PlinyCompute Self-Learning Database Schema Design

DATA

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
DATABASE_NAME	VARCHAR	128	Composite key
SET_NAME	VARCHAR	128	Composite key
CREATED_JOBID	VARCHAR	128	Composite key
IS_REMOVED	SMALL		
SET_TYPE	VARCHAR	32	UserSet, HashSet, PartitionedHashSet
CLASS_NAME	VARCHAR	128	
TYPE_ID	INT		
SIZE	BIGINT		#bytes
PAGE_SIZE	BIGINT		#bytes
REPLICATION	INT		
MODIFICATION_TIME	BIGINT		

1. SIZE is not the current size, instead it is the maximal size the data once occupied. We need this information for all removed data. The system should periodically remove very old removed data based on IS_REMOVED and MODIFICATION_TIME.

DATA_JOB

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
DATA_ID	BIGINT		Composite key
JOB_ID	BIGINT		Composite key
JOB_STAGE_ID	INT		Composite key
IS_SOURCE	SMALL		Null
IS_PROBE	SMALL		Null
IS_SINK	SMALL		Null

1. DATA_ID + JOB_ID + JOB_STAGE_ID is Unique

JOB

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
NAME	VARCHAR	128	Unique
USER	VARCHAR	64	Null
TCAP	VARCHAR	65535	
COMPUTATIONS	BLOB		

JOB_INSTANCE

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
JOB_ID	VARCHAR	128	Unique
JOB_NAME	VARCHAR	64	Foreign key referenced to JOB.NAME
USER	VARCHAR	64	Null
CONF	BLOB		XML configuration file's content
STATUS	VARCHAR	16	Failed/Killed/Prep/Running/Succeeded
SUBMIT_TIME	BIGINT		
LAUNCH_TIME	BIGINT		
FINISH_TIME	BIGINT		

JOB_STAGE

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
JOB_ID	VARCHAR	128	Unique
JOB_NAME	VARCHAR	128	Unique
STAGE_ID	INT		
STAGE_TYPE	VARCHAR	32	Pipeline/Aggregation/BuildHashSet/BuildPartitionedHashSet
STATUS	VARCHAR	16	See Job table
SOURCE_TYPE	VARCHAR	16	Vector/Map/JoinTuple
SINK_TYPE	VARCHAR	16	UserSet/Broadcast/Shuffled/Repartitioned
PROBE_TYPE	VARCHAR	32	HashSet/PartitionedHashSet/None
TUPLESET_SPECIFIERS	BLOB		Handle<Vector<String>> buildTheseTupleSets;
NUM_PARTITIONES	INT		
TARGET_COMPUTATION_SPECIFIER	VARCHAR	128	
AGG_COMPUTATION	BLOB		
START_TIME	BIGINT		
FINISH_TIME	BIGINT		

LAMBDA

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
JOB_NAME	VARCHAR	128	Unique, Foreign key referenced to JOB.NAME
COMPUTATION_NAME	VARCHAR	128	
LAMBDA_NAME	VARCHAR	128	
LAMBDA_INPUT_CLASS	VARCHAR	128	
LAMBDA_OUTPUT_CLASS	VARCHAR	128	
LAMBDA_INPUT_TYPE_ID	INT		
LAMBDA_OUTPUT_TYPE_ID	INT		

CLUSTER

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
NAME	VARCHAR	128	Unique
NUM_NODE	INT		
DISK_READ	BIGINT		#bytes read per second
DISK_WRITE	BIGINT		#bytes written per second
DISK_COPY	BIGINT		#bytes copied per second
NETWORK_THROUGHPUT	BIGINT		#bytes transferred via network per second

CLUSTER_NODE

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
NAME	VARCHAR	64	Unique
CLUSTER_ID	BIGINT		Foreign key referenced to CLUSTER.ID
MEMORY	BIGINT		#bytes
NUM_CORE	INT		#cores
NUM_DISK	INT		#disks
DISK_SIZE	BIGINT		#bytes
LOCAL_DISK_READ	BIGINT		#bytes read in local disk
LOCAL_DISK_WRITTEN	BIGINT		#bytes written in local disk
LOCAL_RACK_WRITTEN	BIGINT		#bytes written in the same rack
REMOTE_RACK_WRITTEN	BIGINT		#bytes written to remote rack
MAX_THREAD_READ	INT		
MAX_THREAD_WRITTEN	INT		
NUM_THREAD_PER_CORE	INT		
MODIFICATION_TIME	BIGINT		

