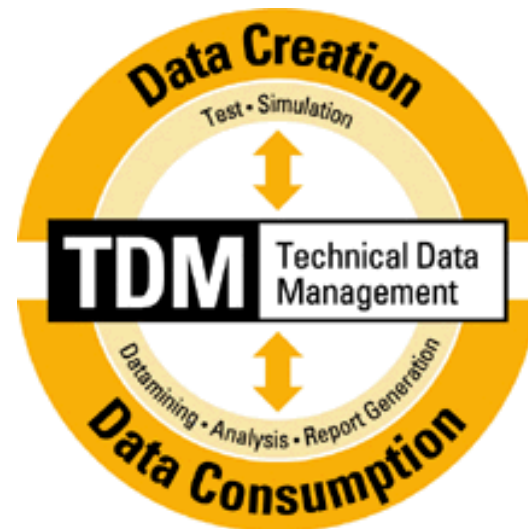# Making the Most out of your Test Systems with Proper Data Storage Techniques

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Determining Your Storage Format

- When determining the appropriate storage format for your data, consider
  - What will you do with your data once you acquire it?
  - Will you write and read data with the same application?
  - How much data will you acquire?
  - At what rate will you acquire data?
  - Will you need to exchange data with another program?
  - Will you need to search your data files?

Data Storage Options

	ASCII	BIN	XML	DB	TDM
Exchangeable	X		X		X
Small disk footprint		X			X
Searchable				X	X
Contains attributes					X
High-speed streaming		X			X

ASCII and Binary Files

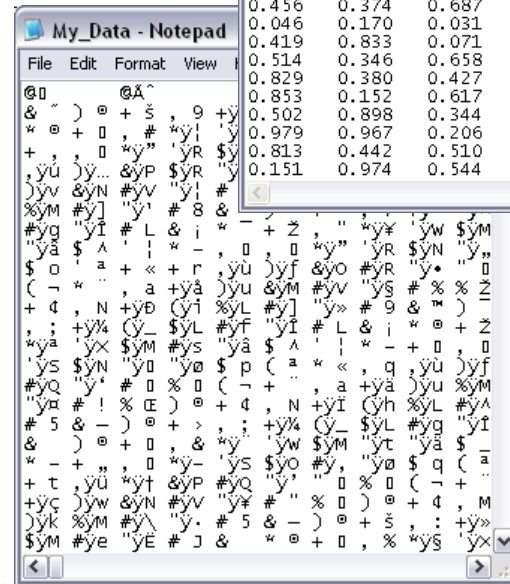|		XML	DB	TDM
Exchangeable		X		X
Small disk footprint				X
Searchable			X	X
Contains attributes				X
High-speed streaming				X

ASCII and Binary Files

ASCII File Characteristics

– Human-readable

– Easily portable to other applications such as Microsoft Excel

– Larger disk footprint

– Slow read and write
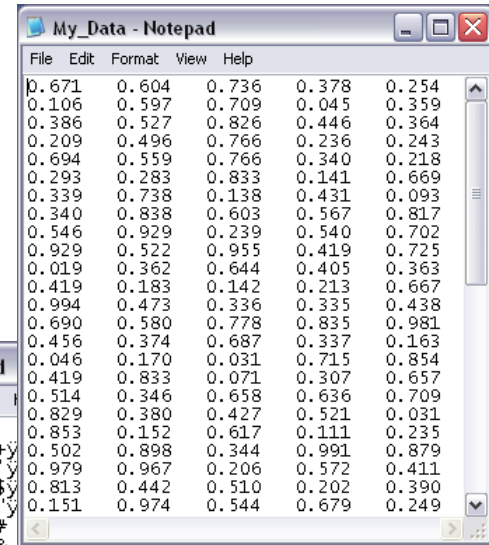
Binary File Characteristics

