04 - Spark Development Process

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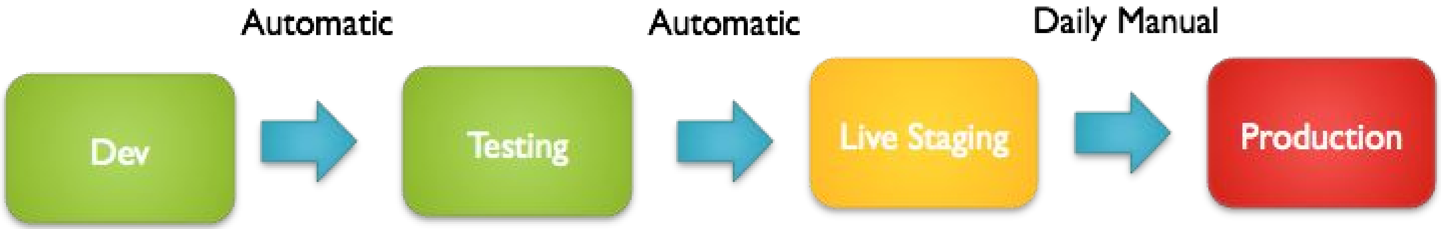
Panorays

Running environments

- □**Development – Testing – Production**
  - Don’t you need more?
    Be as flexible as you can
- □Cluster Utilization
  - **Unified Cluster for all environments** vs. **Cluster per Environment**
  - (Cluster per Data Center)
- □Configuration
  - Local Files vs. Distributed

DevOps - Keep It Simple Stupid!

- □Linux
  - Bash scripts
  - Crontab
- Automation via Jenkins
- □Continuous Deployment – with every GIT push



Dev → Testing (Automatic) → Live Staging (Automatic) → Production (Daily Manual)

Build Automation

- □Maven Sonatype Nexus
  - Sonatype Nexus artifact management
- Jenkins
  - Deploy and Script generation scripts
  - Per Environment Testing
  - Data Validation
  - Scheduled Tasks

Workflow Management

- □Oozie – Very hard to integrate with Spark
    - XML configuration based and not that convenient
- Azkaban (Haven’t tried it)

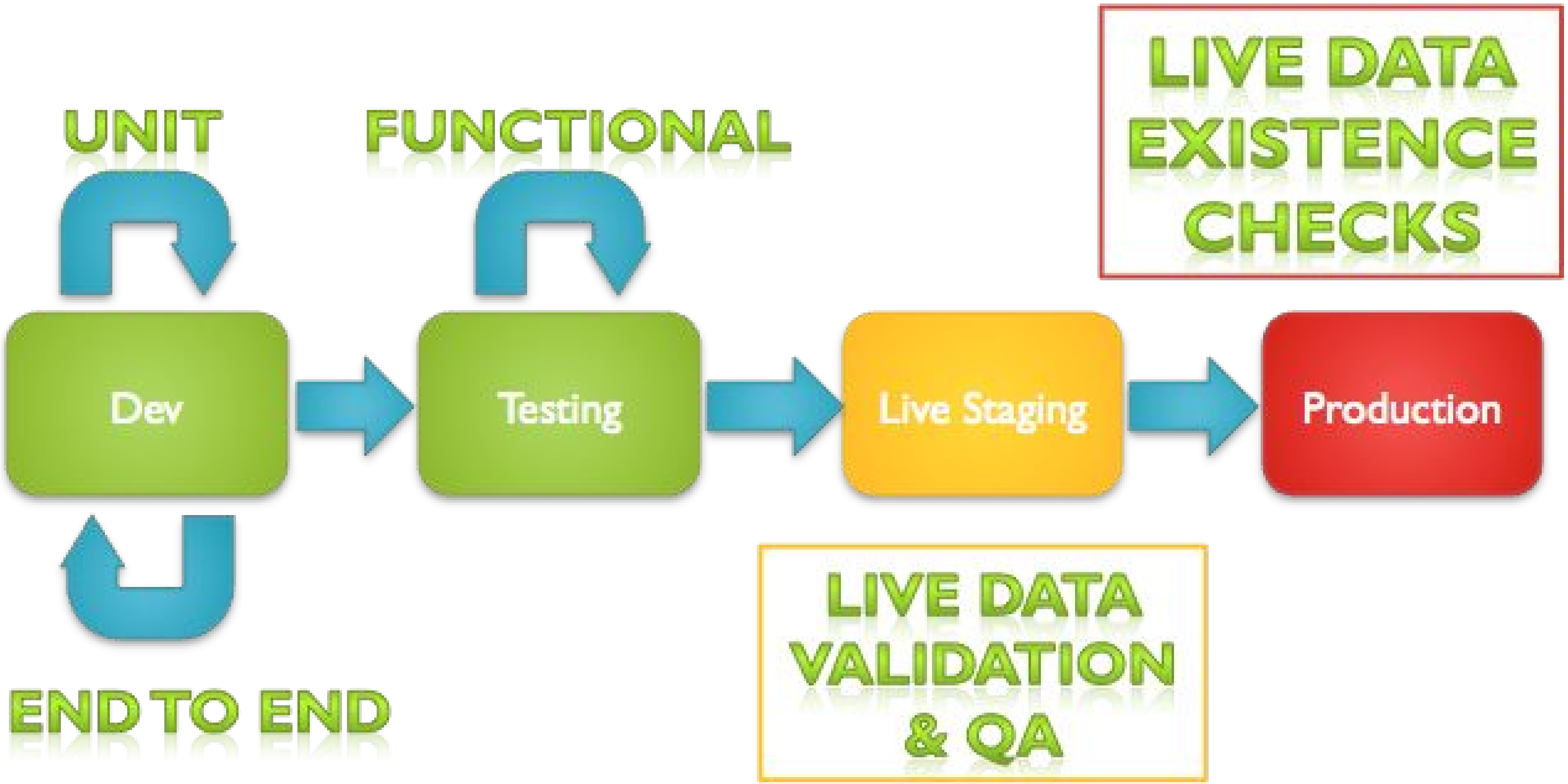
□Chosen:

- Luigi
- Crontab + Jenkins (KISS again)

Testing

- **□Unit**
  - JUnit tests that run on the Spark “Functions”
- **End to End**
  - Simulate the full execution of an application on a single JVM (local mode) – Real input, Real output
- **Functional**
  - Stand alone application
  - Running on the cluster
  - Minimal coverage – Shows working data flow

Testing



Panorays

Logging

- □Runs by default log4j (slf4j)
- How to log correctly:
  - Separate logs for different applications
  - Driver and Executors log to different locations
  - Yarn logging also exists (Might find problems there too)
- ELK Stack (Logstash - ElasticSearch – Kibana)
  - By Logstash Shippers (Intrusive) or UDP Socket Appender (Log4j2)
  - DO NOT use the regular TCP Log4J appender

History Server

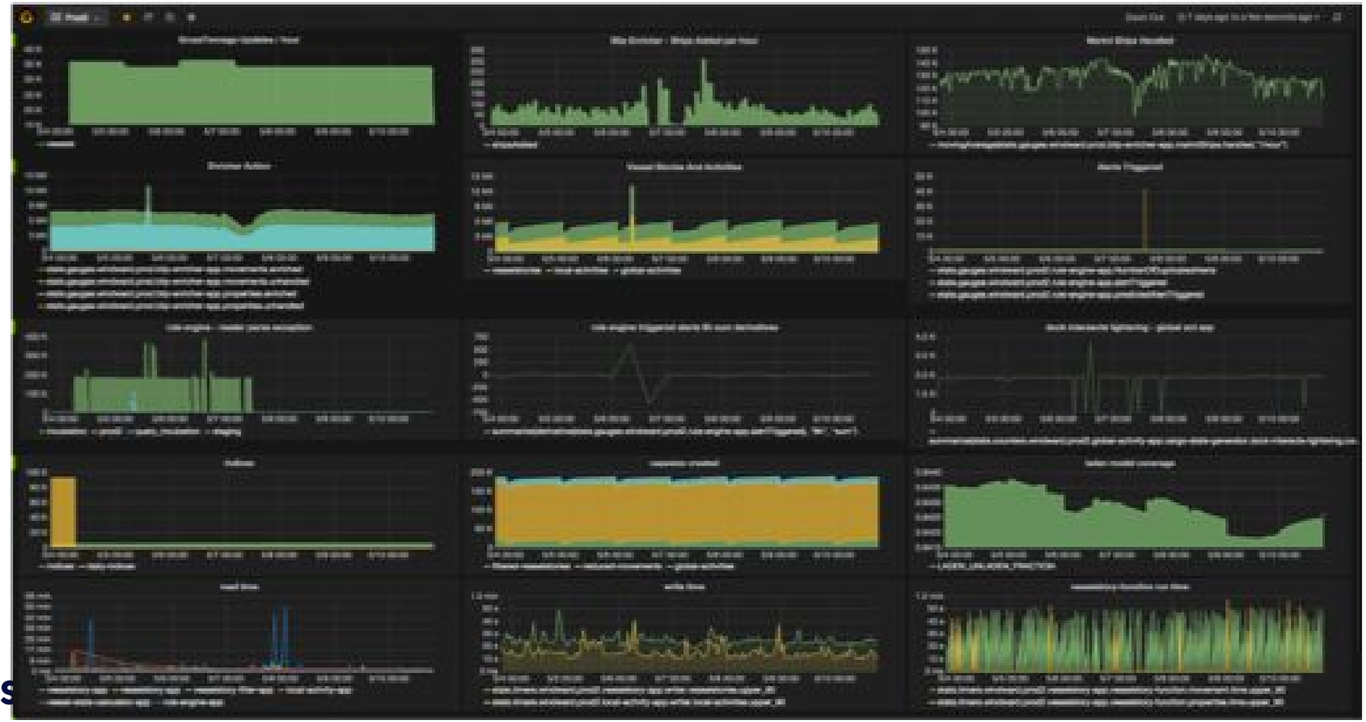
- □Can be run on all Spark deployments:
  - Stand Alone, YARN, Mesos
- Integrates both with YARN and Mesos
  - □In Yarn / Mesos, run history server as a daemon.
- Documentation

