

Jens Dittrich

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# 1 The Young! History of Database Systems...



```
$ SET SOURCEFORMAT"FREE"
IDENTIFICATION DIVISION.
PROGRAM-ID. Seq2Rel.
AUTHOR. MICHAEL COUGHLAN.
* Creates a Relative file from a sequential file.

ENVIRONMENT DIVISION.
INPUT-OUTPUT SECTION.
FILE-CONTROL.
  SELECT SupplierFile ASSIGN TO "RELSUPP.DAT"
    ORGANIZATION IS RELATIVE
    ACCESS MODE IS RANDOM
    RELATIVE KEY IS SupplierKey
    FILE STATUS IS Supplierstatus.

  SELECT SupplierFileSeq ASSIGN TO "SEQSUPP.DAT"
    ORGANIZATION IS LINE SEQUENTIAL.

DATA DIVISION.
FILE SECTION.

FD SupplierFile.
01 SupplierRecord.
  02 SupplierCode          PIC 99.
  02 SupplierName          PIC X(20).
  02 SupplierAddress        PIC X(50).

FD SupplierFileSeq.
01 SupplierRecordSeq.
  88 EndOfFile            VALUE HIGH-VALUES.
  02 SupplierCodeSeq       PIC 99.
  02 SupplierNameSeq       PIC X(20).
  02 SupplierAddressSeq    PIC X(50).

WORKING-STORAGE SECTION.
01 SupplierStatus          PIC X(2).
01 SupplierKey              PIC 99.

PROCEDURE DIVISION.
```

```
WORKING-STORAGE SECTION.
01 SupplierStatus          PIC X(2).
01 SupplierKey              PIC 99.

PROCEDURE DIVISION.
Begin.
  OPEN OUTPUT SupplierFile.
  OPEN INPUT SupplierFileSeq.

  READ SupplierFileSeq
    AT END SET EndOfFile TO TRUE
END-READ
PERFORM UNTIL EndOfFile
  MOVE SupplierCodeSeq TO SupplierKey
  MOVE SupplierRecordSeq TO SupplierRecord
  WRITE SupplierRecord
    INVALID KEY DISPLAY "Supplier status = "
SupplierStatus
  END-WRITE
  READ SupplierFileSeq
    AT END SET EndOfFile TO TRUE
END-READ
END-PERFORM.

CLOSE SupplierFile, SupplierFileSeq.
STOP RUN.
```

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DATA DIVISION.
FILE SECTION.

FD  SupplierFile.
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```

Query

Result

DBMS



60ies

# hierarchical DBMS

# navigational DBMS

no physical data  
independence!

