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# **Multi-user Databases with Microsoft Access**

**A Presentation for the  
Microsoft Access SIG  
of the North Texas PC User Group  
and the Metroplex Access Developers  
by Larry Linson**

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# What is Access?

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- ◆ **“A nice little desktop database”**
- ◆ **First popular Windows database**
- ◆ **For the novice**
- ◆ **For the power user**
- ◆ **For the developer**
- ◆ **A File Server database with Jet**

# **Access can build**

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- ◆ **A standalone database**
- ◆ **A multi-user database**
- ◆ **A client linked to ODBC databases**
- ◆ **A direct client to SQL Server**
- ◆ **A web interface to database**

# **Multuser Database**

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**(for this discussion)**

- ◆ **Access Application Part**
- ◆ **Access (Jet database engine)**  
**Tables and Data**
- ◆ **On a Network**

# Performance Factors

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- ◆ **Hardware Environment**
- ◆ **Software Environment**
- ◆ **Network Environment**
- ◆ **Requirements of Application**
- ◆ **Design of Application**
- ◆ **Implementation of Application**  
(More details about these, later)

# How Many Users?

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## ◆ High-End Reports

- Michael Groh – 150
- Drew Wutka – 135
- Michael Kaplan – 90 +
- Stephen Forte – 95

## ◆ Consensus

- Almost every factor “just right”

# How Many Users?

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- ◆ **“Routine” Reports**
  - in `comp.databases.ms-access` newsgroup
  - from experienced Access developers
  - 30 - 70 users for Access 97 and Access 2000, a few less for Access 2.0
- ◆ **Consensus**
  - Not every factor has to be “just right”

# How Many Users?

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- ◆ **Low -End Reports**
  - Falls over with 4 users
- ◆ **Consensus**
  - At least one factor “very wrong”
  - Often many factors “wrong”
- ◆ **Most common cause, when one proved**
  - Designer / implementer did not understand Microsoft Access



# Resources ...

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- ◆ **Access 97 Developer's Handbook**
- ◆ **by Getz, Litwin, Gilbert**
- ◆ **published by SYBEX**
- ◆ **ISBN: 0 - 7821 - 1941 - 7**
- ◆ **Chap 12 – Developing Multi-User Applications**

# Resources ...

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- ◆ **Access 2000 Developer's Handbook, Volume 2: Enterprise Edition**
- ◆ **by Getz, Litwin, Gilbert**
- ◆ **published by SYBEX**
- ◆ **ISBN: 0 - 7821 - 2372 - 4**
- ◆ **Chap 2 – Developing Multi-User Jet Applications**

# Resources . . .

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- ◆ **Programming Microsoft Access 2000**
- ◆ **by Rick Dobson**
- ◆ **publisher Microsoft Press**
- ◆ **ISBN: 0 - 7356 - 0500 - 9**
- ◆ **Chapter 10 – Working with Multi-User Databases**

# Resources . . .

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- ◆ **Building Applications with Microsoft Access 97**
- ◆ **Manual, comes with Office Developer or the MSDN Library**
- ◆ **publisher: Microsoft**
- ◆ **Chapter 10 – Creating Multi-User Databases**

# Resources

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- ◆ **Microsoft Office Visual Basic Programmer's Guide**
- ◆ **Manual, comes with Office 2000 Developer or the MSDN Library**
- ◆ **publisher: Microsoft**
- ◆ **Chapter 16 –Multi-User Database Solutions**

