OPEN DAYLIGHT SUMMIT

Troubleshooting ODL using Log analyser

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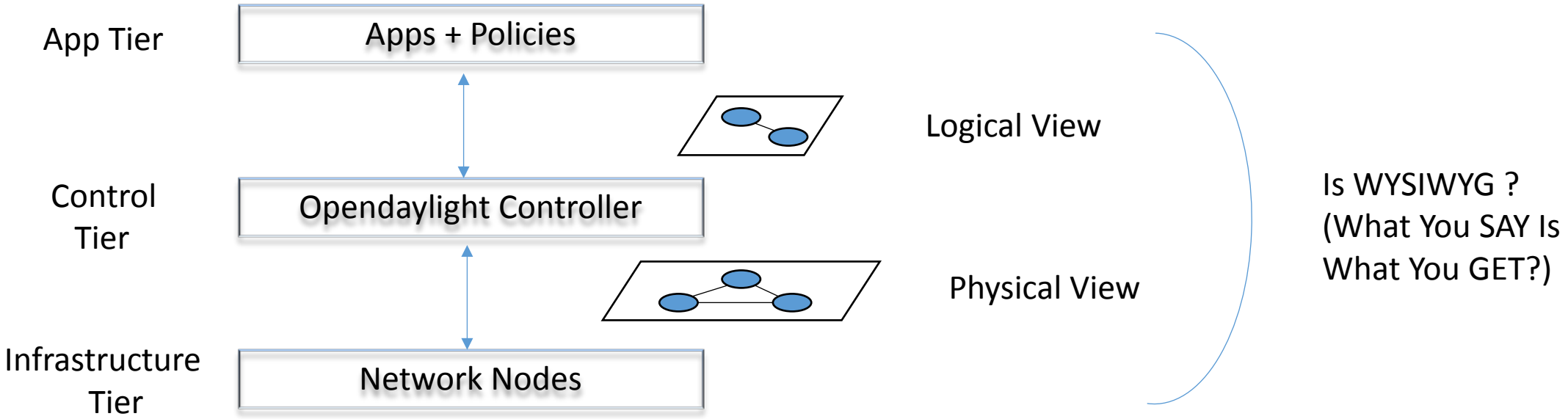
Agenda

- Troubleshooting challenges
- Troubleshooting using log analyzer
- ELK overview
- Installation and configuration
- Demo

SDN Deployment



ODL Troubleshooting Challenges

- Challenges
  - Competence areas
    - Varied nature of projects and competence
    - Correlation of events at various stages to debug a problem
      - (NSF -> MDSAL -> PLUGIN)
  - Module state detection/Race condition
    - Bundle dependency and related issues
  - Log messages issues
    - Sheer volume of log messages

SDN Troubleshooting Challenges

- Complexity at each stage
  - App level
    - Scope limited to analysis of NBI Calls
  - Control tier level
    - Scope limited to analysis of inter module messages and southbound plugin messages
  - Infrastructure level
    - Device specific logs
- Correlation of logs
  - Complex due to different level of abstraction

