Wait stats analysis (Managed Instance)

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//*********************************************************************************
// Wait stats
//*********************************************************************************
// W.01
// top 5  MonDmCloudDatabaseWaitStats  waits by line chart
MonDmCloudDatabaseWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and database_name =~ "{LogicalDatabaseName}" and
NodeName =~ "{NodeName}" and AppName =~ "{AppName}"
| top-nested of bin(TIMESTAMP, 5min) by sum(delta_wait_time_ms), top-nested 5 of wait_type by
total_wait_time_ms_per_sec=round(sum(delta_wait_time_ms)/(5*60),0) desc
| sort by TIMESTAMP asc nulls last
| project TIMESTAMP, wait_type, total_wait_time_ms_per_sec
| render timechart


// W.01.A
// Top 10 MonDmCloudDaabaseWaitStats waits
// ms per sec
MonDmCloudDatabaseWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and database_name =~ "{LogicalDatabaseName}" and
NodeName =~ "{NodeName}" and AppName =~ "{AppName}"
| summarize sum(delta_wait_time_ms) by wait_type
| top 10 by sum_delta_wait_time_ms desc nulls last
| project wait_type, wait_time_ms_per_sec
// W.02
// Top 10 waits (instance-level, absolute values)
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
| where is_primary == 1
| summarize sum(total_query_wait_time_ms) by wait_category
| top 10 by sum_total_query_wait_time_ms desc nulls last
// W.02.A
// Top 10 waits  (ms per sec)
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
| where is_primary  == 1
| top-nested of bin(TIMESTAMP, 5min) by sum(total_query_wait_time_ms), top-nested 10 of wait_category by
wait_ms_per_sec=sum(total_query_wait_time_ms)/(5*60)
| sort by TIMESTAMP asc nulls last
| project TIMESTAMP, wait_category , wait_ms_per_sec
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| render timechart


// W.03
// top 10 query hash of a particular wait
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
| where wait_category =~ "BUFFERIO"
| where is_primary  == 1  //and exec_type ==3
| extend query_key = strcat(database_name, ".", query_hash)
| summarize sum(total_query_wait_time_ms) by query_key
| top 10 by sum_total_query_wait_time_ms desc nulls last
// W.04
// QDS wait over time
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
| where is_primary  == 1
| summarize sum(total_query_wait_time_ms) by  bin_at(TIMESTAMP, 15min, datetime({StartTime})),
wait_category
| render  timechart
// W.04.A
// QDS wait over time ms per sec
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
| where is_primary  == 1
| summarize sum(total_query_wait_time_ms) by  bin_at(TIMESTAMP, 15min, datetime({StartTime})),
wait_category
| extend wait_time_ms_per_sec=toint(sum_total_query_wait_time_ms*1.0/(15*60))
| project TIMESTAMP, wait_category, wait_time_ms_per_sec
| render  timechart
// W.05
// QDS wait per second per cpu over time
let cpu_cap_in_sec=toscalar(
MonDmRealTimeResourceStats
| where LogicalServerName =~ "{LogicalServerName}" and database_name =~ "{LogicalDatabaseName}"
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where replica_type == 0
| top 1 by TIMESTAMP desc
| project cpu_cap_in_sec );
MonWiQdsWaitStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}" and AppName == "{AppName}"
//| where query_hash =~ "0xA224D771D6309702"
| where is_primary  == 1  //and exec_type ==3
| summarize wait_time_ms_per_sec_per_cpu=sum(total_query_wait_time_ms)/(15*60*cpu_cap_in_sec) by
bin_at(TIMESTAMP, 15min, datetime({StartTime})),    wait_category
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| render  timechart


// W.06
// Spinlock stats
let cpu_cap_in_sec=toscalar(
MonDmRealTimeResourceStats
| where LogicalServerName =~ "{LogicalServerName}" and database_name =~ "{LogicalDatabaseName}"
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where replica_type == 0
| top 1 by TIMESTAMP desc
| project cpu_cap_in_sec );
MonDmOsSpinlockStats
| where  TIMESTAMP >= datetime({StartTime}) and  TIMESTAMP <= datetime({EndTime})
| where LogicalServerName =~ "{LogicalServerName}"  and AppName =~ "{AppName}" and NodeName =~ "
{NodeName}"
| summarize sum(delta_spins) by name
| extend elapsed_second = datetime_diff ('second',  datetime({EndTime}), datetime({StartTime}))
| extend delta_spins_per_sec_per_cpu=round((sum_delta_spins*1.0)/(elapsed_second*cpu_cap_in_sec),0)
| top 10 by delta_spins_per_sec_per_cpu desc nulls last
| project name, delta_spins_per_sec_per_cpu
| order by delta_spins_per_sec_per_cpu desc nulls last
| render  columnchart
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