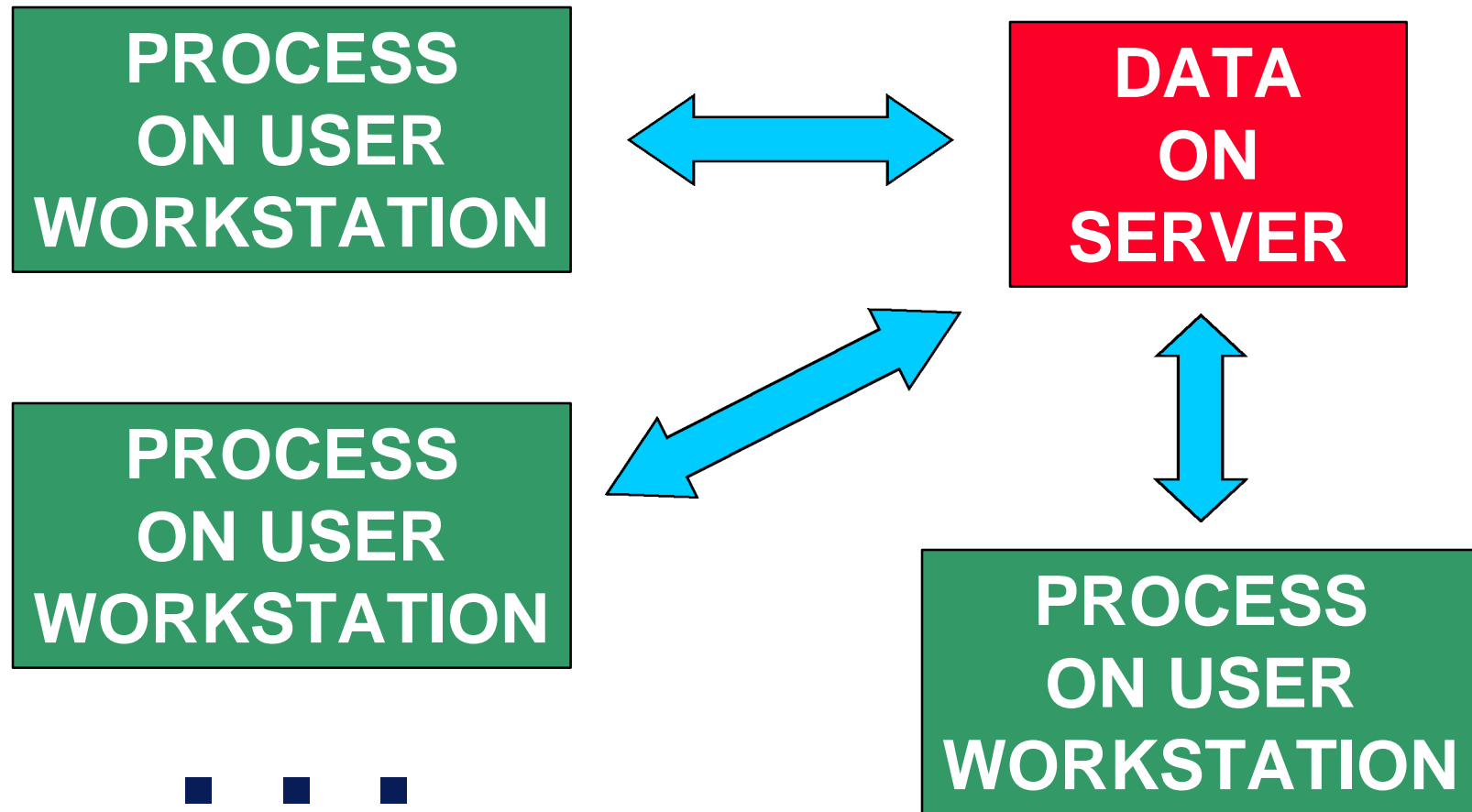
# What's Different?

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- ◆ **Using database across network**
  - **File-Server versus Server Databases**
  - **Performance**
  - **Corruption**
- ◆ **Multiple users of same data**
  - **Collisions (Add and Update) – Locking**
  - **Seeing Other Users Update – Refreshing**
  - **Updating Related Tables – Transactions**
  - **Who Am I? – Identifying Users**

