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Mind your IO: Resource Governor Shows You How

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We all want
good
governance,
Right?



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MCM, MVP, MCT

Only SQL Server, all the time!

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Agenda

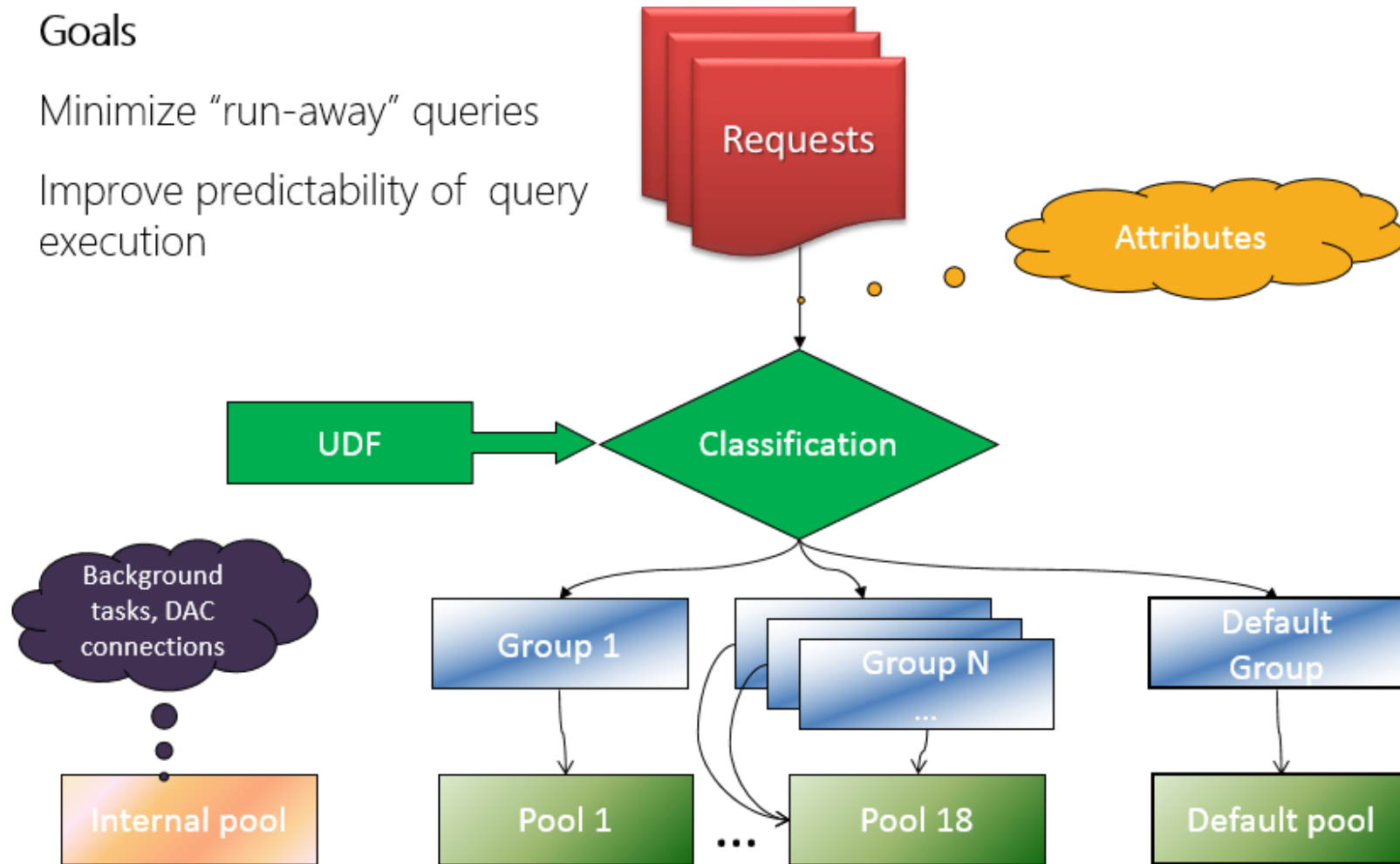
- ➔ Resource Governor – Overview
- ➔ Why care about IO governance?
- ➔ What can you govern?
- ➔ How can you do it?
- ➔ Extended Events & PerfMon Counters
- ➔ DEMO
- ➔ Summary & Call to Action