– Not human-readable

– Not easily exchangeable

– Compact file size

– Streaming capable

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Writing Data to XML Files

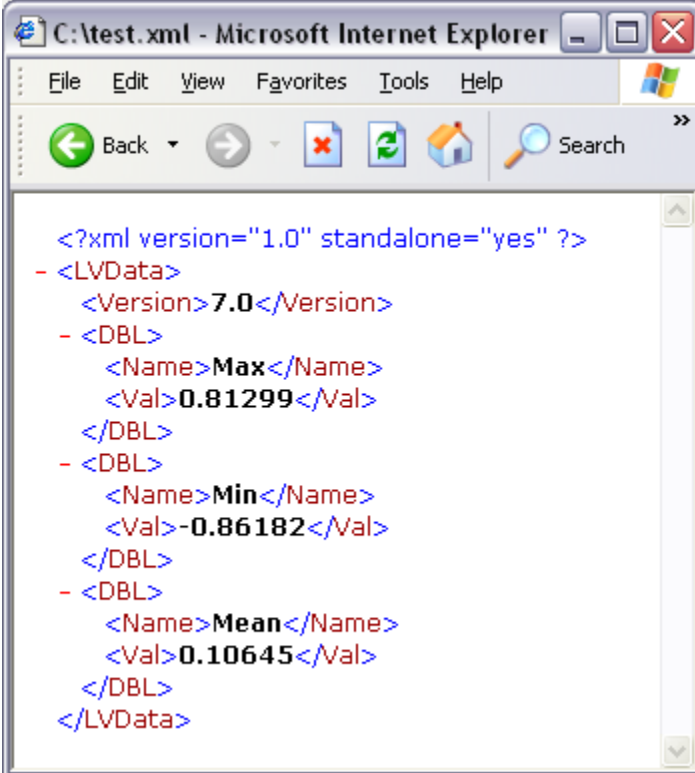|	ASCII	BIN		DB	TDM
Exchangeable	X				X
Small disk footprint		X			X
Searchable				X	X
Contains attributes					X
High-speed streaming		X			X

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XML Files

Characteristics

- Stores complex data structures

- Shows display in a Web browser or in a text editor

Considerations

- Large disk footprint

- Front end schema design

Writing Data to Databases

	ASCII	BIN	XML		TDM
Exchangeable	X		X		X
Small disk footprint		X			X
Searchable					X
Contains attributes					X
High-speed streaming		X			X

Databases

Characteristics

- Store data centrally

- Organize and query test results

Considerations
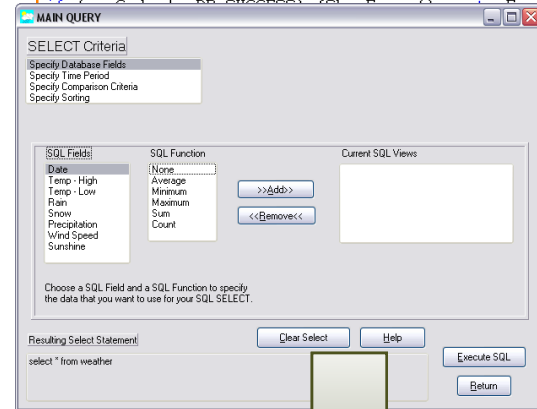
- Programming can be more time intensive

- Require maintenance

- Potentially high cost
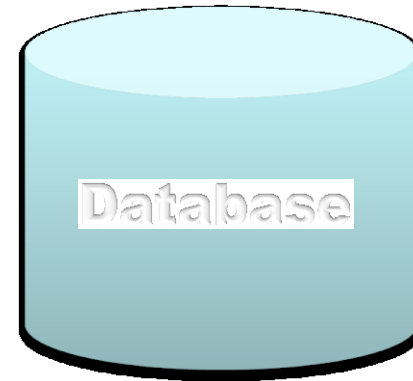
Writing Data to TDM Files

|	ASCII	BIN	XML	DB	TDM
Exchangeable	X		X		X
Small disk footprint		X			X
Searchable				X	X
Contains attributes					X
High-speed streaming		X			X

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TDM File Format

Characteristics

- Flexible way to store data with descriptive information in a number of software products

- Descriptive information can be customized and can include names, units, UUT, operator name, test ID etc.

