Firebird Configuration, episode 2: TempCacheLimit
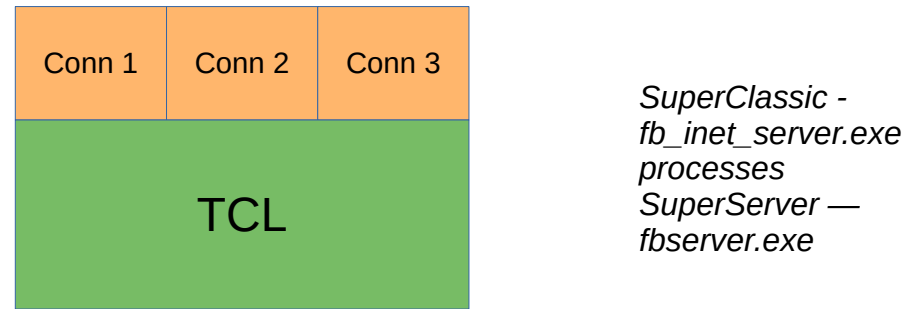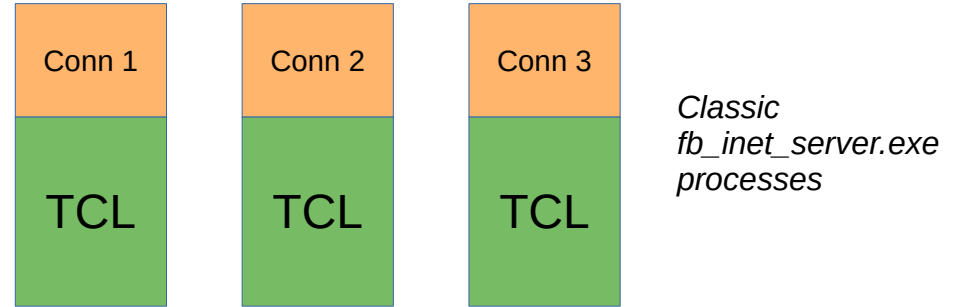
Alexey Kovyazin, President of Firebird Foundation

TempCacheLimit Usage

- Queries with Order By, Group By, Distinct, Union,

- Memory area defined by TempCacheLimit is also used for

  - Temporary BLOBs (which are less than page size)
  - Undo logs
  - Monitoring data
 - Batch data

TempCacheLimit in 2.5

- For Classic — per connection (process)

- For SuperServer and SuperClassic — per process

- In all architecture - only 2Gb max

  - If set more than 2 Gb, will be «turned» from the beginning.

    - For example, set 3Gb = actual 1Gb

    - Set 4Gb = actual 0!

Classic fb_inet_server.exe processes

*SuperClassic - fb_inet_server.exe processes SuperServer — fbserver.exe*

TempCacheLimit in 3.0

- TCL for Classic — per connection (process)

- TempCacheLimit in SuperServer and SuperClassic - united for all databases, per process, not limited to 2Gb!

- For 64 bit Architectures practically can be set up to 64Gb

ServerMode = Classic

Conn 1	Conn 2	Conn 3
TCL	TCL	TCL
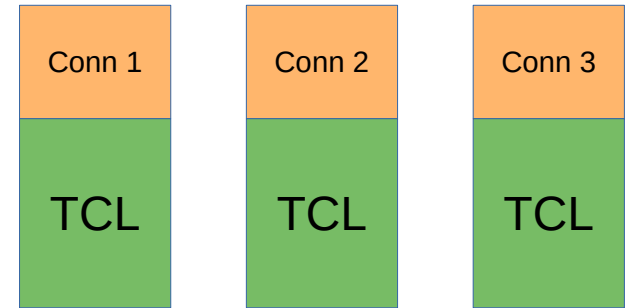
ServeMode=SuperClassic
ServerMode=Super

