RETCHAT

Flume, Kafka and Scalability Spark Streaming

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# Introduction/Purpose

## Purpose

This document provides the detailed design of Flume, Kafka and Scalability Spark Streaming. The document should provide sufficient information to carry out the development of the component.

## Scope

This design document will describe the procedure of setting up Flume, Kafka and Scalability Spark Streaming.

## Overview

Version

| Software | | |
| --- | --- | --- |
| Name | Version | Date |
| Flume |  |  |
| Kafka | 0.9.0.0 | 2016/04/28 |
| Spark |  |  |

# Architecture

## Kafka

### 單機安裝測試

#### 作業環境準備

1. 安裝作業系統

* Centos 6.7 x64

1. 安裝 Java

* wget --no-cookies --no-check-certificate --header "Cookie: oraclelicense=accept-securebackup-cookie" "http://download.oracle.com/otn-pub/java/jdk/7u55-b13/jdk-7u55-linux-x64.rpm" -O jdk-7-linux-x64.rpm
* rpm -ivh jdk-7-linux-x64.rpm

1. 安裝 Java\_Home

* vim /etc/profile
* export JAVA\_HOME=/usr/java/jdk1.7.0\_55
* export PATH=$PATH:/usr/java/jdk1.7.0\_55/bin

#### 系統架設（3 個 broker）

1. 下載 Kafka

* wget http://apache.stu.edu.tw/kafka/0.9.0.0/kafka\_2.11-0.9.0.0.tgz
* tar -xzf kafka\_2.11-0.9.0.0.tgz
* mv kafka\_2.11-0.9.0.0 /usr/local/ kafka\_2.11-0.9.0.0
* cd /usr/local/kafka\_2.11-0.9.0.0

1. 修改設定檔

* vim /usr/local/kafka\_2.11-0.9.0.0/config/server.properties
* advertised.host.name=10.144.30.31 # 加入此行

1. 新增其他兩個 broker

* cp config/server.properties config/server-1.properties
* cp config/server.properties config/server-2.properties
* 分別將內容修改如下：
  + config/server-1.properties:
  + broker.id=1
  + port=9093
  + log.dir=/tmp/kafka-logs-1
  + config/server-2.properties:
  + broker.id=2
  + port=9094
  + log.dir=/tmp/kafka-logs-2

1. 啟動 zookeeper

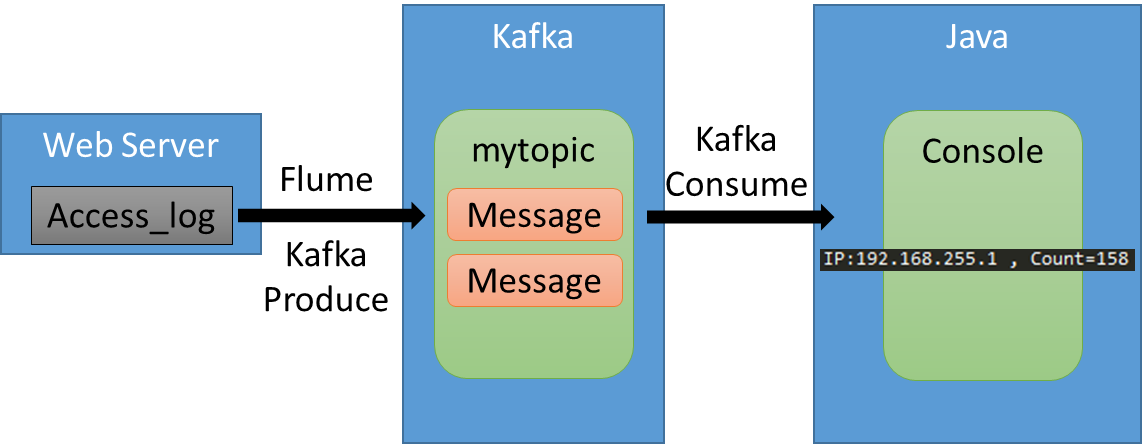
* bin/zookeeper-server-start.sh config/zookeeper.properties &

1. 啟動 kafka

* bin/kafka-server-start.sh config/server.properties &
* bin/kafka-server-start.sh config/server-1.properties &
* bin/kafka-server-start.sh config/server-2.properties &