- Public documentation, Microsoft Excel AddIn, Open Office Calc AddIn and APIs (programming interfaces) available: www.ni.com/tdm
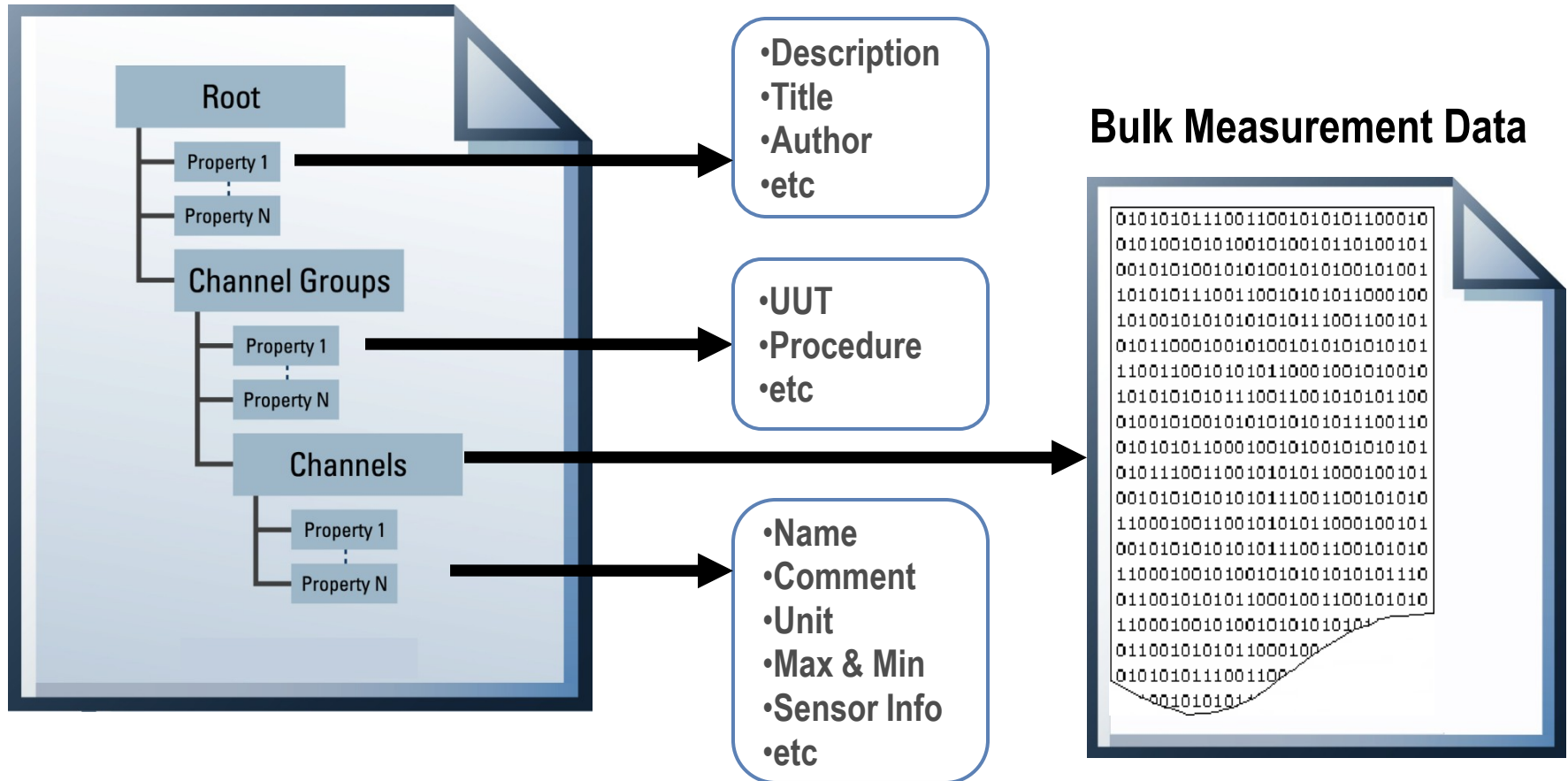
