

HBase at China Telecom

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Infrastructure & Ol Application

HBase usage at China Telecom









hosted by E Alibaba Group China Telecom HBase Platform

 322 hosts in a independent HDFS cluster ,32 cores, 256GB memory, 3.6T*12 disk

HBASI

- 6 HBase clusters with different kinds of application Persistence for Streaming Jobs Online writing/reading Kylin support
- 520 TB data , 1 TB/day
- HBase1.2.0--CDH 5.12.1



- core system
- data collecting system



Data collecting system

Collect different kinds of data with different kinds of collecting method





Data collecting system

OSS data collecting use HBase replication to receive data from 31 Provincial branches





Core System

 core system use HBase to store middle layer data and Aggregation layer data through Spark Streaming





HBASE



- DPI data service
- Location-based data service



• DPI data service

• What is DPI data?

NAME	TYPE	苏州 73	SZ 3561	315	天翼掌厅	- 1805129 <mark>31 1</mark>	341593	71352	465855	7936	145	73
<u>city_name</u>	string	苏州	SZ	315	天翼掌厅	1805148	81176	12999	86490	422	32	16
city_id	string	16 苏州	836 SZ	315	天翼堂斤	1805148	332806	15244	2890	906	22	22
appid	string	22	1119									
appname	string	苏州 22	SZ 154	315	大異筟厅	18051487	63125	16486	60530	1164	22	22
mdn	string	苏州	SZ	315	天翼掌厅	1205148 <mark>7</mark> I	617282	27757	11529	4568	41	41
inputoctets	bigint	41 苏州	2020 SZ	315	天翼掌厅	18051736	37452	8875	51258	586	12	12
outputoctets	bigint	12 55 Jul	78		计增参用				1 10 50 1		~~	
duration	bigint	ማ ኑ ታግ 26	5Z 288	315	大異季月	18051754	61900	16159	148524	757	62	26
anrespdelay	bigint	苏州	SZ	315	天翼掌厅	1805175 <mark>5:</mark> '	174729	21054	59868	546	17	17
girespdelay	bigint	苏州	300 SZ	315	天翼掌厅	18051758: ;	164457	23614	498328	1011	148	29
num	bigint	29 款利	305 87	215	壮超琼工	18051764	1009502	106363	1226857	6703	300	17
httpnum	bigint	1	171	32405	~~~	10031101	1990302	120303	1020001	0705	302	± '
respdelay	bigint											



• DPI data service

• How to use DPI data ?

月盘点		专题	分析		经营	管控		ìe	营支	Ē		营销支	ii i	报表中心 服务支撑	客户视	图渠	道协同	针对性营销
s × 用	户管理	c ×	用户管	湮с×	客	户视图	d ×]								_		
	客户	□名片i	洋细+											☑ 客户名片(日)+	客户特征+	综合评估+		
	用	户名::	李凌志	;			ù	正件类	型: 身	ł份证				证件号码: 220182198204020212	・憲	客户营销	腹	
	时间: 20150527				ţ	地市:长春						县区: 二道区	此客户营销	肖度为66%				
	客	户群:					Į	联系人: 李凌志						证件地址:	活跃 =		66%	
	联	系地址	:自由	大路58	399号		Ł	上务类	型:移	动后们	4			(宽带)端口速率:	球	100直		
	Ŧ	机号码	: 1890	430066	33		ţ	城市描	述 :					用户状态:	◆愛	安白雄自	i RÊF	\smile
	渠	渠道类别: 10 渠道状态:					渠道生效时间: 2013-06-09	此客户健同	康 度为8%									
	渠	道:)	、网时	间:20	009-09	-18			在网时长: 68.3	海生风险			
	第	,一次通	话时间]:)	入网方式: 购机入网						套餐基本费: 59	价值提升		8%	
	贲	帶包月	时长:				ļ	集团名称: 5002891380						最近——次停机时间: 2011-07-26				
	套	靏名称	: (870	00146)	乐享													
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		账期	用户演	本地)	长途)	漫游]	短信	月租	赠款	当月:	手机	彩信)	其他國	消费变化——折线图			月租费 —	▲ 本地通道
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	2	201509	81	48	79	88	92	99	78	29	82	13	3	4		用日	遗 ——	大金 大途
	3	201508	14 46	57	98 25	54 16	6 3	28	60 45	5 9	73 3	62 73	11 35	201510 201508	201506	F	 本地道 図書 	●古费 长途费 言書 過波書 ^{短信} 書
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同合相供	++-+-+	-4± +	-6400 -	منازید .	40									76% 1 2.9K/s				<u></u>