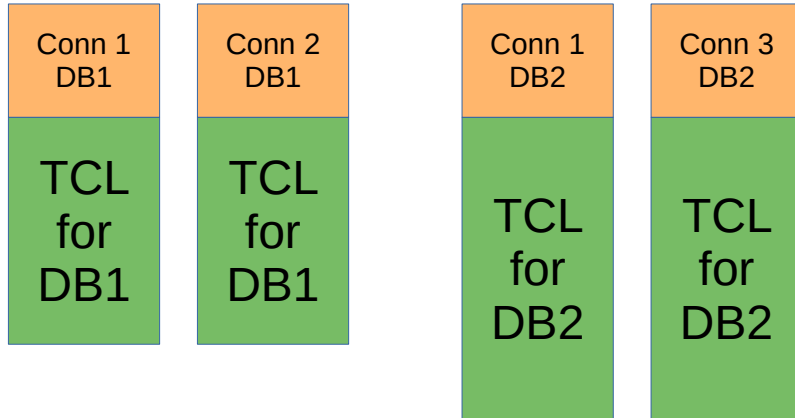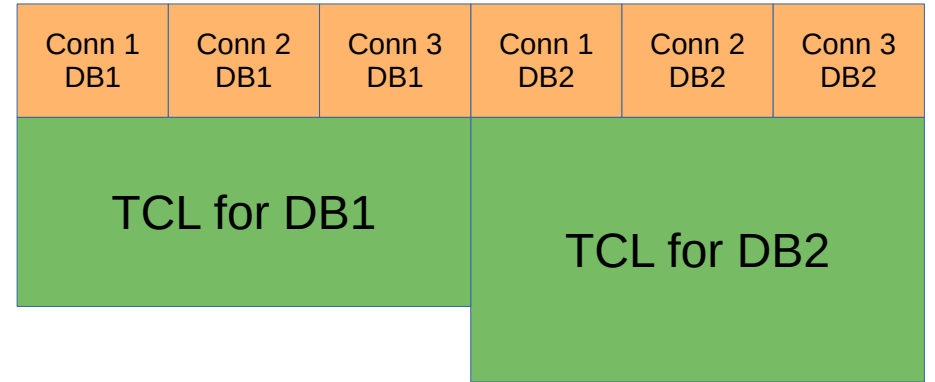| Conn 1	Conn 2	Conn 3
TCL		
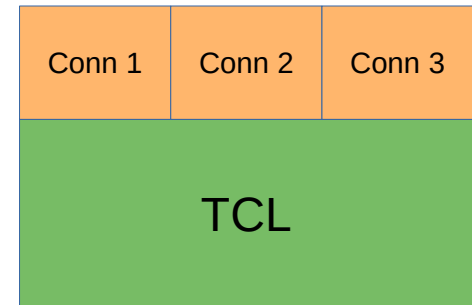
TempCacheLimit in 4.0 - 1

- Big change!
  - Now TempCacheLimit is allocated **per database**
  - **Firebird.conf → TempCacheLimit = XX — default for all databases**
  - **databases.conf → TempCacheLimit = XXX — tuned for each database**

TempCacheLimit in 4.0 — 2

For Classic

For SuperServer

| Conn 1 DB1 |
| TCL for DB1 |

| Conn 2 DB1 |
| TCL for DB1 |

| Conn 1 DB2 |
| TCL for DB2 |

| Conn 3 DB2 |
| TCL for DB2 |

| Conn 1 DB1 | Conn 2 DB1 | Conn 3 DB1 | Conn 1 DB2 | Conn 2 DB2 | Conn 3 DB2 |

TCL for DB1

TCL for DB2

TempCacheLimit in 4.0 — 3

– https://github.com/FirebirdSQL/firebird/issues/5984

For SuperClassic, in
versions 4.0.0-4.0.4

Conn 1 DB1	Conn 2 DB1	Conn 3 DB1	Conn 1 DB2	Conn 2 DB2	Conn 3 DB2
TCL for DB1	TCL for DB1	TCL for DB1	TCL for DB2	TCL for DB2	TCL for DB2

TCL for SuperClassic v4.0 was allocated
per connection, using per database
setting, till the fix

https://github.com/FirebirdSQL/firebird/issues/7928

TempCacheLimit in 4.0 — 4

For SuperClassic
v4.0.5

In version 4.0.5 TCL is allocated per database and shared per all connections

Conn 1 DB1	Conn 2 DB1	Conn 3 DB1	Conn 1 DB2	Conn 2 DB2	Conn 3 DB2

TCL for DB1

TCL for DB2
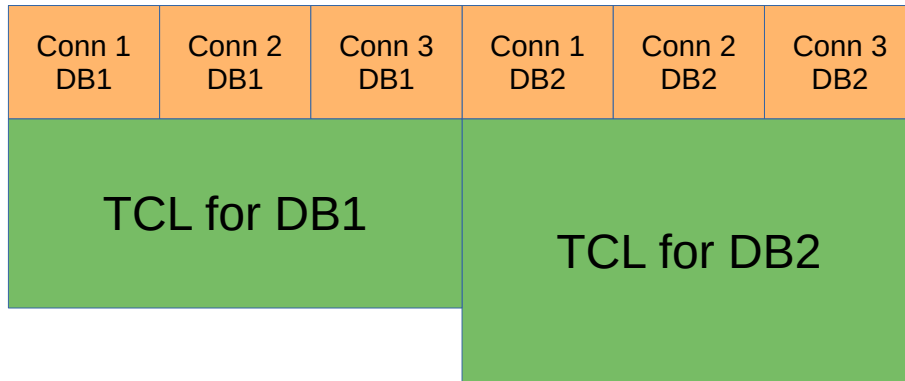
TempCacheLimit in 5.0

- The same as in v4.0.5!

Configuring TempCacheLimit (all recommendations are for 64bit)

- For 2.5
  - SuperServer and SuperClassic — always 2Gb
  - Classic — depends on the number of connections
    - Consider to use multi-instance Classic+SuperClassic for shared access
- For 3.0
  - 10-15% of RAM for SuperServer and SuperClassic
  - Classic — depends on the number of connections
    - Consider to use multi-instance Classic+SuperClassic for shared access
- For 4.0.5+ and 5.0
  - Tuning per database!
  - For SuperServer and SuperClassic - need to know number of databases, to do not use all the memory
  - Classic
- Configuration Calculator for Firebird
  - https://cc.ib-aid.com/democalc.html

Thank you!

- Questions?
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