NATIONAL INSTRUMENTS
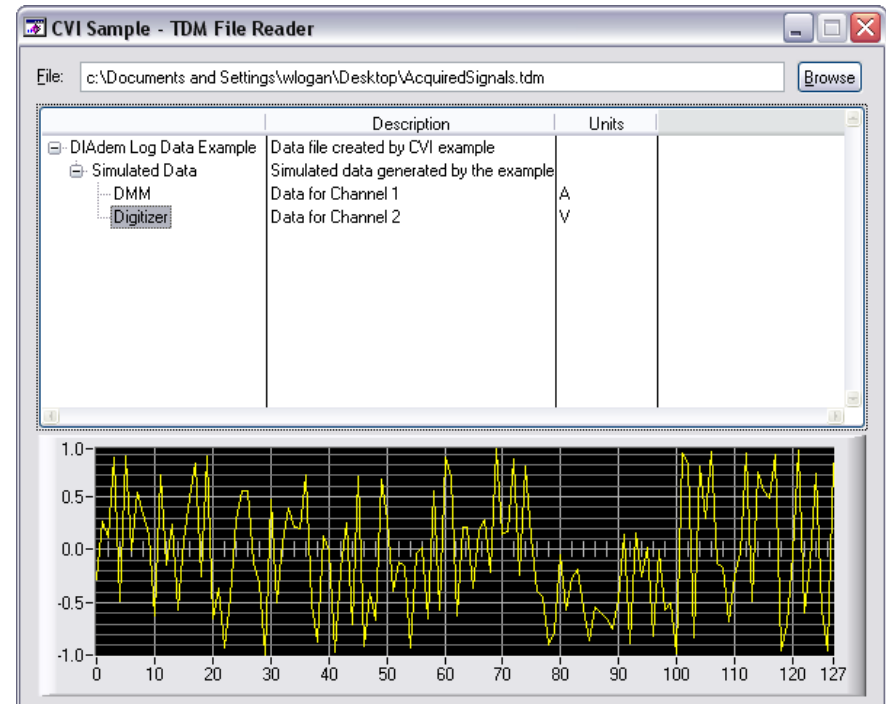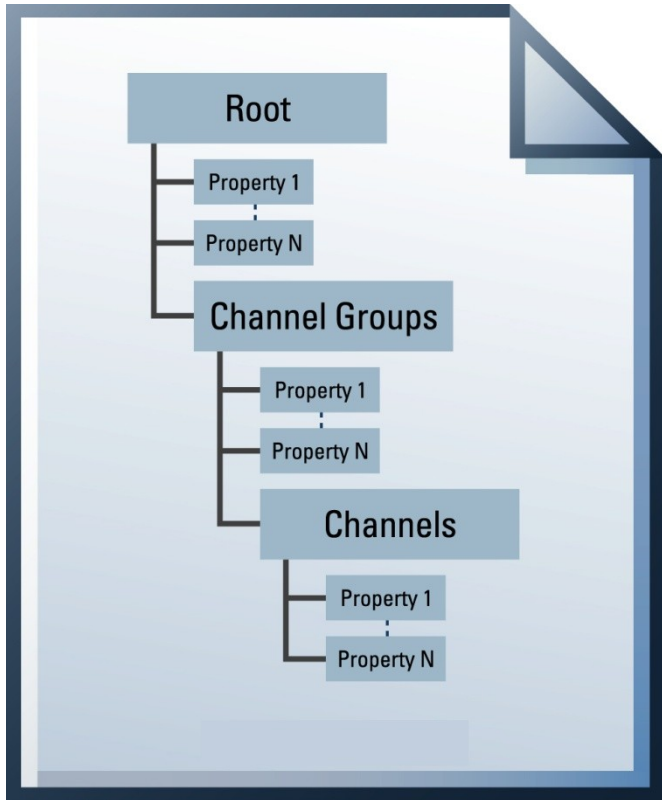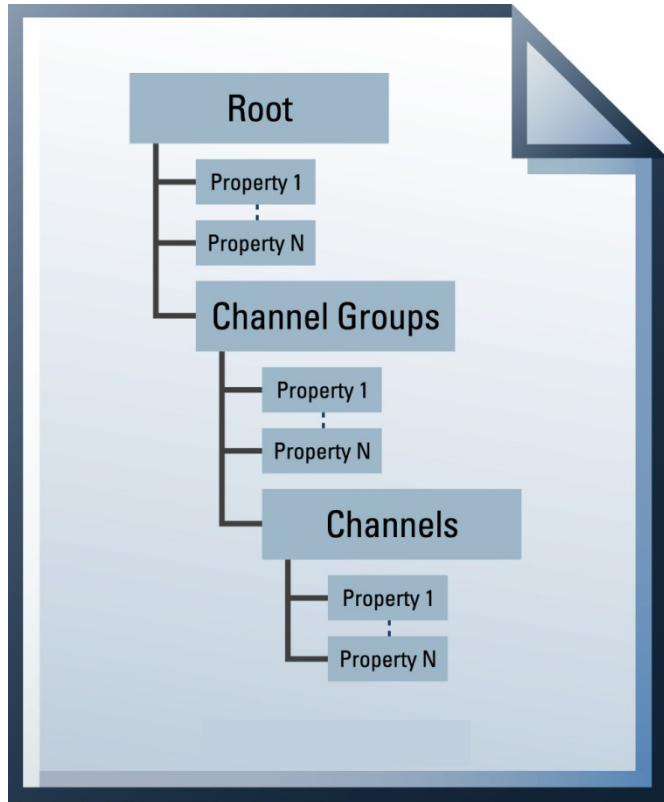
TDM Data Model