CONFIG

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
NAME	VARCHAR		
NUM_THREADS	INT		
NUM_PARTITION_RATIO	DOUBLE		
AVAILABLE_MEM_RATIO	DOUBLE		
DEFAULT_PAGE_SIZE	BIGINT		
MAX_PAGE_SIZE	BIGINT		
SHUFFL_PAGE_SIZE	BIGINT		
BROADCAST_PAGE_SIZE	BIGINT		
REPLICATION	INT		
JOIN_BROADCAST_MAP_RATION	DOUBLE		
JOIN_PARTITION_MAP_RATIO	DOUBLE		
HASH_PARTITION_JOIN_RATIO	BIGINT		
HEARTBEAT_INTERVAL	INT		

LATEST_UPDATE

Field	Data Type	Length	Key / Unique / Null
ID	BIGINT		Primary key
LATEST_UPDATED_JOB	BIGINT		Latest update time
LATEST_UPDATED_JOB_INSTANCE	VARCHAR		Latest update index
LATEST_UPDATED_JOB_STAGE	BIGINT		Latest update time
LATEST_UPDATED_LAMBDA	BIGINT		Latest update time
LATEST_UPDATED_DATA	BIGINT		Latest update time

GG_CPU_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	How to map to cluster node table?
CPU_AIDLE	BIGINT		
CPU_IDLE	BIGINT		
CPU_NICE	BIGINT		
CPU_NUM	INT		
CPU_SPEED	DOULE		
CPU_SYSTEM	VARCHAR		
CPU_USER	VARCHAR		
CPU_WIO	BIGINT		

GG_MEM_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	
MEM_BUFFERS	BIGINT		
MEM_CACHED	BIGINT		
MEM_FREE	BIGINT		
MEM_SHARED	BIGINT		
MEM_TOTAL	BIGINT		
SWAP_FREE	BIGINT		
SWAP_TOTAL	BIGINT		

GG_NETWORK_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	
PKTS_IN	BIGINT		
PKTS_OUT	BIGINT		
BYTES_IN	BIGINT		
BYTES_OUT	BIGINT		

GG_DISK_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	
DISK_FREE	BIGINT		
DISK_TOTAL	BIGINT		

GG_DISK_PARTITION_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	
PARTITION	VARCHAR	100	
DISK_FREE_ABSOLUTE	BIGINT		
DISK_FREE_PERCENT	DOUBLE		

GG_DISK_STATE_NODES

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
NODE	VARCHAR	100	
DISK_NAME	VARCHAR	100	
IO_TIME	BIGINT		
PERCENT_IO_TIME	BIGINT		
READ_BYTES_PER_SEC	DOUBLE		
READ_TIME	BIGINT		
READS	BIGINT		
READS_MERGED	BIGINT		
WEIGHTED_IO_TIME	BIGINT		
WRITE_BYTS_PER_SEC	DOUBLE		
WRITE_TIME	BIGINT		
WRITES	BIGINT		
WRITES_MERGED	BIGINT		

GG_CPU_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME	VARCHAR	100	
CPU_AIDLE	BIGINT		
CPU_IDLE	BIGINT		
CPU_NICE	BIGINT		
CPU_NUM	INT		
CPU_SPEED	DOULE		
CPU_SYSTEM	VARCHAR		
CPU_USER	VARCHAR		
CPU_WIO	BIGINT		
NUM	BIGINT		

GG_MEM_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME	VARCHAR	100	
MEM_BUFFERS	BIGINT		
MEM_CACHED	BIGINT		
MEM_FREE	BIGINT		
MEM_SHARED	BIGINT		
MEM_TOTAL	BIGINT		
SWAP_FREE	BIGINT		
SWAP_TOTAL	BIGINT		
NUM	BIGINT		

GG_NETWORK_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME	VARCHAR	100	
PKTS_IN	BIGINT		
PKTS_OUT	BIGINT		
BYTES_IN	BIGINT		
BYTES_OUT	BIGINT		
NUM	BIGINT		

GG_DISK_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME	VARCHAR	100	
DISK_FREE	BIGINT		
DISK_TOTAL	BIGINT		
NUM	BIGINT		

GG_PARTITION_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME			
DISK_FREE_ABSOLUTE	BIGINT		
DISK_FREE_PERCENT	DOUBLE		
NUM	BIGINT		

GG_DISK_STATE_SUMMARY

Field	Data Type	Length	Key / Unique / Null
TIME_STAMP	BIGINT		Primary key
CLUSTER_NAME			How about CLUSTER_ID?
IO_TIME	BIGINT		
PERCENT_IO_TIME	DOUBLE		
READ_BYTES_PER_SEC	BIGINT		
READ_TIME	BIGINT		
READS	BIGINT		
READS_MERGED	BIGINT		
WEIGHTED_IO_TIME	BIGINT		
WRITE_BYTES_PER_SEC	BIGINT		
WRITE_TIME	BIGINT		
WRITES	BIGINT		
WRITES_MERGED	BIGINT		
NUM	BIGINT		