WAGAW



70ies

Codd invents  
Relational Model

„Codd made relations,

... all else  
is the work of man.“

WHAT  
HOW

# Research Projects

# IBM System R



80ies



**IBM DB2**

# Oracle

# SQL

90ies



# Object-relational DBMS

= relational DBMS +  
object extensions

# Object-oriented DBMS

= real object-oriented  
DBMS

parallel

Web

OLAP =  
OnLine  
Analytical  
Processing

2000

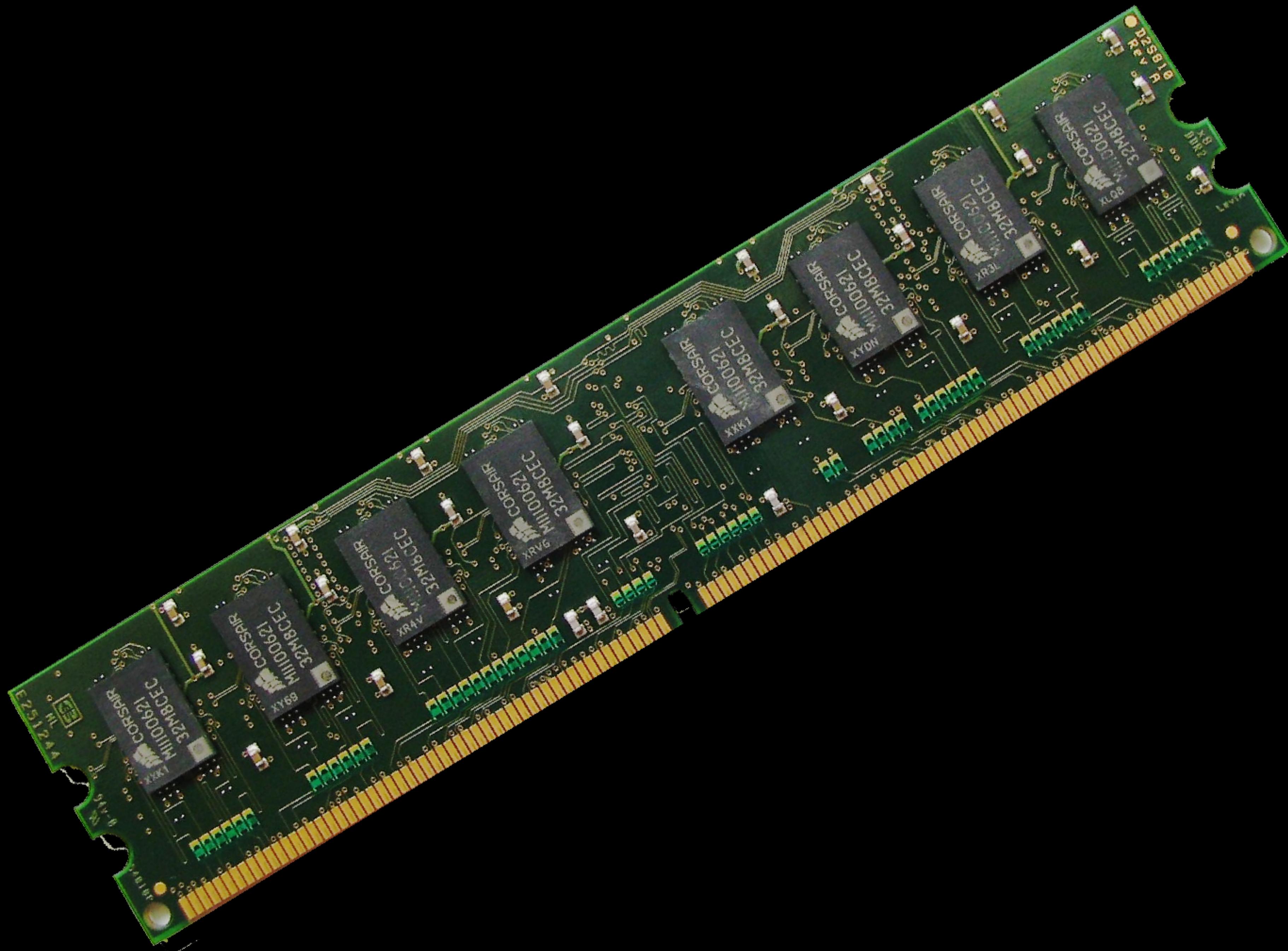


<XML/>

# data stream management

# Column Stores

name	street	city
peter	narrowstreet	new york
steve	macstreet	cuppertino
mike	longstreet	saarbruecken





The Google logo consists of the word "Google" in a bold, sans-serif font. Each letter is a different color: the 'G' is blue, the first 'o' is red, the second 'o' is yellow, the 'g' is blue, the 'l' is green, and the 'e' is red. The letters are slightly rounded and have a three-dimensional, shadowed appearance.

facebook®



Gute Fahrt.

2010





# NoSQL

# Big Data



1 MB



1 GB

**1 TB**  
**(actually does not fit on screen)**

# MapReduce



# Analytics

1,700,000,000?

IBM  
acquiring  
Netezza

263,000,000?

Teradata  
acquiring  
Aster Data

HP  
acquiring  
Vertica

Teradata  
acquiring  
Kickfire

Ingres  
acquiring  
VectorWise

Software AG  
acquiring  
RTM

EMC  
acquiring  
Greenplum

Cisco  
acquiring  
Truviso

X

acquiring

Y

to be  
continued...

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<sup>1</sup> The Young! History  
of Database Systems...

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M93

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