- 3 Levels of Hierarchy
    - File, Groups and Channels
- Each level has associated properties which you can customize
- The TDM data model is saved with each data file, it's self-describing

TDM Files are Self Describing

Root
- Property 1
- Property N

Channel Groups
- Property 1
- Property N

Channels
- Property 1
- Property N

- •Description
- •Title
- •Author
- •etc

- •UUT
- •Procedure
- •etc

- •Name
- •Comment
- •Unit
- •Max & Min
- •Sensor Info
- •etc

Bulk Measurement Data

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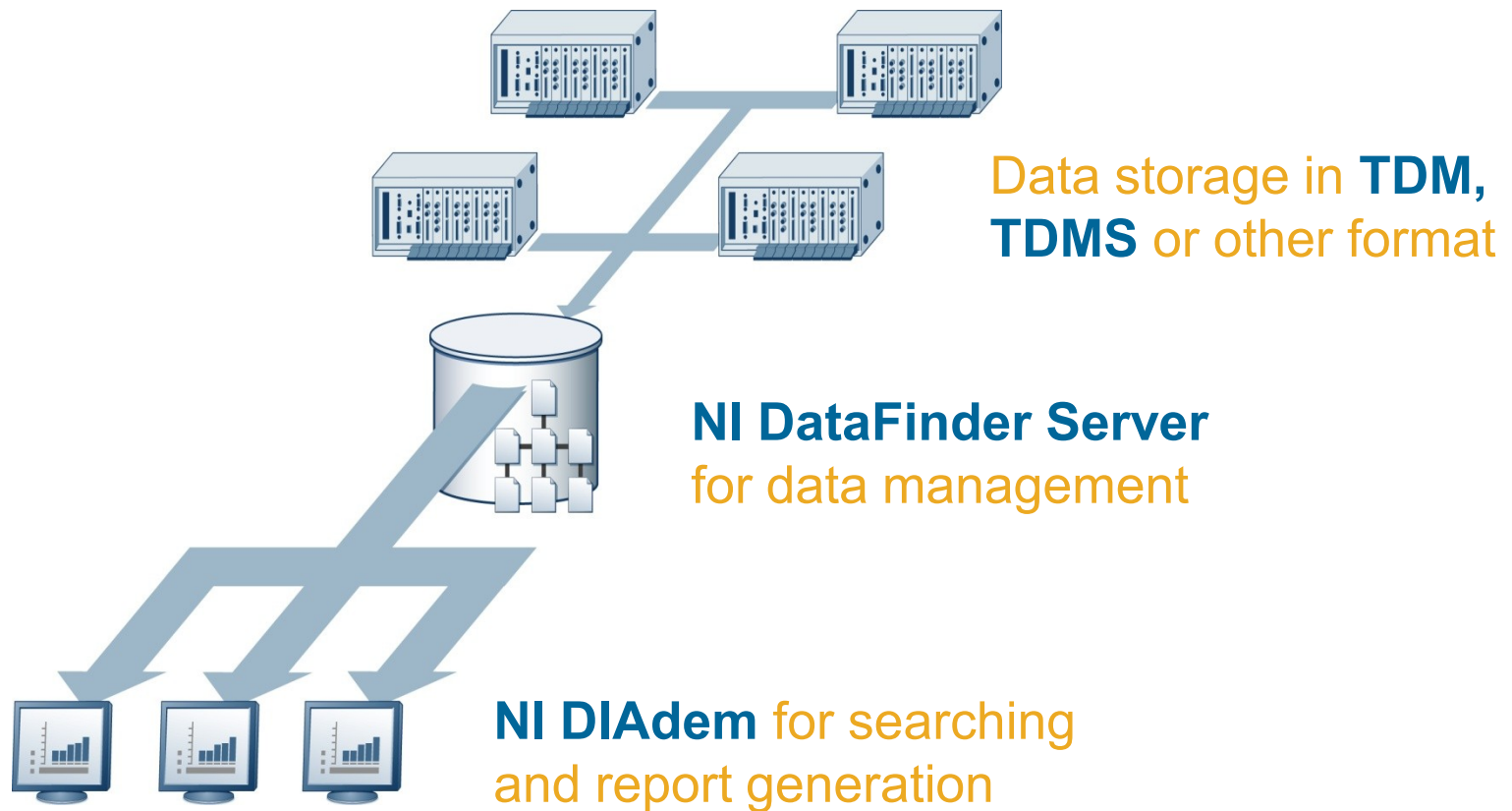
TDM File Format Flavours