Resource Governor - Overview

Goals

Minimize "run-away" queries

Improve predictability of query execution



Resource Governor - Overview

➔ SQL Server 2008

- ➔ Resource Governor was introduced
- ➔ CPU & Memory governance

➔ SQL Server 2008 R2

- ➔ No changes

➔ SQL Server 2012

- ➔ CPU_CAP_PERCENT, AFFINITY

➔ SQL Server 2014

- ➔ IO governance

Why care about IO governance?

→ IO: One of the three holy trinity

- Super-critical for SQL Server performance

→ IO isolation

→ Performance predictability

- Rogue workloads

- Throw away queries

- Maintenance operations

What can you govern?

→ Yes

- Read I/O
- Write I/O (Inserts? Updates? some caveats!)
- Physical Reads
- Data Files

→ No

- Internal Pool
- Logical Reads
- Log Files

How Can You Do It?

```
CREATE RESOURCE POOL pool_name
[ WITH
    (
        [ MIN_CPU_PERCENT = value ]
        [ [ , ] MAX_CPU_PERCENT = value ]
        [ [ , ] CAP_CPU_PERCENT = value ]
        [ [ , ] AFFINITY {SCHEDULER =
            AUTO | ( <scheduler_range_spec> )
            | NUMANODE = ( <NUMA_node_range_spec> )} ]
        [ [ , ] MIN_MEMORY_PERCENT = value ]
        [ [ , ] MAX_MEMORY_PERCENT = value ]
        [ [ , ] MIN_IOPS_PER_VOLUME = value ]
        [ [ , ] MAX_IOPS_PER_VOLUME = value ]
    )
]
[;]
```

DMVs

➔ Changed: `sys.dm_resource_governor_resource_pools`

➔ New columns for I/O max, I/O read/write queue, stall, and violations

➔ Changed: `sys.dm_resource_governor_configuration`

➔ New columns for: I/O stall read/write latency

➔ New:

`sys.dm_resource_governor_resource_pool_volumes`

➔ Per pool: read/write queued, issued, completed, and violations

Extended Events

- ➔ Two new XEvents to trace requests to the IO Resource Manager queues (file_write_enqueued and file_read_enqueued)
 - ➔ Use these together with the events that trace issuing IO (file_read/file_written) and IO completion (file_read/write_completed)
- ➔ 6 new Performance Counters
 - ➔ Track read/write IOs and bytes
 - ➔ Track read/write latency (average msec)

