We will be starting with **Data Inputs -> Files & Directories**
- i) Like we can **Index a local file or monitor an entire directory**

splunk>enterprise Apps ▾ Administrator ▾ Messages ▾ Settings ▾ Activity ▾ Help ▾ Find 🔍

Files & directories

[Data inputs](#) > Files & directories New Local File & Directory

Showing 1-11 of 11 items filter 🔍 25 per page ▾

Full path to your data ▾	Set host ▾	Source type ▾	Index ▾	Number of files ▾	App ▾	Status ▾	Actions
\$SPLUNK_HOME/etc/splunk/version	Constant Value	splunk_version	_internal	1	system	Enabled Disable	
\$SPLUNK_HOME/etc/log/introspection	Constant Value	Automatic	_introspection	13	introspection_generator_addon	Enabled Disable	
\$SPLUNK_HOME/etc/log/splunk	Constant Value	Automatic	_internal	69	system	Enabled Disable	
\$SPLUNK_HOME/etc/log/splunk/license_usage_summary.log	Constant Value	Automatic	_telemetry	1	system	Enabled Disable	
\$SPLUNK_HOME/etc/log/splunk/splunk_instrumentation_cloud.log*	Constant Value	splunk_cloud_telemetry	_telemetry	1	system	Enabled Disable	
\$SPLUNK_HOME/etc/log/watchdog/watchdog.log*	Constant Value	Automatic	_internal	1	system	Enabled Disable	
\$SPLUNK_HOME/etc/run/splunk/search_telemetry/*search_telemetry.json	Constant Value	search_telemetry	_introspection	0	system	Enabled Disable	
\$SPLUNK_HOME/etc/spool/splunk	Constant Value	Automatic	default		system	Disabled Enable	

- ii) Click on **Files & Directories -> New Local File & Directory**
- iii) Setup the source where we want to perform analysis

Source -> C:\Windows\Logs

iv) Optionally we can add **blacklist and whitelist** for filtering purposes -> Click **Next**

The screenshot shows the 'Add Data' configuration wizard in Splunk. The progress bar at the top indicates the 'Select Source' step is complete, followed by 'Input Settings', 'Review', and 'Done'. The left sidebar lists various data sources: Local Event Logs, Remote Event Logs, Files & Directories (selected), HTTP Event Collector, TCP / UDP, and Local Performance Monitoring. The main panel for 'Files & Directories' provides instructions on how to monitor files and directories. It includes a text input field for 'File or Directory' with the value 'C:\Windows\Logs' and a 'Browse' button. Below this, there are optional fields for 'Whitelist' and 'Blacklist', both set to 'optional'. A note states: 'Data preview will be skipped, it is not supported for directories.'

v) **We can optionally specify input settings like source type, App context, Host type and Index**

Source Type: The source type is one of the default fields that the Splunk platform assigns to all incoming data. It tells the Splunk platform what kind of data you've got, so that the Splunk platform can format the data intelligently during indexing. And it's a way to categorize your data, so that you can search it easily.

App Context: Application contexts are folders within a Splunk platform instance that contain configurations for a specific use case or domain of data. App contexts improve manageability of input and source type definitions. The Splunk platform loads all app contexts based on precedence rules

✓ **Here I have used Search & Reporting context**

Host: When the Splunk platform indexes data, each event receives a "host" value. The host value should be the name of the machine from which the event originates. The type of input you choose determines the available configuration options

Index: The Splunk platform stores incoming data as events in the selected index. Consider using a "sandbox" index as a destination if you have problems determining a source type for your data. A sandbox index lets you troubleshoot your configuration without impacting production indexes.

Input Settings

Optionally set additional input parameters for this data input as follows:

Source type

The source type is one of the default fields that the Splunk platform assigns to all incoming data. It tells the Splunk platform what kind of data you've got, so that the Splunk platform can format the data intelligently during indexing. And it's a way to categorize your data, so that you can search it easily.