TDMS

- One single binary file with meta date and mass data

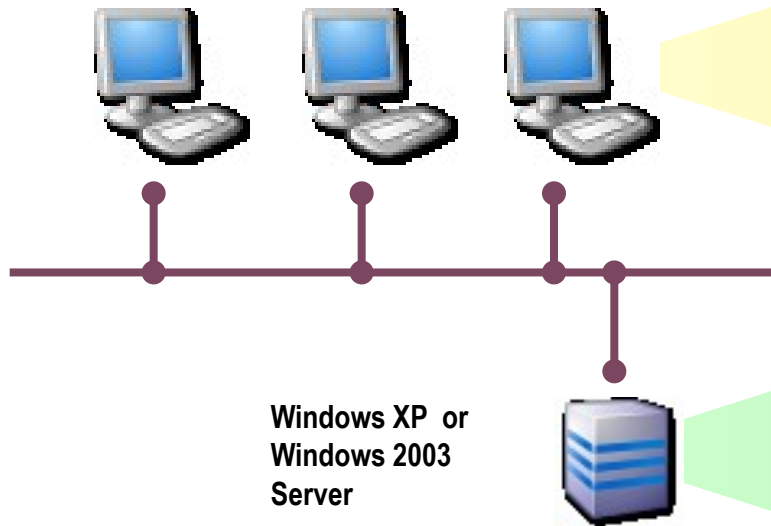- Optimized for high-speed streaming and real-time applications

TDM

- Two files

- XML based human readable header file

- Binary file with mass data

Ready to use Data Management Solution

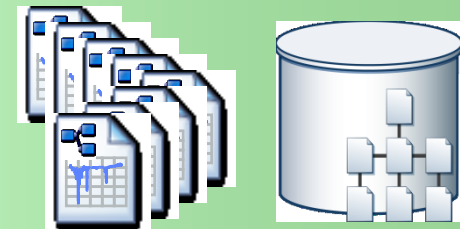Data storage in **TDM**, **TDMS** or other format

NI DataFinder Server for data management

NI DIAdem for searching and report generation

NI DataFinder Server Edition

Search interface in DIAdem client

DataFinder Server Edition

Windows XP or Windows 2003 Server

✓Centralized data management for test data files (can be scattered over different locations)

✓Neither file conversion nor any other IT effort such as data base implementation or maintenance required

✓Parallel data search by different clients using NI DIAdem's integrated searching user interface

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Details for NI DataFinder

Arbitrary Data File → DataPlugin → DIAdem Data Index
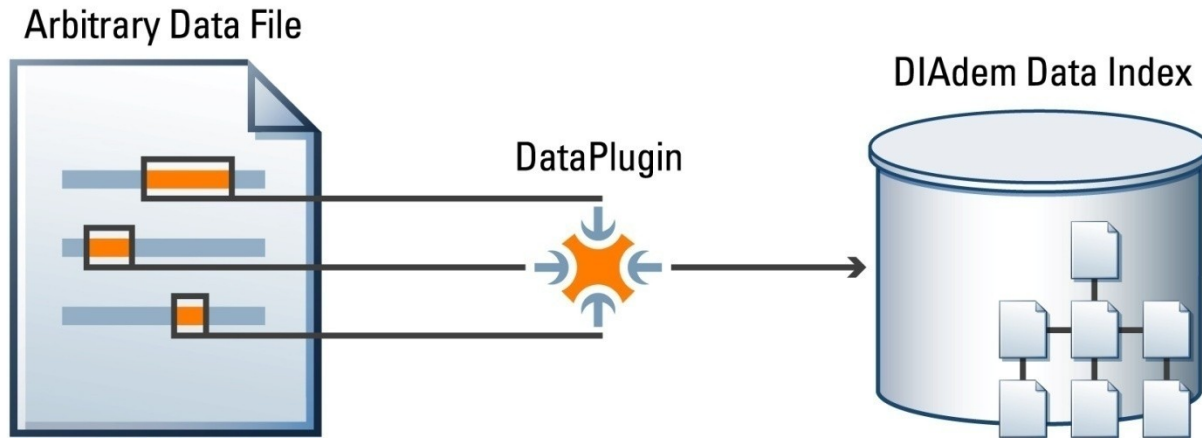
- Extracts descriptive information from data files
- Builds and updates its index automatically
- Works with TDM, TDMS and other file formats
- Requires no IT support to install, configure or maintain

