universität innsbruck

Architektur und Implementierung von Datenbanksystemen

Task 3

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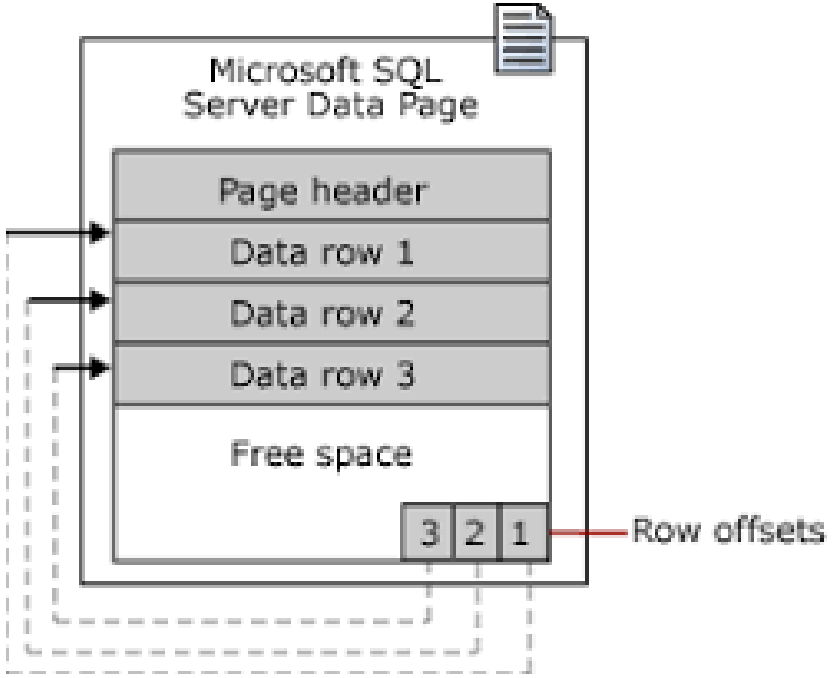
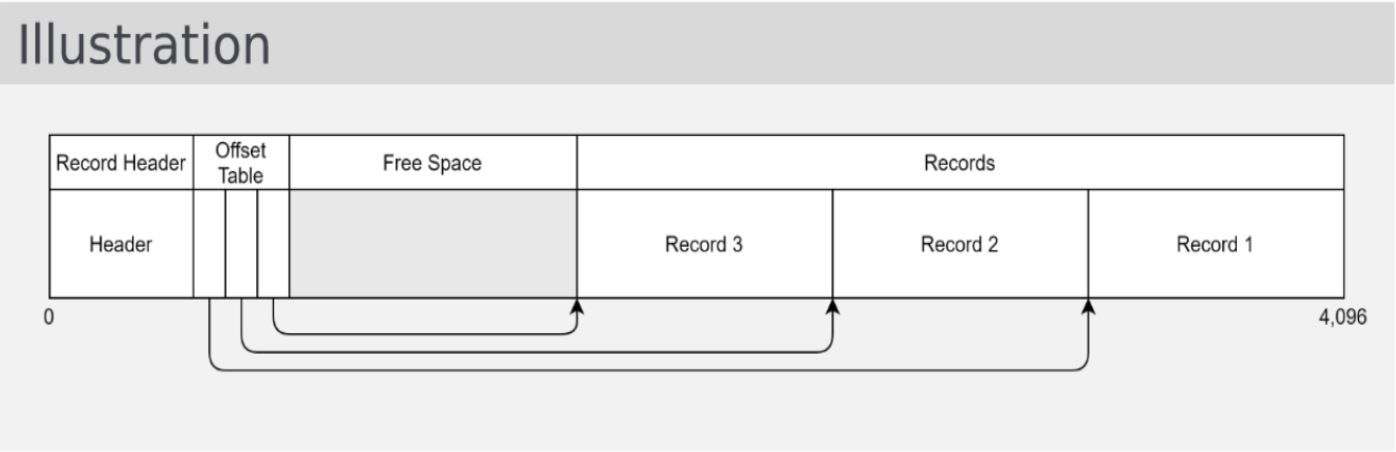
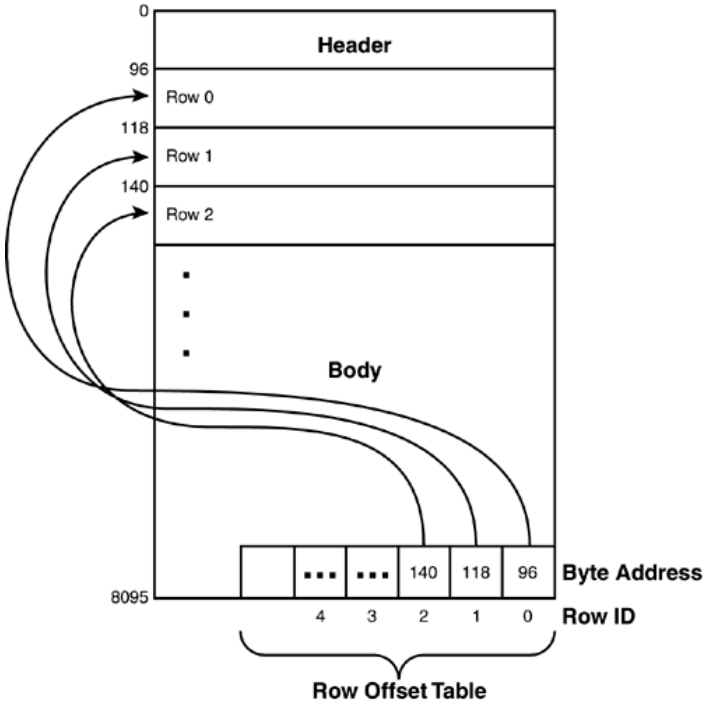
SQL Server Data Page

