

# Tune the query, not the plan

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# Kevan Riley



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19+ years from SQL Server v7.0



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# Execution plans

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- Generated by Query Optimizer
  - Cardinality Estimator
  - Statistics
  - YOUR design
- How SQL will execute the query
  - Table access
  - What order
  - Join algorithm
- VERY useful in performance tuning

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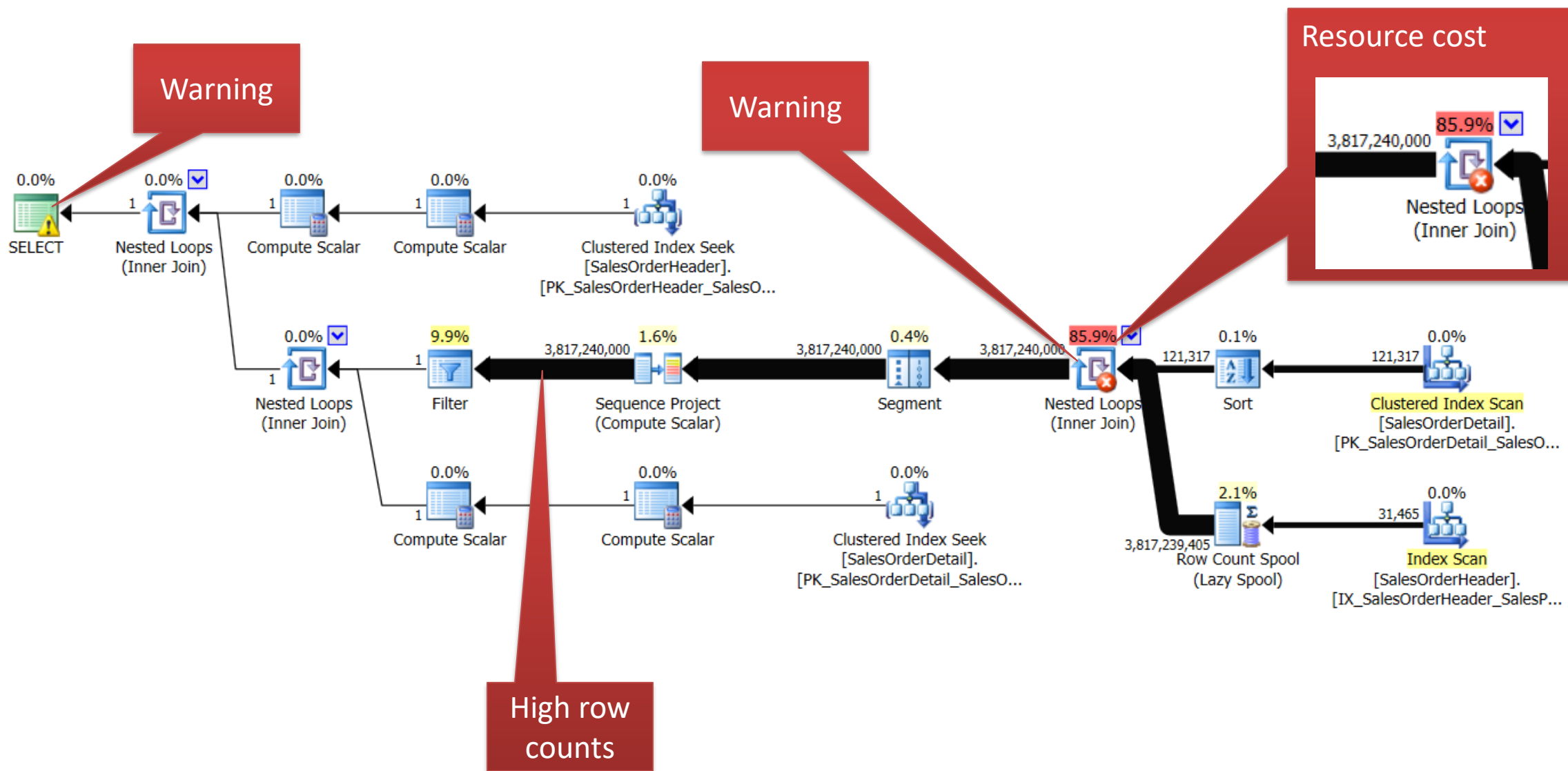
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So what's the  
problem?