Automatic Select New

App context

Application contexts are folders within a Splunk platform instance that contain configurations for a specific use case or domain of data. App contexts improve manageability of input and source type definitions. The Splunk platform loads all app contexts based on precedence rules. [Learn More](#)

App Context

Apps Browser (appsbrowser) ▼

Host

When the Splunk platform indexes data, each event receives a "host" value. The host value should be the name of the machine from which the event originates. The type of input you choose determines the available configuration options. [Learn More](#)

☒ Constant value
☐ Regular expression on path
☐ Segment in path

Index

The Splunk platform stores incoming data as events in the selected index. Consider using a "sandbox" index as a destination if you have problems determining a source type for your data. A sandbox index lets you troubleshoot your configuration without impacting production indexes. You can always change this setting later. [Learn More](#)

Index

Default ▼

Create a new index

vi) Review the settings/configuration -> Click Submit

Add Data

Select Source

Input Settings

Review

Done

< Back

Submit >

Review

Input Type	Directory Monitor
Source Path	C:\Windows\Logs
Whitelist	N/A
Blacklist	N/A
Source Type	Automatic
App Context	search
Host	DESKTOP-U8HOJ5N
Index	1CS_Log_Analysis

vii) After finishing up the setup -> Click on Start Searching

✓

File input has been created successfully.
Configure your inputs by going to Settings > [Data Inputs](#)

Start Searching

Search your data now or see [examples and tutorials](#).

Add More Data

Add more data inputs now or see [examples and tutorials](#).

Download Apps

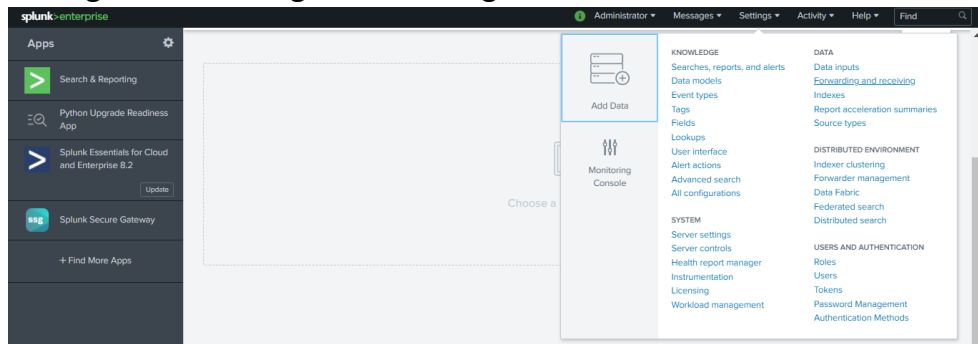
Apps help you do more with your data. [Learn more](#).

Build Dashboards

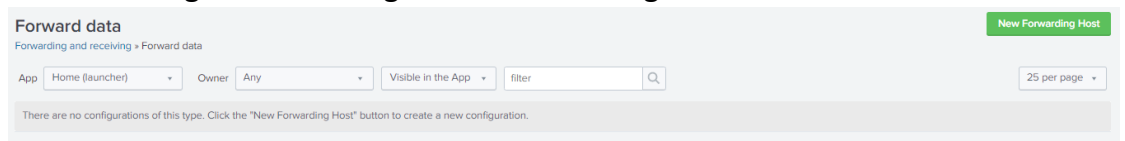
Visualize your searches. [Learn more](#).

B) Next to setup **forwarding and receiving (For multiple machines in a network other than localhost)**

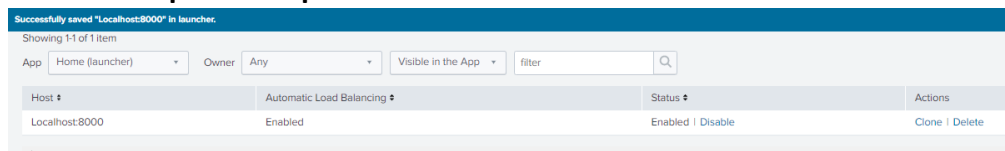
i) **Settings -> Forwarding and Receiving**



