[Copy Perf] How to identify uneven file distribution which causes slow copy performance

Last updated by | Veena Pachauri | Mar 8, 2023 at 11:57 PM PST

Background

Azure IR is a scalable compute resource. When copy activity runs on Azure IR, copy runtime could allocate multiple batch nodes to run the task. Usually every 4 DIUs will spin up a node.

For this kind of distributed workload, sometimes we could see the uneven execution time between the tasks on different batch nodes. This is like the 'Cannikin Law' - the overall copy duration will be dragged down by the longest task.

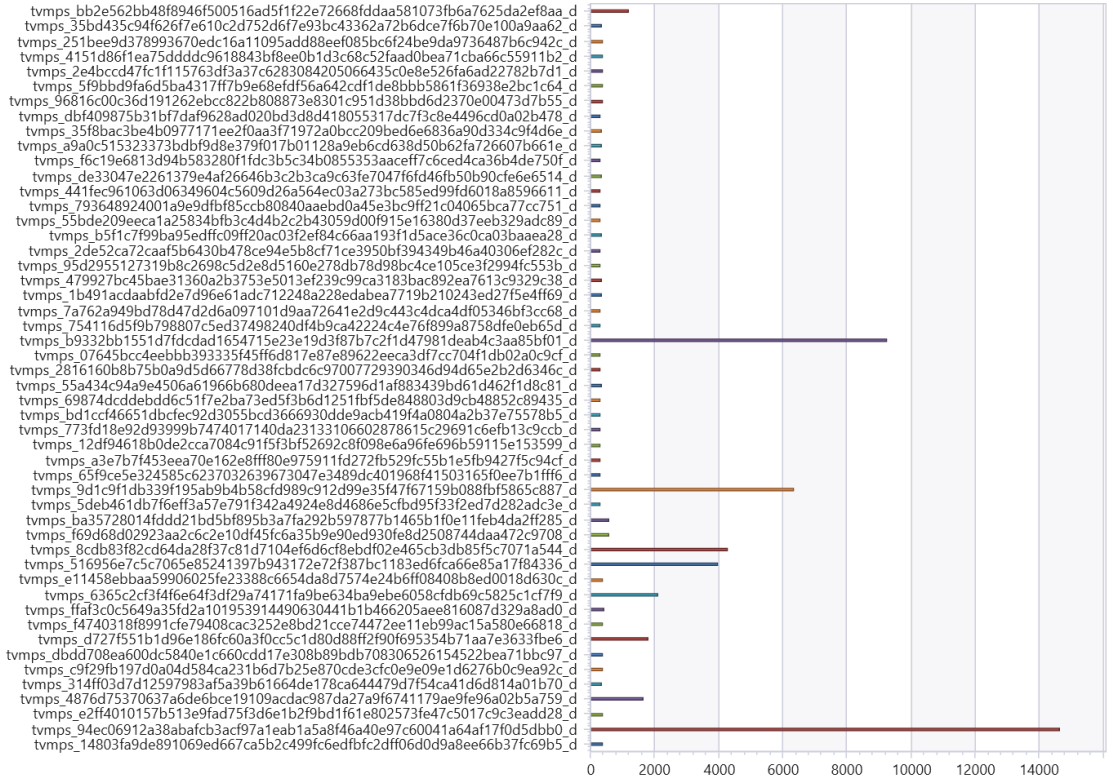
Kusto query

Below query could be very helpful to check the task execution on each node.

```
CustomLogEvent
| where ActivityId == '<Activity_Run_ID>'
| where TraceMessage == 'UpdateTransferJobProgressSuccess'
| summarize count(), start=min(PreciseTimeStamp), end=max(PreciseTimeStamp), duration=max(PreciseTimeStamp)-min(PreciseTimeStamp) by RoleInstance
| join kind=leftouter (CustomLogEvent
    | where ActivityId == 'cc343522-cffc-49d1-8128-525ad394c9fa'
    | where TraceMessage == 'UpdateTransferJobProgressSuccess'
    | project RoleInstance, PreciseTimeStamp, DataSizeOutbound=extract("\\[DataSizeOutbound, ([0-9]+)\\]", 1, common_trim_CustomLogEventMessage(Message))
) on $left.RoleInstance==$right.RoleInstance and $left.end==$right.PreciseTimeStamp
| project RoleInstance, start, end, duration, DataSizeOutbound
| order by duration desc
| render barchart  with (ycolumns=duration, xcolumn=RoleInstance)
```

Query result

You could see from below visual that the execution time among the nodes are not even. 55 out of 64 nodes finished their task within 10 minutes and the other 9 nodes had to run for 4 hours.



Apart from the duration which has been visualized above, you could also check the **DataSizeOutbound** column from the raw query result to see if there are uneven data size distribution.

Suggestions

If you observe above symptomn for a slow copy performance please refer to below suggestions to improve performance:

1. Increase the copy parallel:

1. Increase the copy parallel;
2. Split the copy task into several tasks by
    - making total file count < 10k in each copy can better utilize our cross-machine functionality
    - partition files more evenly based on the size