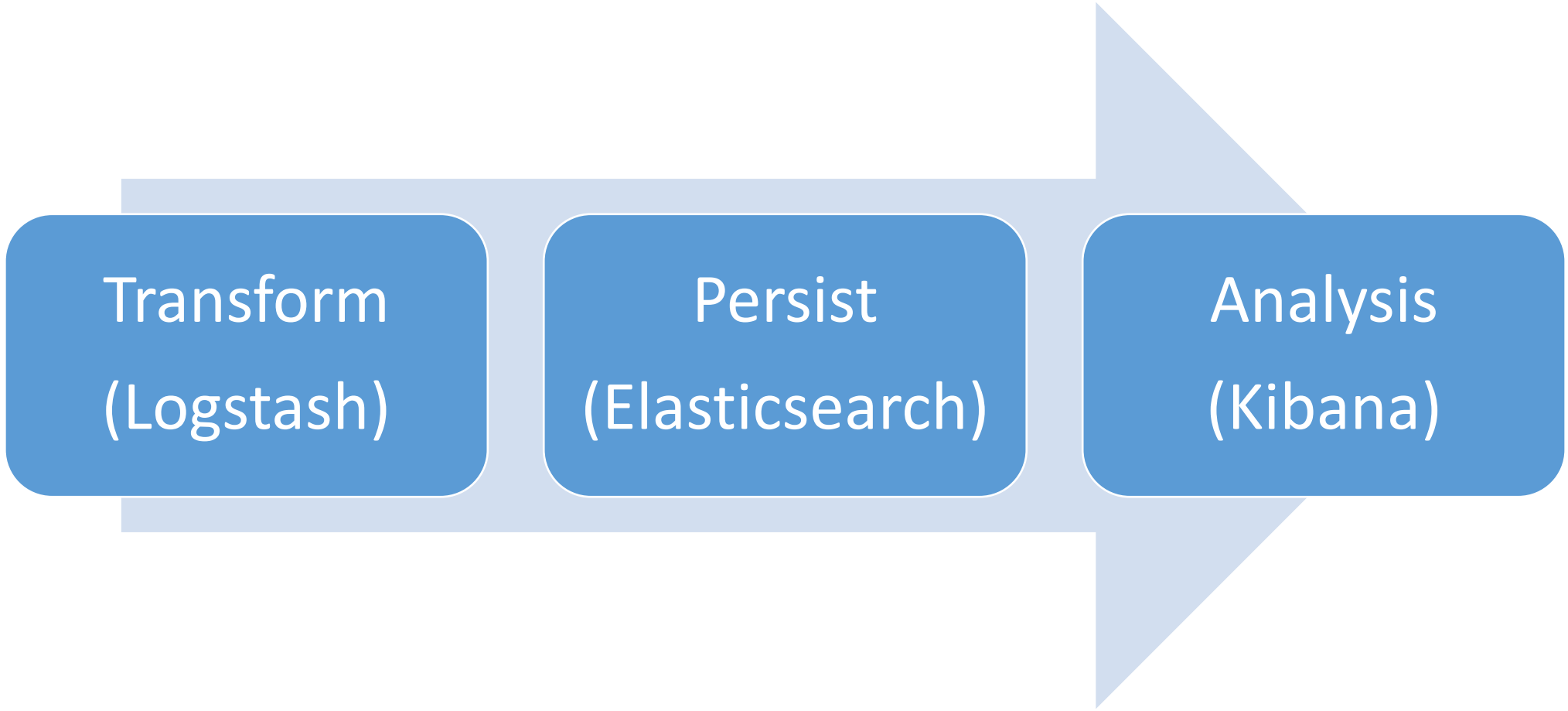
Log analyzer (Warning : Trivial facts)

- Benefits- Log contains extensive volume of useful information as listed below that can be mined to arrive at conclusion
  - Module startup
  - State transition information
  - Exceptions and errors …
- Conventional method – Tail, Awk, sed
  - Time consuming
  - Correlation is difficult
- Automatic log analyzer – Splunk, ELK
  - Powerful and has variety of plugins for transformation and visualization
  - Proactive fault detection

Troubleshooting using log analysis

- Multiphased approach
  - Tiered log analysis
    - Use ELK to do the initial level of log analysis
  - Correlation
    - Define rules for correlation
  - Machine learning
    - Using WEKA for predictive issue reporting

Steps


Transform
(Logstash)
Persist
(Elasticsearch)
Analysis
(Kibana)

ELK

- Elastic Search
  - Store the data that LogStash processed and provide full-text index
- Logstash
  - Collecting and parsing log files. Transform unstructured log into meaningful and searchable
- Kibana
  - Web console for user to interact with Elasticsearch

ELK components

- Logstash
  - Input
    - File, syslog, **log4j**, redis, websocket,
  - Filter
    - Clone, drop, grok, mutate, geoip
  - Output
    - **Elasticsearch**, graphine, statsd, file
- Elasticsearch
  - Mapping
  - SearchAPI
  - Aggregations
    - Bucketizes based on various category
- Kibana
  - Discover
  - Visualize

Prerequisite for ODL

Edit etc/org.ops4j.pax.logging.cfg

Change rootlogger line to "log4j.rootLogger=INFO, out, ELKTransform, osgi:*"

log4j.appender.ELKTranform=org.apache.log4j.net.SocketAppender
log4j.appender.ELKTransform.port=9500
log4j.appender.ELKTransform.remoteHost=127.0.0.1

Logstash

Installation

- sudo wget http://download.elastic.co/logstash/logstash/packages/debian/logstash_1.5.3-1_all.deb
- sudo dpkg -i logstash_1.5.3-1_all.deb
- sudo update-rc.d logstash defaults 95 10

Logstash

- Edit /etc/logstash/conf.d/karaf.conf

```
input {
    log4j {
        mode => "server"
        port => 9500
    }
}
output {
  elasticsearch {
  host=> "localhost"
}
}
```