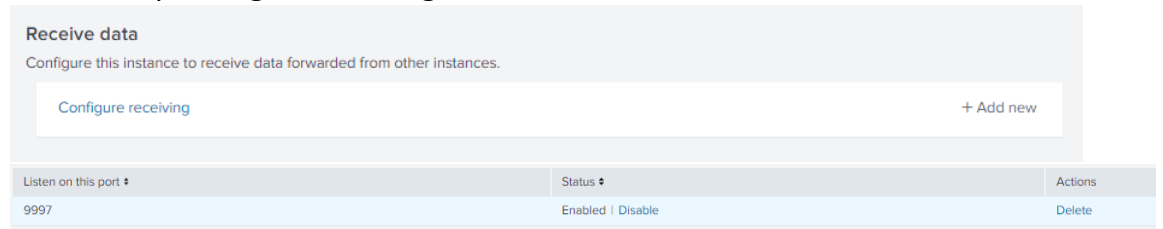
ii) **Click on Configure forwarding -> New Forwarding Host**



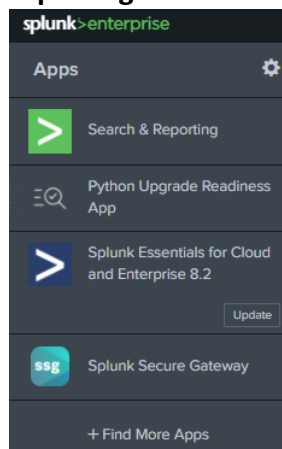
iii) **Define Host port or IP port of other machine -> Save**