#### Flume with Kafka

以下為用 Flume 將 Web Server 的 Access\_log 傳送到 Kafka 上，再以 Java取得 Message 後進行後續處理



1. Flume設定

* vim flume-conf.properties

agent1.sources=source1

agent1.sinks=sink1

agent1.channels=channel1

#Spooling Directory

#set source1

agent1.sources.source1.type=exec

agent1.sources.source1.command=tail -f /var/log/httpd/access\_log

agent1.sources.source1.batchSize = 1

agent1.sources.source1.channels=channel1

agent1.sources.source1.fileHeader = false

agent1.sources.source1.interceptors = i1

agent1.sources.source1.interceptors = itime ihost itype

agent1.sources.source1.interceptors.itime.type = timestamp

#agent1.sources.source1.channels = memoryChannel

agent1.sources.source1.interceptors = itime ihost itype

# http://flume.apache.org/FlumeUserGuide.html#timestamp-interceptor

agent1.sources.source1.interceptors.itime.type = timestamp

# http://flume.apache.org/FlumeUserGuide.html#host-interceptor

agent1.sources.source1.interceptors.ihost.type = host

agent1.sources.source1.interceptors.ihost.useIP = false

agent1.sources.source1.interceptors.ihost.hostHeader = host

# http://flume.apache.org/FlumeUserGuide.html#static-interceptor

agent1.sources.source1.interceptors.itype.type = static

agent1.sources.source1.interceptors.itype.key = log\_type

agent1.sources.source1.interceptors.itype.value = apache\_access\_combinedFe

#set sink1

agent1.sinks.sink1.type=hdfs

agent1.sinks.sink1.hdfs.path=/home/hdfs/flume/logdfs

agent1.sinks.sink1.hdfs.fileType=DataStream

agent1.sinks.sink1.hdfs.writeFormat=TEXT

agent1.sinks.sink1.hdfs.rollInterval=1

agent1.sinks.sink1.channel=channel1

agent1.sinks.sink1.hdfs.filePrefix=%Y-%m-%d

agent1.sinks.sink1.type = org.apache.flume.sink.kafka.KafkaSink

agent1.sinks.sink1.topic = mytopic

agent1.sinks.sink1.brokerList = 10.144.30.31:9092

agent1.sinks.sink1.requiredAcks = 1

agent1.sinks.sink1.batchSize = 20

agent1.sinks.sink1.channel = channel1

#set channel1

agent1.channels.channel1.type=file

agent1.channels.channel1.checkpointDir=/root/flume/point

agent1.channels.channel1.dataDirs=/root/flume/logdfstmp

* 啟動 Flume
  + bin/flume-ng agent -c conf -f conf/flume-conf.properties -n agent1

1. Kafka 設定

（參考上一章節）

1. Java Consumer

import com.fasterxml.jackson.databind.deser.DataFormatReaders;  
import org.apache.kafka.clients.consumer.ConsumerRecord;  
import org.apache.kafka.clients.consumer.ConsumerRecords;  
import org.apache.kafka.clients.consumer.KafkaConsumer;  
  
import java.util.Arrays;  
import java.util.HashMap;  
import java.util.Map;  
import java.util.Properties;  
import java.util.regex.Matcher;  
import java.util.regex.Pattern;  
  
/\*\*  
 \* Created by aiden on 2016/4/28.  
 \*/  
public class Consumer\_Test {  
  
 public static void main(String[] args){  
  
 Properties props = new Properties();  
 props.put("bootstrap.servers", "10.144.30.31:9092");  
 props.put("group.id", "test");  
 props.put("enable.auto.commit", "true");  
 props.put("auto.commit.interval.ms", "1000");  
 props.put("session.timeout.ms", "30000");  
 props.put("key.deserializer", "org.apache.kafka.common.serialization.StringDeserializer");  
 props.put("value.deserializer", "org.apache.kafka.common.serialization.StringDeserializer");  
 KafkaConsumer<String, String> consumer = new KafkaConsumer<>(props);  
 consumer.subscribe(Arrays.asList("mytopic"));  
   