# Your time is precious

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- DBA firefighting
- Looking for quick wins
- Focus on 'bad' operators
  - Table Scans
  - Scan operations in general (prefer seek)



# Performance tuning?

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- Not just the plan
- Time
- CPU
- Reads/Writes



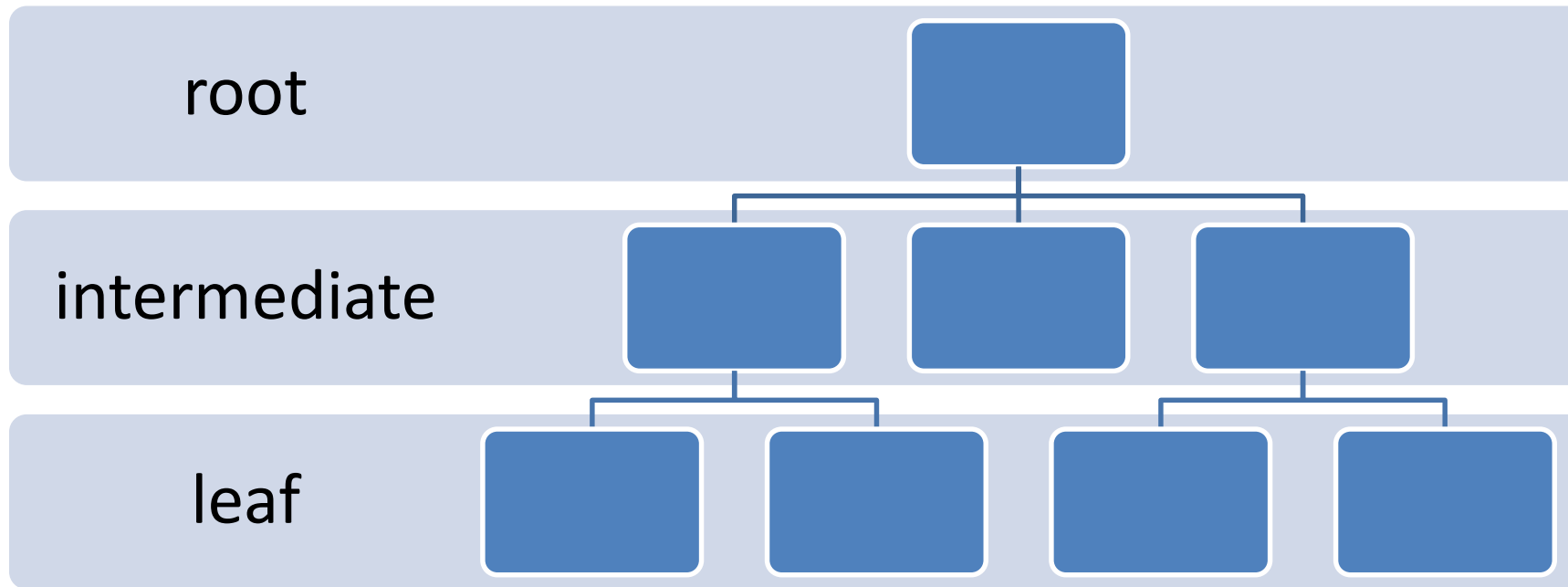
# DEMO

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- Table Scans – removing from plan
- Index Scans vs Index Seeks
  - Does a scan always read all the table?
  - Does a seek only return a few rows?
- How to confuse/coerce the Optimizer
- Constraints