- Page size: 8kb
- 96-byte header containing:
  - Number of rows
  - page type
  - free space
  - …
- Rows follow serially after header
- Row offset at end, reverse from rows



Comparison with block from lecture

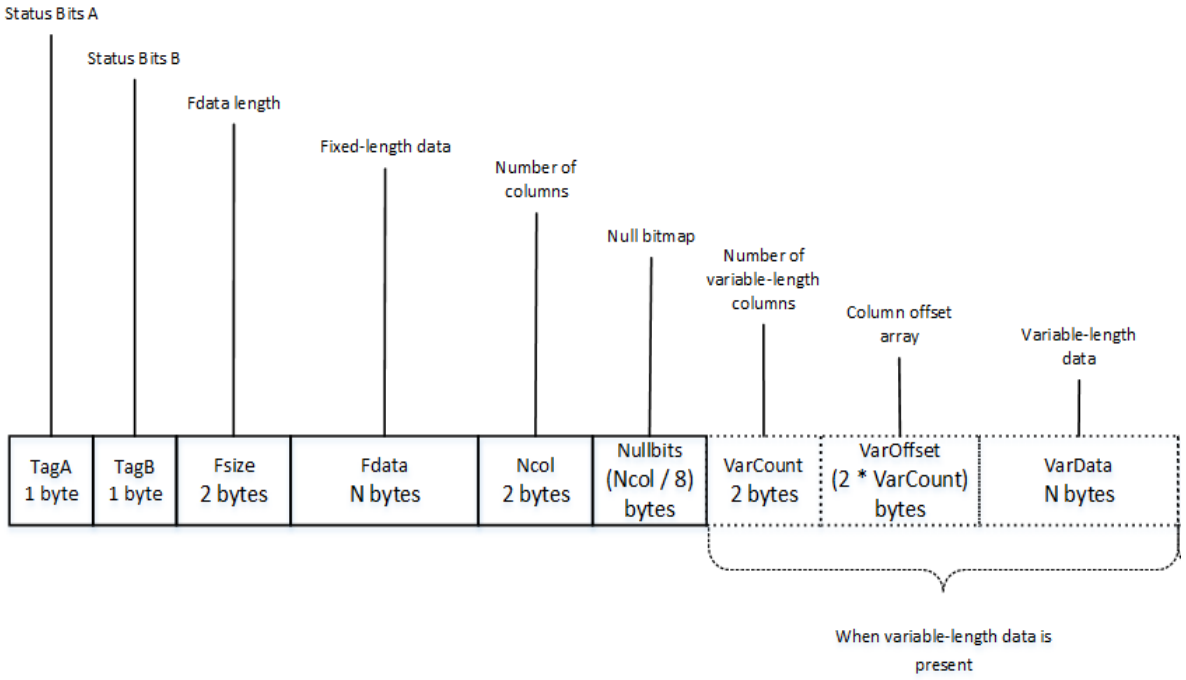




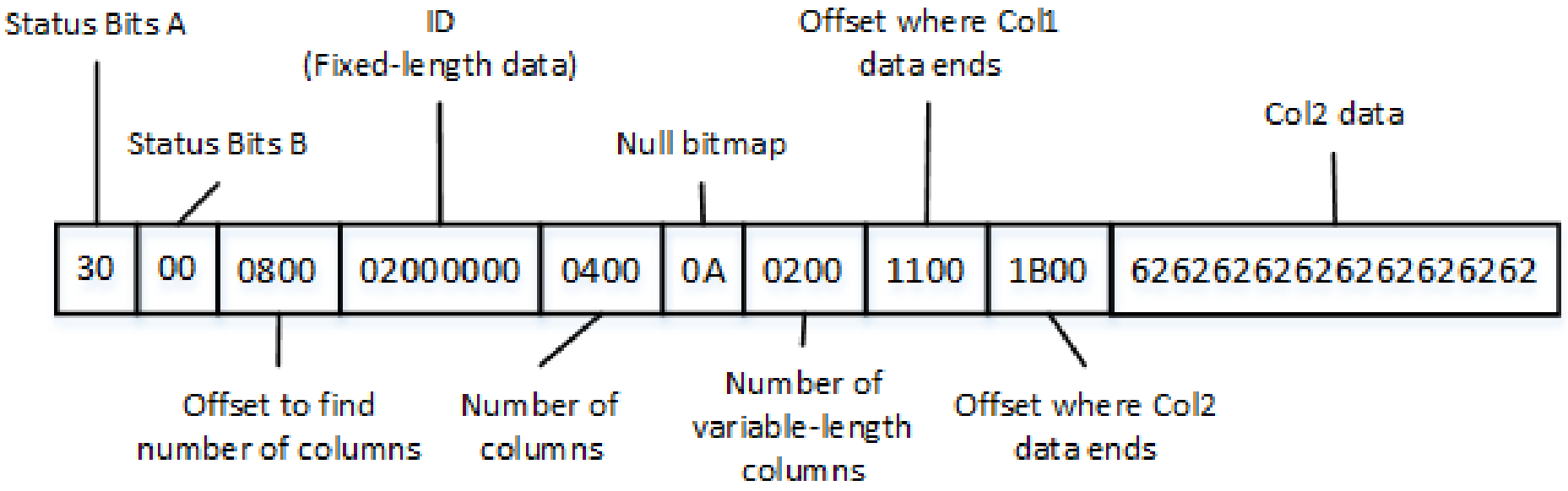
- Records start at the end, grow towards start
- Offset Table starts after header, grows towards end
- Size: 4kb

Record Format SQL Server

- SQL Server uses fixedvar format
- Fixed length:
  - **Tag A, Tag B:** Status bits for row data
  - **Fsize:** Pointer to end of fixed data (ncol)
  - **Ncol:** Number of columns total
  - **Nullbits:** Null bitmap array (for all columns)
- Variable length:
  - **VarCount:** Number of columns n
  - **VarOffset:** Offset array with n offset values

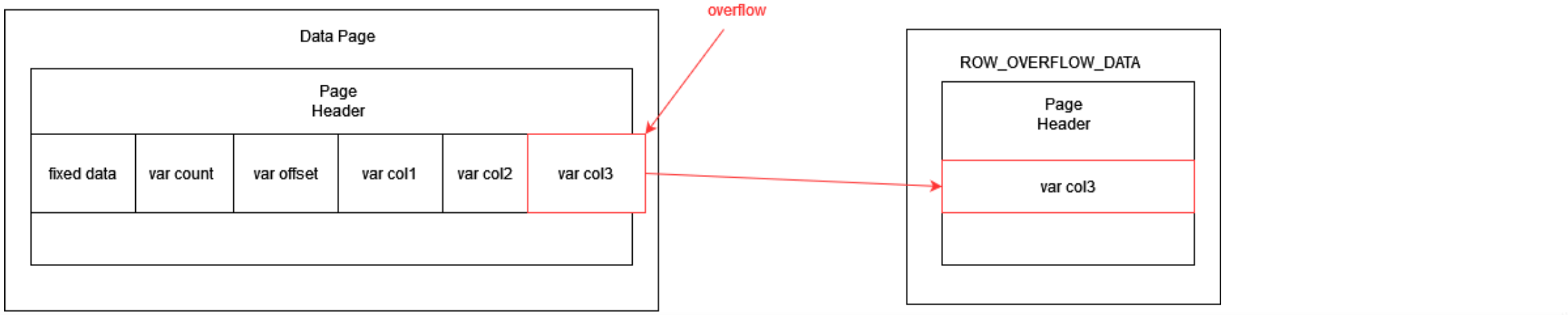


Record Example



Row overflow

- Maximum row size: 8060 Bytes (except text/image pages)
- Columns of rows can be moved off the page
- Upon overflow SQL server moves variable length columns to ROW_OVERFLOW_DATA page
- Overflow = update or insert operation that increases row size over 8060 Bytes
- Upon reduction of row size under 8060 Bytes moved columns get moved back from ROW_OVERFLOW_DATA



Sources

- https://etutorials.org/SQL/microsoft+sql+server+2000/Part+V+SQL+Server+Internals+and+Performance+Tuning/Chapter+33.+SQL+Server+Internals/Database+Pages/
- https://docs.microsoft.com/en-us/sql/relational-databases/pages-and-extents-architecture-guide?view=sql-server-ver15
- https://www.red-gate.com/simple-talk/databases/sql-server/database-administration-sql-server/sql-server-storage-internals-101/
- https://aboutsqlserver.com/2013/10/15/sql-server-storage-engine-data-pages-and-data-rows/
- https://git.uibk.ac.at/informatik/dbis/dbis-teaching/archimpl-course-material-2022/-/blob/main/slides/02_records.pdf

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