Monitoring

- □Graphite
  - Online application metrics
- Grafana
  - Good Graphite visualization
- Jenkins - Monitoring
  - Scheduled tests
  - Validate result set of the applications
  - Hung or stuck applications
  - Failed application

Reporting and Monitoring

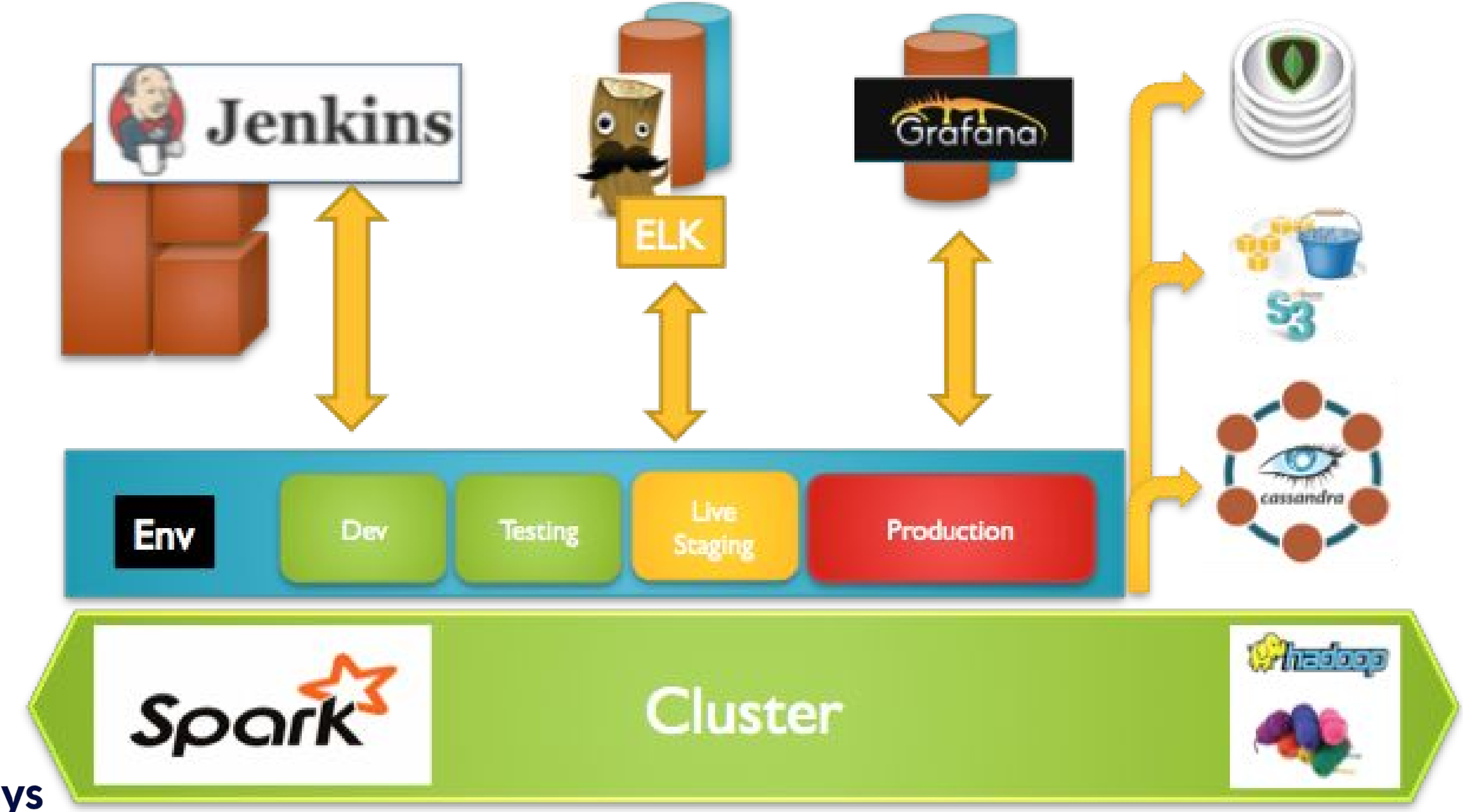
- Grafana + Graphite (InfluxDB) - Example



More Spark Monitoring Abilities

- Master REST API
- Metrics Library
    - Can be plugged to different data sinks
- OS
    - dstat
    - iostat
    - iotop
- JVM
    - jstack

Environment Summary



Panorays

Questions?

Panorays

Mind the Attack Surface