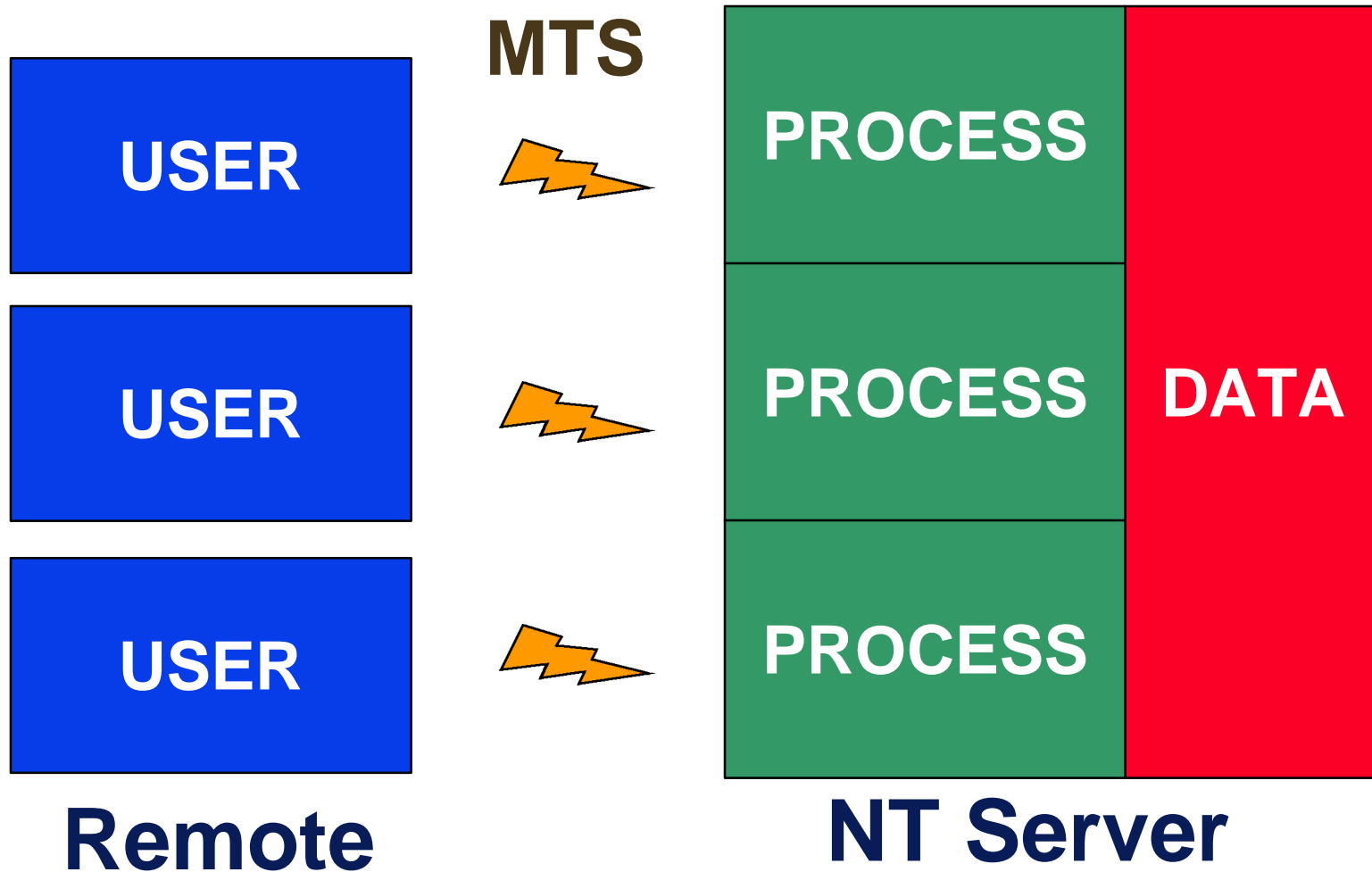
# Multi-user Layout . . .

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# Alternate Layout . . .

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# Multi-User Layout

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- ◆ **Tables on Server**
  - **Available To All Users**
- ◆ **On Users' Workstations**
  - **Access (or Runtime)**
  - **Application Part**
  - **Fetch .DLLs, Objects Locally**

# **Access is a File-Server**

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- ◆ **Retrieval, Extraction, and Manipulation on User's Workstation**
- ◆ **Every I/O Done Across Network**
  - That would normally be to local hard drive
  - Not whole database, nor necessarily whole table
  - Just what Access finds necessary
    - ◆ Index may be enough to find exact records