Demo

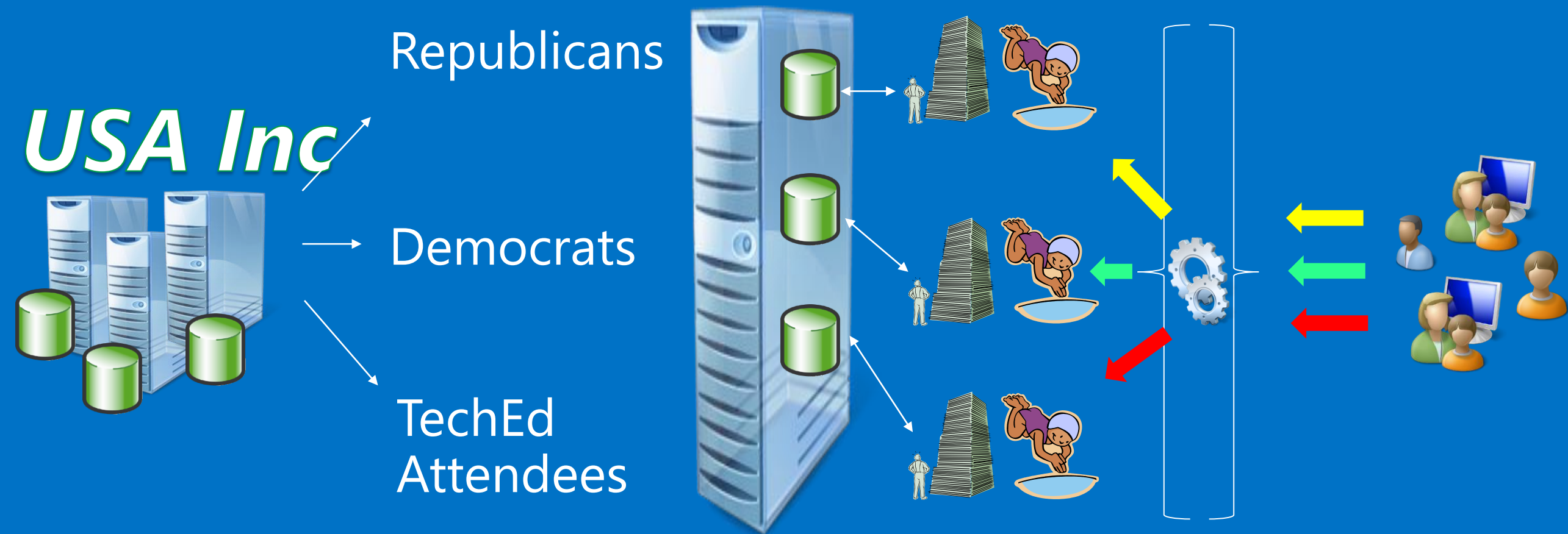
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Real-Time IO Throttling
So what is our scenario?

Demo

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Summary & Call to Action

- ➔ The feature is more matured now 😊
- ➔ Download the scripts (@A_Bansal)
 - ➔ Try it, Test it, play around with it
- ➔ Read/explore more
 - ➔ Try & Test again
- ➔ Finally, Implement it :)

Thank you!

➞ SQL 2014 Resource Governor with @A_Bansal
#msteched @teched_na #sql #sql2014

Resources



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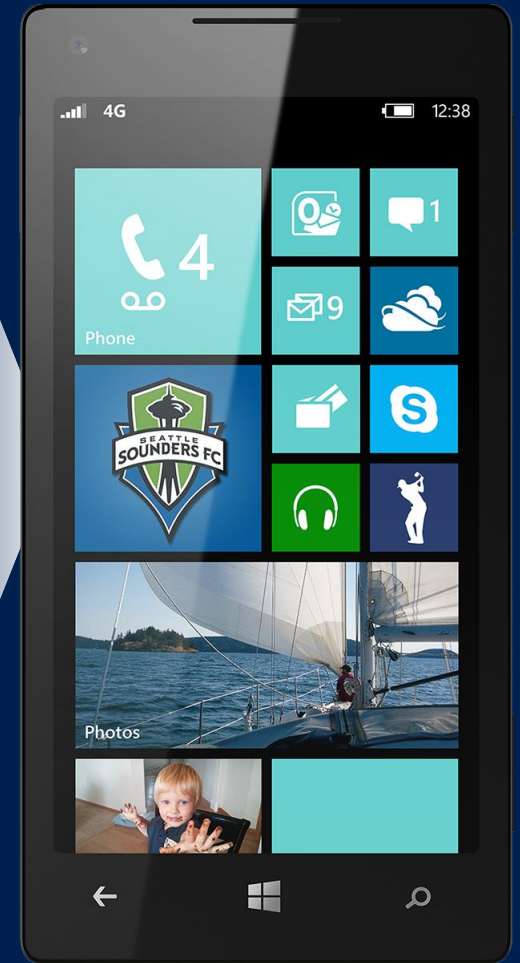
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