 HashMap<String, Integer> list = new HashMap<String, Integer>();  
  
 while (true) {  
 ConsumerRecords<String, String> records = consumer.poll(100);  
 for (ConsumerRecord<String, String> record : records) {  
  
 String value = record.value();  
 //System.out.printf("offset = %d, key = %s, value = %s \n", record.offset(), record.key(), value);  
  
 String ipkey = value.split("-")[0];  
  
 Integer i = -1;  
 if(list.containsKey(ipkey)){  
 i = list.get(ipkey);  
 }  
 list.put(ipkey, ++i);  
  
 for (String s:list.keySet()) {  
 System.***out***.println(String.format("IP:%s, Count=%d", s, list.get(s)));  
 }  
 }  
 }  
 }  
}

## Spark

## Mesos

# Setup

## Kafka

## Spark

## Mesos

# Operation

# Cloud

本章節說明 Amazon EC2 費用評估流程與結果。

## 佈署流程

* 系統移轉測試（3天）
  + 移轉佈署（1天）：將原系統轉移至 Amazon EC2 約一天，流程內容包括：
    - 準備相關環境資料設定檔（IP, 帳號密碼, Disk Partition…..etc）
    - 系統建置設定
    - 系統功能測試
    - 自動化備份、備援測試
    - Cloudwatch告警通知測試
  + 觀察兩天
    - 確認上述測試結果能穩定運作兩天
  + 費用選擇
    - 隨選型主機
* 系統完整移轉（1年）
  + 費用選擇
    - 預付型主機
    - 預付時間有分一年跟三年，規劃以一年為期因應客戶變動

## 所需項目與費用（2016/4/18 更新）

* + 費用選擇：有分隨選、預付、競價、專用四種型態
  + 我們沒有專用需求，競價型雖然便宜但隨時會被停機，故先以隨選型當作系統測試，再用預付型可享七折折扣最符合需求
* 地區選擇：美國西部（奧勒剛）

### 隨選型（前期測試用，預估三天）

* 主機規格與費用

|  |  |  |  |
| --- | --- | --- | --- |
| 項目 | 內容 | 費用 | |
| 單價 | 總價 |
| EC2  （t2.medium） | * CPU：2 Core * Memory：4G | $ 0.052 每小時 | $ 3.744 每三天 |
| EBS | 20G | $ 0.10 每月佈建儲存的 GB 數 | $ 2.00 每三天 |
| Network in |  | $ 0 | $ 0 |
| Network out |  | $ 0.090 每 GB  （每月前1GB 免費） | $ 9.00 / 100GB / 月 |
| Cloudwatch | Dashboards | $ 3.00 per dashboard per mont | $ 3.00 |
| 執行個體的詳細監控 | $ 3.50 按 1 分鐘頻率 | $ 3.50 |
| 警示 | $ 0.10 每月每警示 | $ 0.10 |
| Events | $ 1.00 per million custom events | $ 1.00 |
| 總價 | | | $ 22.344 |

### 預付型（長期使用）

* 主機規格與費用

|  |  |  |  |
| --- | --- | --- | --- |
| 項目 | 內容 | 費用 | |
| 單價 | 總價 |
| EC2  （t2.medium） | * CPU：2 Core * Memory：4G | $ 0.034 每小時 | $ 302每一年 |
| EBS | 20G | $ 0.10 每月佈建儲存的 GB 數 | $ 2.00 每三天 |
| Network in |  | $ 0 | $ 0 |
| Network out |  | $ 0.090 每 GB  （每月前1GB 免費） | $ 9.00 / 100GB / 月 |
| Cloudwatch | Dashboards | $ 3.00 per dashboard per mont | $ 3.00 |
| 執行個體的詳細監控 | $ 3.50 按 1 分鐘頻率 | $ 3.50 |
| 警示 | $ 0.10 每月每警示 | $ 0.10 |
| Events | $ 1.00 per million custom events | $ 1.00 |
| 總價 | | | $ 320.26 |

# Tasks

| Task | Due Date |
| --- | --- |
| Amazon Evaluation | 4/16 |
| Kafka and Flume Setting | 4/30 |
| Ambari Evaluation | 5/7 |
| Spark Streaming Scalability | 5/14 |