LAC *.DAT,HDR
GRAMS_SPC *.SPC
Graphtec_GBD *.GBD
HBM_Catman *.BIN
HBM_Catman_Onl *.DAT,BIN
HBM_MGCCP42 *.MEA
HIOKI-HiCORDER *.MEM,REC,RMS,POW,WAV,R_M,SEQ,MUL,RMM
HIOKI_ASCII *.TXT
HP_SDF *.SDF, TIM
IOTDaAPI *.DC2,DSC,IO$
IPCC *.DAT
JCamp-DX *.DX
K-Net_SM *.EW,NS,UD, EW1,EW2,NS1,NS2,UD1,UD2
Kyowa_KS1 *.KS1
Kyowa_KS2 *.KS2
Kyowa_KU *.KU1
Kyowa_RTM *.RTM
LeCroy_Waveform *.TRC,000,001,002
Lotus123 *.WK4
LVM *.lvm
MatLab *.MAT
MDF *.MDF, DAT
Minitab_MTP *.MTP
MME_Import *.MME

NI DIAdem

Software for Interactively Manage, Search, Analyze and Report Data and for Automated Data Processing

Integrated local DataFinder and search interface for NI DataFinder Server Edition

**Easy and flexible access to data bases and files (ni.com/dataplugins)**

Interactive analysis and report generation without programming (PDF, HTML …)

