

Guide to Chukwa Storage Layout

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1. Overview

This document describes how Chukwa data is stored in HDFS and the processes that act on it.

2. HDFS File System Structure

The general layout of the Chukwa filesystem is as follows.

```
/chukwa/  
  archivesProcessing/  
  dataSinkArchives/  
  demuxProcessing/  
  finalArchives/  
  logs/  
  postProcess/  
  repos/  
  rolling/  
  temp/
```

3. Raw Log Collection and Aggregation Workflow

What data is stored where is best described by stepping through the Chukwa workflow.

1. Collectors write chunks to `logs/*.chukwa` files until a 64MB chunk size is reached or a given time interval has passed.
 - `logs/*.chukwa`
2. Collectors close chunks and rename them to `*.done`
 - from `logs/*.chukwa`
 - to `logs/*.done`
3. DemuxManager checks for `*.done` files every 20 seconds.
 1. If `*.done` files exist, moves files in place for demux processing:
 - from: `logs/*.done`
 - to: `demuxProcessing/mrInput`
 2. The Demux MapReduce job is run on the data in `demuxProcessing/mrInput`.
 3. If demux is successful within 3 attempts, archives the completed files:
 - from: `demuxProcessing/mrOutput`
 - to: `dataSinkArchives/[yyyyMMdd]/*/*.done`
 4. Otherwise moves the completed files to an error folder:
 - from: `demuxProcessing/mrOutput`
 - to: `dataSinkArchives/InError/[yyyyMMdd]/*/*.done`

4. PostProcessManager wakes up every few minutes and aggregates, orders and de-dups record files.
 - from:
postProcess/demuxOutputDir_***/[clusterName]/[dataType]/[dataType]_[yyyyMMdd]
 - to:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[HH]/[mm]/[dataType]_[yyyyMMdd]
5. HourlyChukwaRecordRolling runs M/R jobs at 16 past the hour to group 5 minute logs to hourly.
 - from:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[HH]/[mm]/[dataType]_[yyyyMMdd]
 - to: temp/hourlyRolling/[clusterName]/[dataType]/[yyyyMMdd]
 - to:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[HH]/[data]_HourlyDone
 - leaves:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[HH]/rotateDone/
6. DailyChukwaRecordRolling runs M/R jobs at 1:30AM to group hourly logs to daily.
 - from:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[HH]/[data]_[yyyyMMdd]
 - to: temp/dailyRolling/[clusterName]/[dataType]/[yyyyMMdd]
 - to:
repos/[clusterName]/[dataType]/[yyyyMMdd]/[data]_DailyDone_[yyyyMMdd]
 - leaves:
repos/[clusterName]/[dataType]/[yyyyMMdd]/rotateDone/
7. ChukwaArchiveManager every half hour or so aggregates and removes dataSinkArchives data using M/R.
 - from: dataSinkArchives/[yyyyMMdd]/*/*.done
 - to: archivesProcessing/mrInput
 - to: archivesProcessing/mrOutput
 - to: finalArchives/[yyyyMMdd]*/chukwaArchive-part-*

4. Log Directories Requiring Cleanup

The following directories will grow over time and will need to be periodically pruned:

- finalArchives/[yyyyMMdd]/*
- repos/[clusterName]/[dataType]/[yyyyMMdd]/*.evt