- logstash –f /etc/logstash/conf.d/karaf.conf

Elasticsearch

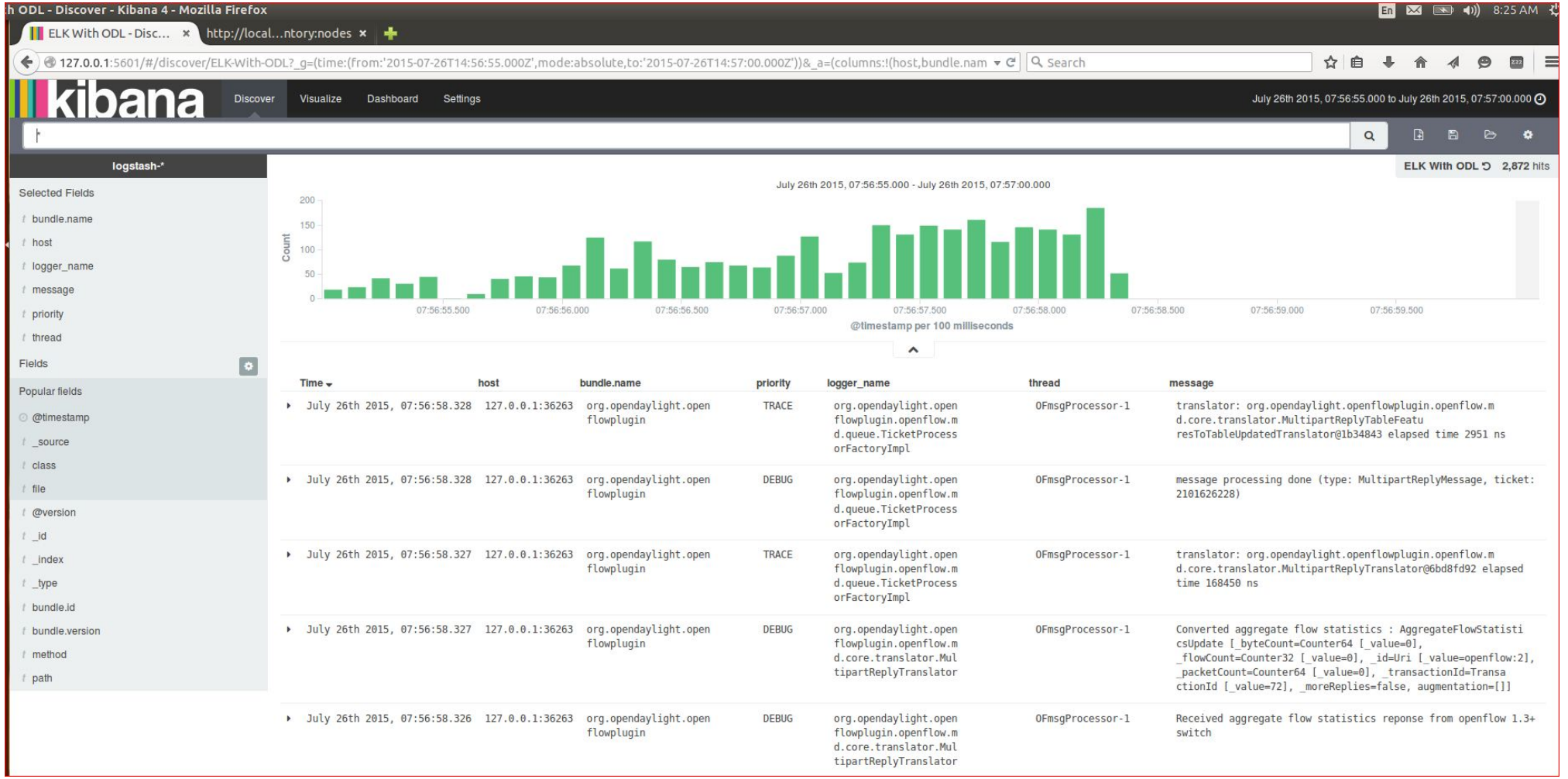
- sudo wget https://download.elastic.co/elasticsearch/elasticsearch/elasticsearch-1.7.0.deb
- sudo dpkg -i elasticsearch-1.7.0.deb
- sudo update-rc.d elasticsearch defaults 95 10
- Add network.host:localhost to /etc/elasticsearch/elasticsearch.yml
- sudo /etc/init.d/elasticsearch restart