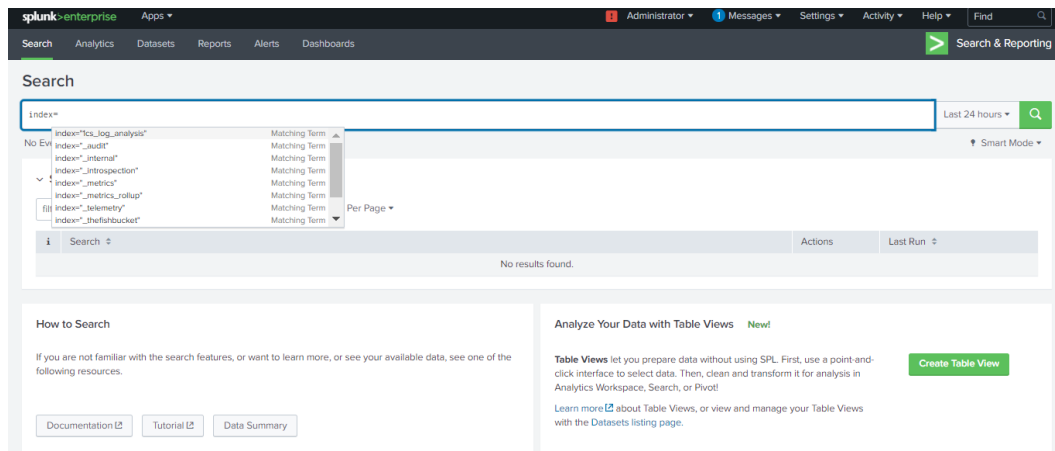


iv) **Similarly, configure receiving data for a different machine -> Save**

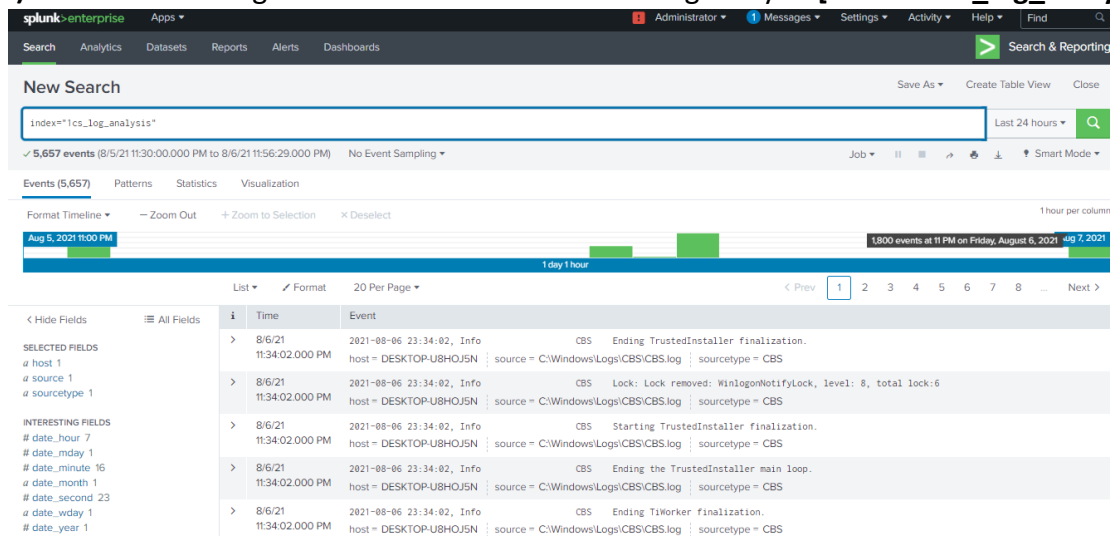


C) **Click on Search & Reporting in the homepage -> Search History**





i) Here we might find the index we made for log analysis [index="1cs_log_analysis"]



ii) We can find the **events occurred** by altering timeline e.g., last 24 hours etc.

iii) We can add **interesting field** for analysis

< Hide Fields All Fields

SELECTED FIELDS

- a host 1
- a source 1
- a sourcetype 1

INTERESTING FIELDS

- # date_hour 7
- # date_mday 1
- # date_minute 16
- a date_month 1
- # date_second 23
- a date_vday 1
- # date_year 1
- a date_zone 1
- a index 1
- # linecount 1
- a punct 66
- a splunk_server 1
- # timeendpos 1
- # timestartpos 1

7 more fields

+ Extract New Fields

punct

66 Values, 100% of events

Selected

Reports

Top values Top values by time Rare values


Events with this field

Top 10 Values	Count	%
-----	3,072	54.304%
-----	462	8.167%
-----	414	7.318%
-----	180	3.182%
-----	156	2.758%
-----	153	2.705%
-----	120	2.121%
-----	120	2.121%
-----	108	1.909%
-----	81	1.432%

iv) In pattern field we can identify the patterns related to the logs

✓ 5,657 events (8/5/21 11:30:00.000 PM to 8/6/21 11:56:29.000 PM) No Event Sampling ▼

Events (5,657) **Patterns** Statistics Visualization

Smaller  Larger

5 patterns based on a sample of 3,968 events

75.86%	<timestamp>, Info CBS Appl: Evaluating package applicability for package Microsoft-Windows-LanguageFeatures-Basic-af-za-Package~31bf3856ad364e35~amd64~~10.0.19041.1, applicable state: Installed
6.75%	<timestamp>, Info CBS Appl: detect Parent, Package: Microsoft-Windows-WMI-SNMP-Provider-Client-Package~31bf3856ad364e35~amd64~~10.0.19041.1, Parent: Microsoft-Windows-Client-Features-Package~31bf3856ad364e35~amd64~~10.0.19041.1, Disposition = Detect, VersionComp: EQ, BuildComp: GE, RevisionComp: GE, Exist: present
3.98%	<timestamp>, Info CBS CbsCoreFinalize: WdsUnload, logging from cbscore will end.
2.44%	<timestamp>, Info CBS Lock: Lock removed: WinlogonNotifyLock, level: 8, total lock:6
0.76%	<timestamp>, Info CSI 00000001@2021/8/6:18:01:59.985 WcpInitialize: wcp.dll version 10.0.19041.1081 (WinBuild.160101.0800)