# Performance Factors

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## ◆ Hardware Environment

- ◆ More Memory
- ◆ Faster Processors
- ◆ Faster Hard Drives

## ◆ Software Environment

- ◆ Not Too Much Else Running

## ◆ Network Environment

- ◆ Faster is Better

# More Factors

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## ◆ Reduce Network Traffic

### – Database Design

- ◆ Appropriate indexing more important
- ◆ Use Queries not Tables
- ◆ No extra Tables in Queries

### – Database Implementation

- ◆ Queries, not DAO Code (When Feasible)
- ◆ Queries, not RecordsetClone.FindFirst

# Record Locking . . .

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## ◆ In Bound Forms

- **No Locks (aka Optimistic Locking)**
  - » Only in the instant the record is saved
- **Edited Record (aka Pessimistic Locking)**
  - » As soon as user begins to edit
- **All Records**
  - » All records in the entire recordset
  - » Batch Updates
  - » Administrative Maintenance

# Record Locking . . .

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- ◆ **Possibilities by Object**
  - **All Three Options**
    - » **Table datasheets; Select, Crosstab, Union Query, Forms, OpenRecordset**
  - **Lock Edited Record or All Records**
    - » **Update, Delete, Make-Table, Append**
  - **Lock All Records**
    - » **Data Definition Queries**
  - **No Locks or Lock All Records**
    - » **Reports**

# Record Locking . . .

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- ◆ **Default Record Locking Option**
  - Established by menu Tools | Options
- ◆ **Applies to All, Except**
  - Data Definition Queries – All Records
  - Open Recordset – Edited Record

# Record Locking . . .

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- ◆ **OpenRecordset**
  - **dbDenyRead or dbDenyWrite**
  - **Overrides .LockEdits property**
  - **Native Access Tables Only**
- ◆ **.LockEdits Property**
  - **True = Edited Record (the default)**
  - **False = No Locks**



# Record Locking . . .

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- ◆ **Advantages of Pessimistic Locking**

- Simple to Develop, Prevents Overwriting

- ◆ **Disadvantages of Pessimistic**

- Lock Multiple Records, Less Concurrency

- ◆ **Advantages of Optimistic Locking**

- Simple to Use, Better Concurrency, Less Lockout

- ◆ **Disadvantages of Optimistic**

- Can be Confusing to User, Allows Overwriting

# Record Locking

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- ◆ **Generally, use Optimistic**
  - **Minimize User Lockout**
- ◆ **Or, Mixed, by Specific Object**
  - **Most Optimistic, but**
  - **Critical Information, Pessimistic**
    - » **Example: Quantity on Hand in Inventory**

# Locking Improvements

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- ◆ **Access 2.0**
  - **Page Locking, Adding Locked Last or New Record**
- ◆ **Access 95, 97**
  - **Page Locking, but Adding Doesn't Lock Last or New Record**
- ◆ **Access 2000**
  - **Record-Level Locking, Optional**

# Transactions

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- ◆ **Changes in a batch**
- ◆ **All Succeed or All Fail**
- ◆ **Same or Related Tables**
  - **Credit New Account and Debit Old Account**
  - **Allocate Stock to Order, Deduct Stock on Hand**

# Causes of Corruption

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## ◆ Ungraceful Termination

- Power Outages
- Users Power-Off
- Flakey Network

## ◆ Countermeasures

- Battery Back-Up
- Condition of Continued Employment
- Isolate Cause and Replace
  - » Hardware
  - » Staff

# Identifying Users

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- ◆ **Typically secure the database**
  - **Everyone Logs In**
- ◆ **Viewing and Reporting**
  - **MSLDBUSR.DLL by Microsoft**
  - **Unsupported**

# **Advanced Multi-User**

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- ◆ **Stretch the Capacity**
- ◆ **“Unusual” Requirements**
- ◆ **Standard Approach Insufficient**
- ◆ **Threshold by Trial and Error**

# Advanced Multi-User

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- ◆ **Unbound Forms**
- ◆ **Code / Queries**
- ◆ **Hold record minimal time**
- ◆ **Other approaches**



# **Advanced Multi-User**

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- ◆ **Buys a little time (at best)**
- ◆ **Consider “upsizing”**
- ◆ **Often non-trivial project**
  - **to extend multiuser application**
  - **to upsize to client-server**

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# The End

## Multi-user Databases with Microsoft Access

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