wzfw	controller : 位置服务相关api	Show/Hide	List Operations Expand Operations
GET	/add		test
GET	/current-city		个人用户当前城市查询功能
GET	/current-location		个人用户当前位置查询功能
GET	/history-location		个人用户历史位置查询功能
GET	/history-track		个人用户历史轨迹查询功能
GET	/residence-location		居住地分析
GET	/roaming-destination		漫游地查询功能
GET	/time-interval		时间段活动地分析
GET	/weekend-location		周末活动地分析
GET	/work-location		工作地分析





02 Monitor & Optimization

How do we monitor HBase and optimization

• HBase Monitor

Tools

ganglia-3.6.0 Zabbix-3.2.4

- Ganglia for HBase basic metrics
- Zabbix for important items to alert

ZABBIX Monitoring Inven	tory Rep	orts Configur	ation A	dministratio	on					
Dashboard Problems Overview We	eb Latest d	data Triggers	Graphs	Screens	Maps	Discovery	IT services			
Dashboard										
Favourite graphs	• 🗸 s	Status of Zabbi	x							
Eavourite coreans		Parameter					Value	Details		
10.142.07.1 Nemonodo 端口52210吃拉指	Z	Zabbix server is rur	ning					Yes	10.142.97.116:10051	
10.142.97.1 Namenode _{第日} 33310 <u>m111</u> 览	N N	Number of hosts (e	nabled/disa	ibled/templat	tes)			2350	2133 / 140 / 77	
10.142.97.1 Namenode 端口54310监控指标概 览		Number of items (e	nabled/disa	ibled/not sup	ported)		535804	473115 / 57551 / 5138		
		Number of triggers	(enabled/di	sabled (prob	lem/ok])		194099	193970 / 129 [10989 / 182981]		
10.142.97.2 Namenode 端口53310监控指 览	标概	Number of users (o	nline)					36	2	
10.142.97.2 Namenode 端口54310监控指	际概	Required server pe	rformance,	new values	per seco	ind		5184.71		
览									U	odated: 16:35:19
Screens Slide	shows									







• HBase ganglia configuration

Edit HBase config file hadoop-metrics2-hbase.properties

*.source.filter.class=org.apache.hadoop.metrics2.filter.RegexFilter
.record.filter.class=\${.source.filter.class}
.metric.filter.class=\${.source.filter.class}
.metric.filter.class=\${.source.filter.class}
hbase.sink.ganglia.metric.filter.exclude=^(.*table.*)|(\\w+metric)|(\\w+region\\w+)|(.*Replication.*)|(Balancer\\w+)|(\\w+A
ssign\\w+)|(\\w+percentile)|(\\w+max)|(\\w+median)|(\\w+min)|(MetaHlog\\w+)|(\\w+WAL\\w+)|(.*bigdata.chinatelecom.cn.*)\$
hbase.sink.ganglia.class=org.apache.hadoop.metrics2.sink.ganglia.GangliaSink31
hbase.sink.ganglia.tagsForPrefix.jvm=ProcessName
*.sink.ganglia.period=20