75.86%

timestamp, Info CBS Appl: Evaluating package applicability for package Microsoft-Windows-LanguageFeatures-Basic-af-za-Package~31bf3856ad364e35~amd64~~10.0.19041.1, applicable state: Installed

6.75%

timestamp, Info CBS Appl: detect Parent, Package: Microsoft-Windows-WMI-SNMP-Provider-Client-Package~31bf3856ad364e35~amd64~~10.0.19041.1, Parent: Microsoft-Windows-Client-Features-Package~31bf3856ad364e35~amd64~~10.0.19041.1, Disposition = Detect, VersionComp: EQ, BuildComp: GE, RevisionComp: GE, Exist: present

3.98%

timestamp, Info CBS CbsCoreFinalize: WdsUnload, logging from cbscore will end.

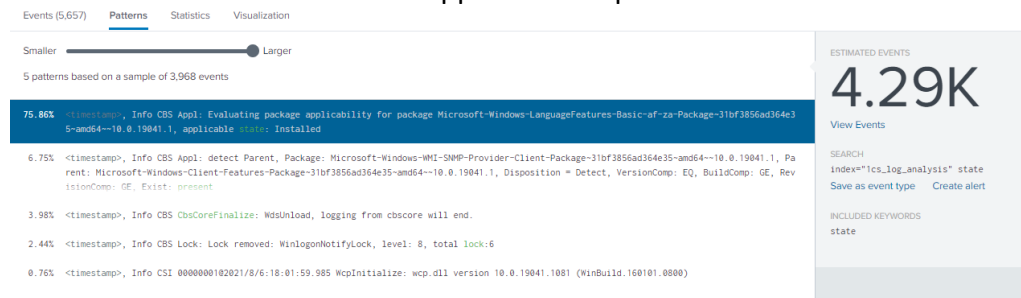
2.44%

timestamp, Info CBS Lock: Lock removed: WinlogonNotifyLock, level: 8, total lock:6

0.76%

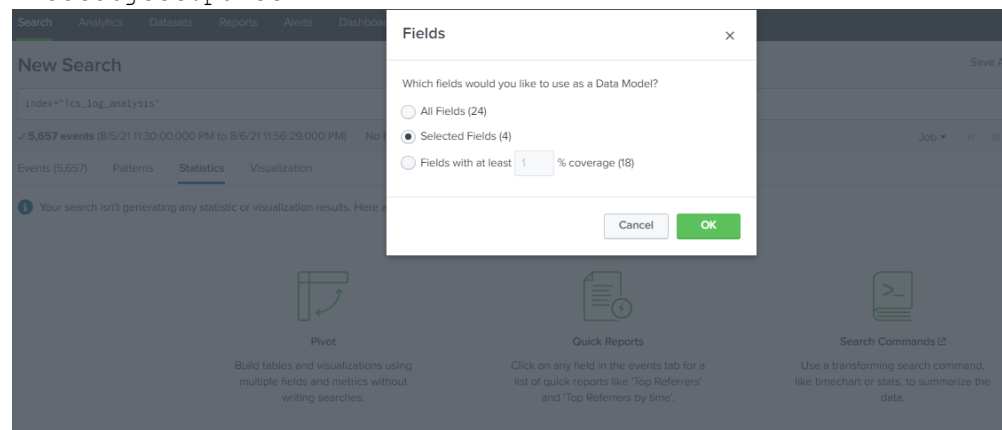
timestamp, Info CSI 00000001@2021/8/6:18:01:59.985 WcpInitialize: wcp.dll version 10.0.19041.1081 (WinBuild.160101.0800)