Integrated data acquisition and interfaces for NI LabVIEW and other software
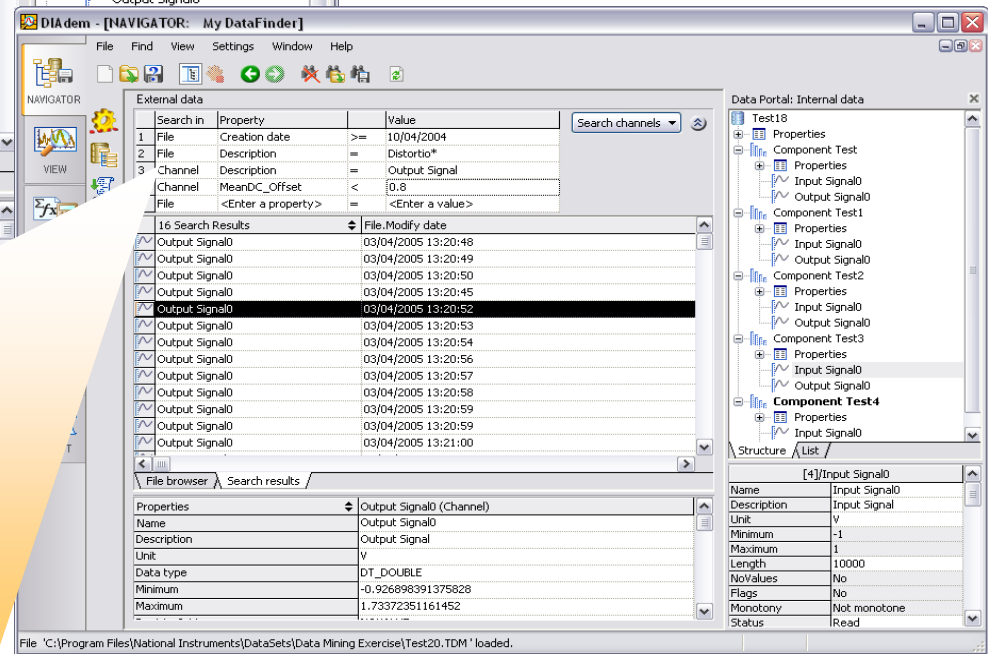
Turn-key applications based on VBScript and custom user interfaces
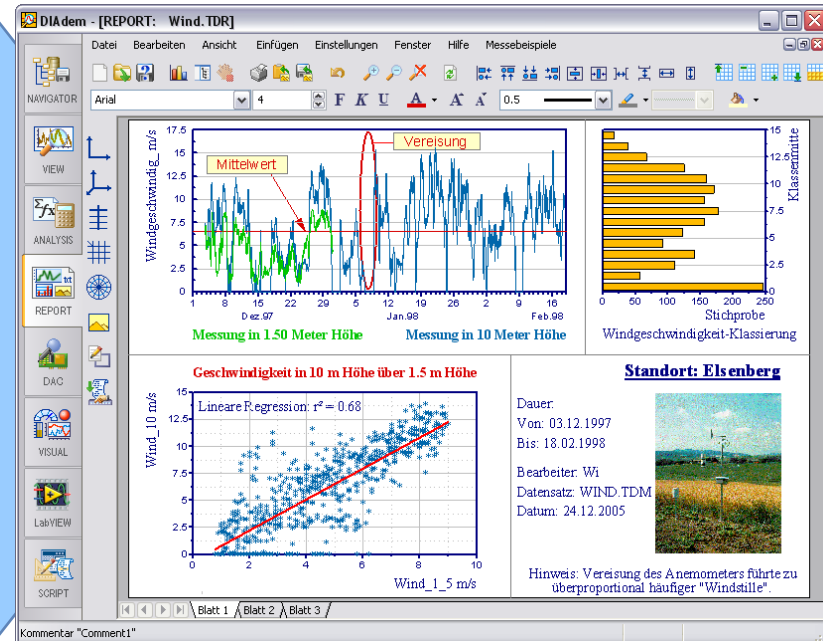
Integrated search interface for easily finding and extracting data from large file repositories
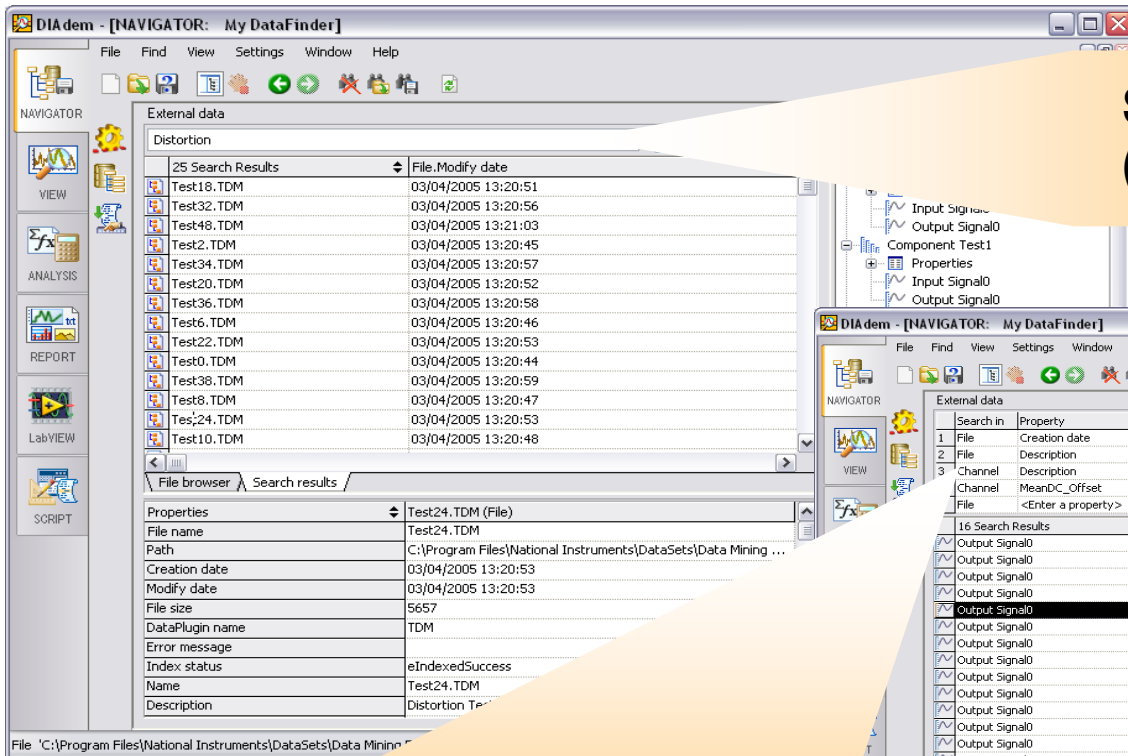
Simple text search (like internet search)

Parametric search using descriptive properties

Summary

- Choosing the right data storage method is essential for an efficient use of the test data

- Databases offer powerful capabilities but require a lot of effort

- TDM format, NI DataFinder and NI DIAdem offer a flexible and cost saving solution:

  + No changes to existing data acquisition systems and file repositories required

  + No IT effort for database design and maintenance

  + Ready-to-use user interface for data search, analysis and reporting

  + Programming environment for automated data processing

More information at:

www.ni.com/tdm

www.ni.com/datafinder

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