



# Test Data Management: Trends and Tips

## *Storage Cost Reduction and Networking Combine with Databases to Support Test Data.*

### Overview

Test Data Management (TDM) continues to grow as an important topic that test and measurement engineers must consider. With the amazing decrease in harddrive costs per GB, and the continuing improvements in network connectivity, test data is being produced at ever-increasing rates. It is just too easy to put massive amounts of data onto multiple test stations or simply throw it all onto a server.

### The Challenge

Standard PC hard drives over the past several years are typically large enough to store all data generated on a test stand over the life of the stand. Plus, large hard drives and networked server technology have combined to make it very painless to push data over the IT “wall”, and let someone else worry about maintenance. Both these scenarios combine to make it difficult to manage and locate test results. Classic warning signs are spending hours locating test data from last month, or, worse yet, rerunning the test rather than spending the time to find the original data. Clearly, test engineers would benefit from some organizational tools. The challenge is using tools that leverage all the networking and database searching capabilities available today. This article discusses some solutions for locating data.

### The Solution

Locating data requires looking some type of identifier. Usually, test engineers organize data by either a file naming convention or an entry into a database via a test ID (*i.e.*, a UUT number). These unique “handles” can be used for locating test data based on a date, lot number, and so on. In a manufacturing operation, this level of identification can work well, unless the test results are being used in a quality control regime, where it is important to locate ranges of test results based on result values. Result values are even more important in product devel-

opment, where test results are less well-defined, and can change from test-to-test or product-to-product.

A solution that works well is a database of test results that holds all types of identifiers: creation date, source, operator, operating conditions, summary statistics, annotations, and so on. The summary statistics are useful for quality control in a manufacturing environment as well as follow-up analysis in a product development realm. These statistics can be useful for search ranges and correlations with the operating conditions.

### Technical Highlights

The identifiers of the test data are referred to as metadata. Metadata is essentially any data that describes data. Thus, the test database is used as a reference library for the actual test data. Searches can be performed based on the metadata information: find all the test results with a maximum voltage greater than twice the upper test limit.

Engineers can either purchase tools to help with this metadata & database approach, write their custom own applications, or consult with custom developers. One tool of interest is Diadem 9.1 from NI that reads LVM files. LVM files can be created within LabVIEW and other NI products. Another tool is Arendar which integrates well with TestStand and is useful in a manufacturing test environment.

Custom applications based on databases are common. Databases should be capable of handling a client-server arrangement, since test metadata is usually centrally located in a single database and accessed from multiple clients.

We have used SQL-compliant relational databases, such as MS SQL Server, and specialized, internet-enabled databases ideal for many of our customers.

The internet-enabled database solutions are much better at handling changing test data and metadata content requirements. These databases are built upon World Wide Web Consortium technology, such as used by Google, to organize metadata across the world.

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# National Instruments Training

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All classes are held at Viewpoint's Certified Training Center in Rochester. To register go to [www.ni.com/training](http://www.ni.com/training) or call 585-475-9555.

For detailed course descriptions, prerequisites, and a complete schedule, go to [www.ViewpointUSA.com/training](http://www.ViewpointUSA.com/training).

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Training Continued On Page 3

*\* Indicates prerequisite required*

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### LabVIEW Real-Time Application Development

2/14

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Quickly learn dynamic system architectures, real-time programming techniques, and time-saving development tips.

Students enrolling in this class should have taken the LabVIEW Basics classes and be comfortable programming in LabVIEW.

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Viewpoint has several years of experience with these internet-enabled databases. The benefits of these databases stem from two major aspects. First, databases in disparate locations can be easily linked. Second, the amorphous nature of links so common on the web allows flexibility in how engineers connect their metadata. A simple example is the desire to view UUT data sorted by a specific test parameter value or by manufacturing line number, especially if the line ID was not included in the initial schema design. It is sometimes very hard to rework a relational database to handle a new schema, but the internet-enabled databases are built for this type of scenario. See [www.viewpointusa.com/app\\_solutions.asp](http://www.viewpointusa.com/app_solutions.asp) for the link to 'Internet Enabled Databases for Test Data Management'.

### Conclusion

The escalating increase of data storage capabilities and decreasing cost per GB is affecting test data management. The temptation to save everything is becoming hard to resist leading to increasing difficulties in locating specific test results amidst the extensive sea of data. Products are being developed to help manage test data. In addition, Viewpoint Systems has years of experience in all these areas and can help you incorporate off-the-shelf products or develop custom solutions to assist in your test data management.

## New Faces at Viewpoint

Viewpoint Systems is proud to announce the addition of two engineers to our staff and two co-op students.



John Percy joined Viewpoint as a Software Engineer in November of 2005 and brings with him his extensive experience designing, integrating, and programming automated systems using LabVIEW. Like all engineers John is a natural problem solver, "Everything is a problem and one just has to work hard to solve that problem." In his spare time John enjoys fantasy, sci-fi, medieval/renaissance books and movies, and working on his home.



Scott Blackwell joined Viewpoint as a Software Engineer in December of 2005. Prior to joining Viewpoint Scott worked as a Manufacturing Engineer where he extensively used his degrees (B.S and M.S) in Computer Integrated Manufacturing. "Working as a Software Engineer perfectly matches my career objective, and Viewpoint is the ideal employer to work for based on my skills and background." Scott enjoys reading programming books and historical fiction while not at work as well as woodworking, camping, fishing, hiking, bicycling.



Michael Dudley joined Viewpoint as a co-op back in November of 2005 is focusing on developing database-driven, xml-based web interfaces that summarize and display test results. Michael's time at RIT studying for his dual BS/MS in Computer Engineering is serving him well in this co-op as he draws extensively on his experiences for his current assignment. Outside of work Michael enjoys playing the cello and as a self described "mad scientist" built a solar mirror array with 1600 mirrors in an effort to "...hopefully melt aluminum cans, once it is aligned properly."



Josh Lewis joined Viewpoint as a co-op back in March of 2005 for an extended co-op block and has returned to Viewpoint in December for a second co-op. Josh has a rich background, receiving his Associates degree in chemical technology from Corning Community College, and is currently studying Computer Science at RIT with a minor in Psychology. Josh enjoys going to concerts, playing video games, and after a long working day relaxing with friends.

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800 West Metro Parkway,  
Rochester, NY 14623 USA.

Phone: 585 475 9555

Email: [info@ViewpointUSA.com](mailto:info@ViewpointUSA.com)

Newsletter Staff

Editor-In-Chief, James Campbell

Senior Editor, Benjamin Hysell

Contributing Editor, Fred Genett

Publisher, Carol Scheuer

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800 West Metro Parkway

Rochester, NY 14623

ph: (585) 475-9555

[www.ViewpointUSA.com](http://www.ViewpointUSA.com)