v) We can count the total events happened for a pattern



vi) We can find the statistical analysis of the logs

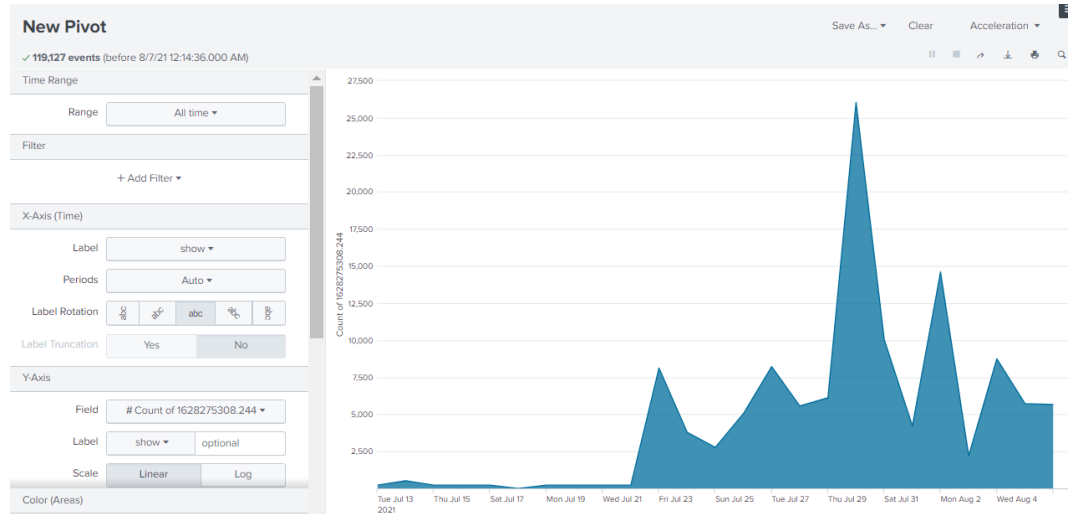
Queries Example: `index= "main" Type= information | stats count by date_hour (index=* OR index=*) (index="lcs_log_analysis") | rename punct AS RootObject.punct | fields "_time" "host" "source" "sourcetype" "RootObject.punct"`



v) We can make a pivot chart based on the fields we want which can be selected here in this dialog box.



vi) We can visualize the information using graphs like line chart, pie chart, area chart, meter gauge , temperature gauge , bubble chart etc.



vii) We can **export, share and print** the graph result from top right corner or **save it in the dashboard**.

Save As Dashboard Panel ×

Dashboard

Dashboard Title

Dashboard ID
The dashboard ID can only contain letters, numbers, dashes, and underscores. Do not start the dashboard ID with a period.

Dashboard Description

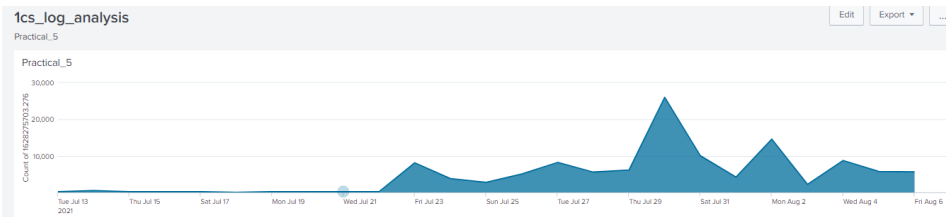
Dashboard Permissions

Panel Title

Panel Powered By

Drilldown

Panel Content



viii) We can understand the health of the system using splunk administrator

Health Status of Splunkd

X

splunkd

Data Forwarding

Splunk-2-Splunk Forwarding

TCPOutAutoLB-0

File Monitor Input

BatchReader-0

Ingestion Latency

TailReader-0

Index Processor

Buckets

Disk Space

Index Optimization

Search Scheduler

Search Lag

Searches Delayed

Searches Skipped

Workload Management

TCPOutAutoLB-0

Root Cause(s):

- More than 70% of forwarding destinations have failed. Ensure your hosts and ports in outputs.conf are correct. Also ensure that the indexers are all running, and that any SSL certificates being used for forwarding are correct.