HBASE

Than we can see many metrics items

Juniouni reales neares (25)			
jvm.JvmMetrics.MemMaxM	jvm.JvmMetrics.MemNonHeapMaxM	jvm.JvmMetrics.LogInfo	jvm.JvmMetrics.GcCountParNew
jvm.JvmHetrics.HemMaxH 6 k 16:20 16:40 17:00	The second sec	jvm.JvmMetrics.LogInfo	And the second
jvm.JvmMetrics.LogWarn	jvm.JvmMetrics.MemHeapUsedM	jvm.JvmMetrics.LogError	jvm.JvmMetrics.ThreadsWaiting
CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift
jvm.JvmMetrics.LogWarn 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	jvm. Jvm/etrics.MemHeapUsedM 40 k 30 k 16:20 16:40 17:00	jvm.JvmMetrics.LogError 0.5 0.0 16:20 16:40 17:00	yum.JvmMetrics.ThreadsWaiting 160 1620 16:20 16:40 17:00
jvm.JvmMetrics.MemNonHeapUsedM	jvm.JvmMetrics.ThreadsNew	jvm.JvmMetrics.MemNonHeapCommittedM	jvm.JvmMetrics.ThreadsTimedWaiting
CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift
yum.JumMetrics.MemNonHeapUsedM	yvm. JvmMetrics. ThreadsNew	Ym. JvmHetrics.MemNonHeapCommittedM 40 3.3 k ↓ 3.3 k ↓ 3.3 k ↓ 3.3 k ↓ 3.3 k ↓ 3.3 k ↓ 1.3 k ↓ 1.3 k ↓ 1.3 k ↓ 1.3 k ↓ 1.4 k ↓	ym.JymMetrics.ThreadsTimedWaiting 25 25 20 16:20 16:40 17:00
jvm.JvmMetrics.GcTimeMillisParNew	jvm.JvmMetrics.LogFatal	jvm.JvmMetrics.GcCountConcurrentMarkSweep	jvm.JvmMetrics.GcTimeMillis
CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift
yum.JvmMetrics.GcTimeMilliSParNev 3.0 4.0 5.0 5.0 1.0 16:20 16:40 17:00	jvm.JvmMetrics.LogFatal	DumMetrics. GcCountConcurrentMarkSwe	ivm.JvmHetrics.GCTimeMillis 3.0 2.0 1.0 1.0 16:20 16:40 17:00
jvm.JvmMetrics.MemHeapMaxM	jvm.JvmMetrics.GcTimeMillisConcurrentMarkSweep	jvm.JvmMetrics.ThreadsRunnable	jvm.JvmMetrics.ThreadsBlocked
CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift	CSV JSON Inspect Trend Hide/Show Events Timeshift
jvm.JvmMetrics.MemHeapMaxM	WinHetrics.GcTimeMillisConcurrentMarkS	yvm.JvmMetrics.ThreadsRunnable	ym.JvmHetrics.ThreadsBlocked





Important metrics •

Туре	Items
System status	ping Available memory in percent Disk usage
HDFS status	NameNode port DataNode port JournalNode port HDFS avaliable space
HBase status	HBase Master Port HBase Region Server Port
Zookeeper status	ZooKeeper Port ZKFC Port
HBase RPC	regionserver.TotalCallTime regionserver.ProcessCallTime regionserver.QueueCallTime regionserver.numActiveHandler regionserver.ipc.numCallsInGeneralQueue regionserver.ipc.numOpenConnections regionserver.RegionServer.numCallsInWriteQueue regionserver.RegionServer.numCallsInReadQueue
Hbase IO	regionserver.Server.Mutate_99th_percentile regionserver.wal.SyncTime_99th_percentile regionserver.server.Get_99th_percentile regionserver.server.ScanTime_99th_percentile





Туре	Items
HBase region	Region num,size BlockCache hit radio
JVM GC	jvm. JvmMetrics.GcTimeMillis jvm.JvmMetrics.GcCount GC log

• HBase Debug case

• One day, our core data system hanged when trying to connection Hbase cluster...

























- CMS vs G1
- Read/Write Splitting and some Optimization

CMS vs G1



-Xms64g -Xmx64g -Xmn16g -XX:+UseParNewGC -XX:+UseConcMarkSweepGC \ -XX:CMSInitiatingOccupancyFraction=65 -XX:+CMSParallelRemarkEnabled \ -XX:SurvivorRatio=28 -XX:PermSize=3g -XX:MaxPermSize=3g \

-server -Xms96g -Xmx96g -XX:PermSize=512m -XX:MaxPermSize=512m \
-XX:+UseG1GC -XX:InitiatingHeapOccupancyPercent=30 -XX:G1MixedGCCountTarget=3 \
-XX:G1ReservePercent=15 -XX:G1HeapWastePercent=5 \

Why?

Optimization

hosted by ECAlibaba Group HBASE

- Use replication
- Use Kerberos
- Optimization hbase.ipc



Q&A



Thanks