# Index structure

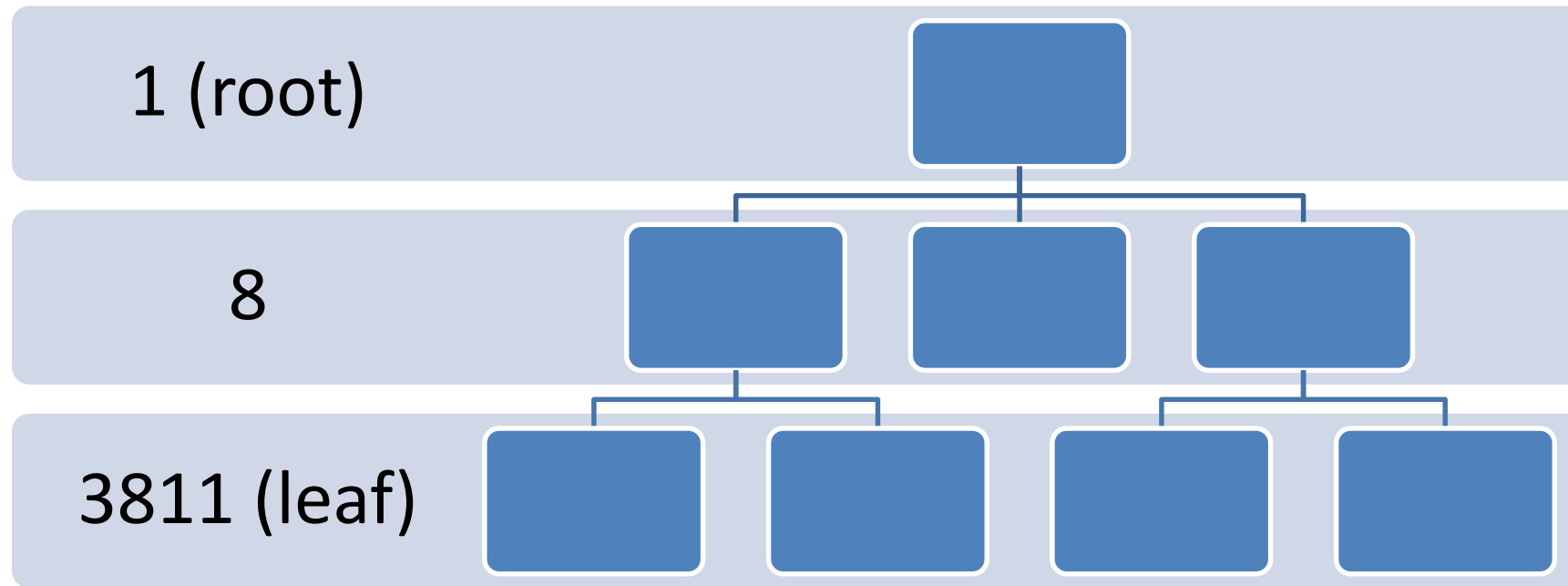
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# Person.Person

## PK\_Person\_BusinessEntityID

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# Conclusions

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- Replacing Table Scans with CLIX Scans is not a perf gain
- Scans do not always read the entire table
- Seeks can return the entire table
- Scan vs Seek – not comparable
  - Seek gives a starting point – needs a predicate on the key
  - Scan starts at one end of an index
- Design of query and schema is important

# Performance tuning – what should we use?

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- set statistics io
- set statistics time
- execution plans
  - understand why you are getting certain operators
  - is there a better way?
- wait stats

# Execution Plan Resources

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- SentryOne Plan Explorer

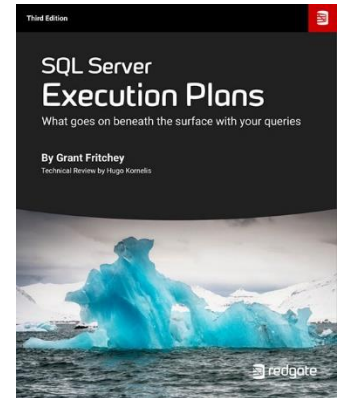
<https://www.sentryone.com/plan-explorer>



- SQL Server Execution Plans – Grant Fritchey

<https://www.red-gate.com/library/sql-server-execution-plans-2nd-edition>

<https://www.red-gate.com/products/dba/sql-monitor/entrypage/execution-plans>



- SQL Server Execution Plan Reference – Hugo Kornelis

<https://sqlserverfast.com/epr>

# Useful links

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- Constraints

- <https://rileywaterhouse.co.uk/helping-the-query-optimizer-with-constraints/>
- <https://rileywaterhouse.co.uk/trusting-constraints/>

- SET STATISTICS

- <https://docs.microsoft.com/en-us/sql/t-sql/statements/set-statistics-io-transact-sql>
- <https://docs.microsoft.com/en-us/sql/t-sql/statements/set-statistics-time-transact-sql>
- <https://blogs.msdn.microsoft.com/sqlserverfaq/2010/09/14/scan-count-meaning-in-set-statistics-io-output>

- Waits

- <https://www.sqlskills.com/blogs/paul/wait-statistics-or-please-tell-me-where-it-hurts/>
- <https://www.brentozar.com/sql/wait-stats/>

# Thanks for listening

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