Generate Diag

Last 50 related messages:

- 08-07-2021 00:27:45.927 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:27:26.081 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:27:06.239 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:26:46.317 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:26:26.450 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:26:06.599 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:25:46.718 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out
- 08-07-2021 00:25:26.853 +0530 WARN AutoLoadBalancedConnectionStrategy [10608 TcpOutEloop] - Cooked connection to ip=127.0.0.1:8000 timed out

Health Status of Splunkd

X

splunkd

Data Forwarding

Splunk-2-Splunk Forwarding

TCPOutAutoLB-0

File Monitor Input

BatchReader-0

Ingestion Latency

TailReader-0

Index Processor

Buckets

Disk Space

Index Optimization

Search Scheduler

Search Lag

Searches Delayed

Searches Skipped

Workload Management

Ingestion Latency

Root Cause(s):

- Events from tracker.log have not been seen for the last 2310 seconds, which is more than the red threshold (210 seconds). This typically occurs when indexing or forwarding are falling behind or are blocked.

Generate Diag

Last 50 related messages:

- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Windows\Logs.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\var\spool\splunk.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\var\run\splunk\search_telemetry.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\var\log\watchdog.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\var\log\splunk.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\var\log\introspection.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Adding watch on path: C:\Program Files\Splunk\etc\splunk.version.
- 08-06-2021 22:29:39.905 +0530 INFO TailingProcessor [8024 MainTailingThread] - Parsing configuration stanza: monitor://C:\Windows\Logs.

5. Playing with the Dashboards like we can have the detailed analysis of dashboard contents

Dashboards

Dashboards include searches, visualizations, and input controls that capture and present available data.

Create New Dashboard

Latest Resources

Examples for Dashboard Studio

Browse examples of dashboards & visualizations. Visit Example Hub

Intro to Dashboard Studio

Learn how to build dashboards with Dashboard Studio. Learn More

Intro to Classic Dashboards

Learn how to build traditional Simple XML dashboards. Learn More

9 Dashboards

All

Yours

This App's

filter

Q

	Title	Actions	Owner	App	Sharing	Type
>	ics_log_analysis	Edit	ashwin52	search	Private	Classic
>	End-to-End Websocket Test	Edit	nobody	splunk_secure_gate...	Global	Classic
>	Integrity Check of Installed Files	Edit	nobody	search	App	Classic
>	Job Details Dashboard	Edit	nobody	search	App	Classic
>	Orphaned Scheduled Searches, Reports, and Alerts	Edit	nobody	search	App	Classic
>	Request Tracing	Edit	nobody	splunk_secure_gate...	Global	Classic
>	Secure Gateway Status Dashboard	Edit	nobody	splunk_secure_gate...	Global	Classic
>	Single Value Test	Edit	nobody	splunk_secure_gate...	Global	Classic
>	Subscription Tracing	Edit	nobody	splunk_secure_gate...	Global	Classic

6. In the **Reports** tab, we can identify the log report based for a specific timeline

Reports

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

6 Reports All Yours This App's Q





i	Title ^	Actions	Next Scheduled Time ↕	Owner ↕	App ↕	Sharing ↕
>	Errors in the last 24 hours	Open in Search Edit ▾	None	nobody	search	App
>	Errors in the last hour	Open in Search Edit ▾	None	nobody	search	App
>	License Usage Data Cube	Open in Search Edit ▾	None	nobody	search	App
>	Messages by minute last 3 hours	Open in Search Edit ▾	None	nobody	search	App
>	Orphaned scheduled searches	Open in Search Edit ▾	None	nobody	search	App
>	Splunk errors last 24 hours	Open in Search Edit ▾	None	nobody	search	App

7. Scrutinizing the **data summary**

Data Summary ×

Hosts (1) **Sources (3)** Sourcetypes (1)

Q

Source ↕	 ▾	Count ↕	Last Update ↕
C:\Windows\Logs\CBS\CBS.log	 ▾	39,123	8/6/21 10:06:49.000 PM
C:\Windows\Logs\CBS\CbsPersist_20210731163517.log	 ▾	72,701	8/6/21 10:06:52.000 PM
C:\Windows\Logs\DISM\dism.log	 ▾	5,503	8/6/21 10:06:52.000 PM