Kibana

- sudo wget https://download.elasticsearch.org/kibana/kibana/kibana-4.1.1-linux-x64.tar.gz
- sudo tar xvfz kibana-4.1.1-linux-x64.tar.gz
- sudo **ln** -s kibana-4.1.1-linux-x64 kibana
- Edit kibana.yml
  - Port:5601
  - Host:”localhost”

DEMO

ELK + ODL



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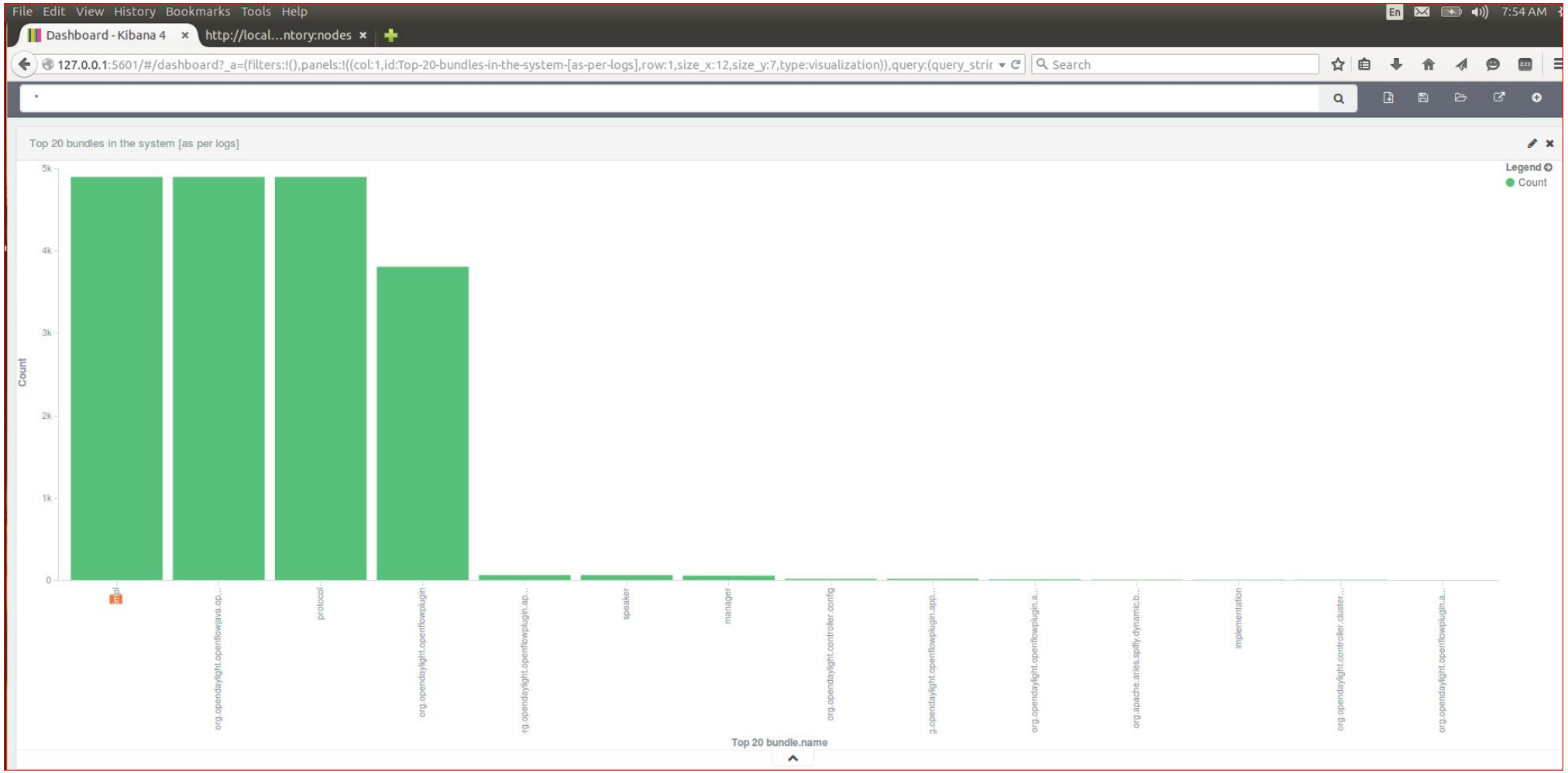
ELK + ODL



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Thank You

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